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ABSTRACT BOOK

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Oral Presentations

1st Oral Abstract

1- **Title**: Safety and Efficacy of Engineered Tissue Composed Of Silk Fibroin and Collagen Seeded With Autologous Chondrocytes in Patients with Cartilage Defects: A Pilot Clinical Trial Study

Authors: Mohammad Naghi Tahmasebi, Arash Sherafatvaziri, Somayeh Kazemnejad, Maryam Darzi, Somayeh Khorasani, Mohammad Tahami

Aim: Osteochondral articular defects represent a key concern in orthopedic surgery. Current surgical techniques to repair osteochondral defects lead to poor subchondral bone regeneration and fibrocartilage formation often associated with joint pain and stiffness. The objective of this pilot clinical study was to test safety and performance of our newly developed collagen/fibroin scaffold which reproduces cartilage-subchondral bone morphology.

Methods: After a preclinical animal study in rabbit that gave us promising results, we performed the pilot clinical study in two patients with knee osteochondral lesions (first with patella lesion size of 6 cm2 and second with medial femoral condyle lesion of 9 cm2) using personalized engineered tissue composed of scaffold and autologous chondrocytes. The patients were assessed according to International Knee Documentation Committee (IKDC), and Visual Analogue Scale (VAS) at baseline, 12 months after surgery. The second MRI was performed at 12 months

Results: IKDC objective score improved after 1 year showing a normal or nearly normal knee in both patients at 1 year of follow up. Similar results were obtained with VAS score. Second MRI showed signs of cartilage coverage of defect.

Discussion & Conclusion: This open surgery was used for treatment of large chondral defects. The results of this technique at short follow-up are encouraging. A big clinical study with a longer follow up and randomized studies are required to confirm the high potential of this novel engineered tissue.

Keywords: cartilage tissue engineering, scaffold, chondrocyte, clinical trial

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2nd Oral Abstract

2- **Title**: Revision Single-Stage Anterior Cruciate Ligament Reconstruction Using an Anterolateral Tibial Tunnel

Authors: Sohrab Keyhani, Mehran Soleymanha

Aim: Revision anterior cruciate ligament (ACL) reconstruction is a technically demanding enterprise. Management of widened or previously malpositioned tunnels is hallenging and often requires innovative approaches. The purpose of this study was to evaluate the function and clinical results of revision single-stage ACL surgery using an anterolateral tibial tunnel (ALTT).

Methods: A consecutive series of knees with arthroscopic ACL revision surgery were analyzed prospectively between April 2012 and September 2015. Among the 93 patients presented with revision ACL reconstruction, 25 patients met the study inclusion criteria for the ALTT technique and were followed up for a minimumof 2 years (range: 24–51 months). Inclusion criteria were ACL reconstruction failure with tibia tunnel malposition or widening more than 14 mm. Exclusion criteria were age < 18 or > 60, infection, chondral damage > grade III (International Cartilage Repair Society, ICRS; candidate for osteotomy), untreated associated ligament injury, uncorrected lower limb malalignment, and previous meniscectomy. ACL graft rerupture was diagnosed by means of clinical examination (Lachman's test in 20-degree knee flexion, positive pivot shift test, and positive anterior drawer) and confirmed by magnetic resonance imaging (MRI). Three-dimensional computed tomography (CT) imagingwas obtained for all patients to assess the femoral and tibial tunnels.

The clinical results were evaluated by means of the Lysholm score, International Knee Documentation Committee (IKDC) score, and Tegner activity level scale. Knee stability was assessed by the Lachman test, pivot shift test, and anterior drawer test. Magnetic resonance imaging (MRI) of the index knee before the surgery and 2 years after revision surgery was assessed.

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Results: The mean Lysholmscore, the mean IKDC subjective score, and the mean Tegner activity level scale were improved significantly postoperatively ($p < 0.001$). Any grade II or III, more instability in sagittal plane, or positive pivot shift test was defined as a failure. None of 25 cases had the anteroposterior laxity or pivot shift test in follow-up visit 6 months after the operation but two cases had a subsequent failure of revision due to new trauma.

Discussion & Conclusion: Overall, using the ALTT in ACL revision surgery to overcome the widening issue has not been emphasized enough in previous clinical studies. The clinical outcomes of this initial case series are very encouraging in the midterm follow-up period. Regular follow-up physical examinations in the case series showed that desired anteroposterior and rotational stability of the knee joint could be reached using a lateral tibial tunnel technique. In this study, the lateral tibial tunnel technique of ACL revision surgery provides three clear benefits. First, there is no need for second-stage operation.

Second, patients could return to their work and sports activities faster than two stage revision. Third, graft fixation through the new tibial tunnel with good-quality surrounding native bone could be stronger than previous dilated tunnel which has been filled with allograft. The mean length of the ALTT in this study was 35.8 mm (32–43 mm); this means that the lateral tibial tunnel technique provides acceptable tunnel length to achieve proper and strong fixation of the allograft in revision reconstruction of ACL.

This study showed that ACL revision surgery with ALTT can reliably restore stability and provide fair functional outcomes in patients with ACL retear. One could expect acceptable lateral tibial tunnel length compared with medial tibial tunnel in classic ACL revision, intact bony surround, and good graft fixation. This technique is clinically relevant in that making an anterolateral tunnel in one-stage ACL revision surgery had a good subjective result with low complication rate in midterm follow-up.

Keywords: anterior cruciate ligament, revision anterior cruciate ligament reconstruction, anterolateral tibial tunnel, single-stage

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3rd Oral Abstract

3- **Title**: Rotating Hinge Knee Causes Lower Bone-Implant Interface Stress Compared To Constrained Condylar Knee Replacement

Authors: David Backstein, Mansour Abolghasemian, Saeid Samiezadeh, Habiba Bougherara, Darryl D'Lima

Aim: To compare the stresses at bone-arthroplasty interface of constrained and semiconstrained knee prostheses, using the finite element (FE) method as a predictor of the survivorship of the implants.

Methods: Three-dimensional FE models of the knee implanted with rotating hinge (RHK) and legacy constrained condylar (LCCK) prostheses were generated to study the loads and stresses for two situations: medial- and lateral collateral ligament deficiencies in full extension.

Results: On average, the shear stress developed at bone-implant interface dropped from 16.9 MPa to 13.7 MPa (18.9%), and the interface von-Mises stress lowered from 37.6 MPa to 30.2 MPa (19.6%) in RHK compared to those in LCCK prostheses. RHK design also resulted in a more uniform stress distribution at the interfaces in both femur and tibia. The average polyethylene liner stress dropped from 9.6 MPa to 2.6 MPa (a 72.7% decrease) in RHK design when compared to that in LCCK design.

Discussion & Conclusion: The more uniform interface stress suggests fewer density changes at the periprosthetic regions due to bone remodelling. Moreover, the lower polyethylene stresses are likely to reduce wear and damage. These findings reveal that the RHK design may have more favorable mechanical features compared to LCCK design in full extension boundary conditions, implying a potentially better survivorship.

However, the findings should be interpreted cautiously as other configurations were not investigated.

Keywords: Knee revision, LCCK, RHK, constraint

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4- **Title**: Hyperplasia: A Risk Factor For Periprosthetic Joint Infection In Male Patients

Authors: Hamidreza Yazdi, Camilo Restrepo, Mohammed Hammad, Leonard Gomella, Paul Chung, Javad Parvizi

Aim: Total joint arthroplasty (TJA) has been growing in popularity due to its excellent success rate allowing continued mobility and function for millions of patients with degenerative joint disease.

Despite this great success, periprosthetic joint infection (PJI) remains a rare, yet devastating, complication that continues to haunt the outcome of TJA. It occurs in 1-2% of TJA procedures [8-10] in the United States and is one of the most common reasons for TJA revision. These revisions have become a tremendous burden to the society, healthcare, and more importantly to the patients, with a projected cost that will exceed $13 billion in 2030. Thus, it is of paramount importance that every effort is made to minimize the risk of PJI.

There are many risk factors for PJI. In most studies, the prevalence of PJI has been higher among the male population. Studies have hypothesized that the immune system of males and females differ in their response to a pathogen as a result of modulation effect of sex hormones and sexual chromosome genetic content. The difference in skin microorganisms may be another possible reason for the difference in the rate of PJI between cases. Despite these hypotheses, the exact reason for the higher rate of PJI among males remains unknown.

Benign prostatic hyperplasia (BPH) is a common chronic condition that affects millions of the aging male population. Bladder outflow obstruction can arise secondary to BPH predisposing the affected male patient to urinary tract infection (UTI). This can lead to organisms gaining access to the joint via the bloodstream. This study hypothesized that patients with symptomatic BPH are at increased risk of infection because of the potential for transient bacteremia or UTI that may exist in these patients.

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Methods: Following institutional review board approval, a prospectively maintained institutional database was utilized to identify all male patients undergoing TJA between January 1st, 2006 to April 30th, 2017. All patients that had primary or revision total hip or knee arthroplasty were included. Patients who underwent revision TJA due to PJI without a past history of aseptic TJA were excluded. If a patient had multiple TJA on more than one joint, each joint was considered as a separate case. If a patient had both primary and revision TJA at our institution for the same joint, it was considered as a revision case. A total of 12,902 patients were included in this study. The mean age was 62.47 ± 11.8 (15-98) years and the mean body mass index (BMI) was 30.1 ± 5.5 kg/m^2 (15-68).

Majority of patients were Caucasians or African Americans. Most of the surgeries were on hip joints (57.8%) and primary arthroplasty (86%) (Appendix 1). Of these patients, 386 (3%) had symptomatic BPH based on the International Classification of Diseases, 9th and 10th Revision (ICD-9/10) followed by manual confirmation, past medical history of symptomatic BPH based on verbal report of being treated or a history of current BPH-related drug medications.

We mandated a one year follow up that lead to excluding 2,338 patients (792 patients were excluded due to loss of follow-up and 1,546 patients because of less than one year follow-up). Finally, we had 305 TJA with symptomatic BPH, and 10,258 TJA without symptomatic BPH.

The institutional database was queried to obtain the following variables: age, type of surgery (primary or revision), type of joint operated (knee or hip), laterality (unilateral or simultaneous bilateral), tumors or no tumors, osteoarthritis (OA) or rheumatoid arthritis (RA), race, BMI, comorbidities and culture results and details of urinary tract infections (if any).

The 250 symptomatic BPH patients were then matched in a 1:3 ratio to 708 patients based on age±5 years, date of surgery±2.5 years, joints operated, type of surgery, laterality, tumor/no tumor, OA/RA, BMI±3Kg/m^2, and Charlson Comorbidity Index (CCI)±2. Using the International Consensus Definition (ICM), patients who developed PJI following TJA were identified. All patients were followed-up for at least 12 months with a mean follow up of 60.5 (12 - 152.1) months.

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Results: *Unmatched Study Populations:*

Overall, 3% of males had symptomatic BPH. 84.3% of symptomatic BPH group had primary TJA and 50.2% had TKA. Most of the surgeries in this group were nontumoral (95.7%) and mainly on osteoarthritic joints (95.4%). The PJI rate in symptomatic BPH cohort was 7.9% versus 2.8% in controls.

The preliminary analyses showed that symptomatic BPH groups were older. Races other than Caucasians and African Americans were more common in symptomatic BPH patients. This group also had more knee surgeries, bilateral simultaneous TJA, primary or metastatic bone tumor, and RA incidences, high comorbidity indexes and PJI (all $p<0.05$, Table 2). Both groups were similar in BMI and revision incidence.

In the PJI group, the joint infection chronicity, UTI incidence and urine culture results were similar in symptomatic BPH and controls ($p=0.12$, 0.67 and 0.85, respectively).

The culture results from infected joints, showed that the majority of infections in symptomatic BPH group were positive for multi bacteria ingrowth or had negative results (culture negative infections) ($p=0.008$).

With regard to PJI outcome, the bivariate analyses showed that, revision surgery (Odds ratio [OR]:30.69 95% Confidence interval [CI]: 21.92 – 42.98, p= 0.000), symptomatic BPH (OR: 2.99, 95% CI: 1.91 – 4.67, p=0.000), bilateral simultaneous (OR: 7.72, 95% CI: 3.98 – 14.97, p=0.000), age (OR: 1.81, 95% CI:1.34 – 2.45, p= 0.000), race other than Caucasians and African Americans (OR: 6.48, 95% CI: 4.14 – 10.16 , p=0.000), RA (OR:3.54, 95% CI: 1.40 – 8.91, p= 0.01) and tumor surgery (OR:5.71, 95% CI: 2.93 – 11.16, p=0.000), were statistically significantly associated with higher odds of infection.

After controlling for confounding variables and with multimodal regression analysis, revision surgery (OR: 24.38, 95% CI: 13.42 – 44.31, p= 0.000), symptomatic BPH (OR: 8.13, 95% CI: 0.97 – 66.67, p=0.05) and race other than Caucasians and African Americans (OR: 4.82, 95% CI: 2.69 – 8.64, p= 0.000) were associated with higher rate of PJI.

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Matched Study Populations:

We matched 250 cases with symptomatic BPH with 708 patients in the control group. Both matched group were similar in age, BMI, CCI, Elixhauser, hip/knee, primary/revision,

unilateral/bilateral simultaneous surgeries, tumor/no tumor and OA/RA (all p-values>0.05. Race was not included in the matching process as Caucasians and African Americans were less common than others in symptomatic BPH groups.

The analyses demonstrated that symptomatic BPH group had a statistically significantly higher risk for PJI than controls (OR: 2.21, 95% CI: 1.18 – 4.15, p=0.01). Any race, other than Caucasians, and African Americans, also had higher risk of PJI in the symptomatic BPH group compared to controls (OR: 6.84, 95% CI: 3.142-14.927 p=0.000).

PJI patients had similar UTI incidence (p=0.28) and joint infection chronicity (p=0.66). Culture-negative of infected joints, was more in the BPH group although the p-value was marginally significant (p=0.06). Other infective organisms including Methicillin susceptible *staphylococcus aureus* (MSSA), Methicillin resistant *staphylococcus aureus* (MRSA), gram-negative and multi-bacterial, were similar in both groups.

Discussion & Conclusion: Patients with symptomatic benign prostatic hyperplasia carry a higher risk of periprosthetic joint infection compared to controls. This may partly explain the higher rate of periprosthetic joint infection that is seen in male patients.

Keywords: Benign prostatic hyperplasia; Prosthetic joint; infection; Male

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5- **Title**: Outcome Of Unicompartment Knee Arthroplasty With ACL Deficiency And Excessive Posteromedial Wear Of Tibia

Authors: Seyed Mohammadjavad Mortazavi, Ali Okati, FMY Khan, Abbas Noori

Aim: Unicompartment Knee Arthroplasty (UKA) is a noble option of joint reconstruction in patients with osteoarthritis (OA) contained to one compartment of the knee. Medial UKA can be performed in patients with normal lateral compartment, stable patella-femoral joint and healthy cruciate ligaments. A decent Anterior Cruciate Ligament (ACL), is long believed prerequisite for efficacious UKA.

Methods: We studied eleven patients who underwent UKA. Preoperatively no ligamentous instability or no excessive posterior tibial wear was noted in these patients, therefore no Magnetic Resonance Imaging (MRI) or Commutated Tomography (CT) scans were performed. However intraoperatively ACL deficiency and posterior tibial slope wear was identified. Owing to acceptable stability and other healthy ligaments, we decided to refrain from reconstruction of ACL or other tibial slope altering procedures. Patients was scored with Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) preoperatively and post operatively on follow up.

Results: Excellent clinical outcome is observed in these patients with good range of motion.

Two-year follow shows no need for revision. No instability is noted. WOMAC score showed good functionality.

Discussion & Conclusion: ACL insufficiency is not an absolute contradiction of UKA, specifically while using fixed bearing design. Wearing of posteromedial slope of tibia does not affect the outcome in UKA. Excellent outcome of UKA can be expected without ACL reconstruction or tibial slope altering procedures in ACL insufficient knees.

Keywords: Knee; Unicompartment; Arthroplasty; ACL; Tibial slope; Outcome study

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6- **Title**: Comparison Of Functional Motor Control Exercises With Conditioning Training On Pain And Function In Wrestlers With Iliotibial Band Syndrome

Authors: Mojtaba Jahanshahi, Mohammadhosein Nasermelli, Pouya Rabiei, Maarten Moen, Behnaz Ganji Naming

Aim: Iliotibial Band Syndrome (ITBS) is known as one of the common overuse injuries in different athletic activities. However, improving function in athletes with ITBS is still a controversial matter. From the histological and patho-kiniosiological points of view, ITBS has been associated with shortness of tensor fasciae latae muscle and consequently weakness in the gluteal muscles. As a result, it leads to ITBS, changing in movement pattern, creating muscle imbalance and problems like Trendelenburg position. On the other hand, gluteal muscles weakness and decreased hip abductor moment can lead to hip adduction and internal rotation during performing functional activities (i.e., single-legged activities) or in stance phase of running that in turn can increase the risks of ITBS or other knee related injuries. Thus, all together, this study aimed to compare two different strategies (functional motor control (FMC) exercises and conditioning training (CT)) on pain and function (performance, muscle strength and hip and knee joints' ranges of motion (ROM) in elite Greco-Roman wrestlers with ITBS.

Methods: Sixty elite Greco-Roman wrestlers with ITBS were randomly allocated to FMC exercises, CT, and control a group (20 individuals for each group). Subjects in experimental groups passed 8 weeks, 3 sessions per week (60-90 minutes) of FMC and CT. CT included four inhibit, lengthening, activation, and integration stages. 1st and 2nd stages focused on inhibiting and lengthening of the short tensor fasciata Lata, ITB, hip adductors, and quadratus lumborum muscles. 3rd stage used to activate and increase the strength of two vital and mostly weak gluteus maximus and medius muscles. Finally, in 4th stage, specific exercises for improving lateral muscle subsystem were selected with the aim of improving synergistic muscle cocontraction. In FMC exorcises, the aim was to increase the cognitive and automatic control of the knee's kinematics. Exercises were: 1. The opposite foot on

low step with hand support, 2. The opposite foot on low step without hand support, 3. The opposite lower leg facing the wall, 4. The opposite foot facing the wall, 5. Only hand supported, 6. Without support. Subjects in control group received no specific exercises. At baseline and after 8 weeks of intervention, primary outcome (pain) was assessed by Visual Analogue Scale (VAS). Performance was assessed by 3 triple hop test for distance, single leg vertical jump, and modified agility T tests. Hip abductor and internal/external rotator muscles, and knee flexor/extensor muscles strength assessed by a hand-held dynamometer, and hip abduction/adduction, internal/external, and knee flexion/extension ROMs measured with a goniometer. The ANOVA statistical test was used for statistical analysis.

Results: The results showed that although both intervention could significantly reduce pain and improve performance compared to the control group; however, in both, FMC was more effective than CT ($p \leq 0.005$). In terms of (hip abduction, internal/external rotation, and knee flexion/extension) muscle strength, significant differences ($p \leq 0.005$) were observed between FMC and CT compared to control group. Also, FMC showed more significant impact ($p \leq 0.005$) in comparison with CT. Significant differences ($p \leq 0.005$) were observed between FMC and CT compared to control group in all ROM outcomes. Between two FMC and CT groups, CT was more effective than FMC in improving hip abduction/adduction and external/internal rotations as well as knee flexion/extension ROMs ($p \leq 0.005$).

Discussion & Conclusion: Regarding the effect of FMC on muscle strength, one reason for this effectiveness can be seen in the nature of FMC exercises in the current protocol. Analysis of FMC exercises indicates that one-foot squat movement can be accompanied with empowerment and deployment of gluteus medius (MVC, %82), quadriceps femoris (160% MVC under 90 degrees of flexion and 50% MVC in 10 degrees of flexion) and hamstring muscles (30-90% MVC in 10 to 90 degrees of flexion) (30, 31). This factor can question the 3rd phase (activation phase) in the CT, in which the muscles have been trained in isolation and in the open chain kinematic exercises. Hence, the superiority of FMC exercises can be justified to CT in the hip and knee muscles. Also another factor that should be taken into account is the longer period in which FMC exercises have been applied (8 weeks), while CT are provided

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in 3 separate phases and the maximum training time has been only 3 weeks. On the other hand, one reason for superiority of CT in increasing the ROM is the techniques which increase the length in the 2nd phase of the exercises. These techniques included static stretching. Static stretching is a flexible technique used to grow elasticity of muscle and connective tissue and increase joint's ROM via creating mechanical and neural adaptation. This mechanical adaptation can affect the viscoelastic properties of the shortened neuro-myofascial tissue and consequently caused joint's ROM improvement. Finally, it is concluded that FMC exercises was superior to CT in terms of pain, performance, and muscle strength while CT was more effective than FMC exercises in joints' ROMs. Although study showed that both interventions can be utilized in improving function in wrestlers with ITBS, more investigations are required.

Keywords: Athletes; Iliotibial Band Syndrome; Motor Control; Muscle Strength; Range of Motion

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7- **Title**: Medial Meniscus Locked Bucket Handle Tears Repair, Using Posteromedial And Posterolateral Approach; A Consistent Series Of 48 Patients

Authors: Mehran Soleymanha, Sohrab Keyhani

Aim: Evaluation clinical outcomes and technical aspects of arthroscopic repair and proper suturing the posterior third of the locked bucket handle meniscal tears (BHMTs) of the medial meniscus including "Corner point" and using the modified all inside technique through the posterior portals.

Methods: 52 patients underwent arthroscopic repair for the locked BHMTs of the medial meniscus concomitant with the ACL reconstruction were enrolled in the study after qualification. A modified repair technique under direct vision through the posterolateral transseptal portal view was used in all patients. Patients were assessed by the International Knee Documentation Committee (IKDC) scores, Lysholm score and Tegner activity level scale.

Results: Forty-eight (36 men and 12 women) patients were followed up for a minimum of 3 years (range 36-58 months). The mean, Tegner activity level scale, IKDC and Lysholm score significantly improved in all study participants ($p < 0.001$). In all patients' clinical examination showed negative Lachman and Pivot shift test. No limitation of motion,

synovitis or hemarthrosis, infection, popliteal neurovascular, peroneal nerve injury and other major complication were observed.

Discussion & Conclusion: This study provides evidence that modified all inside technique through the posterior portals may be practical, safe with minimal risk of injury to the neurovascular structure in repair for the locked BHMTs of the medial meniscus tears during ACL reconstruction. Repair with this technique could be clinically relevant as improves surgery outcomes while facilitating secure stabilization of the locked BHMTs using vertically oriented mattress sutures along with the posterior third especially corner point of the medial meniscus. That is medial meniscus attachment to semimembranosus.

Keywords: bucket handle meniscal tears, medial meniscus, posteromedial approach, posterolateral transseptal portal

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8- **Title**: Kinematic And Mechanical Alignment In Total Knee Arthroplasty; A Randomized Control Trial

Authors: Mohammad Mahdi Sarzaeem, Farzad Amuzadeh Omrani, Mahdi Aghaalikhani

Aim: Setting alignment after total knee arthroplasty is a necessary step in this surgical procedure. The aim of the alignment is to obtain a stable and well-aligned tibiofemoral and patellofemoral joint as well as longterm patient satisfaction. In the kinematic alignment (KA), the knee joints be built as the basis of the patient's anatomy. The aim of this study is to compare kinematic alignment with mechanical alignment in total knee arthroplasty.

Methods: In this randomized clinical trial, 45 patients who underwent bilateral total knee arthroplasty were enrolled. One of the knee was aligned kinematically and the other knee was aligned mechanically in each patient. All of the surgical procedures were done through subvastus approach. After arthroplasty, the patients were assessed at the second, 6th and 12th month in addition to the first and third week of the postoperative period. The patients' assessments were done by an orthopedic surgeon who was completely blind than the study. Oxford knee, WOMAC and SF-36 scores were used for following the patients. In addition, the patients range of motion were measured by Goniometer, timed up and go (TUG), two-minute walk, timed up and down stairs. Furthermore, the knee alignment was explored pre and post operatively through the three joint view radiography.

Results: The kinematic and mechanical alignments were similar with each other in terms of the range of motion. Component placement in the kinematic alignment was more anatomical. oxford knee score was 42.6 in kinematic alignment which was higher than mechanical alignment (41); moreover, WOMAC score was 92 and 88 in kinematic and mechanical alignment respectively. Failure to treatment was not seen in the oneyear follow-up.

Discussion & Conclusion: kinematic alignment after total knee arthroplasty in effective in terms of knee function and patients satisfaction. In addition, failure of the treatment in the kinematic alignment may be lower due to the use of components in this method.

Keywords: kinematic alignment; mechanical alignment; total knee arthroplasty

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9- **Title**: The Relationship Of TFI And Meniscal Injury In Patients With Anterior Cruciate Ligament Tears

Authors: Seyed Mohammadjavad Mortazavi, Nima Bagheri, Ali Okati, Mohammad Moharrami, SS Tamehri

Aim: ACL (anterior cruciate ligament) is one of the main structures in knee that stabilized knee joint in anteroposterior plain. Previous studies shown that increasing time from ACL injury (TFI) could lead to meniscal injury especially medial meniscus. We developed present study to uncover that the relationship of TFI, BMI and age with pattern of Meniscal injury.

Methods: in present retrospective cohort study, we included 111 patients who had a reconstructed ACL injury in our institution. All patients were followed with a mean of 23 months and Lyshorm score, pain VAS score were performed for all patients. We extracted the meniscal condition in operation from HIS (Hospital Information System).

Results: From January 2015 to September 2018, present study included 111 patients (102 male, 9 female) with mean age of 27.9 years. All patients were followed with a mean time of 23.2 months (range: 3 to 46 months). Present study showed that mean TFI of patients with Medial meniscal injury was 17.4 ±16.8 and significantly was higher than the Patients with Lateral meniscal injury (9.3 ±8.3 months) and intact meniscus (7.4 ±8.1 months) (P=0.001). Current study showed that the patients had TFI lower than 6 months significantly had higher rate of intact meniscus and increasing TFI higher than 6 months could increase the rate of Medial meniscal injury (P=0.001). There were no significant differences in Age, BMI and gender between groups of meniscal injury. In final follow-up visit, the patients had 94 % satisfaction rate and the mean of Lyshorm score was 87.1 ±13.7 and pain VAS score was 2.7 ±2.3.

Discussion & Conclusion: in conclusion, this study explore that there was a correlation between increasing time from ACL injury and rate of Medial Meniscal injury. Present study investigate that it is suggestible patients with ACL tear should be reconstructed in golden time (lower than 6 months) to prevent from meniscal damage.

Keywords: ACL tear, Meniscal injury, TFI, Time from Injury

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10- **Title**: Graft Passage Optimization In Posterior Cruciate Ligament Reconstruction Using A Newly Introduced Device

Authors: Abolfazl Bagherifard, Mahmoud Jabalameli, Hooman Yahyazadeh, Alireza Mirzaei, Mehdi Moayedifar

Aim: Posterior cruciate ligament (PCL) reconstruction is a challenging operation for orthopedic surgeons. The lead suture passing through the tibial tunnel is one of the most difficult and time-consuming parts of this surgery. For this purpose, the guide wire will be introduced to the tunnel in outside-in fashion to facilitate the passage of lead suture. However, due to the poor visualization and capsular adhesion of the posterior tibia, tracing of the guide wire is troublesome, particularly in patients with intact anterior cruciate ligament (ACL). We designed a lasso-shaped device with curvatures similar to PCL offset guide. We hypothesized that this device considerably reduces the timing of graft passage by easing of guide wire tracing in an inside-out fashion. Here, we aimed to evaluate this hypothesis.

Methods: In a prospective pilot study, a total of 16 patients with ACL and PCL ruptures who were elected for surgical reconstruction were included. The patients were randomized in the case and control group. In the case group, the guide wire passage was done using the newly introduced device. In the control group guide wire passage according to the inside-out conventional method. The timing of the guide wire passage through the tibial tunnel was compared between the case and control group. All the surgeries were performed by a single senior knee surgeon with a similar joint preparation technique.

Results: The mean age of the patients was 28.6±5.2 years in the case and 29.1±4.8 years in the control group. This difference was not statistically significant (p=0.61). All patients were male. The mean duration past the injury was 7.3±3.3 months in the case and 7.6±3.1 months in the control group. This difference was not statistically significant as well (p=0.53). The mean time of guide wire passage was 6.2±2.8 min (range 3 to 10 min) and 19±10.6 min (range 6 to 41 min) in the control group.

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This difference was statistically significant ($p<0.001$). The guide wire passage was event-free in both groups.

Discussion & Conclusion: Despite advances in PCL reconstruction techniques, many aspects of this surgery, such as surgical approach, graft choice, and reconstruction technique, remain to be optimized. Graft passage, as one of the most complicated and time-consuming parts of this surgery, also needs to be improved. In this study, we showed that the timing of a graft passage could be considerably facilitated using the newly introduced lasso-shaped device in an inside-out approach. Subsequently, the timing of this graft passage step will be considerably reduced. In conclusion, we recommend using this device in future PCL reconstruction workouts

Keywords: Posterior cruciate ligament, reconstruction, graft passage, lead suture.

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11- **Title**: Standing Spinopelvic Parameters Is Not Different In Patients with Hip Osteoarthritis

Authors: Seyed Mohammadjavad Mortazavi, Mohammadali Ghasemi, Hosein Shafiei, Nima Bagheri

Aim: The role of pelvic incidence (PI) or measurement of other pelvic parameters such as sacral slope (SS) and pelvic tilt (PT) in hip osteoarthritis(OA) leading to Total Hip Arthroplasty (THA) is unclear. Therefore, we undertook this study to evaluate if pelvic incidence has any relevance in degenerative hip disease leading to THA.

Methods: This cohort study piloted on 120 people, 60 normal individuals as control group and 60 who underwent THA due to degenerative joint disease. We measured PI, SS and PT preoperatively in 60 patients with severe osteoarthritis who underwent THA and compared it with 60 normal individuals. SPSS 20 for windows used to analyze the data.

Results: The demographic characteristic of two groups were not significantly different. The mean PI angle were 50.5 degrees (27.9 - 84.5) in control group and 51(27.7 to 78.1) in patients with hip OA (P>0.05). The mean PT were 12.6 degrees (1.0-25.0) in controls and 11.2 degrees (1.8 and 24.8) in patients (P>0.05). The mean SS were 39.1 degrees (19 to 60.), and 44.4 degrees in patients with hip OA (P>0.05).

Discussion & Conclusion: Our study showed that standing spinopelvic parameters in patients with hip OA ins not significantly different from patients without hip disease.

Keywords:

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12- **Title**: Tranexamic Acid Is Associated With Reduced Periprosthetic Joint Infection After Primary Total Joint Arthroplasty

Authors: Hamidreza Yazdi, Mitchell R. Klement, Daisuke Inoue, Chi Xu, Karan Goswami, Javad Parvizi

Aim: Periprosthetic joint infection (PJI) is a rare, yet a devastating, complication of total joint arthroplasty (TJA). It occurs in 1-2% of TJA procedures and is one of the most common reasons for TJA revision. By 2030, primary TJA has been projected to grow by 174% to 572,000 for primary total hip arthroplasty (THA) and by 673% to 3.48 million for primary total knee arthroplasty (TKA). Failures of TJA because of complications such as infection, loosening, periprosthetic fracture, and postoperative pain are indications for revision surgery. These revisions will become a tremendous burden to the health systems, with a projected estimate for cost of $13 billion in 2030. Given the increased demands for arthroplasty, patients should be perioperatively optimized to minimize the incidence of PJI, and other complications, following TJA. Preoperative anemia and blood loss during primary total joint arthroplasty (TJA) leading to allogeneic blood transfusion, have been identified as risk factors for surgical site infection (SSI) and PJI in TJA. This has led to a growing increase in the use of antifibrinolytic drugs to reduce blood loss and blood transfusion post TJA. The results from previous studies and extensive meta-analysis have established that tranexamic acid (TXA) is a safe and effective drug for reducing blood loss and the need for allogeneic blood transfusion post-TJA. Although efficacy of TXA in reducing blood loss and the need for allogeneic blood transfusion has been well established, the potential role of TXA in redcuing PJI following TJA has not been elucidated. This study was conceived to examine the hypothesis that administration of intravenous (IV) TXA can lead to a reduction of PJI after primary TJA.

Methods: Following institutional review board (IRB) approval, a prospectively maintained, single-institution database was queried to identify 7,725 patients undergoing primary TJA between January1st, 2013 to June 31st, 2017. All patients

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who had primary total hip or knee arthroplasty were included. For patients who had multiple joints replacement, each joint was considered as a separate case. Patients undergoing revision arthroplasty, primary arthroplasty in tumor cases, and those with inadequate follow-up (1012) were excluded. Overall, 6,340cases were included in the study with minimum 1-year follow-up. Of these, 2,927 (46.2%) were male. The mean age was 64.72± 10.7 years (range, 12-98 years) and the mean body mass index (BMI) was 29.8± 5.3 Kg/m2 (range, 14- 58.3 Kg/m2) (Table 1). The mean follow-up was 26.3 months (range, 12-67.3 months). The cohort was divided into two groups. Patients who received intravenous TXA prior to arthroplasty (3,683 patients) and those who did not receive TXA (2,657 patients). Patients in the TXA group were all administered a single dose of TXA (15 mg/kg) intravenously (IV), 20-30 minutes prior to incision or inflation of tourniquet. The antibiotic and postoperative care was the same for both patient groups. The majority of patients (91.8%) in the study received aspirin (325mg/d or 81mg bid) for 4 weeks postoperatively. Using the World Health Organization (WHO) definition, preoperative anemia was defined as hemoglobin (Hgb) < 13g/dL in males and Hgb < 12g/dL in females. Patient demographics, comorbidities, operative details, and perioperative variables were recorded and compared across the two cohorts. Patients who developed PJI following primary TJA were identified using the 2018 International Consensus Meeting definition and subsequently confirmed by manual chart review.

Results: Overall, 3,683 patients (58.1%) received intravenous preoperative TXA. The overall incidence of preoperative anemia was 16%, postoperative blood transfusion was 1.8%, and PJI rate was 2.4%. Most of TJA surgeries were done under neuroaxial anesthesia (91.7%) and nearly all (96.6%) of total knee replacements were done under tourniquet. The preliminary analyses showed that patients receiving TXA were younger, more likely to be female, had a lower BMI and comorbidities, and undergoing THA. This group was also more likely to receive aspirin (for DVT prophylaxis) and had less anemia (all $p<0.05$). The outcome measurement showed that TXA group have a smaller postoperative hemoglobin decrease, less need for allogeneic blood transfusion, shorter length of hospitalization, less wound complications and lower PJI rate (all $p<0.05$). Intraoperative blood loss, 90-days

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readmission and postoperative thromboembolic events were similar in both groups. With regard to PJI rate, bivariate analyses showed that rheumatoid arthritis (Odd ratio(OR): 5.07, 95%CI: 3.28-7.83 ,P=0.000),higher BMI (OR: 1.06, 95%CI:1.03-1.09,P=0.000), higher Charlson Comorbidity index (OR: 1.27, 95% CI: 1.13-1.43,p= 0.000),male gender(OR: 1.58, 95%CI: 1.14- 2.20, p= 0.005),renal disease(OR: 3.86, 95%CI: 2.22-6.73, p=0.000), liver disease(OR: 3.74, 95%CI:1.33-10.54, p= 0.01), coagulopathies (OR:2.54, 95%CI:1.09-5.88, p=0.03), longer length of hospital stay(OR:1.18, 95%CI:1.13-1.23, p=0.000), longer operation time(OR: 1.01,95%CI:1.01-1.02, p=0.000) and anemia(OR: 4.63, 95%CI: 3.31- 6.46 p=0.000), were associated with higher odd of PJI. Administration of TXA (OR: 0.47, 95%CI: 0.34- 0.66, p=0.000), neuroaxial anesthesia (OR: 0.32, 95%CI:0.21-0.48, p=0.000) and simultaneous bilateral surgeries (OR: 0.24, 95%CI: 0.06, 0.96, p=0.04) were associated with lowered odds of infection. After controlling for confounding variables, multivariate analysis showed that administration of TXA (OR: 0.68, 95%CI: 0.46- 0.99, p=0.04) was associated with lower rate of PJI. TXA also was more effective in nonanemics (OR: 0.52, 95%CI: 0.32- 0.84, p= 0.008) and patients undergoing hip arthroplasty (OR: 0.50, 95%CI: 0.31- 0.81, p= 0.005) than anemic patients and those undergoing knee arthroplasty.

Discussion & Conclusion: Based on the findings of this study, tranexamic acid appears to be associated with reduced PJI following primary TJA. Although the exact reason for such finding is unknown, we speculate that the beneficial effect on TXA may relate to its efficacy in reducing blood loss and the need for allogeneic transfusion, both of which are known to influence surgical site infection after all surgical procedures including total joint arthroplasty.

Keywords: Tranexamic Acid; Periprosthetic Joint Infection; Anemia; Primary Joint Arthroplasty; Complications

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13- **Title**: Arthroscopic Treatment of Diffuse Pigmented Villonodular Synovitis of the Knee: Complete Synovectomy and Septum Removal- Midterm Results

Authors: Sohrab Keyhani, Mehran Soleymanha

Aim: The purpose of this study was to evaluate and describe the clinical results of complete arthroscopic synovectomy through the four arthroscopic portals in the knees affected by diffuse pigmented villonodular synovitis (DPVNS).

Methods: Between 2009 and 2012, 21 patients (15 men and 6 women) with histologically confirmed DPVNS of the knee were enrolled in the study after qualification. In all cases, PVNS was preliminary diagnosed with the aid of magnetic resonance imaging (MRI) and further confirmed via postsurgical pathologic examination.

Inclusion criteria: clinical examination, an MRI of the affected knee, postsurgical pathologic confirmation of DPVNS, lack of any major degenerative changes. Exclusion criteria: DPVNS with extra-articular extension into bone and soft tissue, history of recurrence, or evidence of PVNS in any other joints, signs of focal PVNS. Symptoms: swelling, diffuse non-specific knee pain, decreased range of motion. Anteroposterior, lateral and flexion weight-bearing radiographs of the knee were performed to detect and exclude other pathologies such as osteoarthritis. All patients underwent complete synovectomy through the four arthroscopic portals: posteromedial, posterolateral, anteromedial, and anterolateral portals. None of the patients received radiofrequency ablation after the shaving technique or for hemostasis. Each patient was evaluated before treatment and followed up for a minimumof 5 years (range: 60–79 months) using the Lysholm score and International Knee Documentation Committee (IKDC) score. Postoperative complications, clinical recurrences, and treatment details were recorded.

Results: Both Lysholm score and IKDC scores were significantly improved in all study participants ($P < 0.001$). There were no complications during or after the arthroscopic procedure. Two patients displayed evidence of local recurrence without clinical signs during the follow-up period. No evidence of swelling, infection, joint

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Stiffness and neurovascular lesions were detected.

Discussion & Conclusion: The recurrence rate in this study is significantly better than the best results with the open surgical approach. The reported rate of recurrence after open synovectomy for DPNVS of the knee vary in the literature (25-46 %). The possibility of full access to the joint cavity was provided by anterior and posterior arthroscopic portals and posterior septum removal.

Arthroscopic surgery offers the ability to resect diseased synovium with minimal loss of function and faster recovery. Complication such as pain and joint stiffness are frequently noted after open synovectomy. This technique is clinically relevant in that a well-done complete arthroscopic synovectomy can be safely used for treatment of DPVNS with low complication and recurrence rate. This study showed that arthroscopic treatment treatment of DPVNS through the four arthroscopic portals (anterior and posterior) has fewer complications and relatively shorter postoperative recovery time. It could be used, safely and easily, while ensuring satisfactory control of diffuse PVNS with low recurrence rates. Intraarticular DPVNS of the knee could be treated with attentive arthroscopic synovectomy without requiring for postoperative chemoradiotherapy.

Keywords: Knee, pigmented villonodular synovitis, arthroscopic synovectomy

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14- **Title**: Correction of Alignment in ACL Tear: A Case Series Study
Authors: Seyed Mohammadjavad Mortazavi, Abbas Noori

Aim: ACL injury is a well-known risk factor in the development of OA. Varus knee also may predispose individuals to osteoarthritis. Osteotomy is accepted in the management of posterior and posterolateral instabilities but in ACL-deficient cases is not well established.
Methods: From September 2016 to May 2019, 250 ACL reconstructions were done. Patients were observed from 6-30 month and their outcome was measured by questionnaire before and after surgery. Correction of genovarum was performed in cases with: 1-lateral thrust 2- medial chondral defect 3-medial meniscus allograft.
Results: outcome was excellent in 5 patient and good in 1 patient. Six patients with aforementioned inclusion criteria, needed to undergo osteotomy (five HTO and one DFO), 6 individuals needed to undergo lateral thrust and 1patient had to undergo for lateral thrust and medial chondral defect. In 5cases, HTO was done first and in the same surgery, arthroscopic ACL reconstruction was done. In 1 case, distal medial femoral osteotomy was done because of high LDFA and normal MPTA, and for decreasing the interference with ACL reconstruction in the lateral side of distal femur.
Discussion & Conclusion: ACL reconstruction in individuals with genuvrum does not need to be followed with osteotomy (97.6%), and only if ACL insufficiency is combined with lateral thrust or medial chondral defect, osteotomy will be needed. type of osteotomy is decided according to the LDFA and MPTA of participants.
Keywords: ACL, HTO, DFO, genuvarum, lateral thrust, chondral defect

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15- **Title**: Hip Arthroscopy Is Effective for Treatment of Septic Arthritis; A Systematic Review

Authors: Ali Parsa, Rik Molenaars, Farzad Omidi Kashani, Maryam Mirzaei

Aim: This systematic review aims to afford an up-to-date overview of the role of hip arthroscopy in drainage of the septic hip.
Methods: The following electronic databases has been searched systematically on March 2019: PubMed, Cochrane Library, Medline, and EMBASE. Selected search key words were: Hip, arthroscopy, "septic arthritis". Study design and reported data in this study as according to the guidelines of Preffered Reporting Items for Systematic Reviews and Meta- Analysis (PRISMA) Protocol. Two independent researchers has been worked to select the literatures. In case of disagreement in selection process a third researcher was added to solve the problem.
Results: Initial pool of searched studies was 58. Seventeen studies were eligible (2 case-control study, 10 case series, and 5 case reports), which reporting on 114 patients (114 hips) treated. The mean age of patients was 23.3 year (range 3-45). The mean length of patient follow-up was 24.1 months (range, 6 to 84). Patients who need further arthroscopic procedure for irrigation was 5 out of 114 (4.4 %) or those in whom "arthroscopy only procedure" failed to eradicate the infection and an open procedure carried out also was very low (less than 1%). Transient pudendal nerve palsy- instrument breakagebleeding from portals and suture abscess were reported as possible complications for hip arthroscopy, in this review we did not found any of these complications. Our search fails to find out more serious complications like, proximal femoral physeal separation, acetabular cartilage injury, and growth issues, in pediatric age group. The overall complication rate in this review was 2.6%. Femoral head osteonecrosis was detected after hip arthroscopy procedures in one patient and another patient had a transient femoral nerve palsy. The last complication was an entrapped suction drain. Mean duration of hospitalization in hip arthroscopic procedures was 3.8 days. All studies reported significant improvements in patient pain and function.

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Discussion & Conclusion: We believe that hip arthroscopy with large volume irrigation is an effective method to address native hip Septic arthritis in addition its less invasive nature, decrease hospitalization and recovery time along with lower rate of complications. The major limitation is this fact that hip arthroscopy is a technically demanding procedure that performed in such centers and this facility is not available in even many academic centers.
Keywords: Hip; arthroscopy; native hip; septic arthritis

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16- **Title**: Evaluation Of Ground Reaction Forces In Patients With Various Severities Of Knee Osteoarthritis

Author: Zohreh Shafizadegan, Zahra Sadat Rezaeian, Fatemeh Shafizadegan

Aim: Osteoarthritis is the most expensive form of arthritis1 and associated costs will increase with progression of disease severity. Alteration of the joints' mechanical alignment, pain, functional dependency and problems associated with walking mobility as well as changes in knee joint ground reaction force (GRF) are considered as the most common complications of knee OA. Knee osteoarthritis (KOA) changes the force applied on the lower extremities as various grades of KOA change gait pattern by different compensatory mechanisms. Loads applied on the knee joint play a significant role in progression of KOA. The purpose of this study was to investigate the relationship between various severity of KOA and the forces applied to the lower limb during walking.

Methods: Sixty-eight limbs were divided into three groups of mild, moderate and severe KOA and a healthy normal group according to the Kellgren–Lawrence scale. The subjects walked with a self-selected speed to collect five successful trials. The components of ground reaction forces i.e., medio-lateral (ML), first peak of antero-posterior (AP1), second peak of antero-posterior (AP2), first peak of vertical (VP1), second peak of vertical (VP2) and vertical valley (V.V) were collected.

Results: AP1 and AP2 had decreasing pattern with increasing disease severity. Although ML Peak and VV have shown rising trend from normal people to severe KOA, ML difference was not significant in various groups ($P > 0.05$). In addition, the VP1 did not differ significantly among the subjects. In contrast, the VP2 decreased significantly in OA subjects. According to the results of table2, The ML peak and VP1 did not show any association to severity ($r < 0.01$, $P > 0.05$) but AP1, AP2, VP2 and V.V had weak correlation to disease stage ($r < 0.5$ and $P = 0.001$). Statistical analysis has shown negative weak association between VP2 with disease severity ($r = -0.411$, $P = 0.001$).

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Table 1: Mean ±SD of force components and post hoc analysis for various group

	ML peak	AP1 peak	AP2 peak	Vertical peak1	Vertical peak2	Vertical valley
Normal	0.07 ± 0.03	$0.11 \pm 0.02^{a,b,c}$	$0.18 \pm 0.03^{b,c}$	0.998 ± 0.05	$1.10 \pm 0.05^{a,b,c}$	0.88 ± 0.07
Mild KOA	0.08 ± 0.03	0.08 ± 0.02^{d}	$0.15 \pm 0.04^{b,c}$	0.98 ± 0.09	1.02 ± 0.09^{d}	0.89 ± 0.09
Moderate KOA	0.08 ± 0.03	0.08 ± 0.03^{d}	$0.11 \pm 0.04^{a,d}$	0.995 ± 0.05	1.01 ± 0.05^{d}	0.91 ± 0.04
Severe KOA	0.08 ± 0.02	0.07 ± 0.03^{d}	$0.11 \pm 0.03^{a,d}$	1.01 ± 0.07	1.01 ± 0.07^{d}	0.94 ± 0.05

Medio-lateral (ML), first peak of antero-posterior force (AP1), second peak of antero-posterior force (AP2), first peak of vertical force (VP1), second peak of vertical force (VP2), vertical valley (V.V).
[a] $p < 0.05$ versus mild group and other groups.
[b] $p < 0.05$ versus moderate group and other groups.
[c] $p < 0.05$ versus severe group and other groups.
[d] $p < 0.05$ versus healthy group and KOA groups.

Table 2:Correlation analysis between force components and various groups

	ML peak	AP1 peak	AP2 peak	VP1	VP2	V.V
KOA Severity	$r = 0.095$	$r = -0.397$	$r = -0.476$	$r = 0.039$	$r = -0.411$	$r = 0.301$
	$p = 0.299$	$p = 0.001$	$p = 0.001$	$p = 0.672$	$p = 0.001$	$p = 0.001$

Discussion & Conclusion: The results of this study have shown that the first AP peak and second vertical peak of GRF are more sensitive to KOA. In addition, AP1 and AP2 had a decreasing trend with disease progression. This may imply that these parameters may be attributable proxies to distinguish KOA subjects from healthy ones. Moreover the subjects with more severe OA had a decrease in both progression and braking components of AP force; which may be contributed by reduced walking speed and the altered kinematic of hip and knee joints in KOA. In spite of no correlation between ML peak force and KOA severity, ML peak force was one of the good predictors of KOA in more advanced stages after adjustments for age and BMI. Incremental trend of ML peak entails that the management strategies by which ML peak force would be returned to normal state are clinically valuable for KOA prevention and recession. Besides, the increasing trend of ML Peak force from healthy individuals to severe KOA must be considered for developing rehabilitation programs.

Keywords: Osteoarthritis of knee, severity, gait, ground reaction force

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17- **Title**: Bone Healing Properties Of Collagen/PGA Scaffold Impregnated With Human Bone Marrow Mesenchymal Stem Cells (BM-Mscs): Clinical Trial In Scaphoid Fracture

Authors: Javad Behravan, Ali Moradi, Hojjat Naderi Meshkin, Vahid Moghimi, Shirin Toosi

Aim: We have evaluated the efficacy of a collagen/poly glycolic acid (PGA) scaffold impregnated with bone marrow mesenchymal stem cells (BM-SCs) in regeneration of scaphoid bone fracture.

Methods: Clinical evaluation for all patients suffering from scaphoid fracture was performed in Imam Reza (A) hospital. The patients were divided into two random groups of five patients. Test group provided consent and received collagen/PGA scaffold with BM-MSCs in fracture site and control group received autologous iliac crest bone graft. Experimental groups were analyzed by CT scan and radiography and the treatment outcomes were evaluated at 1, 3 and 6 months after surgery.

Results: The results of CT scan data showed a faster healing procedure in the collage/PGA with BM-MSCs group as compared to the control group. Our results indicated that the Collagen/PGA scaffold with BM-MSCs had a significant effect on wound healing.

Discussion & Conclusion: The collagen/PGA scaffold seems to be a promising candidate to be considered for nonunion fractures and bone tissue engineering.

Keywords: Collagen scaffold, bone marrow mesenchymal stem cell, scaphoid fracture

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18- **Title**: Comparison Of Efficacy Of Aspirin 80 mg, Aspirin 325 mg, Enoxaparin, And Rivaroxaban In Prevention Of Coagulopathy In Patient With Knee Joint Replacement Surgery

Authors: Gholamreza Ghorbani Amjad, Seyed Kamaledin Hadei, Esmaeil Sadeghi

Aim: Total knee arthroplasty is a very complicated operation. One of the most dangerous complications of this surgery is thromboembolism. There are many anticoagulants used to prevent post-TKA thromboembolism. These medications reduce the risk of VTE, although they may cause hemorrahge. Recently, there are several studies supporting the use of antiplatelet drugs like aspirin for post-TKA thromboprophylaxis although there is insufficient evidence for their use. However, there is no consensus on which drug has the desired benefit / loss profile. The aim of this study was to compare the efficacy of aspirin, enoxaparin and rivaroxaban in preventing VTE in patients after TKA.

Methods: This study was a randomized clinical trial. After the entrance of patients with inclusion criteria, block randomization method was used to assign patients to 4 groups.

This study was a prospective randomized controlled trial on 232 patients with osteoarthritis who underwent primary unilateral TKA. A total of 232 patients were included in the study, each group consisting of 58 patients. The first group received ASA 80 mg twice daily, the second group received ASA 325 mg once daily, the third group received enoxaparin 40 mg daily subcutaneously and the fourth group received rivaroxaban 10 mg daily. All 4 groups were treated for 21 days and all patients were followed after 6 weeks. All surgeries were performed by a single surgeon under the same conditions with cemented prosthesis. Patients were visited by primary surgeons at one week, three weeks and six weeks after surgery. Patients were asked about the side effects of the medication and the symptoms of venous thrombosis and thromboembolism. The prevalence of DVT, dominant / latent blood loss, ulcer complications and subcutaneous ecchymosis in the treated organs were compared between 4 groups. Patients were routinely Doppler sonographed by a skilled

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radiologist in the sixth week and then results were recorded

Results: 3.017 percent of patients were diagnosed with VTE. Monte Carlo test (nonparametric chi-square) found significant relationship between medication type and side effects (p-value: 0.000) and overall side effects in the group recieving aspirin 80 mg were less than others drugs and in the was the most among patients receiving rivlroxaban. The thromboembolism occured in 3 aspirin-treated patients; 2 case had deep vein thrombosis, which one of them had pulmonary artery embolism and the other patient only had canalized deep vein thrombosis on ultrasound. In the patient group receiving aspirin 235 mg and enoxaparin only one case and in the rivaroxaban recipient group 2 cases of deep vein thrombosis were detected by color Doppler ultrasound. No significant relationship was found between the drug used and the incidence of thromboembolic events (p-value: 0.87). The highest incidence of hematoma was reported in the present study with rivaroxaban.

Discussion & Conclusion: This study shows that the risk of VTE with enoxaparin and aspirin 325 mg is reduced compared to aspirin 80 mg and rivaroxaban. However, these drugs also had higher side effects such as bleeding, wound secretion, and gastrointestinal intolerance. The choice of prophylaxis should be based on the balance of risk / benefit profile of each drug. It is recommended to pay more attention to the prophylaxis of thromboembolic events with aspirin after knee replacement surgery due to the ease of access and the low cost and side effects of this drug.

Keywords: Aspirin, enoxaparin, rivaroxaban, knee arthroplasty, thrombosis

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19- **Title**: Reliability And Validity Of The Persian Version Of The Forgotten Joint Score In Patients With Hip Or Knee Arthroplasty

Authors: Omid Shahpari, Amirhosein Zabihi, Mohammadhosein Ebrahimzadeh

Aim: The aim of this study is assessment of Reliability and Validity of the Persian Version of the forgotten joint score in Patients with hip or knee arthroplasty.

Methods: In this study, initially, two Persian translators translated the English version into Farsi, and then the two translators matched their translations and gave the final Persian version to the researchers. The latest version was translated into English by a professional translator and then matched to the original by an English speaker. Upon approval (for initial assess), the final version was administered to patients underwent knee and hip arthroplasty, to check for any ambiguity in the questions and options, since the lack of ambiguity in the questionnaire and comprehensibility of the items, the questionnaire was given to the patients, accompanying with the Persian version of OKS (Oxford knee score) and HHS (Harris hip score), which had previously been studied for validity and reliability. The data were then entered into SPSS software and analyzed. Alpha Cronbach was used to examine the internal consistency of the questionnaire responses.

Results: In this study, 28 patients (18 men and 10 women), who underwent total hip surgery were studied. The correlation coefficient (0.733) indicates that there is a good correlation between the two questionnaires, and the questionnaire has a good internal validity and reliability. Also, in this study, 36 patients (10 male and 26 female) who underwent TKA surgery were studied. The results of correlation analysis of the two OKS and FJS questionnaires, showed a correlation coefficient (0.777) indicating that there is a moderate correlation between the two questionnaires and the questionnaire has moderate internal validity and reliability.

Discussion & Conclusion: At the end of this study, the reliability and validity of the Forgotten Joint Score questionnaire were confirmed.

Keywords: Hip, knee, arthroplasty

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20- **Title**: The Clinical Outcome Of Simultaneous Lateral Close Wedge Distal Femoral Osteotomy And Anterior Cruciate Ligament Reconstruction In The ACL-Deficient Varus Knees

Authors: Amin Moradi, Alireza Sadeghpour

Aim: Anterior cruciate ligament (ACL) rupture has devastating effect on the knee structures specially menisci. The deterioration of knee function and repeated giving way gradually causes degenerative changes in the cartilage and meniscus especially in the medial side. On the other hand, varus alignment leads to excessive loading of the medial compartment, which can increase the risk for progression of osteoarthritis. There are many studies that present successful results after combined ACL reconstruction and High tibial osteotomy for varus angulated ACL-deficient knees, but sometimes we find that the femur bone is the origin of majority of varus deformity. In these case we have to do osteotomy in the femoral side of the knee to eliminate joint line obliquity. This study **for the first time** reports the medium-term clinical and radiographic outcomes of a group of patients who underwent anterior cruciate ligament (ACL) surgery combined with lateral close wedge distal femoral osteotomy for varus-related early medial osteoarthritis (OA) and ACL deficiency knee.

Methods: Between 2016 and 2019 all the patients attending the knee clinic with ACL injury associated medial compartment osteoarthritis (Kellegren's grade 2 or 3) were considered for inclusion in the study. Then the amount of varus deformity and its origin (tibia, joint and femur) was calculated on preoperative weight bearing alignment radiograph. The patients who had varus knee with origin from the femoral side of the knee (Lateral distal femoral angle >93°) remained in the study.

Nineteen patients underwent single-bundle ACL reconstruction surgery and a concomitant lateral closing-wedge distal femoral osteotomy. Evaluation consisted of range of motion of the knee, Lachman and pivot shift test for instability, IKDC and KOOS scores for knee function before procedure and 1 year after the surgery. The time of union and limb alignment were evaluated on radiographs.

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Results: The mean age at surgery was 37 ± 5.2 years and all the patients were men. During arthroscopy, medial meniscus tear was found in 12 patients that led to partial meniscectomy in 9 cases and repair in 3 cases.

The average time for radiological union of the osteotomy was 3.67 ± 0.7 months. There was no significant difference between ROM of the knees before and after surgery. In all cases Lachman test and in 16 cases pivot shift test was negative. Only in 3 patients pivot shift test was positive grade 1. There was a significant improvement in IKDS score and all subscales of KOOS scores after surgery ($P<0.05$). No patients underwent osteotomy or ACL revision.

Discussion & Conclusion: Nowadays combined ACL reconstruction and HTO is an acceptable salvage procedure allowed patients with medial osteoarthritis, varus alignment and chronic ACL deficiency to restore knee laxity, correct alignment and resume a recreational level of activity but sometimes the source of varus deformity is in the femoral site of the knee and High tibial osteotomy can't be a good solution to correct the deformity. In these cases distal femoral osteotomy can be considered the only effective option to correct the knee alignment and unload the medial compartment of the knee. Our study for the first time concentrated on simultaneous ACL reconstruction and distal femoral osteotomy and revealed an obvious improvement in IKDS score and all subscales of KOOS scores after this procedure without any cases of nonunion.

Combined lateral close one-stage distal femoral osteotomy and ACLR is a safe and effective procedure for the treatment of patients suffering from symptomatic varus OA in combination with anterior knee instability. The presence of an experienced, well-trained physician is considered to be mandatory in order to perform this relatively demanding operation and avoid intra-operative complications.

Keywords: Distal femoral osteotomy, anterior cruciate ligament, Medial osteoarthritis, Varus knee.

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21- **Title**: Mobile-Bearing- Versus Fixed-Bearing Total Knee Arthroplasty: Are The Outcomes Significantly Different?

Authors: Ali Yeganeh, Mehdi Moghtadaei, Majid Abedi, Mohsen Motalebi, Alireza Poolad, Kimia Haghighifard, Mostafa Salehpour, Hosein Farahini

Aim: Total knee arthroplasty (TKA) is a successful orthopedic procedure and its number increases parallel to the population aging and increased rate of symptomatic osteoarthritis. Therefore, optimization of this procedure in an orthopedic priority. To reduce wear and improve range of movement (ROM), the mobile-bearing (MB) implant was developed as an alternative to fixed-bearing (FB) implant in TKA. However, there is no consensus regarding the superiority of MB implant over FB implant. In this study, we aimed to compare the outcome of MB versus FB implant in patients who underwent TKA.

Methods: In a retrospective study, 140 patients who underwent TKA during the study period were included. MB and FB implant were used in 85 and 55 patients, respectively. The outcome measures included the knee ROM, knee injury and osteoarthritis outcomes score (KOOS) in Persian, and patients' level of satisfaction that was categorized in three subsets including dissatisfied, satisfied, and very satisfied.

Results: The mean follow-up of the patients was 5.3±3.7 years in the MB and 5.6±3.9 years in the MB group (p=0.35). The mean age of the patients was 67.8±6.8 in the MB and 66.4±7.3 years in the FB group (p=0.61). The mean KOOS score was 84.04±17.6 in the MB group and 89.1±14.1 in the FB group (p=0.23). The mean knee ROM was 117±12 and 115±11 in MB and FB group, respectively (p=0.44). The satisfaction rate was 72.9% in the MB and 85.5% in FB groups. This difference was not statistically significant, anyway (p=0.11).

Discussion & Conclusion: None of the earlier investigations have reported a significant superiority of MB design in patient satisfaction, clinical, functional and radiological outcome. Similarly, the results of current study did not reveal the superiority of MB implant over FB implant in knee ROM, KOOS, and patients' satisfaction.

Keywords: Total knee arthroplasty, mobile-bearing (MB) implant, fixed-bearing (FB) implant.

Poster Presentation

1st Poster

1- **Title**: The Effect Of Adding Corticosteroid To The Periarticular Injection Cocktail For Pain Control After Total Knee And Hip Athroplasty: Double Blinde Randomized Clinical Trial

Authors: Abolfazl Bagherifard, Kaveh Gharanizadeh, Mahmoud Jabalameli, Mehdi Mohammadpour, Amirmohsen Khorrami

Aim: The impact of periarticular corticosteroid injection for pain control after total joint arthroplasty (TJA) is controversial. Here, we aimed to investigate this controversy in patients undergoing total hip arthroplasty (THA) and total knee arthroplasty (TKA).

Methods: Forty two THA and 42 TKA patients were included. The patients of each group were randomly allocated into the group A (cocktail+steroid) and group B (cocktail alone). The outcome measures were visual analogue scale (VAS) for pain at five different time-points for both THA and TKA, and the knee range of motion (ROM) and straight leg raise (SLR) for the TKA group. Patients were followed for 3 months to observe infection, wound complication and any venous thromboembolic event.

Results: In the THA group, the pre-operative VAS, 12h, 24h, 48h, and 72h post-operative VAS were not statistically different between the group A and B (p=0.49, p=0.5, p=0.96, p=0.15, p=0.11, respectively). In the TKA group, the pre-operative VAS, 12h, 24h, 48h, and 72h post-operative VAS were not statistically different between the group A and B (p=1, p=0.47, p=0.82, p=0.92, p=0.5, respectively). The mean knee range of motion and ability to perform SLR was not significantly different between TKA patients of the steroid and non-steroid group (p=0.18 and p=0.58, respectively). The only observed complication was one surgical site infection in the non-steroid group.

Discussion & Conclusion: Our results does not support the efficacy of including steroid in the periarticular injection cocktail for the pain control after the THA, as well as TKA.

Keywords: Total hip arthroplasty, total knee arthroplasty, periarticular corticosteroid injection, postoperative pain control

Poster Presentation

2- **Title**: Is Routine DVT Prophylaxis Effective Following ACL Reconstruction?
Author: Amirmohammad Navali

Aim: Arthroscopy has been considered a benign procedure, and routine prophylaxis is not the standard of care in many institutions; however, prospective studies have suggested that, in the absence of thromboprophylaxis, the incidence of venographically detected DVT in patients undergoing knee arthroscopy can be as high as 18%. At an advanced arthroscopic knee course in August 2006, the audience surveillance revealed that 4 out of 40 knee arthroscopic surgeons (10%) had experienced fatal pulmonary emboli in their practice. The incidence of DVT in patients undergoing knee arthroscopy treated with low molecular weight Heparin (LMWH) for 7 to 10 days was 0.85% versus 4.1% in patients receiving no thromboprophylaxis—for a relative risk reduction of 79.3%. In a study conducted by San Ye et al. (2013) the incidence of DVT after arthroscopic ACL reconstruction was 14%. Marieke C. et al in their study showed that the incidence of venous thromboembolism after arthroscopic ACL reconstruction is relatively high; a 9% incidence of asymptomatic proximal or distal deep vein thrombosis was found, whereas 4% of patients were symptomatic. In a recent systematic review and meta-analysis, the pooled risk ratio for the development of DVT was 0.18 for those who had LMWH prophylaxis compared with patients who did not receive prophylaxis. In this study, the incidence of proximal DVT was very low after arthroscopic surgery regardless of receiving prophylaxis (4 of 2,184) or not (29 of 1,814). The rate of proximal DVT in total DVT occurrence can be markedly reduced from 21.3% (29 of 136) to 11.1% (4 of 36).
Methods: We conducted a cohort study on the incidence of symptomatic DVT and pulmonary emboli following arthroscopic ACL reconstruction. In a period of 11 years, 2265 cases of ACL reconstructions were performed by a single surgeon. In the first 1222 cases no prophylaxis was used and in the following 1043 cases, either LMWH of Aspirin was prescribed. In the post-operative period, patients with abnormal calf and/or thigh pain, swelling of the limb and pulmonary symptoms are

investigated for DVT using color Doppler sonography.

Results: A total of 11 cases (0.48%) of symptomatic DVT including 4 cases of pulmonary emboli (PE) were detected. Two patients had massive PE requiring ICU admission. The incidence of symptomatic DVT after arthroscopic surgery was quite low regardless of receiving prophylaxis (4 of 1043) or not (7 of 1222). Statistically, there was no significant difference between two groups ($P>0.05$). Protein C, Protein S, Anti-thrombin III and Factor V (Leiden) were measured in DVT cases. One case of Protein C deficiency, two cases of Protein S deficiency, one case of anti-thrombin deficiency and three case of mutated Leiden Factor V were detected. Three patients had a family history of DVT following surgery.

Discussion & Conclusion: Despite the low incidence of DVT/PE after ACL reconstruction in order to prevent severe complications including mortality, we recommend the use appropriate prophylaxis according to the local and national guidelines.

The American College of Chest Physicians (ACCP) guidelines do not recommend routine thromboprophylaxis other than early mobilization (grade 2B). For patients with additional thromboembolic risk factors or for those who have undergone a complicated procedure, thromboprophylaxis with LMWH is recommended (grade 1B).

The need for an accepted national protocol for DVT prophylaxis after ACL reconstruction is obvious. This scientific guideline can prevent disastrous fatal complications following apparently safe arthroscopic surgeries and legally support the surgeons' practice.

Keywords: ACL, Reconstruction, Deep vein thrombosis, prophylaxis

Poster Presentation

3- **Title**: Loop-Post Fixation, a Novel Technique for Meniscal Root Repair

Authors: Nohammadnaghi Tahmasebi, Arash Sherafatvaziri, Mohammad tahami

Aim: Several biomechanical studies have reported that medial meniscus posterior root tear (MMPRT) increases the contact surface and decreases peak pressure because of a loss of hoop tension after disruption of circumferential fibers, similar to the effects observed in knees subjected to total meniscectomy. Fixation by restoring hoop tension is crucial to prevent degenerative changes. Fixation is typically achieved using a simple stitch. However, such stitches can result in poorer meniscal healing because of reduced holding strength. Several suturing techniques are introduced for meniscus root repair including two simple stiches, Mason-Allen stich, single loop and double loop techniques. Each of these has some limitations .We herein introduce a method of MMPRT fixation using a modified version of the double loop stich technique.

Methods: General arthroscopic examination is routinely started via anterolateral (AL) portal. Transverse anteromedial portal (AM) is created near patellar tendon under spinal needle guidance so that the working instruments can be introduced straight forward to the interval of medial femoral condyle and PCL. This position allows for excellent visualization of the medial meniscus posterior root tear. First, if MMPRT is confirmed on arthroscopic examination, the superficial medial collateral ligament (MCL) is released by percutaneous needling to provide a sufficient working space. Second, far anteromedial portal is also created in transvers manner by inserted a spinal needle in a way that can afford access to medial 1 cm of medial meniscus root. Landmarks relevant to the insertion of the posterior horn of the medial meniscus, including the PCL insertion point, medial tibial spine, and articular margin of the posteromedial tibial plateau, should be identified by arthroscopy after superficial MCL release. Medial wall notchplasty is used to remove fibrous tissue and creation of adequate space to identify the edge of the meniscus. Arthroscopic grasper is used to check the mobility of meniscus root tear, if reduction of meniscus cannot performed easily, release of fibrous tissue from posterior meniscocapsular

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attachment will be done by arthroscopic probe. Debridement of the torn meniscal edge is performed using a shaver .Curette is inserted through the AM portal to create a bony bed at the insertion site. EZpass 70 degrees (Zimmer-Biomet) of contralateral side is loaded by nylon 1/0 and then passed through the far AM portal and the meniscus is penetrated 1 cm medial to tear area in superior-inferior direction. The thread is retrieved from near AM portal and a loop express braid 2/0(Zimmer-Biomet) or fiber wire 2/0 (Arthrex) is attached to it and passed through the medial meniscus and brought out through the far AM portal , leading nylon thread is released and the loop pulled back into the joint. Both free ends of thread passed through the loop by suture retriever in the joint , eliminating the risk of portal entrapment, by traction on free ends of thread , the first suture loop construct is tightened. The same steps are repeated for making the second suture loop construct passed 5 mm from the torn edge of medial meniscus but the loop is not tightened. The arthroscope is changed to near medial portal and the first loop free ends is retrieved through the anterolateral portal using the space that is now created in the second loop construct. The second loop is tightened now and the free ends of first loop retrieved through the far anteromedial portal again. In the next step, to create a tibial tunnel, making an incision on anteromedial aspect of proximal tibia, an anterior cruciate ligament reconstruction tibial tunnel guide is inserted through the AM portal, with its tip placed in contact with the attachment site of the medial meniscal posterior root. A 3/32 Kirschner (K-wire) is then passed through the guide, with the K-wire visualized directly using an arthroscope via the AL portal. After confirming that the tibial tunnel is suitable and the K-wire tip is well positioned, reaming is done by 4.3 mm cannulated reamer of ACL set .A nylon loop is passed through the eyelet end of the guide-wire and introduced into the joint via the tibial canal. First and second suture loops are retrieved and brought out of tibial canal. After tensioning of both sutures in 30 degrees of knee flexion, a screw post or button is used to fix both loops ends over the tibial cortex. Postoperative Rehabilitation Lifestyle modifications aimed at avoiding deep knee flexion should be recommended for all patients. Range of motion exercises are performed for 3 weeks postoperatively, And progressive range of motion exercises can be performed, at up to 90_ flexion, 6 weeks postoperatively.

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Partial weight-bearing exercises (i.e., toe touching using crutches) commence 6 weeks postoperatively, with the brace locked to allow for full extension of the knee joint in the first 3 postoperative weeks. Full weight-bearing and progressive closed kinetic chain strengthening exercises are permitted 6 weeks after surgery.
Results:
Discussion & Conclusion: This article introduced an MMPRT fixation method that uses a modified double loop stitch technique. The stitch exhibits superior holding power because of its locking effect compared with the simple stitch .Both vertical loops catch the bulk of meniscus, thereby preventing pullout of the repaired tissue. Passing the first loop through the pulley that is created by the second loop allows to change the direction of pulling force more medially than anteriorly to reduce the meniscal extrusion. The stitch also provides good initial holding strength and a large meniscus-bone contact area that improves healing potential. Because the main meniscus fibers are circumferential and tangentially oriented to the root insertion, the risk of premature suture pullout is reduced by loop-post fixation technique
Keywords: Meniscus root , suture fixation ,double loop

Poster Presentation

4- **Title**: A Comparative Study on the Clinical Results of Arthroscopic Rotator Cuff Repair and Open Repair Surgery

Authors: Mohammadreza Guity, Maziar Nafisi, Seyed Saeed Khabiri, Nima bagheri

Aim: Despite the obvious advantages of arthroscopic rotator cuff repair, there are no definitive evidences regarding the superiority of this method over open surgery. The aim of this study is to compare the results of arthroscopic rotator cuff repair and open repair surgery.

Methods: A total of 52 patients referring to a general university hospital were included in the study and assigned to two groups of arthroscopic repair and open repair. Demographic information of patients and the presence of any underlying disease and the grade of rotator cuff tear were recorded. The pain scores of the patients were measured three times, before, 48 h after surgery and 6-month follow-up, using the VAS system. To evaluate the clinical performance of patients, UCLA scoring system (only 6 months after the surgery) and Constant (before and 6 months after surgery) were utilized.

Results: 32 patients were assigned to the open repair surgery and 20 to the arthroscopic repair group. The two groups were not significantly different in terms of pain variables, 48 hours after operation ($P = 0.054$) and 6 months after operation ($P = 0.638$), constant score 6 months after operation ($P = 0.157$) and UCLA shoulder rating scale 6 months after surgery ($P = 0.167$). Moreover, there was not any significant difference between the two groups with regard to these variables before surgery.

Discussion & Conclusion: The results of this study showed that arthroscopic rotator cuff repair was a safe procedure which was as effective as open repair surgery. Also, reduced postoperative pain was one of the advantages of this method noted in the present study, although the long-term severity of pain in this method was not significantly different from the pain of patients undergoing open surgery.

Keywords: Rotator cuff tear, Arthroscopic surgery, Open Surgery

Poster Presentation

5- **Title**: The Role Of Tibial/Femoral Tunnel Angle And Graft Inclination Angle In The Outcome Of The Anterior Cruciate Ligament Reconstruction

Authors: Mehdi Moghtadaei, Majid Abedi, Ali Yeganeh, Hooman Yahyazadeh, Nima Hoseinzadeh, Javad Moeini, Kimia Haghighifard

Aim: The tear of anterior cruciate ligament (ACL) is one of the frequent orthopedic injuries causing knee instability. ACL reconstruction is the treatment of choice in these injuries and is comprised of the anatomic placement of the ACL graft in the drilled tibial and femoral tunnels. Accurate positioning of the tunnels and graft are considered as key elements in the success of ACLR surgery. In this study, we aimed to find how tunnel and graft inclination angle associates with the outcome of ACLR surgery.

Methods: In a retrospective study, a total of 37 patients who underwent ACLR surgery were included. Transportal arthroscopic reconstruction technique was implemented in all surgeries. The tunnel and graft inclination angle were assessed on plain radiographs. Outcome of the surgery was evaluated using the Persian version International Knee Documentation Committee (IKDC). KT-1000 arthrometer score was used for the assessment of the knee instability. The Lachman and the pivot shift test were used for the assessment of joint function and ACL integrity.

Results: The average age of the patients was 30.1±9.4 years, ranging from 18 to 50 years. The ACLR surgery was successful in 36 patients and Unsuccessful in one patient. No significant correlation was found between the IKDC score and tibial or femoral tunnel angle. A negative correlation was observed between the IKDC score and the graft inclination angle ($r = -0.326$, $P= 0.049$). In this respect, in graft angles between 20° to 36°, better IKDC scores were seen at the more horizontal graft. Other evaluated outcome measure including the Lachman scores and the pivot shift test as well as KT-1000 arthrometer score were not associated with graft or tunnel angles.

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Discussion & Conclusion: Since the tibial and femoral tunnel localization define the graft inclination angle, the inaccurate tunnel positioning results in a graft malpositioning and unfavorable outcome of ACLR surgery. In this study we found a significant association between the graft inclination angle and the outcome of ACLR surgery. This result highlights the role graft alignment in the success of ACLR surgery. Further studies with larger patients number with shed more light on the role of graft and tunnel angle in the outcome of ACLR.

Keywords: Anterior cruciate ligament, anterior cruciate ligament reconstruction, tibial tunnel angle, femoral tunnel angle, graft inclination angle

Poster Presentation

6- **Title**: Preoperative Optimization Of The ACL Reconstruction Technique By FMEA

Authors: Mohammad Razi, Arya Honarpisheh, Hamid Honarpisheh

Aim: The aim of this study is to develop a personal portfolio software tool to optimize the ACL Reconstruction surgical operation procedure by FMEA preoperatively.

Methods: The Failure Modes and Effects Analysis (FMEA), also known as Failure Modes, Effects, and Criticality Analysis (FMECA), is a systematic method by which potential failures of a product or process design are identified, analyzed and documented. It enables the surgeon to assess the risk associated with the identified failure modes, effects and causes, and prioritizes issues for possible corrective actions. Once identified, the effects of these failures on performance and safety are recognized, and appropriate actions are taken to eliminate or minimize the effects of these failures. In this way one may identify and carry out corrective actions to address the most serious concerns. An FMEA is a crucial reliability tool that helps avoid costs incurred from product failure and liability. A well designed FMEA examines potential product failures and the effects of these failures to the end user. As with most aspects of design, the best approach to completing an FMEA is with cross-functional input from the participants. It is an engineering analysis to mprove the design of the both system and the procedure. To complete the FMEA most efficiently, the designer conducted the FMEA concurrently with the optimal design process then meeting with the cross-function process small group to discuss and obtain consensus on the failure modes identified and the ratings assigned.

For this purpose a systematic review search on ACL reconstruction surgical operation procedure was carried out. The elements of the process and FMEA is carried out and periodically updated. The ACL reconstruction surgical operation procedure FMEA software is built using Excel spreadsheet 2016 version. The last clinical evidences are collected, worked up and instituted in the software tool. The

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tool functionality is verified by novice review and its validity verified by expert judgment elicitation.

Results: The software includes the workup of 37 procedural components related to ACL reconstruction surgical operation procedure, starting from history taking to the 6 month post-op follow up. Each component is recited back to its objective, rationale or circumstances, and its evidential strength of recommendation from the literature. The novice and the fellow can review the information relevant to the procedural component in this step if needed. The possible technical and nontechnical potential complication associated with each component of the procedure is then revealed by questions aroused and the relevant potential failure identified. In the third step a hypothesized cause- effect chain concerning the possible consequences of the supposed failure is drawn by 5-why method of scrutiny. Using the estimated frequency, severity and the detect ability of the potential failure, the mode-risk criticality estimate (RCE) and the risk priority number (RPN) are calculated. Considering the most critical potential failure, one may identify cause(s) of the potential failure by risk cause analysis and take the proper precautions accordingly or redesign the process, thereby improving her/ his performance and optimizing the procedure by determining actions to reduce risk of failure mode. In the Follow up period of any case effectiveness ratings can be done further by strain test and pilot tests to repeat and revise the potential failure mode-risk criticality estimate (RCE) and the risk priority number (RPN) improvement. Personalized clinical guidelines may well be developed using each case analysis so far. The application of the software tool may be demonstrated during the presentation.

Discussion & Conclusion: A collection of 38 componential cognitive elements of experientially

developed protocol related to the management of ACL injury is elicited and Criticality analyzed using FMEA method. The whole available information derived from systematic reviews is piled up in the excel software. The most up to date evidences announced by the American Academy of Orthopedic Surgeons (AAOS) clinical guideline are implemented as the basis of the decision making concerning each ACL case item. The potential failures specific to the surgeon and case

conditions helps the development of expertise. The toolkit developed hereby in excel software is capable of being upgraded and employed as a personal ACL injury management portfolio by the knee fellows and surgeons. Biomechanical index analysis and the relevant cognitive bias analysis remains to be elaborated further.

Keywords: Knee, ACL injury, EBM practice, personal portfolio

Poster Presentation

7- **Title**: Evaluation Of The Clinical Result Of The Autologous Blood Injection In Tennis Elbow Treatment

Authors: Mohsen Mardani Kivi, Mahmoud Karimi Mobarakeh

Aim: This study compares the result of autologous blood injection (group1) with that of corticosteroid (group2) which is proposed one of standard treatment of tennis elbow.

Methods: A randomized prospective case series study was planned on 46 patients with tennis elbow, 26 were treated by injection of autologous blood and 20 were treated by corticosteroid (depomedrol) injection. Nirschl phase and Visual Analogue Scored (VAS) were measured preprocedure and 1,3,6 month after injection. At the end satisfaction of patients was measured by Verhaar scoring system.

Results: Our patients mean age was 45.8 ± 9.6 years. 15men and 21 women were treated. Pain Score (VAS) reduced from 6.46 (1-9) to 0.54 (0-2) and, Nirschl phase reduced from 6.15 (1-7) to 0.5(o-2) after blood injection. In group 2 VAS and Nirschl were reduced from 7.5 (5-9) and 5.25 (3-8) to 0.8 (0-6) and 0.5 (0-4), respectively. Eighty four percent of good and excellent result in group 1 and 85.5 % of same result in group 2 were recorded.

Discussion & Conclusion: In med-term the results of injection of both corticosteroid and autologous blood are similar. Given the availability, Low cost and satisfactory outcomes, autologous blood injection can be evaluated as a useful treatment for tennis elbow.

Keywords: Tennis Elbow, autologous blood injection, lateral epicondylities

Poster Presentation

8- **Title**: Accuracy Of Sonography For Diagnosis Of Ankle Ligaments Injury In Comparison With MRI And Physical Examination

Authors: Seyed Mahdi Mazloumi, Amirhosein Kasaeian, Behzad Aminzadeh, Seyed Hadi Seyed Hoseinian

Aim: Ankle sprain is one of the most common injuries to the limbs and accounts for 85% of all ankle injuries. MRI can be used to differentiate between acute and chronic injuries. Ultrasonography is helpful in evaluating lateral ankle ligaments by providing high quality anatomy and pathology of ligaments. Since MRI is not always available and MRI is not cost-effective due to higher costs in all patients, ultrasound can be performed in Patients were replaced to diagnose ligament injuries.

Methods: Patients who refered to the Shahid Kamyab Hospital with ankle sprain are entered in this study and examined by a resident orthopedic. After undergoing ligation examinations including ADT, IST, EST, ST and ERST, the trauma mechanism and demographic characteristics were also recorded as the result of clinical examinations in the pre-prepared questionnaire. Then the radiographs of the patients were arranged and the ankle shape was standing. The patient was excluded from the study if there was an ankle fracture. Patient's radiographic findings were then taken from the patient's MRI and also by an ultrasound sonography expert, an ankle ligament was performed. MRI images were reported by the radiologist without any knowledge of the results of other methods and their findings were recorded. Data were analyzed by SPSS software.

Results: The results of this study demonstrated that in comparison with ultrasonography with clinical examination, in diagnosis of ankle ligament injuries, except in the studies of deltoid ligament and PTFL (P-value = 0.077 and P-value = 0.382), the other cases were consistent. Comparison of ultrasonographic diagnostic methods with MRI revealed that ultrasound diagnostic methods are suitable for diagnosis of ankle ligament injuries. The sensitivity, specificity, positive predictive value and negative predictive value in the diagnosis of ATFL of all criteria were 100%; in the detection of CFL criteria, 92.9%, 66.7%, 91.8%, 70.0%, in the

diagnosis of deltoid, 090, 5 (78.7%), 72.7% (92.7%); in the diagnosis of sinzema, 70.4%, 88.5%, 67.9%, 89.6%; in the detection of PTFL 25/31, 6/96, 5/62, 7 / 88. **Discussion & Conclusion**: In this study, considering that MRI is not always available, ultrasound is recommended because of the desirable diagnostic value of diagnosis, cost, availability, and even portability and lack of MRI contraindications.

Keywords: Sonography, ankle, ligament injury

Poster Presentation

9- **Title**: Chronic Pectoralis Major Tear Repair With Achilles Tendon Allograft In In Eighteen Bodybuilding Athletes

Authors: Mohsen Mardani Kivi

Aim: Pectoralis major tendon rupture is increasing in frequency due to the uptake of bodybuilding exercises, specially the bench press maneuver, and weight-lifting.

Methods: In a case series, we present 18 cases of pectoralis major muscle tear in bodybuilding athletes underwent open surgical repair during January 2016 till December 2018. All cases were chronic tear and 2 were revision. Surgical method was based on Achilles tendon allograft used to augment the ruptured site. The results were analyzed using (1) DASH score (Disability of shoulder arm and hand), (2) Bak's criteria and (3) Constant score in pre operation visit and 1, 3 and 6 months follow up.

Results: All cases were male with the mean age of 28.4±3.2. Mean time lag between injury to surgery was 12±1 month; 4 months to 6 years. Return to regular sport began at 3months after surgery and mean time of return to professional bodybuilding was 7±1.4 months. Hematoma presented in 1case and no infection occurred. At the final follow-up, Bak criteria revealed "excellent" in 15 patients and "good" in 3 cases, with most in the "good" group reporting cosmetic concerns. Removing cosmesis, 94.44% scored "excellent". The mean of constant score was 86.47±2.22 and mean DASH score decreased from 49.6 in pre operation visit to 13.53 in the last follow up ($P<0.001$).

Discussion & Conclusion: It seems that our surgical method is an effective approach in cases with pectoralis major tears.

Keywords: Pectoralis major, Achilles tendon, Allograft

Poster Presentation

10- **Title**: Manipulation of Vision and Cognition on Postural Control in Patients with Patellofemoral Pain Syndrome

Authors: Afsaneh Zeinalzadeh, Saeed Talebian, Salman Nazari Moghadam

Aim: To compare the effects of vision and cognitive load on static postural control in subjects with and without patellofemoral pain syndrome (PFPS).
Methods: Twenty-eight PFPS patients and 28 controls participated in the study. Postural control was assessed in isolation as well as with visual manipulation and cognitive loading on symptomatic limb. The outcome measures of postural control were quantified in terms of area, anterior-posterior (AP), medial-lateral (ML) and mean velocity (MV) of the displacements of center of pressure (COP). In addition, cognitive performance (auditory Stroop task) was measured in forms of average reaction time and error ratio in baseline (sitting) and different postural conditions.
Results: PFPS subjects showed greater increases in area ($p=0.01$), AP ($p=0.01$) and ML ($p=0.05$) displacements of COP in the blindfolded tasks as compared to control group. However, cognitive load did not differently affect postural control in the two groups. Although PFPS and control group had similar reaction times in the sitting position ($p=0.29$), PFPS subjects had longer reaction times than healthy subjects in dual task conditions ($p=0.04$).
Discussion & Conclusion: Visual inputs seem to be essential for discriminating postural control between PFPS and healthy individuals. PFPS patients biased toward decreasing cognitive performance more than healthy subjects when they perform the single leg stance and cognitive task concurrently.
Keywords: Postural control; Patellofemoral pain; Cognition; Visual input

Poster Presentation

11- **Title**: 3d-Printed Customised Jigs Improve Accuracy In Upper Extremities Orthopedic Surgery

Authors: Ashkan Sedigh, Mohammad Zohoori, Arash Hashem Nasab, Amirreza Kachooei

Aim: Patient-specific orthopedic surgery employing 3D-Printed customized jigs for Cubitus Varus corrective osteotomy is becoming increasingly popular for upper limbs surgery. This study has shown that this case with provided cutting and osteotomy jigs lead to a more accurate limb alignment and deformity correction.

Methods: The 3D model of the bone is generated by the CT scan raw data. This toolkit which is used by an open-source software (Fiji) helped orthopedic surgeons to make a 3D model of the scan data within the required Hounsfield unit. This threshold separates the compact and spongy bone in the CT-scan data. In this study, which is implemented by 3D point cloud registration algorithm; we aimed to correct the deformed humerus patient bone. In the next step, two STL objects must be registered in an alignment that both proximal are pointregistered together within the least error in the overlapped proximals. Based on this modeling, 40 degrees of angulation was measured and a wedge of the same degrees was designed to be cut and move. Given that, we designed a cutting jig to guide for the wedge to be cut. By reducing the distal segment to the proximal humerus, the 40 degrees deformity was corrected and alignment was achieved precisely Superimposition of preoperative and postresection images enabled quantitative analysis of resection accuracy.

Results: Patient was followed for 4 months. Bone healing was indicated. Range of motion was complete in compare to the opposite side. Visual analogue scale (VAS) at activity was 2 and VAS at rest was 4 out 10.

Discussion & Conclusion: It seems that bone reconstruction and computer simulation is a reliable method to make custom-made cutting guides for precise correction of deformities. It helps shorten the surgery time and increases the accuracy of deformity correction. A number of recent publications have illustrated the same steps including importing raw data, pre-processing-3D-printing, and the operation.

Keywords: 3D-Printing and modelling, Cubitus Varus, Deformity Correction, Customised Jig, PreOperative Planning

Poster Presentation

12- **Title**: Long Term Results Of Treating Large Post-Traumatic Tibial Plateau Lesions With Fresh Osteochondral Allografts

Authors: Allan Gross, Sebastian Leon, Oleg Safir, David Backstein, Paul Lee, Paul Kuzyk, Mansour Abolghasemian

Aim: Fresh osteochondral allograft has been a treatment option for large post-raumatic tibial osteochondral defects in young, high-demand patients. Being less common than the distal femoral counterpart, there is a paucity of data on the long-erm outcome of this procedure and the affecting variables.

Methods: Fresh osteochondral allograft has been a treatment option for large post-traumatic tibial osteochondral defects in young, high-demand patients. Being less common than the distal femoral counterpart, there is a paucity of data on the long-term outcome of this procedure and the affecting variables.

Results: We identified 133 cases fulfilling the inclusion criteria with 20 lost to follow-up in less than 2 years. The remaining 113 patients (67 females) with an average age of 43 (24-72) were evaluated at an average follow up of 13.8 years (1.7-4). Overall, 48 conversions to total knee arthroplasty (46) or another osteochondral allograft (2) had been performed at a mean of 11.6 years (1.7-34) after surgery. The other 65 had a mean follow-up of 15.5 (4.3- 31.7) years, with a mean MHSSS of 85.5 (56-100) at the last follow-up review, significantly higher than the preoperative value of 69 (48-85) (P value< 0.001) The Kaplan-Meier graft survivorships were 90% at 5 years, 79% at 10 years, 64% at 15 years and 47% at 20 years (fig. 1). Associated complications included infection (2.8%), graft collapse (15.4%), and knee pain from hardware (14%). Multivariate analysis revealed that older age at the surgery, involvement of the medial plateau and higher number of previous surgeries were inversely associated with survivorship (table 1). Having a workers compensation file was associated with a less improvement of the MHSSS and the score tended to decline over time.

Discussion & Conclusion: FOCA transplantation is a viable option for large post-traumatic tibial osteochondral defects in young patients, with satisfactory midterm

survivorship and functional outcome. Although half of these patients will require knee arthroplasty by 20 years, FOCA is an excellent option to delay the need for knee arthroplasty surgery. Patients who are older at the time of surgery, those with edial lesions and those with multiple previous surgeries will have a less favorable prognosis. The findings may provide a long-term benchmark by which future treatments for tibial osteochondral defects can be measured.

Keywords: Knee Fresh Osteochondral Allograft

Poster Presentation

13- **Title**: Valgus Knee Arthroplasty Using Anterolateral Approach

Authors: Hamidreza Aslani, Amir Farahanchi Baradaran, Ali Aidenlou, Omid Sheikhhasani

Aim: Valgus knee deformity has been classified into three groups by Ranawat in 2005. Total knee arthroplasty (TKA) is a potential treatment for patients with moderate to severe deformity (more than 10° deformity). The purpose of this study is to evaluate the outcomes of the valgus knee treatment with TKA using the anterolateral approach.

Methods: Overall, 18 patients underwent TKA of them 3 were lost to follow-up. The mean age of patients was 59.18 years old in the time of operation and all underwent surgery using the anterolateral approach.

Results: The average follow-up period was 6.29 years. The mean pre-operation mechanical axis was 20.88°, which decreased to 1.71° post-operatively. In the last follow-up, the average Oxford Knee Score (OKS) was 40.65 and no significant pain was reported.

Discussion & Conclusion: In conclusion, this study illustrated that TKA using the anterolateral approach in patients with valgus knee deformity is a reliable treatment with good to excellent outcomes.

Keywords: valgus deformity, knee joint, total knee arthroplasty, anterolateral approach

Poster Presentation

14- **Title**: Clinical Results of Arthroscopic Excision of Dorsal Wrist Ganglion

Authors: Mohammad Mohammadi Bolbanabad, Amirreza Abdollahian, Hosein Saremi

Aim: The aim of this study is to determine efficacy and complications of rthroscopic excision of dorsal wrist ganglion.

Methods: it was a cross-sectional study and we examined 20 patients, referred to the orthopaedic clinic of Besat Hospital from october 2014 to 2016. Indication for surgery was chronic pain, swelling of dorsal wrist and limitation of the wrist movement. 14 patients were women at 6 men. average age was 31.3 all patients have gone through the arthroscopic surgery . the average followup time was 33 months, they were examined for recurrence and any complications and pain .satisfaction, and scar of surgery was evaluated The gathered data was analysed by independent T test and CHI2 test on SPSS program.

Results: The preoperative pain was average 5.6 in VAS pain scale; which diminished to 1.7postoperatively. The average scar was O: 1.4 P: 1.5 in Vancouver scar unit. There were no recurrency up to average od 33 months or major complications. And Patients' satisfaction was7.4 from 10.

Discussion & Conclusion: results showed that the excision of dorsal root ganglion with arthroscopic method had low risk of recurrence and postoperative complications such as residual pain and scar.

Keywords: Wrist arthroscopy, wrist ganglion, Arthroscopic Excision

Poster Presentation

15- **Title**: Partial Two-Staged Revision For Infected Tumor Prostheses

Authors: Peter Ferguson, Jean Camille Mattei, Julia Visgauss, Anthoni Griffin, Jay Wunder, Mansour Abolghasemian

Aim: Periprosthetic joint infection (PJI) is one of the major causes of failure after megaprosthetic limb reconstruction. Historically, two-stage revision has been the gold standard for management of chronic periprosthetic infections. While exchange of the modular components of the implant is not associated with any undo morbidity to the patient, explantation of the components from the bone prosthesis interface are often associated with considerable bone destruction, particularly in well ingrown, uncemented implants. This creates considerable challenges with prosthesis re-implantation, fixation quality, and potential functional morbidity. The increase in uncemented stems in the setting of megaprosthetic reconstruction has inspired various techniques for the management of periprosthetic infections, allowing retention of well fixed, uncemented stems. This study was performed to assess the outcomes of a modified 2-stage revision technique.

Methods: All patients with chronic PJI after limb salvage surgery for malignant bone tumors treated with partial 2-stage revision were included. Indications included chronic PJI of uncemented tumor prostheses with well-fixed intramedullary stems when removal of the stem would result in considerable bone loss and morbidity to the patient. The technique included explantation of all modular parts with retention of well-ingrown diaphyseal stems during the first stage surgery. The limb would be stabilized and antibiotic cement spacer placed into the wound while the patient completed an appropriate course of antibiotics. When the infection was deemed to be eradicated, a second stage surgery would be performed to re-implant the modular components. Outcomes included survivorship with failure defined as reinfection with the same bacteria and functional status.

Results: 23 partial 2-stage revisions (21 patients, 13 males) were performed between 1990 and 2012. 22 were knee prostheses and one was a hip. 16 had received chemotherapy but none had received radiotherapy. Mean age at the time of stage one

was 40.4 years, an average of 9.2 (0.1-26) years after the original implantation surgery. Mean number of surgeries in all patients was 2.9 (range 2-6, median: 3) including 1st and 2nd stage revision, debridement surgery, soft tissue reconstruction and amputation or resection surgery. At a mean follow-up of 78 months, 16/23 (70%) cases were infection free. The remaining 7/23 (30%) had recurrence of infection at an average of 9 (0-37) months after the second stage reimplantation. Reinfections were treated with amputation in 3, suppressive antibiotic in 2, another 2-stage revision in 1 and removal of the implants in 1. Twoyear survivorship was found to be 74%, falling to 67% at 5 years, remaining the same for up to 15 years. Higher age at the time of initial wide resection surgery ($P<0.001$) or at the time of first stage surgery ($P=0.046$), original diagnosis of chondrosarcoma ($P=0.006$), a mixed gram+ and gram- infection ($P=0.025$), in addition to affection by diabetes mellitus ($P=0.033$) were associated with failure. Mean TESS for the surviving limbs was 81 at the last followup and the mean MSTS was 78.

Discussion & Conclusion: Partial 2-stage revision for treating PJI of tumor prostheses is associated with about 67% long term control of the infection, which is close to the reported success rate of the conventional 2-stage revision of tumor prostheses. This technique can be considered as a viable option for infected well-fixed cementless implants, especially when insufficient bone stock is available for a conventional 2 stage procedure, so that other possible options would be amputation or resection arthroplasty.

Keywords: Tumor prosthesis, infection, partial 2-stage revision, implant retention

Poster Presentation

16- **Title**: Pes Anserine Insertion Site: Is It Related To Height?

Authors: Seyed Mohammadjavad Mortazavi, Ali Okati, Abbas Noori

Aim: Pes anserine tendons are considered as an important source for obtaining autogenous grafts in knee ligament reconstruction. This study aims to investigate distance of pes anserine insertion site from knee anteromedial joint line and its relationship with height.

Methods: of total 50 patients who were included in this study, 31 patients underwent arthroscopic ACL reconstruction with pes anserine tendinous autografts and 19 underwent High Tibial Osteotomy (HTO). Distance from the knee anteromedial joint line to upper border of gracilis tendon was measured intraoperatively; in addition to the record of Height and demographic characteristics.

Results: The mean distance from knee anteromedial joint line to upper border of gracilis was 51+9mm (37 -70). The mean height was 168+7cm (155-185). The height was correlated significantly with distance (r =.934, n =50, p = .000). 1 cm increment of height from 168(mean height), results in 1.2mm increment of the distance from 51mm (mean distance).

Discussion & Conclusion: The mean distance from knee anteromedial joint line to upper border of gracilis is 51+9mm (37 -70mm) which was correlated significantly with height.

Keywords:

Poster Presentation

17- **Title**: The Effect Of Early Progressive Resistive Exercise Therapy On Balance Control Of Patients With Total Knee Arthroplasty

Authors: Razieh Yousefian Molla, Heydar Sadeghi, Amirhosein Kahlaee, Hamidreza Hosseinzadeh

Aim: Although total knee arthroplasty (TKA) is a common treatment for severe osteoarthritis, high risks of fall and balance loss are the main complications of this procedure. While multiple rehabilitation protocols have been suggested for TKA, efficacy of early resistive exercise therapy aimed at improving balance has not yet been thoroughly investigated.

Methods: In this double-blind randomized controlled trial study, 40 patients with severe osteoarthritis, sampled by a\ simple convenient method, were randomly assigned into either "control" group or "early resistive exercise" group. After TKA surgery, both groups attended a routine rehabilitation program while the experimental group received extra early resistive exercises. Static, semi dynamic, and dynamic balance were assessed by the Sharpened Romberg (SRBT), Star Excursion (SEBT), and Berg (BBT) balance tests prior to surgery, after the rehabilitation process (seventh week), and at a 2-week later followup time (ninth week).

Results: At the end of the seventh and ninth weeks, in both groups all 3 balance scores were significantly enhanced comparing the baseline scores ($P < .001$). The experimental group had significantly higher scores than the control group in SRBT, SEBT, and BBT after the intervention and at the follow-up time ($P < .001$). Discussion & Conclusion The findings of this study showed that rehabilitation following TKA is accompanied by balance (static, semi dynamic, and dynamic) improvement, and this improvement is greater among patients participating in an early resistive exercise regimen. Early progressive resistive exercise in addition to routine physical therapy may lead to better balance performance than routine physical therapy and might be incorporated into the postoperative physical therapy of these patients. Further studies with longer follow-up periods are needed to confirm these results.

Keywords: Balance, Early Resistive Exercise, Rehabilitation, Total Knee Arthroplasty

Poster Presentation

18- **Title**: Effect Of Various Treatments In Drug Induced Knee Avascular Necrosis: A Review Of Studies

Authors: Omid Shahpari, Sima Derakhshanpour

Aim: efficacy assessment of different Treatment Options (surgical and non-surgical) in knee Avascular Necrosis: A Review study.

Methods: The Scopus, Pubmed, and Web of Science databases were searched for English language studies that addressed treatments other than knee arthroplasty in knee avascular necrosis. The studies were systematically screened and eligible studies trials, were chosen. We included all studies which have focused on investigating preserving treatment options for drug induced knee osteonecrosis. The effectiveness of existing pharmacological, physical therapy, and surgical other than arthroplasty treatment options in the treatment of early stages is assessed.

Results: Spontaneous and post-arthroscopic osteonecrosis of the knee can initially be managed non-operatively, while secondary osteonecrosis is best treated surgically. Initial surgical treatment consists of joint preserving procedures in those patients in pre-collapse stages, and arthroplasty as the end stage treatment for those symptomatic patients who have progressed to advanced collapse and osteoarthritis.

Discussion & Conclusion: Osteonecrosis is a devastating disease that can lead to end-stage arthritis of various joint including the knee. We present a thorough review of the English literature about corticosteroid induced knee osteonecrosis. The purpose of this article is to highlight the recent evidence concerning the treatment options across the spectrum of management of osteonecrosis of the knee including lesion observation, medications, joint preserving techniques, and total joint arthroplasties.

Keywords: knee – avascular necrosis-osteonecrosis-distal femor – proximal tibia

Poster Presentation

19- **Title**: Open Wedge High Tibial Osteotomy: Preserving Vs. Releasing Superficial MCL

Authors: Mohsen Mardani Kivi, Mahmoud Karimi Mobarakeh

Aim: how to approach the medial collateral ligament (MCL) in open wedge high tibial osteotomy (HTO) is still challenging. This study seeks to evaluate the results of open wedge high tibial osteotomy with or without releasing MCL.

Methods: In this prospective clinical trial study, those patients between 16-50 years old with knee pain and varus knee were evaluated for eligibility. Treatment outcomes included: stability against valgus force, patellar height, posterior slope of the plateau, and Modified Hospital for Special Surgery Knee Scoring System (KSS) including quadriceps strength, knee range of motion, knee joint stability, pain, flexion contractures of knee, and the rate of varus alignment evaluated pre and postoperatively.

Results: there were 60 patients (74 knees) with mean age of 26.7+9 knees in preserving MCL group. The overall score of KSS reached 81.9+13.4 from 53.5+15.2. 60 patients (40 knees) with mean age of 25.5+8.4 were in releasing MCL group. The overall score improved from 52.4+14.6 to 65.4+17.8. In the preserving MCL group, complications of surgery and valgus instability were lower; and Insall-Salvati Index and posterior tibial slope remained unchanged Discussion & Conclusion both techniques lead to an improvement in the KSS score; however it was more significant in Preserving MCL group with lower complication and no valgus instability.

Keywords: varus knee, osteotomy, open wedge high tibial osteotomy, Medial collateral ligament

Poster Presentation

20- **Title**: Biomechanical Role of Posterior Cruciate Ligament in Total Knee Arthroplasty

Authors: Kamran Hassani

Aim: The knee joint is a complex structure which is vulnerable to injury due to various types of loadings as a consequence of walking, running, stair climbing, etc. Total knee arthroplasty (TKA) is a widely used and successful orthopedic procedure which during that the posterior cruciate ligament (PCL) can either be retained or substituted. Different surgical techniques suggest retention or sacrifice of the PCL in TKA for the treatment of osteoarthritis which may alter the post-op outcomes. The objective of this study was to evaluate the biomechanical role of PCL after TKA surgery using finite element (FE) modeling.

Methods: A three-dimensional (3D) FE model of the prosthetic knee was developed and its validity was compared to available studies in literature. Further, the effect of the retention or removing of the PCL as well as its degradation (i.e variation in mechanical properties) and angle on knee biomechanics were evaluated during a weight-bearing squatting movement.

Results: The validity of the intact model were confirmed. The results revealed higher stresses in the PCL and tibial insert at higher femoral flexion angles. In addition, the effect of variations in the stiffness of the PCL was found to be negligible at lower while considerable at higher femoral flexion angles. The variations in the elevation angle of the PCL from 89º to 83º at the critical femoral angles of 60º and 120º showed the highest von Mises stresses in the tibial insert.

Discussion & Conclusion: The results have implications not only for understanding the stresses in the prosthetic knee model under squat movement but also for providing comprehensive information about the effects of variations in the PCL stiffness and balancing on the induced stresses of the PCL and tibial insert.

Keywords: Femoral prosthesis; Total knee arthroplasty; Posterior cruciate ligament; von Mises stress; Finite element analysis

Poster Presentation

21- **Title**: Arthroscopic Findings In One Hundered Patients With Anterior Shoulder Instability

Authors: Mohammadnasir Naderi, Hadi Ghotbi, Hassan Keihanshokooh, Mehdi Rahimi

Aim: In anterior shoulder instability the most common finding is bankart lesion, but in recent years associated injuries was noticed more and their importance became more prominent.

Methods: We studied one hundred patients with anterior shoulder instability who treated by arthroscopic methods. The patients had more than one time apparent shoulder dislocation. 14 patients was female and remaining 85 were male studied from March 2010 to August 2017.The mean age was 29.4 (range from 16 to 76).

Results: Right shoulder was involved in most patients (74%(. Anterior bankart lesion was found in 95 patients and bony bankart in 3 patients, and in two remaining patients Laterjet operation was performed due to large bony defect . There was hill Sachs lesion in 40 patients which repaired by remplissage technique in 39 patients. In 35 % of patients there was posterior bankart and in 31% SLAP lesion was found. In two patients with capsular laxity, rotator interval closure was done. In one patient there was loose body in shoulder joint that removed, and in one patient shoulder osteoarthritis changes was found.

Discussion & Conclusion: Our findings revealed that in patients with anterior shoulder instability, the chance of associated injuries is more than previous beliefs. By the way, it seems that for achieving a successful result, it is better to repair all lesions.

Keywords: shoulder, instability, arthroscopy

Poster Presentation

22- **Title**: The Influence Of Tibial Tuberosity Trochlear Groove Distance On The Development Of Patellofemoral Pain

Authors: Mohammadnaghi Tahmasebi, Mohammadjavad Zehtab, Leila Aghaghazvini, Hossein Miresmaeili, Arash Sherafatvaziri, Seyed Shahin Mirkarimi

Aim: Tibial tuberosity-trochlear groove distance (TT-TGD) measurements play a decisive role in evaluating patellofemoral joint disorders. However, the prevalence of pathological TT-TGD among patients with patellofemoral pain remains unclear. The purpose of this study was to compare the size of TT-TGD among patients with patellofemoral pain syndrome (PFPS) and those with no history of patellofemoral pain.

Methods: A total of 100 cases participated in this case-control study, among whom 53 individuals were in the case group and 47 individuals were in the control group. TT-TGD was measured by magnetic resonance imaging.

Results: The mean TT-TGD was 12.3±3.3 in patients and 9.3±2.4 in controls ($P<0.001$). Among patients, we had totally 34 patients with TT-TG equal or lower than 13 (64.2%) and in 18 patients, it was higher than 13 (34%).

Discussion &Conclusion: Several anatomical risk factor may play role in development of pfps. The displacement of the tibial tuberosity towards the lateral side by causing lateral stretch on the patellar tendon increases contact pressure in the patellofemoral joint and causes pain. In a study recently conducted by Carlson et al, TT-TGD was measured in patients with PFPS by MRI. In this study, the mean TT-TGD was higher in the patients group than in the control group. Also, 30% of the patient group had TT-TGD higher than 15 mm. In another study conducted by Wittsteinet al with the aid of MRI, it was shown that TT-TGD in the PFPS group was higher than that of the healthy group. The findings were consistent with our study results.

In an older study by Jones et al, TT-TGD was measured in patients with PFPS by CT scan. In this study, TT-TGD was significantly higher in the patients group than

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in the control group. They suggested that TT-TGD more than 9 mm be considered the cut-off value for the detection of patellofemoral malalignment. (21). According to the findings of this study and previous studies an increase in TT-TGD might justify part of the PFPS-resistant cases (19- 21). TTO is one of the most commonly used treatments for patellar instability, however, its effectiveness in the treatment of PFPS is unclear. Based on the studies conducted by MRI, a TT-TGD higher than 15 mm can be considered a threshold to perform TTO (7, 19, 25, 26). TTO may help to improve the pain in these patients by creating a balance in the extensor mechanism of the knee although there is currently a lack of evidence to perform TTO in all patients with increased TTTGD. Therefore, the presence of TT-TGD of more than 15 in MRI for performing TTO in all cases of PFPS is not sufficient (8,9,19). According to the findings of this study, we cannot offer optimal cut-off value to perform TTO on patients with resistant PFPS. We propose that the increase of TT-TGD should be considered one of the factors influencing the development of PFPS. As far as we know, there are few studies comparing TT-TGD between healthy people and those with PFPS, thus more studies are needed to determine the prevalence of tibial tuberosity lateralization among people with PFPS. Considering the advantages of MRI in detecting cartilage lesions and soft tissue, the use of this diagnostic modality instead of CT scan to measure TT-TGD is recommended.

Discussion & Conclusion: The TT-TGD mean in patients with PFPS was greater than that in the control group. An increase in TT-TGD can be considered one of the factors behind the development of PFPS, therefore, Measurement of TT-TGD using MRI should be performed as part of the evaluation of PFPS-resistant cases. Acknowledgments: we thank our colleagues drmajidshakiba from advanced diagnostic and invasive research center (Tehran university of medical sciences) who performed data analyzing that greatly assisted the research.

Keywords: knee, MRI, patelofemoral pain syndrome, chondromalacia patellae

Poster Presentation

23- **Title**: Primary Repair Of Intraoperative Medial Collateral Ligament Injury During Medial Pie-Crusting Technique In Primary Total Knee Arthroplasty

Authors: Mahdi Motififard, Mohammadreza Piri Ardakani, Erfan Sheikhbahaei, Hojjat Cheragh Sahar

Aim: TKA for patients with additional Varus knee deformity is complicated due to the balancing of the tibial alignment during the surgery. Recently Pie-crusting technique have been proposed as an effective and safe technique for TKA in patients with varus deformity who need additional release of medial soft tissue. However application of this technique have not become widespread due to potential postoperative MCL disruption and posteromedial laxity. A constrained TKA implant may be necessary in cases with intraoperative PML. However application of constrained condylar knee prosthesis (CCKP) may be associated with increased wear, osteolysis, and aseptic loosening rates. This unique prosthesis is not easily available in every medical center. Furthermore it is expensive and cannot be afforded by all of the patients. In our clinic, constrained TKA implants are 250% more expensive than standard posterior stabilized non- constrained cemented implants. tendon repair by sutures can be an accessible, reasonable and affordable approach for patients who have genu varum and soft tissue balancing have to be performed for them during the surgery and thus face posteromedial component disruption during the pie-crusting technique in TKA. The aim of this study is to determine rate of MCL disruption in medial pie-crusting technique and assessing clinical outcome of tendon reefing with sutures for patients with PML and if medial repair can act as an appropriate substitute for CCKP.

Methods: In this prospective study, among 1053 patients with symtomatic osteoarthritis, 974 patients who had indications of total knee arthroplasty were chosen between 2015-2019. One single experienced orthopaedic surgeon performed all of the TKA surgeries. 653 patients needed tibial balancing during the surgery, therefore pie-crusting technique was performed to release posteromedial components. In 36 of them medial laxity was seen during the surgery thus medial

collateral ligament reefing was performed. The knee joint was immobilized for three weeks and multiple sessions of physiotherapy started.in addition to demographic data including age, sex, BMI, their knee functions were evaluated after 6 months by assessing knee range of motion, flexion contracture using goniometer, Knee Society Score and reoperation. Joint Instability, prosthesis failure, infection and any other postoperative complication was evaluated. Their extracted data analyzed by IBM SPSS software.

Results: Pie-crusting technique was performed for 653 (67.04%) of our selected TKA patients. 35 (5.3%) of patients balanced with medial Pie-crusting experienced joint laxity during the surgery due to posteromedial component disruption. Our patients aged 66.60±5.83 (52-78) years that 91.4% of them were female and 68.6% of them had normal BMI level. Mean calculated varus knee angle during and before the surgery was 11.51±3.31 (6-18) degree. After six months of follow-up, 29(82.8%) patients achieved acceptable results with stable joint. Three(8.6%) patients needed revisional surgery and CCKP. Two(5.7%) patients had unstable joint and did not permitted to perform the revisional surgery. Two(5.7%) patients had restricted joint movements. 17 patients (48.57%) experienced no postoperative complication. Knee Society Score and range of motion improved in both stable and unstable joint groups significantly.

Discussion & Conclusion: pie-crusting technique should be performed cautiously and step-by-step to avoid complete release and joint laxity. Joshua. J et al. revealed that 2.7% of their patients experienced posteromedial joint instability due to TKA pie-crusting, however, 5.35% of our patients had MCL tear during the surgery. Although CCKP can help these patients, it is expensive and is not available in every medical center, therefore, tendon reefing can be performed instead for these patients. Range of motion in final follow-up in Joshua J. et al. study achieved to mean 108 degrees and in our patients after 6 months follow-up achieved 100.28 degree. Chen-Yi Ye et al. study is the one that compared the CCK results. They stated that the mean KSS and fKSS before the surgery were 26 and 40 respectively and after the surgery became 80 and 85 respectively. In comparison to our patients with refeed MCL, KSS and fKSS before the surgery were 31.97 and 16.00 respectively and after

the surgery became 81.80 and 61.00 respectively. Therefore, it can be drawn from our study that in case of reefing the teared MCL instead of CCK has acceptable results. In conclusion, Primary repair of medial collateral ligament in patients with severe varus deformity with MCL tear during medial pie-crusting technique in total knee arthroplasty is a safe and effective technique eliminating need for more expensive treatments like CCKP, Which increased knee function and range of motion with limited need for reoperation due to joint instability.

Keywords: total knee arthroplasty; varus deformity; medial collateral ligament; instability; pie-crusting

Poster Presentation

24- **Title**: Evaluation Of 3-Dimensional Profile Of Asian Knee

Authors: Babak Otoukesh, Bahram Boddouhi, Peyman Kaghazian

Aim: Maintaining proper size and rotation of components of total knee arthroplasty is mandatory for optimal longevity. Ethnical differences may affect fitness of the prostheses that were manufactured mainly based on Caucasian dimensions. This review aimed to evaluate
3- dimensional characteristics of distal femur and proximal tibia among Asian populations.
Moreover rotational profile of distal femur was also assessed
Methods: Databases were searched and relevant studies were selected. Including criteria were: studies on Asian populations, studies on morphological and rotational characteristics of the knee joint and prostheses. Finally 21 studies were selected.
Results: Based on the studies male subjects enjoy larger dimensions, while total configuration is proportionately similar to female at axial section. Some other studies in white populations or Asian populations found significant discrepancies among genders. Also it was indicated as anteroposterior size grows, aspect ratio shows downward inclination in both genders and in studied prostheses for Asian populations.
In contrast to western Caucasian knees, there are some parameters in the Asian knees which decrease upon increasing the other parameters and the size of the knee. Finally females enjoyed greater value of these rotational values in majority of the studies.
Discussion & Conclusion: Generally, it can be said that assumption of smaller knee in Asian relative to white population is more accurate on femoral side while tibial dimensions share more homogenous profiles.
Keywords: Total Knee Arthroplasty; 3-dimensional Profile; Asian knee

Poster Presentation

25- **Title**: The Changes Of Pelvic Obliquity Angle Early Postop Of Total Hip Arthroplasty

Authors: Seyed Mohammadjavad Mortazavi, Alireza Moharrami, Hossein Shafiei, Mohammadali Ghasemi

Aim: End-stage degenerative joint disease(DJD) in hip joint not only affect patient's quality of life and activity of daily living but also affect other adjacent joints. In this order, long lasting hip DJD could force pelvis to tilt in coronal plane (pelvic obliquity) also could affect sagittal lumbo-pelvic balance. In this study, we assessed how pelvic obliquity will change in early stage following total hip arthroplasty.

Methods: All total hip arthroplasty patients were extracted from institutional database from January 2015 to January 2018. All preoperative pelvic anteroposterior radiographs were observed by one of researchers and all patients with pelvic obliquity were included. Postoperative radiographs were assessed by the same researcher and pelvic tilt in coronal plane were calculated. With mediCAD 3.5 all data.

Results: present study included 730 patients who underwent THA. The results of PO angle changes in early post-operative showed that, 56.7 % of patients had no change, 18.5 % get worse with mean of 3.39 degrees, 13.2 % had reversed with a mean of 7.23 degrees, 8.2 % had improvement with mean of 5.38 degrees and 3.2 % had improvement in PO angle but had not normal alignment.

Discussion & Conclusion: According to our findings, pelvic obliquity changes could categorized in five groups, patients with worsening of pelvic obliquity in same direction, no change in pelvic obliquity, improve obliquity but not normal, patient who had no pelvic obliquity after the surgery (entirely became normal with THA) and patients who had reverse pelvic obliquity in opposite direction following the surgery.

Keywords: Hip, Arthroplasty, Pelvic Obliquity

Poster Presentation

26- **Title**: Evaluating The Efficiency Of Autologous Bone Marrow Concentrate In Repairing Damaged Knee Cartilage In Patients With Moderate To Severe Knee Osteoarthritis

Authors: Amin Razi, Farshid Bagheri, Seyed Mahdi Mazloumi, Hasan Attarchi, Mohammadtaghi Peivandi

Aim: we investigated the repairing and regenerative ability of bone marrow concentrate (BMC) in patients with primary moderate to severe osteoarthritis (OA) (based on X-ray findings, pain and functional score, and magnetic resonance image (MRI)) of the knee.

Methods: Five cases of OA were treated with bone marrow-derived mononuclear cell (BMMC) grafting. We acted one-step BMMCs as the total mononuclear cells. We harvested 120 mL of BM from the posterior iliac crest. Then, the volume of the aspirate was reduced by transferring plasma, platelets, and red blood cells by centrifuging the aspirate and Ficoll washing. The final volume, about 1.5 mL, was then combined with hyaluronate as a scaffold and inserted into the impaired knee percutaneous. Patients were checked-out by MRI and pain and function before the operation, then at three months post operation to check the amount of carriage volume

Results: All symptoms of the patients progressed over the follow-up period of three months. Average of all scores in pain, functional status of knee, walking distance, daily living, and quality of life displayed statistically significant recovery (P-value <0.05). Comparison of MRI at baseline and three months post-stem cell injection showed an increase in cartilage thickness in three out of five patients and a major decrease in the size of edematous subchondral patches in entire patients.

Discussion & Conclusion: Due to the lack of severe complications like infections and allergies, and based on past studies mononuclear cells that are embedded on scaffold, this is an useful treatment for patients with OA. Moreover, the transplantation of autologous bone marrow mononuclear cells (ABM-MCs) may be a more practical for cartilage repair in clinical utilization.

Keywords: Total Mononuclear Cell, Knee Osteoarthritis, Bone Marrow mononuclear cells, Cartilage Regeneration

Poster Presentation

27- **Title**: Investigation The Effect Of Avocado/Soybean And Icariin On The Chondrogenesis Of Human Adipose Derived Stem Cells On Poly (Lactic-Co-Glycolic) Acid/Fibrin Hybrid Scaffold

Authors: Majid Pourentezari, Mohammad Mardani, Batool Hashemibeni, Ali Valiani, Morteza Anvari, Esmat Mangoli

Aim: Avocado/soybean (ASU) and icariin (ICA) components are described to have a chondroprotective result by advantage of anti-inflammatory and anabolic effects on chondrocytes. The aim of this study was to observe the effect of avocado/soybean and icariin on the chondrogenesis of human adipose derived stem cells on poly (lactic-co-glycolic) acid/fibrin hybrid scaffold

Methods: human adipose derived stem cells (hADSCs) seeded in PLGA/fibrin scaffold and cultured in chondrogenic media. These cells divided into 5 groups (control, TGFβ-3, ASU, ICA and ASU/ICA). The viability of cells in different groups were assessed by MTT. The expression of chondrogenic related genes (Sox9, type II collagen, Aggrecan), type X collagen and type I collagen were quantified by real time PCR. Protein expression levels of collagen type II and X were evaluated by Western blotting.

Results: The viability and proliferation of cells in groups of ASU, ICA and ASU/ICA significantly increased in comparison with the TGF-β3, this increase for the group of ASU and ICA were not significant.

In comparison with the control group, genes expression levels of type II collagen, SOX9 and aggrecan were significantly increased, 6/6, 9.1 and 4 fold in ASU group, respectively. However, hypertrophic (collagen type X) and fibrosis (collagen type I) markers in comparison with TGF-β3 decreased 4.6 and 1.5 fold, respectively. In ASU group, genes expression levels of type II collagen, SOX9 and aggrecan were significantly increased, 5.8, 5.7 and 2.3 fold respectively in comparison with the control group. However, hypertrophic and fibrosis markers in comparison with TGF-β3 decreased 6.5 and 1.6 fold, respectively. Group ASU/ICA genes expression type II collagen, SOX9 and aggrecan were significantly increased, 9.6, 9.3 and 5.6 fold

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respectively in comparison with the control group. In spite of, hypertrophic and fibrosis markers in comparison with TGF-β3 decreased 7.6 and 2.5 fold, respectively.

Protein levels of type II collagen significantly increased in all groups in comparison with the control group. Protein levels Type X collagen significantly decreased in the groups of ASU, ICA and ASU/ICA in comparison with TGF-β3.

Discussion & Conclusion: Using ASU, ICA and particularly synergist form can induce chondrogenesis in hADSCs in PLGA/Fibrin composite scaffold.

Keywords: Avocado/Soybean, icariin, human adipose-derived stem cells, polylactic acid-polyglycolic acid (PLGA), fibrin, Chondrogenesis

Poster Presentation

28- **Title**: Soft Tissue Release In TKA Of Severely Deformed Varus Knees: A Novel Approach

Author: Rshid Ganji, Ahmadreza Zarifian, Saeid Ganji, Nima Ghaboulian Zare

Aim: Varus knee deformity is a relatively common concern in developing countries like Iran, where patients mostly refer to orthopedist in late stages after years of osteoarthritis (OA). The introduction of total knee arthroplasty (TKA) has led to a revolution in the treatment of patients with end-stage OA of the knee. To obtain a successful TKA in these patients with severe varus deformities, accurate soft tissue balancing is of utmost importance. The therapeutic approach toward medial soft tissue release depends mostly on the severity of the deformity. Although there is a consensus in mild to moderate varus deformities, where deep medial collateral ligament (MCL) release corrects the deformity, proper treatment approach in cases with severe or fixed varus deformities is still controversial. Each technique has its own downsides that is why many surgeons are unable to maintain joint stability and thus have to use semi-constrained prosthesis in these patients. In this study, we aimed to assess the feasibility of a novel approach in stepwise medial release for severely deformed varus knees.

Methods: In this cross-sectional prospective study, we included all varus knees operated in our center during 2018. All TKAs performed by one single surgeon were extracted from a single-center database comprising over 6000 TKA operations. Based on the severity of varus deformity, patients were categorized into three groups of mild (0-9.9 degrees), moderate (10-24.9 degrees) and severe (>25 degrees). A stepwise surgical approach was used, in which we first removed osteophytes and released deep MCL (dMCL) for all varus knees. Then, if the gap was still imbalanced, medial tibial osteotomy and/or superficial MCL (sMCL) pie crusting was performed. If the gap balance was not achieved, in the third step we released sMCL and if required, posterior oblique ligament (POL). Subtle changes might be made in this approach based on the flexibility of varus deformity. All TKAs were carried out using cemented posterior-stabilized prosthesis. However, we used semi-

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constrained knee prosthesis if there was a suspicion of later joint instability. Use of a semi-constrained prosthesis and reaching a balanced intra-operative gap were assessed to measure outcomes. Data were analyzed in SPSS (v. 22, IBM Statistics, USA) and $P<0.05$ was considered statistically significant.

Results: During the study period, 998 knees were operated, of which 964 (96.59%) had different grades of varus deformity. Out of all 964 varus knees, 415 (43%) had mild deformity, 490 (50.8%) had moderate deformity, and 59 (6.1%) had severe varus deformity. There was no significant difference between the right and left side knees regarding the severity of varus deformity ($P=0.937$). In mild varus knees, osteophyte removal and releasing dMCL sufficed in 327 (78.8%), while 86 (20.7%) needed pie crusting of sMCL, and in 2 (0.5%) knees with fixed deformities we had to release sMCL. Among moderate varus knees, 242 (49.4%) were operated using osteophyte removal and releasing dMCL alone. However, 158 knees (32.2%) required sMCL pie crusting and the remaining 90 (18.4%) needed sMCL release. In severe varus knees, removing osteophytes and dMCL release were successful in only 10 (16.9%) and 17 (28.8%) needed sMCL pie crusting, while the majority of them (n=30, 50.8%) treated with sMCL release. The remaining 2 knees (3.4%) in the severe varus group had extremely fixed deformities and it was inevitable to treat them with POL release. Intraoperative balancing of the gaps was achieved in all knees (100%). There was no need for semi-constrained prosthesis in 941 knees (99.5%), but 5 knees (0.5%) were treated using semi-constrained prosthesis.

Discussion & Conclusion: Although achieving gap balance and favorable stability outcomes in TKA is attainable in mild to moderate varus knee deformities, it is very difficult in severe deformities, making it a different entity that surgeons should face in TKAs of the severe varus knees. We found that the stepwise approach to soft tissue release in varus knees can markedly decrease the use of semi-constrained prostheses in varus knees, especially severe ones, without affecting the outcomes of TKA. It can be stated that precise gap balancing and joint stability can be attained through sMCL release and leaving posteromedial corner in the majority of severe varus knees. Via this stepwise approach, the knee stability is maintained while avoiding adverse outcomes of major soft tissue release in posteromedial corner such as medial widening of the joint.

Keywords: Soft Tissue Release, Total Knee Arthroplasty, Varus Deformity

Poster Presentation

29- **Title**: Ultrasound-Guided Injection Of High Molecular Weight Hyaluronic Acid Versus Corticosteroid In Management Of Plantar Fasciitis: A 24-Week Randomized Clinical Trial

Author: Seyed Ahmad Raeissadat, Farshad Nouri, Hadi Esmaeily, Mahtab Darvish

Aim: Plantar fasciitis (PF) is the leading cause of heel pain in adults. This study was designed to evaluate the effect of hyaluronic acid (HA) injection in reducing the symptoms of PF, compared with corticosteroid (CS) injection as a conventional treatment.

Methods: In this triple-blind, randomized, clinical trial, 75 patients who had the symptoms of PF for at least 3 months were randomly divided into 2 groups of 38 and 37 individuals. Then each patient received either a single injection of high molecular weight (>2000 kDa) HA (1 ml HA 20 mg + 1 ml Lidocaine 2%) or CS (1 ml methylprednisolone 40 mg + 1 ml Lidocaine 2%) under the guide of ultrasonography (US). Visual analog scale (VAS), foot ankle ability index (FAAI), pressure pain threshold (PPT), functional foot index (FFI), and plantar fascia thickness were then measured using US at baseline, 6 weeks and 24 weeks after the injection. Eventually, at the end of the treatment period, the patients' satisfaction was measured. Intention to treat analysis was used to assess the results.

Results: After 24 weeks of follow-up, results from 60 subjects were fully obtained, however results of 73 patients included into intention to treat analysis in sixth-week follow up. In both groups, VAS, plantar fascia thickness measured by US and FFI decreased, while FAAI and PPT increased significantly (P <0.001). At the baseline and at the 24th-week, no significant difference between the two groups was observed in any of the variables. However, a comparison between the baseline and the 6th-week results shows a prominent decrease in PPT and plantar fascia thickness in the CS group compared to the HA group (P = 0.004 and P = 0.011). Finally, there were no statistical difference between the two groups in treatment satisfaction (P = 0.618).

Discussion & Conclusion: Both CS and HA were effective modalities for PF and can improve pain and function with no superiority in 24th-week follow-ups, although CS seems to have a faster trend of improvement in the short term.

Keywords: Corticosteroid, Hyaluronic acid, VAS, FAAI, PPT

Poster Presentation

30- **Title**: Management Of Intraoperative Ligament Complications In Total Knee Arthroplasty

Author: Rashid Ganji, Ahmadreza Zarifian, Saeid Ganji, Nima Ghaboulian Zare

Aim: Intraoperative ligament complications often remain undiagnosed and neglected during total knee replacement (TKR) surgery. Failure to manage these intraoperative complications may result in knee instability and prosthesis loosening. We aimed to investigate functional outcomes in patients with intraoperative ligament complications during their TKR and compare different approaches in management of these complications.

Methods: In this analytic cross-sectional study, we retrospectively reviewed all records of 504 patients who underwent primary TKR in our hospital setting during 2016. Demographic characteristics of patients were collected. Intraoperative ligament complications and corresponding therapeutic approaches were recorded in specific checklists for all patients. Functional outcomes were assessed using clinical examinations and new knee society score (KSS) during a long-term follow-up. Data were entered into and analyzed in SPSS and $P<0.05$ was considered statistically significant.

Results: Overall, 504 patients (836 knees) were operated, of whom 437 (86.7%) were female. The mean age was 66.78±7.21 years. The average follow-up period was 32.45 months (ranging from 24 to 40 months). The most common intraoperative ligament complication among our patients was iatrogenic popliteus tendon cut in 25 knees (3%). Medial collateral ligament (MCL) injury occurred in 2 knees (0.24%) and 11 knees (1.3%) had superficial MCL popping during soft tissue release. Among varus knees, 18 (2.1%) had over-released MCL (excluding superficial MCL popping) and 13 (1.5%) had under-released MCL. Among our 42 (5%) valgus knees, 30 needed lateral release and only three had intraoperative ligament complication under lateral structural release, which was managed with varus-valgus constrained (VVC) prosthesis. There was a significant difference between varus and valgus knees in terms of intraoperative ligament complications (P=0.037). Different

therapeutic approaches including ignoring, repair, augmentation, using constrained prostheses and external knee support were used based on patients' situation. Intraoperative MCL injury was very rare and responded well to our therapeutic approach. Popliteus tendon injury was often ignorable. Over-release was more favorably managed with lower rate of reoperation compared with under-release, which significantly affected functional scores and yields higher reoperation rate. Ligament balancing was more complex in varus knees compared with valgus knees. Finally yet importantly, posterolateral capsular release in varus knees is not completely predictable, especially in severe deformities and stepwise medial release is preferred in these cases.

Discussion & Conclusion: Intraoperative ligament complications can be easily managed if diagnosed. Unbalanced knees resulting from these complications, especially under-released varus knees can lead to post-operative pain, affect functional knee scores, and increase reoperation rate.

Keywords: Soft Tissue Release, Total Knee Arthroplasty, Ligaments

Poster Presentation

31- **Title**: Enhanced Corrosion and Tribocorrosion Behavior of Ti6Al4V Alloy by Auto–Sealed Micro arc Oxidation Coatings

Author: Mohammad Fazel, Mohammadreza Salimijazi, Morteza Shamanian

Aim: Due to high strength and fracture toughness, low weight and good corrosion resistance, titanium and its alloys are one of the most used materials in biomedical industries and orthopedic applications. Nevertheless, it is well known that the poor tribological properties makes these materials undergo severe wear and surface degradation, especially under contact and/or sliding in corrosive environments like in hip/knee replacements. The aim of this study was therefore to enhance the corrosion and tribocorrosion properties of Micro Arc Oxidation (MAO) coatings by sub-zero temperature operation on Ti6Al4V alloys.

Methods: The samples were oxidized in an acidic electrolyte that contained 1.8 M H_2SO_4 and 0.4 M H_3PO_4 at two different temperatures of 20oC and –10oC. Surface morphology and chemical composition of oxide layers were characterized by scanning electron microscopy (SEM; Philips XL 30) combined with energy dispersive spectroscopy. Potentiodynamic polarization tests were performed using a Potentiostat/Galvanostat device. Tribocorrosion behaviour were also considered in an electrochemical cell using a linear reciprocating sliding tribometer.

Results & Discussion: The results showed that the plasma discharged channels on the surface of –10oC MAO layers were sealed by solidified erupted materials (Figure 1).

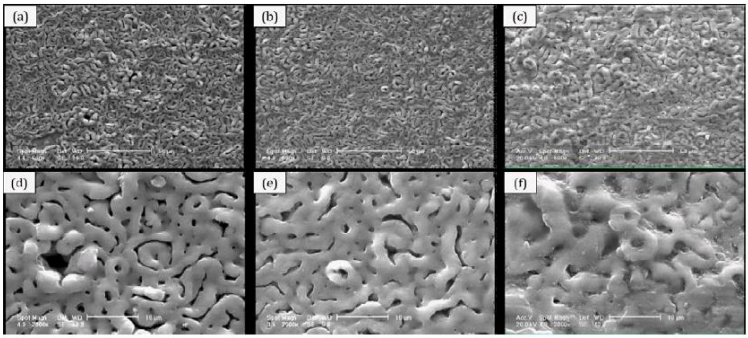

Figure 1. SEM micrographs of the MAO layers at the constant voltage of 180 V and three different electrolyte temperatures: (a, d) 20oC, (b, e) 0oC and (c, f) –10oC.

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The corrosion measurements showed that the corrosion and passive current densities of the sub–zero treated samples were lower than those performed at 20oC by almost 15% and 60%, respectively. The MAO layers formed at –10oC also demonstrated the lowest potential drop at tribocorrosion studies (Figure 2).

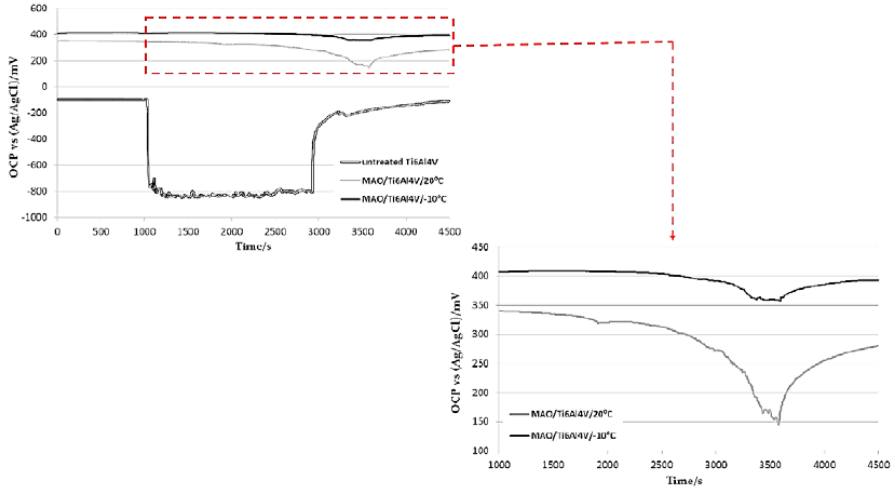

Figure 2. Variations of OCP values of untreated Ti6Al4V alloy before and after micro–arc oxidation at 20oC and –10oC during tribocorrosion experiments.

The dominant wear mechanism was changed from a strong fatigue wear accompanied by propagation of fatigue cracks and coating delamination in 20oC formed MAO layers, to a mild abrasive wear with a smooth surface in the sub–zero micro arc oxidized samples.

Conclusion: To sum up, it could be concluded that the tribocorrosion resistance of the sub–zero micro arc oxidized specimens was significantly more than general MAO coatings.

Keywords: Ti6Al4V alloy, Micro Arc Oxidation, Sub-zero temperature, Corrosion, Tribocorrosion

Poster Presentation

32- **Title**: Evaluation Of Safety Of Intradiscal Implantation Of Nucleus Pulposus Derived Chondrocytes In Regeneration Of Human Degenerated Lumbar Disc In Patients With Chronic Low Back Pain, A Phase 1 Clinical Trial

Author: Naser Aghdami, Mohammadebrahim Taherian, Narges Labibzadeh

Aim: Chronic low back pain is one of the most common causes of disability in all societies. Even after invasive treatments, about 70% to 80% of patients will have recurrent pain. Disc degeneration commonly occurs due to changes in disc morphology composition of the extracellur matrix as well as loss of disc cells, therefore, a potential therapeutic strategy would be the augmentation of the disc cell population to restore normal biologic function and matrix insufficiencies. Nucleus pulposus derived chondrocytes can be a source for disc regeneration. Our goal in this phase 1 clinical trial was to evaluate the safety of post-endoscopic surgery implantation of nucleus pulposus derived chondrocytes.

Methods: Patients with chronic low back pain who did not respond to conservative treatments for at least 6 months of treatment and who were candidates for endoscopic disc enucleation, were enrolled to this clinical trial. Patients underwent endoscopic disc enucleation surgery. During the operation, the protruded part of the nucleus pulposus, was removed and this sample of nucleus pulposus was sent to the Royan Institute clean room for culturing chondrocytes. One month later, and upon arrival the number of chondrocytes reached a limit of 20 million chronocities per disc, these cells were reimplanted. Patients were evaluated for side effects according to Common Terminology Criteria for Adverse Events (CTCAE) version 4.0. They were followed up 3, 6, 12 and 24 months after implantation of chondrocytes.

Results: Five patients were included to this clinical trial, including 1 female and 4 men. Mean age were: 40.3 years old, and average BMI were: 25.5 Kg/ m2. Mean time when patients had low back pain was: 14 ± 1 months. They were followed up for two years after chondrocytes implantation. No side effects were seen at this period of time. Baseline VAS (Visual Analogue scale) and ODI (Oswestry low back pain questionnaire) values and follow up data are shown in the Table. Pain of all the

patients was reduced according to VAS and ODI questionnaire 6 months after implantation of chondrocytes, and this decrease remained two years after implantation. According to the results of MRIs, the amount of disk protrusion decreased compared to pre-implantation and remained the same for two years after implantation (Figure).

Discussion & Conclusion: In this clinical trial, we investigated the safety of intradiscal implantation of autologus nucleus pulposus derived chondrocytes for the patients suffering from chronic uncontrolled low back pain. According to the results of this treatment, it can be concluded that treatment of chronic low back pain using of chondrocytes derived from the autologus intervertebral disc, is safe, which has had very good effects on our patient's outcomes. To further investigations for evaluate this implantation efficacies, this treatment should be taken on a larger number of patients and with longer time for follow-up.

Keywords: Low Back Pain, Stem Cell, Chondrocyte

Poster Presentation

33- **Title**: Arthroscopic Treatment of Acute Type III Acromioclavicular Joint Dislocation

Author: Hamidreza Aslani, Rahmatollah Serri, Amir Farahanchi Baradaran

Aim: Acromioclavicular joint dislocation (ACJD) is a common injury among shoulder injuries. There are six types of ACJD due to Rockwood classification and there are controversies over whether the treatment of type III dislocation should be done conservatively or surgically. The aim of this study was to evaluate the outcomes of arthroscopic treatment of ACJD type III.

Methods: 36 patients underwent arthroscopic treatment using EndoButton, out of which 7 were lost to follow-up. The average follow-up period was 3.8years (2-6 years). The pain was evaluated using the visual analog scale (VAS) before surgery and during the follow-up period. The function of the shoulder was evaluated with the University of California, Los Angeles (UCLA) scale after the surgery and during the follow-up period and compared with the uninjured shoulder. All the patients were between 20 to 65 years old with type III ACJD.

Results: All the patients were followed-up for at least 2 years. There was no recurrent dislocation or subluxation in patients during this period and all patients reached a normal range of motion in the final follow-up. No significant pain was reported after the surgery (0.34 ± 0.48) and the mean UCLA score was 33.90 ± 1.17 in the final follow-up that was comparable with the intact shoulder.

Discussion & Conclusion: In conclusion, the results of this study illustrated that the outcome of arthroscopic treatment of type III ACJD using EndoButton was satisfactory with low complication and this method can be considered as a safe and useful procedure in the treatment of these patients.

Keywords: Acromioclavicular joint, joint dislocation, arthroscopy

Poster Presentation

34- **Title**: Intravenous Versus Topical Efficacy Of Tranexamic Acid Admisistration On Reducing Of Blood Loss After Total Knee Arthroplassty: A Randomized Clinical Trial Study

Author:Ali Torkaman, Hamidreza Yazdi, Amir Rostami, Hosein Akbari Aghdam

Aim: Blood loss during and immediately after total knee arthroplasty (TKA) is one of the most challenging complications. Tranexamic acid(TXA) has been shown effective in reducing perioperative blood loss. Two main route of administration are topical and intravenous. Our hypothesis was that intravenous infusion of TXA maybe has better effect than topical injection in reducing blood loss in patients underwent total knee arthroplasty.

Methods: 85 patients who underwent total knee arthroplasty in our hospital randomized in two groups: Intravenous group 1 g TXA 10 min before tourniquet inflation and topical group 1 g TXA diluted in 10 cc normal saline during wound closure. Primary outcome was blood loss measured from total amount of blood in drain, hemoglobin(HB) drop and need for transfusion. Secondary outcome were complications such as deep vein thrombosis(DVT) and thromboembolism, the length of hospitalization.

Results: Patients who received topical TXA had higher total drain output (a difference of 104 mL) compared with those who received IV TXA (560 compared with 456 mL; $p < 0.0001$) also HB drop was higher in group with topically received TXA($P=0.05$).

Discussion & Conclusion: Intravenous infusion of TXA instantly before surgery had more effect on decreasing blood loss than topical injection in total knee arthroplasty.

Keywords: Tranexamic Acid , Total Knee Arthroplasty, Blood Loss

Poster Presentation

35- **Title**: Relationship Between Clinical And Histopathologic Integrity Of Posterior Cruciate Ligament (PCL) In Patients With Knee Replacement

Author: Hoseinali Hadi, Ali Rahbari, Mahmoud Jabalameli, Ahmadreza Behrouz, Zahra Rezaei, Amir Azimi

Aim: Osteoarthritis is the most common cause of knee pain causing knee function impairment Knee replacement is a standard treatment for improving performance in patients with knee osteoarthritis. Posterior cruciate ligament (PCL) plays an important role in knee structure and is essential for knee kinematics in accompany with anterior cruciate ligament (ACL)

The aim of conducting this study was to evaluate the macroscopic and clinical changes of PCL during surgery in patients experiencing knee replacement and to examine the relationship between histopathological changes and clinical changes of PCL in patients subject to knee replacement.

Method: 102 patients candidate for knee replacement were enrolled in the study.

In order to determine the clinical health of PCL during operation, the cruciate ligament was divided into 3 groups of completely healthy, weakened, and ruptured using direct observation method

PCL was removed and sent for histopathologic examination to assess ligament`s degeneration rate.

The association between the clinical changes of PCL and histopathological health of PCL was investigated.

Result: The mean age of the patients was 69.73 ± 7.81 years .There was no significant difference between the decades of age and the total degeneration score(TDS) of PCL (P = 0.204).There was no significant difference between sex and total degeneration score(TDS) of PCL (P = 0.934) Regarding the clinical status of PCL, 90 (88.2%), 11 (10.8%), and 1 (1%) patients had healthy, weak, and ruptured PCL, respectively.Clinical PCL had no significant difference with histopathologic changes in PCL (P > 0.05).the mean total score of PCL degeneration was 3.09 ± 1.47 in all patients.There was no significant difference between the total degenerative

changes (TDS) of PCL and deformity severity (P = 0.47).There was no significant difference in the total degenerative changes (TDS) of PCL in motion disability groups (P = 0.925) .

Discussion & Conclusion: Clinical PCL status was not significantly different from the histopathological changes of PCL (P > 0.05). There was no significant difference between the total score of degenerative changes (TDS) of PCL and deformity severity (P > 0.05). There was no significant difference in the total degenerative changes (TDS) of PCL in motion disability groups (p > 0.05).

Keyword: knee arthroplasty, histopathological changes of PCL, posterior cruciate ligament

Poster Presentation

36- **Title**: Grade Two Ankle Syndesmotic Injury And Its Superior Treatment
Author: Hanieh Akbarimehr

Aim: The purpose of this study is to evaluate the challenge of musculoskeletal physicians' diagnosis of ankle syndesmotic injury (High Ankle Sprain). The controversies regarding diagnostic tests, treatment plan, rehabilitation program and prognosis in this article have been examined among patients. Use of surgery and suture button device have become prevalent compared to conservative treatment although the literature is emphasizing on both. Nonsurgical treatment, on the other hand, needs to be prioritized when it comes to the most of the syndesmotic injuries with no fractures and the outcome of this treatment is generally good despite the fact that the length of treatment might become longer.

Methods: 346 athletes from both professional and armature groups who referred to physicians of the Orthepodic Clinic with a probable diagnosis of syndesmotic injury have been evaluated using clinical examination, conventional radiography and MRI. For professional athletes MRArthroscopy were utilized. Based on the grades of the injury the patients have been categorized into four categories. Those with fractures have been excluded from these and therefore three remained categories were evaluated. Those with partial tear of tibiofibular ligaments and stability of the ankle have been tagged as grade one and a cast and non-weight bearing for 3 weeks accompanied with aggressive rehabilitation program have been implemented. The second grade has shown some diastasis and medial clear space in their radiography for which it was not clear to diagnose the partial or complete rupture of the syndesmotic ligaments. The third group had a complete rupture of AITFL, interosseous membrane and PITFL in which medial and Tibfib clear space and overlap differs from a normal ankle. This injury is generally accompanied by proximal fibula fracture and surgical treatment was suggested for this category.

In this article, the remained 76 athletes with Grade two injury who has no fractures were separated from the other groups. The stability of their ankles were measured using plain radiographs and stress testing and were identified as stable and unstable.

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In grade two stable cases, and based on the athletes' preference of conservative treatment, aggressive rehabilitation program for 2 months along with a short term non-weight bearing was prescribed and if unstable non-weight bearing for a month and rehabilitation for 5 months were prescribed.

Results: 15 athletes out of those 76 cases had the second grade of ankle syndesmotic injury with clear medial and Tibfib space which was clearly shown on a plain radiography. Using drawer test and rotation test the instability was confirmed and they were asked to do a 4 week of non-weight bearing along with a 16 week of rehab Programme for proprioception strengthening which includes acute, subacute and advanced training.

The other 61 athletes were suggested to stop weight bearing for 2 weeks and they were put into a rehab program for 5 weeks.

The patients were followed up 3 months after their return to the sport and if no return of the pain was identified, the treatment has been considered as successful.

63 percent of patients with instable grade two syndesmotic ankle injury were treated successfully using conservative treatment and their return to the sport was successful.

85 percent of those patients with stable grade two syndesmotic injury were treated successfully using nonsurgical treatment as suggested above and their return was successful as well.

Discussion & Conclusion: The rate of surgical treatments of high ankle sprain in Iran has increased rapidly in recent years and a more attentive treatment approach in cases of dilemma needs to be planned to ensure the safety and efficiency of the made decision.

If the grade two high ankle sprain is stable, non-surgical method and its prognosis have shown to be more superior to the surgical method and the long term athletic performance have been proven to be of no difference of those who were voluntarily treated surgically. The follow up of the mentioned cases have shown patient's prognosis is highly dependent on the stability of their ankle and their commitment to the rehab program. If fully committed, the need for surgical treatment can be

eliminated and patient's satisfaction and conservative treatment in modern medicine can be favored for the future cases and studies.

Keywords: Key words: High ankle sprain, syndesmotic injury, Sports injury, rehabilitation program, Tight rope, screws

Poster Presentation

37- **Title**: Role of Hip Arthroscopy in the Treatment of Hip Avascular Necrosis: A Systematic Review

Author: Omid Shahpari, Mohammadhosein Ebrahimzadeh

Aim: Is there any role for Hip Arthroscopy in the treatment of Hip Avascular Necrosis?

Methods: This review was conducted to collect data from the available literature on the hip arthroscopy for the management of AVN. For this purpose, the articles focused mainly on the management of avascular necrosis by joint spairing and published up to 2019 were searched in four databases, including Google Scholar, PubMed, Scopus, and Medline. This study was conducted based on the seven stages recommended in Cochrane Handbook.

Results: The articles representing hip arthroscopy were assessed regarding the osteonecrosis of the femoral head. The obtained results were classified into three main categories, namely risk factors, reoperations, and complication. Iatrogenic chondrolabral injury was the most common complication reported during and after hip arthroscopy. The main risk factors included younger age, greater comorbidity, low surgeon volume, and larger femoral head size.

The findings supported hip arthroscopy for the treatment of AVN and better assessment of associated injuries same labral pathology. This approach is becoming more proper for the diagnosis and treatment of hip disorders. The increased risk of the incidence of major complications during arthroscopy depends on the magnitude and duration of traction during hip arthroscopy.

Discussion & Conclusion: Avascular necrosis (AVN), which is also known as osteonecrosis, is a chronic disease leads to the death of bone cells due to decreased blood flow to bones in the joints. Alcoholism, steroid use, and hip trauma are the main causes of this problem. In this disease, the disruption of the vascular supply to the femoral head causes articular surface collapse, and consequently, osteoarthritis. Modern joint-sparing procedures have been suggested to improve AVN; however,

hip arthroplasty is the most common procedure. Nevertheless, the evidence supporting the use of hip sparing approach is not sufficient for the treatment of AVN

Keywords: 'Hip arthroscopy' - 'avascular necrosis', 'osteonecrosis', and 'femoral head'

Poster Presentation

38- **Title**: Not-Approved Weight Gain Supplements As a Cause Of AVN: A Cautionary Report

Author: Seyed mohammadjavad Mortazavi, Mehdi Karimi, Alireza Moharrami, Hosein Shafiei

Aim: Avascular necrosis (AVN) of the femoral head is a leading cause of end-stage joint disease in the young population that can conduct patients to total hip replacement in early life. There is a growing number of femoral head AVN patients with a history of self-medication with herbal supplement used for weight gain in our country. We developed this study to demonstrate the prevalence of not-approved weight gain supplement(NWGS) usage in femoral head AVN.

Methods: An observational and cross-sectional study was run to estimate the prevalence of weight gain supplement usage in osteonecrosis patients in Imam Khomeini hospital, Tehran, Iran from January 2012 to January 2018.

Results: Of 207 AVN patients had been visited in our institution, there are 115 male and 92 female.

Forty-four patients (20.95%) had a history of using NWGS, and there had no other risk factors of femoral head osteonecrosis. The mean age of NWGS group was significantly lower compared with other patients (25.1 vs 35.5 years) (P=0.001) and mean BMI in NWGS group was significantly lower in comparison with other AVN patients (23.4 vs 25.1) (P<0.05). The rate of Bilateral AVN was significantly higher in NWGS group compared with other patients (93.1 % vs 71%) (P<0.001).

Discussion & Conclusion: based on the present study, not-approved weight gain supplements can be a risk factor for bilateral AVN of femoral head, and it is necessary to have an educational program to alert young population about side effects of Not-approved supplements for weight gain.

Keywords:

Poster Presentation

39- **Title**: Do Depression And Anxiety Correlate To Total Knee Arthroplasty Outcome? Study Of An Iranian Cohort

Author: Arash Sherafatvaziri, Mohammad Tahami, Mohammadnaghi Tahmasebi, Saeed Abdolkarimi

Aim: Total knee arthroplasty is a common procedure for advanced degeneration of this joint and is estimated to be increasingly performed all over the world. It is a successful procedure but some may not be quite happy with it, and psychological problems have been implied as potential culprits. Our aim was to analyze correlation between preoperative depression and anxiety with outcome scores.

Methods: In a cohort study from June 2016 to December 2017, all patients admitted for total knee arthroplasty in an educational hospital, excluding infectious cases, revisions, those who did not consent and Non-Farsi speakers, filled in three questionnaires both before and at least six months after arthroplasty: Hospital anxiety and depression score (HADS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and International Knee Documentation Committee (IKDC). Calculated scores were examined by Spearman test.

Results: After mean follow of 17.4+_6 SD (6-24) months, all of our predominantly female patients (90%) who aged between 48-82 years (mean 67.6+_7.4) were fairly or strongly satisfied with their new joint. Outcome scores (WOMAC and IKDC) improved significantly at follow up, as did depression and anxiety scores ($p<0.0001$). Preoperative depression and anxiety scores conversely correlated with postoperative WOMAC and IKDC scores.

Discussion & Conclusion: Regarding cultural differences, local studies do benefit caregivers in refining their routines. Converse correlation found between preoperative mental scores and f/u outcome scores may reflect catastrophizing of pain and disability, altered patients' motivation for rehabilitation process, or simply pessimistic explanatory styles. Adjusting for confounding variables and assessing the value of preoperative psychiatric optimization would compensate for our limitations in future larger volume samples and clinical trials.

Keywords: Knee Artroplasty, Hospital anxiety and depression score, WOMAC, IKDC, Outcomes, satisfaction

Poster Presentation

40- **Title**: Comparison Of Neurocognitive Reaction Time Between Patellofemoral Pain Syndrome And Healthy Individuals

Author: Esmaeil Emami, Seyed Hadi Seyed Hoseinian, Hosein Negahban, Afsaneh Zeynalzadeh, Salman Nazari moghadam

Aim: While the relevant studies showed decreased reaction time in post-traumatic complaints such as ACL injury, little studies pay attention to non-traumatic disorders such as patellofemoral pain syndrome (PFPS). The purpose of the present study was to compare the neurocognitive function in PFPS and healthy individuals.

Methods: Design: In this cross-sectional study, twenty five PFPS (20 women and 5 men, mean age 29.28 years, SD 5.59) and 25 healthy controls (19 women, 6 men, mean age 29.32, SD 5.30) were recruited in the present study. The baseline scores from a Deary-Liewald Reaction time (DLRT) were analyzed to compare the upper extremity reaction time, ankle plantar flexion reaction time (braking time) and knee extension reaction time between PFPS and healthy individuals. The PFPS patients were matched with healthy controls based on gender, height, weight, age, and sport activity level before pain occurrence.

Results: The PFPS patients had slower reaction time that were statistically significant in upper extremity reaction time ($P=0.04$), and braking time of the symptomatic knee ($P<0.001$) as compared with healthy control. The symptomatic knee extension reaction time was slower than healthy matched leg, but this difference was not statistically significant ($P=0.24$).

Discussion & Conclusion: The PFPS patients may be correlated with cognitive impairment. It seems that the PFPS patients was more susceptible to injury than healthy individuals. Cautiously, neurocognitive reaction time may be a factor for predisposing non-traumatic injuries such as PFPS.

Keywords: Knee, Neuromuscular, Reaction time, Patellofemoral Pain Syndrome, Sport

Poster Presentation

41- **Title**: The Effect Of Supervised Versus Unsupervised (Home-Based) Physiotherapy On Functional and Quality Of Life Outcomes in the Early Phase Following Total Hip Arthroplasty

Author: Omid Shahpari

Aim: The aim of this study, is a systematic review on studies to answer which physiotherapy program rout (**supervised versus unsupervised)** is superior in terms of functional and quality of life outcomes in the early stage of rehabilitation in patients with THA.

Methods: A computer literature search of PubMed, Scopus, Web of Science, CINAHL and Cochrane Central was conducted using relevant keywords. Two authors extracted the data independently using an online data extraction form. All data were assessed and pooled to final deduction.

Results: this study found no significant difference in important measured parameters between the functional exercise groups and the control groups.

Discussion & Conclusion: Substantial postoperative improvement in all recorded outcomes was demonstrated for both rehabilitation modalities. Therefore, with informal home exercise may be sufficient for most patients at asubstantial cost saving.

Keywords: total hip arthroplasty- supervised - unsupervised - physiotherapy

Poster Presentation

42- **Title**: Comparison of Shoulder Apprehension Test and Range of Motion Following Bankart Repair, Bankart and Remplissage Procedure and Latarjet Procedure for Recurrent Anterior Dislocation

Author: Ali Sanei, Hosein Saremi

Aim: The purpose of our study was to compare Apprehention test and range of motion of the shoulder in the outcomes of arthroscopic Bankart repair Bankart and Remplissage and Latarjet procedure in patients with recurrent anterior dislocation of the shoulder.

Methods: patients who were operated for anterior shoulder instability at least 2 years ago in our center were called by phone to come to our center for physical examination.Apprehention test and measurement of ROM by goniometer of both shoulder recorded before evaluating documents of surgery.then they divided into group A, B, C as having Bankart repair,Bankart repair plus remplissage and laterjet procedure respectively. To compare the results.

Results: about half of them accepted our announcement. The number of participants was 128. (34 bankart, 68 bankart_rempilssag and 26 patients for latarjet) .there was no redislocation in this period. Apprehension test was positive 2 patients with bankart, Repair, 8 patients with bankart and rempilssag and no one in latarjet.

Average limitation of movement in external rotation was (9/12) degree in bankart, (7) degree in bankart_rampilssag and (18/53) degree in latarjet. And this average in external rotation-abduction was (8/76) degree in bankart, (10/44) degree in bankart_rampilssag and (16/61) degree in lataejet. Procedure.

Conclusion & Discussion: according to this number of cases and short term followup, three operations had satisfactory results, remplissage dosenot induce more restriction of range of motion but as it was indicated where there was more boneloss for glenoid or humeral head ,apprehention test is positive more than in cases who had just indication of Bankart repair.latarjet procedure seems to be very effective but couses more restriction of ROM.long term stydy with more cases is recommended to compare results of these procedures.

Keywords: Shoulder artheoscopy,Bankart repair,Remplissage,Latarjete procedure

Poster Presentation

43- **Title**: Intra Articular Injection For Osteoarthritis: A Systematic Review

Author: Reza Abouali, Milad Heidarian, Hossein Bahram moghadam, Reza Khedri, Hamid Yazdani Nejad, Rozhin Heydari, Amirhosein Mohammadi

Aim: Osteoarthritis is a degenerative joint disease identified by the destruction of the articular cartilage. Knee osteoarthritis (OA) may ultimately require total knee arthroplasty (TKA). Treatment of OA is mostly palliative based on nonsteroidal anti-inflammatory drugs, opioids, and intra-articular injection. This review aims to discuss the intra-articular treatment based on platelet-rich plasma injections (PRPs), intra-articular corticosteroids (IA-CS), intra-articular hyaluronic acid (IA-HA), bone marrow-derived mesenchymal stem cells (BM-MSCs), mesenchymal stem cells (MSCs), and other treatments to perceive new products of regenerative medicine.

Methods: Using the keywords of "knee osteoarthritis" and "injection", a literature review on Pubmed, Scopus, Cochrane library, Medline, Embase, and Web of Science was done. A comprehensive analysis of all levels-of-evidence defined by the American Academy of Orthopedic Surgeons classification system was covered as well. In the end, thirty-eight related articles discussing intra-articular injection of the knee, including five cohorts, were selected to be assessed thoroughly.

Results: PRP is better over other intra-articular treatments in improving pain scales in the short and medium term. However, the clinical effectiveness of PRP for the treatment of osteoarthritis is still under discussion. Although IA-HA can provide clinically significant effects in a remarkable number of patients, new data indicates that the apparent effectiveness of this treatment is mostly a result of other factors, including the placebo effect. IA-CS is more effective on pain relief than IA-HA, while IA-HA is more effective in the long term. In the short term, BM-MSCs are safe and reduce synovial inflammation and cartilage degradation. Intra-articular MSCs provide improvements in pain and function in knee osteoarthritis. Encouraging intra-articular treatments are currently in clinical development in the United States, including small-molecule and biologic therapies, devices, and gene therapies. Biologic therapies are an emerging field showing early promising results.

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However, more research is required.

Discussion & Conclusion: IA-CS and IA- HA can be beneficial for patients, who do not obtain sufficient pain relief with oral agents.Despite some promising early results for PRP, BMSC, and MSCs therapies, evidence of efficacy on cartilage repair remains limited. However, there still appears to be evidence justifying their use for the treatment of knee osteoarthritis. Due to the limited quality of currently available evidence, higher qualities RCTs are required

Keywords: Knee osteoarthritis, intra-articular injection, mesenchymal stem cell

Poster Presentation

44- **Title**: Treatment Options in Hip Avascular Necrosis: A Systematic Review
Author: Omid Shahpari, Negar Chaharjuy

Aim: Efficacy Assessment Of Different Treatment Options In Hip Avascular Necrosis: A Systematic Review
Methods: The Scopus, Pubmed, and Web of Science databases were searched on March, 2019 for English language studies that addressed treatments other than total hip arthroplasty in ONFH. The studies were systematically screened and 43 eligible studies (28 randomized controlled trials, 15 prospective study) were chosen.
We included randomized controlled trials and prospective studies of the last 20 years which have focused on investigating preserving treatment options for non-traumatic ONFH. The effectiveness of existing pharmacological, physical therapy, and surgical other than arthroplasty treatment options in the treatment of early stage ONFH is assessed.
Results: Core decompression (CD) plus cytotherapy followed by alendronate treatment, cocktail treatments, extracorporeal shock wave therapy (ESWT) plus alendronate, and avascular biomaterials plus cytotherapy were most likely to reduce the treatment failure rate respectively in a frequentist framework. The effect of CD plus cytotherapy was significantly better than the effect of CD alone in improving the WOMAC score. ESWT is the most effective treatment for improving Harris hip scores.
Discussion & Conclusion: The role of preventive treatment options is to relieve pain and preserve the femoral head as long as possible. Finding an optimal treatment option appropriate for a patient regardless of being dependent on individual factors and lesion characteristics needs a comprehensive classification system of treatment options. In this systematic review, therapeutic hip preservation strategies were assessed and CD plus cytotherapy proved to be a relatively superior treatment for reducing treatment failure rates in early and intermediate ONFH patients.
Keywords: hip, avascular necrosis, treatment

Poster Presentation

45- **Title**: Comparison Of The Subvastus Minimally Invasive Approach Versus The Standard Parapatellar Approach In Total Knee Arthroplasty: A 1-Year Follow-Up Study

Author: Seyed Morteza Kazemi, Mohammad Movahedinia, Seyed Mohsen Hoseininejad, Ehsan Hakimi

Aim: Besides the common medial parapatellar (MP) approach for total knee arthroplasty (TKA), another subvastus (SV) approach also exists which involves smaller incisions and less soft tissue dissection and theoretically offers better clinical outcomes. We compared clinical and functional outcomes of these two approaches in a one-year follow-up study.

Methods: A double-blinded study was conducted on 60 eligible patients, candidate for TKA, who were randomly assigned in two equally-sized groups, each operated by one approach (MP or SV). Outcome measures were compared at five main time points (on admission, 2, 6, 12, 24 weeks and one year post-operation) between the two groups. These included post-operative (knee function using WOMAC index, length of stay in hospital, the promptness of the return to straight-leg-raising) and intra-operative (length of surgical scar, knee range of motion, operation time, tourniquet time, blood loss during operation, 24-hour drain volume, and the need for lateral release and blood transfusion) measures.

Results: The patients operated by subvastus approach had significantly greater improvement in pain (-9.3 ± 1.6vs.-7.2 ± 1.7, $P<0.001$) one year after operation. They had also significantly better score improvement in functional limitation and in the global WOMAC score. There was also a significant difference in promptness of return to straight-leg-raising after surgery (MP: 3.60 ± 1.49 vs SV: 1.81 ± 1.30, $P < 0.001$).

Discussion & Conclusion: Our study proves that subvastus approach provides better WOMAC score, shorter surgical scar and lower blood loss due to the shorter time of surgery, compared to standard medial parapatellar approach in a short term follow-up, however long-term follow-up is mandatory for definite judgment.

Keywords: Total knee arthroplasty, subvastus, parapatellar, minimally invasive

Poster Presentation

46- **Title**: Efficacy Of Physical Therapy With And Without Scapular Training On Pain, Function, Quality Of Life And Effectiveness Of Treatment In Shoulder Impingement Syndrome: Double Blinded Randomized Control Trial

Author: Fatemeh Zarei Moghadam, Mohammadhosein Ebrahimzadeh, Ali Moradi, Amir Reza Kachooei, Salman Nazari Moghadam

Aim: Although many studies assessed the role of scapular PT on pain and 6 function of patients with shoulder impingement syndrome, yet little is known about the 7 effect of scapulo-gleno-humeral (SGH) PT as a comprehensive PT in these patients. The purpose of the present study was to evaluate the effects of an exercise protocol, with and without 3 scapular physical therapy (PT), on pain, function, quality of life and the effectiveness of 4 treatment in patients with shoulder Impingement Syndrome (SIS).

Methods: Forty patients meeting the inclusion criteria were randomized into two groups; conventional and comprehensive physical therapy. Both groups received a 4-week intervention, three times a week. The Intervention for conventional group consisted of electrotherapy, exercise therapy, and manual therapy on glenohumeral joint. Comprehensive group received the same intervention supplemented by scapular physical therapy. Primary outcome measures were function measured by the shoulder pain and disability index (SPADI), and the quick version of disabilities of the arm, shoulder and hand (Quick-DASH***),*** *and* quality of life measured by Western Ontario rotator cuff (WORC) questionnaire. Secondary outcomes were pain measured by visual analogue scale (VAS), and the effectiveness of treatment assessed with global rating of change scale (GRC). All outcome measures were measured before, immediately after, and 1 and 6 months after completion of the intervention. The study is registered at www.irct.ir (June 28, 2018; IRCT31396).

Results: Six months after the completion of the program, function, quality of life, pain and GRC scale in the comprehensive physical therapy group significantly improved compared with the conventional physical therapy ($P < 0.05$).

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This behavior repeated one month after the end of intervention on the VAS and GRC variables in the comprehensive physical therapy group as compared with conventional group ($P < 0.05$).

Function, quality of life, pain and GRC scale improved similarly in both groups immediately after treatment ($P > 0.05$).

Discussion & Conclusion: The comprehensive physical therapy was more effective in reducing pain and improving function and quality of life, and its effect was longer than conventional physical therapy in patients with SIS.

Keywords: Rehabilitation, Scapular training, Exercise; Motion; Rehabilitation; Scapula; Shoulder

Poster Presentation

47- **Title**: Total Knee Arthroplasty In Varus Knee: The Importance Of Tibial Cut
Author: Seyed Mohammadjavad Mortazavi

Aim: We developed a classification based on the presence of lateral laxity and the amount of medial defect to guide the surgeon during TKA.
Methods: 194 knees in 163 patients were included in this study. There were 111 female and 52 male.
The mean age of patients were 60.44(34 to 80) years. The mean BMI was 29.6. The mean varus deformity was 16.9 degrees (9 to 42). We then classified varus knees as type I if there is no defect and lateral laxity, type II if there is no defect but lateral laxity exists, type III if there is medial defect without lateral laxity and Type IV if there is both lateral laxity and medial defect.
Results: All patients were received PS system 13 % of knees were in type I, 18% in type II, 27% in type 3, 42% in type 4. Patient in type II need least thickness of lateral tibial cut followed by knees in type 4. 35(37.2%) of knees in this study needed medial release, most of them in knees with type II varus .96% of patients received 10 mm or less PE liner.
Discussion & Conclusion: Our study showed that the amount of lateral laxity and medial tibial defect would help surgeon to determine the thickness of lateral tibial cut at first and the potential need for lateral release at the final balancing. He or she therefor will able to get a well-balanced, wellaligned and stable TKA while using a thin PE insert and avoid higher constraint
Keywords

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48- **Title**: The Effect Of Therapeutic Touch On Postoperative Pain Relief In Arthroplasty Patients:A Review Study

Author: Zahra Gholipour Soleimani, Fatemeh Moadab

Aim: With increase in the life expectancy, performing a complete arthroplasty operation of the knee joint to enhance the life quality and mobility is increasing. Although the purpose of knee joint replacement is to improve the disease and life quality of the patients, it has some complications, the most common of which is pain. Therapeutic touch is one of the complementary therapies assumed to be effective in reducing pain in patients. Therefore, this review study tried to examine the effect of therapeutic touch on pain relief in patients undergoing arthroplasty surgery

Methods: The study was review using the keywords "therapeutic touch", "arthroplasty", "pain", "complementary medicine", and "non-pharmacological interventions" based on Mesh, by searches in the Pubmed, Science Direct, and Google scholar databases during 2001-2019. After critically evaluating the papers according to CONSORT tool, the papers were classified according to poor, medium, and good quality

Results: Out of searches in websites, 72 papers were found and after removing repetitive and non-related ones, and those with lack of access to the full text of the papers, 34 papers were analyzed. The results of different studies showed that therapeutic touch interventions are effective in reducing pain in patients and bring about relaxation in patients. Moreover, the studies indicated that the therapeutic touch enhances the life quality, effective in helping them return to everyday life as soon as possible.

Discussion &Conclusion: As pain control, after arthroplasty surgery, has a major role in recovering and their returning to normal life, non-pharmacological interventions based on therapeutic energy like therapeutic touch can affect the pain in these patients and help better life quality and make them feel comfortable. Thus, the intervention based on therapeutic touch and training in this regard require great attention given their effect on patients' well-being as well as the financial burden on care systems.

Keywords: Therapeutic touch, arthroplasty, pain, complementary medicine, non-pharmacological interventions

Poster Presentation

49- **Title**: Investigating The Rotation Profile Of Lower Extremity In Iranian Population

Author: Hoseinali Hadi, Mahmoud Jabalameli, Fatemeh Safi, Ahmadreza Behrouz, Zahra Rezaei, Amir Azimi

Aim: Disorders of the lower extremity rotation profile of a wide range of clinical problems from an asymptomatic in-toing or out-toeing gait to symptomatic cases of impaired walking and ankle pain, patellar pain and instability, and hip pain. A traditional torsional evaluation was performed using a clinical examination. For the first time in 1970, CT scans were used to evaluate the rotation profile. This modality was quickly used to evaluate the profiling routines there is a controversy about the natural angles of the femur version, the distal femoral angle, the knee torsion, and the tibial torsion. In this study, we decided to use a CT scan to examine the rotational profile of the lower extremity in the Iranian population.

Method: In this observational study, 94 patients (180 knees) who had undergone a lower extremity CT angiography due to vascular problems, were enrolled in this study. Four femoral version, distal femoral torsion, knee torsion and tibial torsion were measured. A proximal cut of femur was selected to measuring the femoral version, the femoral head, the femoral neck and the grater trochanter, and the angle between this line and the line tangent to the posterior femoral condyles was selected (6-8).

To measuring of the distal femoral angle, the angle between the axis of transepicondialar and the line tangential to the posterior femoral condyle is used (9, 10)

To examine the knee torsion, the angle between the line tangent to the posterior femoral condyles and the line tangent to the tibial plateau (Proximal to Fibula) is used

To study the tibial torsion, the angle between the line tangent to the posterior tibial plateau and the line exactly proximal to the tibiaotalar joint cross the middle part of the medial and lateral malleol was investigated (11)

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Results: 94 people with an average age of 48.03 ± 21.18 who had the highest age of 94 and the youngest were 11 years old. Of whom 35 (37.23%) were female and 59 (62.77%) were male

The mean femoral anteversion was 8.76 ± 10.97 degrees and the highest degree of femoral version was 41.08 and the lowest was 21.49 degrees retro verts, with 33 limbs (18.34 percent) retrovert and 147 limbs (81.66 percent) ante vert. The average anteversion in females was 12.50 degrees And in the males was 6.65 degrees.

The mean distal femoral torsion was 1.54 ± 2.25 degrees and the highest distal femoral torsion was 7.38 degrees externally rotated and the lowest was 12.97 degrees internally rotated. With 29 limbs (16.11%) internally and 151 limbs (83.89%) externally. The mean distal femoral torsion was 1.34 degrees in females and 1.65 degrees in males.

The mean torsion of the knee was 5.99 ± 4.98 degrees and the highest knee torsion was 16.96 externally rotated and the lowest was 10.61 degrees internally rotated. 15 of limbs (8.38%) were internally rotated and 165 (82.62%) of the limbs were externally rotated. The mean torsion of the knee was 5.38 degree in female and 6.34 degree in males.

The mean of Tibial torsion was 26.71 ± 11.14 degrees, and the highest tibial torsion was 57.98 and the lowest was 3.79 degrees of externally rotated. All of them were externally rotated. The mean tibial torsion was 32.27 in female and 23.87 in males

Conclusion & Discussion: In the study of the rotational profile of the lower extremity and evaluation of ante version, Tibial torsion and distal femoral torsion in the Iranian population, the mean value obtained in this study was consistent with the mean presented in other studies.

Also, the mean of femur and tibia torsion was higher in males than females, and the mean distal femoral torsion and knee torsion were higher in males than in females

Keywords: femoral ante version, distal femoral torsion, tibial torsion

Poster Presentation

50- **Title**: Corticosteroids or Platelet-Rich Plasma Injections for Rotator Cuff Tendinopathy: A Double Blind Clinical Trial

Author: Haleh Dadgostar, Mohammad Razi, Farinaz Fahimpour

Aim: We compared structural and clinical changes in RC muscles after corticosteroids and PRP injections.

Methods: This is a randomized double blind clinical trial. All individuals with diagnosis of RC tendinitis during 2014-2017, were considered. Individuals were randomly allocated to either receive PRP or corticosteroids.

Overall, 3cc of PRP was injected within the subacromial joint and another 3cc was injected at the site of the tendon tear, under the guide of sonography. For the corticosteroid group, 1cc of Depo-medrol 40mg and 1cc of lidocaine (2%) was injected within the subacromial joint.

Results: Overall, 58 patients entered the study. Comparison of pain, range of motion (ROM), Western Ontario RC (WORC), Disability of Arm-Hand-Shoulder (DASH) scores and supraspinatus thickness showed significant improvement during follow-ups in both groups ($p<0.05$).

During three months follow-up, pain improvement was significantly better within the PRP group (from 6.66±2.26 to 3.08±2.14 and 5.53±1.80 to 3.88±1.99, respectively; $p=0.023$). Regarding ROM, the PRP group had significant improvement in adduction (20.50°±8.23° to 28°±3.61° and 23.21°±7.09° to 28.46°±4.18° for the PRP and corticosteroid groups, respectively; $p=0.011$) and external rotation (59.66°±23.81° to 76.66°±18.30° and 57.14°±24.69° to 65.57°±26.39°, for the PRP and corticosteroid groups, respectively; $p=0.036$) compared to the corticosteroid group.

During the six month follow-up, those who received PRP had better improvement in abduction (102.22°±32.14° to 158.88°±30.27° and 132.90°±52.55° to 165.90°±32.31° for the PRP and corticosteroid groups, respectively; $p=0.049$). However, regarding external rotation the corticosteroid group showed better improvement (60.27°±25.46° to 80.83°±14.87° and 55.45°±29.10° to 80.0°±8.94°,

respectively; p=0.033). Moreover, in the PRP group, the WORC index showed better improvement during the six month follow-up.

Discussion & Conclusion: We found that PRP renders similar results to that of corticosteroids in most clinical aspects among patients with RC tendinopathies, however pain and ROM may show more significant improvement with the use of PRP. Considering that the use of corticosteroids may be contraindicated in some patients and may be associated with the risk of tendon rupture, we suggest the use of PRP in place of corticosteroid based injections among patients with RC tendinopathy.

Keywords: Corticosteroid, Platelet Rich Plasma, Rotator Cuff, Tendinopathy, Supraspinatus

Poster Presentation

51- **Title**: The Relationship Of Tear Drop And Inferior Border Of Femoral Head In Normal Hip

Author: Seyed mohammadjavad Mortazavi, Mohammadali Ghasemi, Alireza Moharrami, Hosein Shafiei

Aim: The position of femoral Head to acetabulum is matter of controversy among hip surgeons.

Literature considered that teardrop sign is in same level with inferior of acetabulum and inferior border of femoral head is in same alignment with teardrop sign in AP plane Hip radiographs. Sutton et al reported that when inferior of femoral head is 5 mm lower than teardrop, it termed hip ptosis. The study suggested that hip ptosis is a risk factor of femoral head Impingement. We developed present study to explore which position of femoral head to teardrop is normal in general population.

Methods: present retrospective study was enrolled on 99 patients with normal hip AP radiographs from January 2017 to January 2018. The patients presented with nonorthopedic complaints in our institution. All radiographs were reviewed and assessed by an expert orthopedic surgeon.

Results: in present study, 99 cases (53 female, 46 male) were included with a mean age of 36.4 years. The mean distance between inferior border of femoral head and teardrop was 5.84

±3.04 and the mean was 6.61 ±2.54 in males and was 5.27 ±3.31 in females. There was significant (P=0.029) different between male and female in position of femoral head in normal population. There was no correlation between age and the distance in present study.

Discussion & Conclusion: we explore that normally inferior border of femoral head is not in same alignment with teardrop in the normal population. Therefore, the ptosis term for femoral head might be normal in our evaluation.

Keywords:

Poster Presentation

52- **Title**: Simulation Of Carbon/Peek Composite And Stainless Steel Hip Prostheses
Author: Kamran Hasani

Aim: This study was aimed at investigating the mechanical performance of the carbon/PEEK composite prosthesis having three different fiber plies configurations compared to traditional stainless steel (SS) ones.
Methods: The implant-bone system was established and subjected to a load from the head of the femur and abductor muscle sides. The bone part of the model was consisted of the cortical and cancellous. Mesh density analyses have been performed to determine the suitable number of elements and nodes to not only minimize the simulation cost but also achieve accurate mesh size-independent stress and strain values. The stresses and strains then in the implant-bone systems were calculated and compared.
Results: The results revealed lower stresses and strains in composite prostheses compared to SS ones. The fiber plies orientation of the carbon/PEEK composite prosthesis showed to have a key asset in stress and strain distribution of the implant-bone system as when the fiber plies orientated multidirectional with -45 and +45 degrees, suitable stress and strain distributions were achieved.
Discussion & Conclusion: The results revealed the advantage of composite prosthesis with fiber plies orientation configuration III compared to other configurations and SS ones as they showed lower stresses and strains under the same loading and boundary conditions. The results have practical implication in designing of hip prosthesis to not only minimize the stresses in the femur but also increase the lifespan of the implant in the body.
Keywords: Femoral prosthesis, Hip replacement, Composite materials, Stress, Strain, Finite element analysis

Poster Presentation

53- **Title**: Pelvic Obliquity, Is It Normally Neutral Angle?

Author: Seyed Mohammadjavad Mortazavi, Alireza Moharrami, Hosein Shafiei

Aim: The definition of pelvic obliquity angle (PO) still unclear in the normal population. Several factors might cause the obliquity i.e. hip osteoarthritis, developmental dysplasia of hip, trauma, scoliosis and spine related factors. Perhaps, pelvic obliquity is expressed as a deviation of neutral alignment in the normal population. We developed present study to evaluate the distribution of pelvic obliquity angle in normal population.

Methods: present study retrospectively enrolled on 134 cases (70 female and 64 male) without any problem of spine, pelvic and lower extremity abnormality who referred to our institution from January 2017 to January 2018 for non-orthopedic problems. We retrospectively reviewed radiographs from institutional PACS and measured PO angle using mediCAD Classic software.

Finally, all data were analyzed with SPSS software (version 24.0, USA).

Results: present study show that all data has significant relationship in one sample T test. All PO angles were normally distributed in kurtosis and skewness test. The patients were aged with a mean of 39.6 ±16.8 in current study. The mean of PO angle was 2.18 ±1.6 in all patients and 0.13 standard error of mean. There was no significant differences between male and female genders (2.07 ±1.6 vs 2.27±1.6, P=0.47). This study reveal that age and PO angle had not any correlation (P=0.165).

Discussion & Conclusion: despite this fact, there was an attitude that PO angle normally is in neutral alignment, our result uncover that the normal range of PO angle was not neutral and ranged from 0.58 to 4.4 degrees with one standard deviation from mean in normal population.

Keywords:

Poster Presentation

54- **Title**: Repairing Of Pie-Crusting-Induced Posteromedial Laxity during Total Knee Arthroplasty

Author: Mehdi Motififard, Hojjat Cheragh Sahar, Arvin Shahzamani, Mohammadreza Piri, Erfan Sheykhbahaei

Aim: Varus knee deformity is one of the complications of severe osteoarthritis. To balance the tibial alignment during the total knee arthroplasty (TKA) process, stepwise pie-crusting technique is the most prevalent method of releasing the posteromedial components. Knee instability is one of its undesirable complications due to excessive or inconsiderate releasing. Constrained condylar knee prosthesis (CCKP) should be used for these patients instead of routine and regular prosthesis, which it is expensive and not available in every medical center. This soft tissue disruption can be repaired by reefing the tendons by sutures instead.

Methods: In this prospective study, 974 patients who had indications of TKA selected from 2015 to 2019. 653 patients needed tibial balancing during the surgery therefore, stepwise pie-crusting technique performed to release posteromedial components. In 36 of them joint laxity was seen during the surgery and medial collateral ligament repaired by sutures.

After three weeks of immobilization and multiple sessions of physiotherapy, their knee functions evaluated in our clinic. Knee society score (KSS) was measured before and after the surgery in the overall patients and in each group. IBM SPSS software tests (simple and paired t-test) were used for further analysis.

Results: After six months of follow-up, Mean knee range of motion was 100.28±13.39 (75-125) degree. 17 patients (48.57%) experienced no postoperative complication. 37.14% of our patients (n=13) had difficulty in extending their knee completely. None of our patients had sagittal instability however, coronal instability was seen in 14.28% (n=5) whom brace was needed in three of them (60%) and revision surgery was performed for two of them (40%). Mean KSS was increased from 31.97±5.02 to 81.80±17.79 in the study population (P=0.001). In the patients who achieved postoperative stable joints (n=30) by primary repair, KSS increased

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from 32.73±4.95 to 88.76±3.31 (P=0.001) and KSS was increased form 27.40±2.50 to 40.00±7.90 (0.039) in patients who needed postoperative brace or revisional surgery (n=5). Comparing mean KSS before the surgery in both groups did not show any significant difference (P=0.161), however, KSS was significantly higher in patients with postoperative stable joints (P=0.006).

Discussion & Conclusion: Pie-crusting technique is an effective but dangerous method during TKA which should be performed cautiously and extended gradually to avoid complete soft tissue release and joint laxity. Although CCKP can help these patients, it is expensive and is not available in every medical center, therefore, as our results showed, intraoperative primary tendon repair by suture can be a good substitute for these patients.

Keywords: Total Knee Arthroplasty; Varus Deformity; Medial Collateral Ligament; Instability; Pie-Crusting

Poster Presentation

55- **Title**: Arthroplasty of Neurogenic Arthropathy of the Knee A Review of Literature

Author: Hamidreza Aslani, Amir Farahanchi Baradaran, Ali Oliashirazi, Alisina Shahi

Aim: The purpose of this article is to review the literature data of neuropathic arthropath y of the knee joint after arthroplasty to assess whether it can be considered as a choice treatment for this disease.

Methods: A comprehensive literature review was performed using PubMed, Google Scholar, Science Direct, and ISI Web of Knowledge using OR, AND, NOT between the keywords including "knee joint"," Charcot joint", "total knee arthroplasty".

Results: Among all the articles reviewed, 8 met our inclusion criteria. Overall there were 108 patients (149 knees) reviewed in this study. The complication rate was 27.5% (41/149) of the procedures postoperatively which 23 (15.4%) of them underwent reoperation and others were treated conservatively.

Discussion & Conclusion: In conclusion, total knee arthroplasty can be considered as a reliable treatment for patients suffering from neuropathic arthropathy

Keywords: Neurogenic arthropathy, knee joint, total knee arthroplasty

Poster Presentation

56- **Title**: Dynamic Balance, Pain And Functional Performance In Cruciate Retaining, Posterior Stabilized And Uni-Compartmental Knee Arthroplasty

Author: Sanaz Badpa

Aim: All statistical measures were performed using SPSS version 17 for Windows. Initially and as a pre-requisite for parametric analysis, data were screened for normality assumption through using Kolmogorov-Smirnov and Shapiro-Wilks normality tests, and testing for the presence of extreme scores and significant skewness and kurtosis. In addition, data were screened for homogeneity of variance assumption. Once data were found not to violate the normality and homogeneity of variance assumptions, parametric analysis was conducted. Mixed design MANOVA was used to compare among the four assessments (within-subject effect "time"), the four tested groups (between-subject effect "tested group") and the "time*tested group" interaction.

Methods: Forty-five patients with unilateral KA participated in the study. They were divided into three groups of 15 patients each. Group I included those who had CRTKA, group II included those who had PSTKA, and group III included those who had UKA. All patients shouldn't have had any previous KAs with their present unilateral KA being conducted using the medial para-patellar approach. They were operated on and referred by the same surgeon. They followed the same postoperative hospitalization and home care programs. An additional group of 15 patients, serving as control (group IV) participated in the study. The control group included those who had unilateral moderate or severe knee OA (determined as grades III or IV using Kellgren and Lawrence scale [49]) and who were indicated for surgery but weren't operated on yet. Groups I, II, III and IV involved 9, 8, 8, and 8 females respectively and 6, 7, 7, and 7 males respectively.

Results: Descriptive statistics revealed that the mean±SD values for the age were 54.53±3.44, 55.13±3.48, 52.8±1.9 and 55.33±2.32 years and the BMI were 35.7±3.01, 35.7±1.99, 35.6±1.88 and 35.73±1.03 kg/m2 for groups I, II, III, and IV respectively with no significant differences among the groups for both the age and

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BMI. The Mixed Design MANOVA revealed highly significant within-subject and between-subject effects together with significant time*tested group interaction (p=0.000). The within-subject effect revealed significant decreases (p0.05) in BBS scores among the four times of assessment in the control group

Discussion & Conclusion: CRTKA is preferable to PSTKA with UKA being generally superior to TKA, possibly due to the preserved human proprioceptors in the un-excised compartmental articular surface.

Keywords: Dynamic Balance, Functional Performance, Knee Arthroplasty, Pain.

Poster Presentation

57- **Title**: The Results Of Tibial Plateau Fractures Treatment By Closed Reduction And Close Pining Fixation & Cast Brace

Author: Farshid Alazmani Noodeh, Zohreh Samadi, Fatemeh Taziki Balajelini, Majid Asgari

Aim: fracture that involves the tibial articular surface in the absence of proper treatment can cause complications such as organ dysfunction along, restriction of movement, early arthritis, pain, infection and eventually lead to impaired function and disability. This study investigated the Plateau Tibial Fractures Treatment by closed Reduction and Close Pinning Fixation & Cast Brace.

Methods: A randomized clinical trial study including 27 patients with fractures Plateau Tibial who were selected randomly, was performed. After explaining the treatment Process to the patients, closed reduction was performed by stretching and clamping was prformed. Then desired reduction based on the textbooks criteria, the pin percutaneous fracture fixation and casting was done. After two weeks, Cast Brace was taken and knee ROM was started. Finally, after the end of treatment, the final assessment was carried out according to the VAS scale. Data were analyzed using SPSS software and descriptive statistics.

Results: 20 men and 7 women participated in the study. The average duration of union in samples of 2.09 months. The mean length of hospitalstay was 4 (range, 2–6) days. The mean Rasmussen score was 27.05 for all patients; it was 29.4 for type I, 28.2 for type II, 26.3 for type III, and 24.3 for type IV fractures. Knee ROM mean score was 105.88. During the 12 months in patients no cases of infection, Thromboembolism and Arthrosis was observed.

Discussion & Conclusion: The treatment of plateau tibial fractures with Close Pinning and Cast Brace can be minimized by adjusting the cost of hospitalization, the patient earlier and reduce the risk of thromboembolism to zero. Also, given that in this way will be less manipulation of soft tissue infection is also reduced to a minimum.

Keywords: plateau tibial, fracture, closed reduction, treatment

Poster Presentation

58- **Title**: Review Of The Use Of Cefazolin In The Prevention Of Infections After Knee Arthroplasty Surgery

Author: Mohammad Arabsorkhi Mishabi

Aim: Joint replacement of knee is one of the surgical procedures for patients with joint destruction and clinical signs of pain, deformity and knee limitation. There are factors that may cause the surgery to fail and the patient will have to undergo a re-surgical procedure. One of the most common causes of knee replacement surgery is infection. Prophylaxis with antibiotics, especially cefazolin, is one of the effective strategies for reducing post-surgical infections.

Accordingly, the aim of this study was to determine the effect of using cefazolin in the prevention of infections after knee arthroplasty.

Methods: In this study, valid scientific articles were indexed in ISI, PubMed, Scopus, Sid, Magiran databases using key words (infection, knee replacement, joint replacement, cefazolin) Was investigated. The range of time from 2012 to 2018 was considered for the selection of papers.

The articles were found in 100 articles, of which 64 articles were included in the study, and then these articles were evaluated in terms of title, abstract and full text. After removing repetitive and unrelated, 36 articles related to research were selected.

Results: The mean age of the subjects was 67.37 years. The average age of the studied men was 76 and the mean of the women was 65.7 years. The rate of infection after prophylaxis with cefazolin antibiotics in the knee surgery group with a confidence interval of 95% (0.9-1.5) varied from 0% to 1.06. I-squared and Chi-squared tests showed that there was a heterogeneity between early studies to estimate the overall prevalence of post-prophylaxis infection in knee surgeries.

Discussion & Conclusion: The rate of knee joint infection after surgery in patients with cefazolin antibiotic prophylaxis is low, so it is recommended that this antibiotic be used during knee replacement surgery.

Keywords: infection, knee replacement, joint replacement, cefazolin

Poster Presentation

59- **Title**: Graphene Oxide as Delivery Carrier in Three Dimensional Hydrogels
Author: Mohammad Ghaderi Zamharir

Aim: Tissue engineering with stem cells in three dimensional (3D) scaffolds is a promising future therapy to treat osteoarthritis and Intervertebral disc (IVD). However, this field faces the challenge to design delivery carriers to efficaciously deliver biological factors inside these 3D cell-containing scaffolds for appropriately-guided cell differentiation. Studying the role of Graphene oxide as growth factor delivery carrier in three dimensional is main goal.

Methods: This essay is a systematic review of English articles published in PubMed, Science Direct since 2015. Being up to date, matching with keywords and accessing the full text were incoming metrics.

Results: Graphene oxide (GO) have recently attracted interest for their biomedical feature as they can adsorb so much biological molecules, thus offering high potential as delivery carriers. In one study found graphene oxide flakes to adsorb transforming growth factor β3 (TGF-β3), which were then incorporated into a collagen hydrogel. Human mesenchymal stem cells (hMSCs) were surrounded in the same gel and chondrogenic differentiation assessed. The study showed GO flakes adsorbed >99 % TGF-β3 with <1.7 % release. In other study explored the use of graphene oxide as nano-filler for the reinforcement of FEFKFEFK (β-sheet forming self-assembling peptide) hydrogels. Their results accept the presence of strong interactions between FEFKFEFK and GO flakes with the peptide coating and forming short thin fibrils on the surface of the flakes.

Discussion & Conclusion: The results show GO flakes as highly-efficient for delivering carrier in 3D to guide cells in the same scaffold and induce tissue formation. The ability of GO flakes to provide sustained local delivery makes this material attractive for tissue engineering strategies, in particular for regionally-specific mesenchymal stem cells differentiation.

Keywords: graphene oxide, delivery carrier, three dimensional, hydrogels

Poster Presentation

60- **Title**: Evaluation Of The Mechanical Characteristic Of Plga And Plga/Fibrin Scaffolds In Providing An Appropriate Enviromentfor Viability And Growth Of Human Adipose-Derived Stem Cells For Tissue Engineering

Author: Majid Pourentezari, Batool Hashemibeni, Maryam Yadegari, Ebrahim Tavakoli, Morteza Anvari, Ali Valiani, Azam Hassanpour

Aim: Tissue engineered from mesenchymal stem cells (MSCs) requires a scaffold to keep the cells in the area defect and to act as a supporter for inducing tissue formation.

Methods: We developed a three-dimensional (3-D) special poly-lactic-glycolic acid (PLGA) /fibrin (F) composite scaffold that provided structural supporter and stimulated repair. 3-D PLGA scaffold have been prepared via Solvent casting/salt leaching (SC/SL) techniques and the hybrid scaffold of PLGA/F was fabricated by F. Characterization techniques such as X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR) and Scanning electron microscopy (SEM) were performed. Furthermore, mechanical properties of the PLGA and PLGA/F composite scaffolds were determined. 3-D PLGA and PLGA/F scaffolds seeded with cultured human adipose tissue-derived stem cells (hADSCs) and analyzed by MTT at 3 and 7 days.

Results: The results revealed that the scaffolds contain sufficient porosity with highly interconnected pore morphology. Increase the amount of fibrin enhanced compressive modulus and compressive strength of the PLGA scaffolds. The water absorption capacity difference for the PLGA scaffold with and without F. Our findings showed that PLGA/F scaffold in vitro, enhanced cellular viability was observed compared to PLGA scaffold in 3 and 7 days.

Discussion & Conclusion: Our studies have shown that the PLGA/Fibrin scaffold can be useful in tissue engineering

Keywords: PLGA, fibrin, scaffolds, human adipose-derived, stem cells, Mechanical characteristics

Poster Presentation

61- **Title**: Experimental And Three Dimensional Finite Element Analysis Of Bone Drilling: Investigation Of Temperature, Tool Wear Using Scanning Electron Microscopy

Author: Marjan Ghafourian, Maryam Koopaei

Aim: The purpose of this study was to evaluate the three dimensional finite element analyses (FEA) of bone drilling and surgery in respect to mechanical properties, in different strain rate. Prediction of temperature, stresses and the form of the chip were investigated. Finite element analysis enables us to have better biomechanical understanding of bone surgery. This model also can be used in medical education based on virtual reality.

Methods: This research consists of two main sections. In the first part threedimensional finite element analysis of bone drilling was performed according to mechanical properties of the bones. In the second part, the experimental tests of bone drilling and temperature measurement and examination of bone fractures were performed using scanning electron microscopy (SEM).

The finite element analysis is an instrument for better understanding of biomechanical conditions during bone drilling. Biomechanical understanding of bone drilling and comparison of the finite element analysis with the experimental results can be helpful in evaluating of finite element analysis. To perform FEA, the exact model of tools and bones was developed in SolidWorks software. Then the models were imported into DEFORM V11 and meshed (Figure 1). The comparison of the SEM of the tool and tool modeled for FEA was illustrated in Figure 2. One of the main challenges in FEA is the use of a model that can predict bone behavior during complex stresses and sudden strains.

To describe the elastic-plastic behavior of the bone, Johnson-Cook model (Equation 1) was used.

$$\bar{\sigma} = (A + B\bar{\varepsilon}^{n})\left(1 + C\ln\left(\frac{\dot{\bar{\varepsilon}}}{\dot{\bar{\varepsilon}}_0}\right)\right)\left(\frac{\dot{\bar{\varepsilon}}}{\dot{\bar{\varepsilon}}_0}\right)^{\alpha} \qquad \text{Equation 1}$$

Poster Presentation

For obtaining the constant parameters in Johnson – cook model, Split – Hopkinson test on bone samples was done and fitted to Johnson Cook's equation. For this purpose, multi-level surface fitting technique was used in Matlab software. An example of this fitting using different strain rates is shown in the Figure 3. In order to conduct experiments, a drill with 2 mm in diameter and 800 rpm was used. The bovine cortical bone was used for experimental test. The bone was free from any musculoskeletal disorder. For more precision a computer numerical control (CNC) milling machine with three degrees of freedom was used. The temperature data was recorded during the tests using the infrared thermometer. To evaluate the capability of the proposed model, the tool wear by the SEM were investigated and the results were compared with the FEA results.

Results: The thermal results of a three dimensional finite element model are shown in the Figure 4. The results of the temperature measurement of the experimental tests (45 پ} 0.7 centigrade degree) have a reasonable agreement between the measured values and the finite element results. The study at 15 different points showed that the difference between the measured temperature and the FEM results was not significant ($p = 0.74$). The results of the tool wear with finite element method as well as SEM results are shown in the Figure 5. It's demonstrating the capability of the FEM model in prediction of tool wear in cutting edge of tool (Figure 5). It is also compared to the ability to model the prediction of bone chip after drilling bone as one of the most appearance of bone drilling (Figure 6).

Discussion &Conclusion: This study has shown that the finite element analysis can use for biomechanical and surgery of bone to better understanding the thermal and biomechanical condition and stresses.

Keywords: finite element analysis, bone, drilling, scanning electron microscopy

Poster Presentation

62- **Title**: A New Radiographic Method For Estimating Tibial Malrotation

Author: Hamidreza Yazdi, Sepideh Abdi, Parham Pezeshk, Alireza Yousof Gomrokchi

Aim: Diaphyseal tibial fractures are the most common bone fracture in the body and are usually treated with intramedullary nailing method. However, this approach is responsible for 41% of rotational deviation. The aim of this study was to provide a radiographic evaluation method to determine tibial malrotation in closed fixation of tibia bone fractures during or after surgery.

Methods: This study was conducted in a university hospital from May, 2015 to March, 2016. All patients referring to the hospital with complaints of minor trauma around the ankle and knee requiring radiographic evaluation of both joints were enrolled in the study. Inclusion criteria included age between 20 and 50 years as well as normal axial, sagittal, and coronal lower limb alignment, no history of previous lower limb injury (such as fractures of the tibia or fibula), ankle or knee sprain, no history of previous lower limb surgery, metabolic or congenital bone diseases, or malignancy. In all cases, a standard anteroposterior (AP) radiograph of the knee was taken, and then, without changing the limb position or image setting, an AP radiograph of the ankle was obtained. The overlap between the distal tibia and fibula was measured on PACS program environment.

Results: Fifty cases were included in this study.The mean age of males and females was 29.08 ± 2.49 years and 31.46 ± 2.04 years, respectively. The range of distal tibia-fibula overlap one centimeter above the tibiotalar joint line was 7.81 to 9.09 mm (confidence interval of 95%), and its percentage to the fibula shaft width at the same level was 49.43% to 54.35%.

Discussion & Conclusion: According to the results, it can be concluded that distal tibia-fibula overlap when the knee is in the true anteroposterior (AP) position, regardless of side and gender, is 7.81 to 9.09 mm or 49.43% to 54.35%.

Keywords: Tibial rotation, Anteroposterior radiography, Tibia-fibula overlap, Ankle, knee

Poster Presentation

63- **Title**: Medial Collateral Ligament and Posteromedial Corner Reconstruction with Allograft

Author: Mohsen Mardani Kivi, Amirreza Sadeghifar, Mahmoud Karimi Mobarakeh

Aim: the result of new method of MCL and PMC Reconstruction with Allograft

Methods: Patients with grade 3 damage to medial and cruciate ligaments enrolled. The result of study before and after 6 month follow up using the research tools were compared with contralateral knee. Evaluattion of results by comparing the stability and IKDC questionnaire score, was performed six month later.

Results: Average age was generally 26.82 years. 73% right and 27% left knee damaged. Average scores IKDC before and after surgery respectively was 65 and 89.8. This score improving was compared for each case which represents a significant improvement of symptoms ($P<0.05$). IKDC average score of injured knee were compared with the contralateral knee that achieved respectively 98.9 and 93. This score for everyone was compared with himself that this difference was not statistically significant. Knee stability test was performed before and after surgery. All patients had third degree of tearing.

Discussion & Conclusion: The result of Reconstruction of MCL and PMC with allograft and this new technique is good

Keywords: Allograft, Medial collateral ligament, Knee Posteromedial corner Reconstraction

Poster Presentation

64- **Title**: Genu Recurvatum Following Primary Total Knee Arthroplasty: A Potential Indication for Isolated Polyethylene Exchange

Author: Seyed Mohammadjavad Mortazavi, Ehsan Ghadimi, Ali Okati, Nima Bagheri

Aim: Isolated liner exchange is a rare option in revision total knee arthroplasty (TKA) with variable results. It can be successful in selected patients with well-fixed and well aligned TKA. We therefore reported our our experience with isolated PE exchange for gene recutratum following TKA at our institution.

Methods: From January 2011 to January 2018 we performed 876 primary TKA at our institution using single radius design. All patients underwent operation by single surgeon using a standard surgical protocol. Four patients came to us with recurvatum deformity of the operated knee at average 1.3 y(6 month to 3 years) following surgery (0.4%).

Results: The mean age of patients with recurvatum was 59 (55 to 67). All patients were female with some generalized ligamentous laxity. We managed them conservatively with hinged knee brace for 3 months. 3 patients did not respond to non-operative treatment, therefore, isolated PE exchange were performed. We observed wear at the base of polyethylene post in all 3 revised patients. The mean thickness of PE has been increased from 8.6 mm to 16 mm to. At an average follow up of 2 years, all patients going well without any residual recurvatum deformity.

Discussion & Conclusion: Isolated polyethylene exchange could be considered in patients with recurvatum following single radius TKA design with at least short term follow up success. Using thicker polyethylene at the time of primary TKA in patients with ligamentous hyperlaxityn might have prevented this complication

Keywords:

Poster Presentation

65- **Title**: Health-Related Quality of Life in Joint Replacement

Author: Seyed Taghi Nourbakhsh, Fatemeh Mirzaei, Zohreh Zafarani, Hamidreza Aslani

In recent decades, there has been a significant increase in the number of elderly population in developed countries. Increasing patient access to health care has been an important studied topic. This increase in aging population is likely to be correlated with a parallel increase in the number of joint arthroplasty (JA) done in this group. JA is associated with pain relief and enhancement in function and quality of life. Cost-effectiveness acceptability curves showed that, for all patients, JA was almost 100% cost-effective.

With more than millions JAs performed annually in the world, there has been increased notice focused on the leverage that these procedures apply overall healthcare economy. In conclusion, this may be of increasing significance in the future as the medicaid programs develop under the Arthroplasty protection and affordable care act.

Keywords: Arthroplasty, joint replacement, quality of life, elderly population

Poster Presentation

66- **Title**: Repair of Distal Biceps Tendon Rupture: A New Technique (Three Holes Technique)

Author: Fatemeh Mirzaei, Mohammadamin Aslani, Zohreh Zafarani, Hamidreza Aslani

This study describes a three holes technique. The procedure is performed through a 5_cm transverse skin incision distal to the elbow. The tendon is sutured perpendicular to each other. In this technique we created one hole in the radial tuberosity and two small holes in anterior surface of the radial bone. The three holes technique was used in 8 patients. All were satisfied and returned to activities. This technique is a safe and effective method of repair of distal biceps tendon rupture that allows active mobilization with minimal risk of complication.

Keywords: Distal biceps tendon, Avulsion, Distal biceps rupture, Repair

Poster Presentation

67- **Title**: Arthroscopy Effect On Knee Pain Caused By Sports Injury

Author: Esmaeil Imani, Seyed Hadi Seyed Hoseinian, Hosein Negahban, Afsaneh Zeynalzadeh, Salman Nazary Moghadam

Aim: While the relevant studies showed decreased reaction time in post-traumatic complaints such as ACL injury, little studies pay attention to non-traumatic disorders such as patellofemoral pain syndrome (PFPS). The purpose of the present study was to compare the neurocognitive function in PFPS and healthy individuals.

Methods: Design: In this cross-sectional study, twenty five PFPS (20 women and 5 men, mean age 29.28 years, SD 5.59) and 25 healthy controls (19 women, 6 men, mean age 29.32, SD 5.30) were recruited in the present study. The baseline scores from a Deary-Liewald Reaction time (DLRT) were analyzed to compare the upper extremity reaction time, ankle plantar flexion reaction time (braking time) and knee extension reaction time between PFPS and healthy individuals. The PFPS patients were matched with healthy controls based on gender, height, weight, age, and sport activity level before pain occurrence.

Results: The PFPS patients had slower reaction time that were statistically significant in upper extremity reaction time ($P=0.04$), and braking time of the symptomatic knee ($P<0.001$) as compared with healthy control. The symptomatic knee extension reaction time was slower than healthy matched leg, but this difference was not statistically significant ($P=0.24$).

Discussion & Conclusion: The PFPS patients may be correlated with cognitive impairment. It seems that the PFPS patients was more susceptible to injury than healthy individuals. Cautiously, neurocognitive reaction time may be a factor for predisposing non-traumatic injuries such as PFPS.

Keywords: Knee, Neuromuscular, Reaction time, Patellofemoral Pain Syndrome, Sport

Poster Presentation

68- **Title**: Introduction Of Orthopedic Patient-Centered Care. How It Works The Importance Of Advantages And Limitations

Author: Hamid Farokhi, Maryam Kalhori, Faeze Kalhori, Firoozeh Kalhori

Aim: To reveal importance and effectiveness of patient centered care in orthopedics first of all we need to explain what it who it works is

Methods: The importance of the ability of skeletal movement and function to improve quality of life, prevent cardiovascular disease and control diabetes has been therefore, increasing the effectiveness of treatment in orthopedic proven specialty has a significant effect on improving the overall health and quality of life of patients. What impacts treatment effectiveness in orthopedic specialty is the extent of patient collaboration during treatment, which is why the American academy of Orthopedic surgeon at 2006 advised to shift the paradigm s from disease-centered to patient-centered care to improve patient and family awareness. At first it was thought that the patient-centered care system was part of the nursing system and therefore a part of the hospital accreditation system was also provided for training, but reports indicated that patient-centered care was ineffective in hospital accreditation in such a way that Running there.

Patient-centered care system is not a new part of the existing medical system but a new one next to the patient-centered system, not a disease, and this is a paradigm shift as recommended by the American Orthopedic Association.

Patient-centered care system as (PCMH) and later specialized in patient-centered care) PCSPIs one of the best systems that has been able to greatly improve the level of medical service, while greatly reducing the cost of treatment. Implementation of this system has reduced the cost of treatment by up to, % 30 increased patient satisfaction by % 30 and preserved patient health by. % 25

The system is usually implemented in five parts. The first part of the patient's medical information is systematically recorded in greater detail and recorded during an

examination under an up-to-date electronic recording system with electronic analysis capability and diagnostic details. And then the patient will be taught how to make the disease happen, the logic of the treatment will be explained to the patient, and a specific program that will be applicable and most effective based on the abilities and living environment and mental framework will give the patient the most impact. During all these stages the patient has the opportunity to discuss and change It will be well maintained and maintained after the implementation of the continuous communication with the patient and if necessary part of the program will be changed. At the same time, identifying the causes of the illness will provide the training needed to change the lifestyle. And follow-up will be given to conduct the training and follow-up will be required elsewhere. All findings related to patients' experiences are recorded in the electronic patient records and this information will be optimized when making decisions.

This system allows patients to have realistic expectations of the outcome of surgery or non-surgical treatment of illnesses and to be an active member of the treatment team themselves. This is why the physician-patient relationship, especially in the field of orthopedics, is associated with the risk of non-recovery and complications. There will be a significant improvement

Although most physicians have performed parts of the system with limited personal experience, parts of the system have previously been published by the Ministry of Health and Medical Education under the heading of very detailed health education, but this too could not be generalized. The reason for the shift in the medical system paradigm is from the disease-centered to the patient-centered system, and therefore the implementation of the patient-centered care system seems critical.

Due to the low level of health literacy among Iranian patients with multiple literature implement this system has been proven to result in the treatment of orthopedic patients it can help them.

But the problem with this system is that there are problems with it, the most important being the paradigm shift of practitioners in establishing cultural infrastructure and electronic systems and the need to re-create each system based on

countries and cultures. But in spite of these problems, due to the considerable advantages in our country, as the American Society of Orthopedic Surgeons has suggested, the time has come for physicians to migrate from the patient-centered system to the patient-centered system.

Conclusion: patient centered care is a critical need paradigm shift now for middleeast and iran

Keywords:

Poster Presentation

69- **Title**: Effective Of Teaching On The Quality Of Life In Patients With Back Pain
Author: Soraya Nejati, Samaneh Sharifzadeh

Aim: Almost a third of the world's population suffers from severe back pain. One of the most common causes of low back pain is disc herniation. People with chronic pain experience failure in the physical, social and psychological problems and reduced quality of life will suffer. The concept of quality of life as a sign of quality health care and disease control programs is. Several therapeutic approaches for the treatment of chronic low back pain or control is used. Regarding the effect of education on quality of life in patients with chronic low back pain, the aim of this study was to improve the quality of life of these patients.

Methods: This study was a clinical trial. 50 of patients with chronic low back pain caused by a herniated disc, Intervention four-hour meeting was conducted in four consecutive weeks. The instruments used included a demographic questionnaire and the SF36 quality of life questionnaire score on each question was based on the Likert scale. The lowest score and the highest scores were 0-100. The higher scores showed better quality of life. Samples first completed the demographic questionnaire and SF36 Quality of Life Questionnaire. Then, again, samples completed the SF36 questionnaire at the end of the fourth week and three months after the intervention. Information was collected into 16 spss software version and data using statistical t-test and chi-squer were analyzed. Descriptive statistics, frequency tables, absolute, measures of central tendency and dispersion were used to describe the data.

Results: The quality of life in patients with chronic low back pain caused by lumbar disc herniation increased, but a month after training did not show a significant increase. These increase was not statistically significant (P = 0.68). The quality of life of patients three months after the end of training had increased and this increase were statistically significant (p = 0.025).

Discussion & Conclusion: According to the results of this study, it can be said that education is significant and these increase has improved quality of life of patients with back pain caused by lumbar disc.

Keywords: Chronic low back pain, herniated disc, teaching

Poster Presentation

70- **Title**: Outcomes with Surgical Implant Generation Network IM Nail in the Treatment of Lower Limb Implant Failure in Herat Regional Hospital, Herat, Afghanistan

Author: Mohammadjavad Nazari, Zahra Abbasi, Seyed Sharif Hamed, Wais Farda, Nasrollah Hidarian

Aim: The aim of the fracture treatment is to achieve union with timely functional recovery. Internal fixation with adherence to strict biomechanical principles is often required to achieve this. However, a fixation device may fail to hold a reduced fracture until union, giving rise to non - union or delayed union with implant failure. The aim of this study was to see the efficacy of exchange of failed implant with SIGN, an intra - medullary interlocking nail

Methods: 16 cases of long bone fractures (Femur and Tibia), who had the problem of poor fracture healing because of the fracture pattern or implant were prospectively studied in 6 months post-op. Their failed implants were exchanged with SIGN interlocking nail.

Results: In our study 81% of patients were males and the other 19% were females. Majority of the patients were in the age group of 9-48 years. Femur (11 cases) was more frequently involved than Tibia (5 cases). The rate of infection was 6%. 75% of patients were able to squat and smile. Painless full weight bearing was 78.5% and healing by X-Ray in 81% observed. Knee flexion > 90 degree was present in 87.5%. Screw loosening was 1 case and there was no case of implant failure and deform

Discussion & Conclusion: Surgical Implant Generation Network (SIGN) IM Nail, is the option of choice in our hospital as any hospital in Low and Middle Income Countries (LMIC) to be replaced with failed implant management. Thorough reaming of the medullary canal should be done to remove endosteal fibrous tissue in all cases of exchange nailing.

Keywords: implant, failure, SIGN, intramedullary, fracture

Poster Presentation

71- **Title**: Total Knee Arthroplasty and Brucellosis Infection: Case Report and Literature Review

Author: Mohammadali Sazegari, Fatemeh Mirzaei, Mohammadamin Aslani, Zohreh Zafarani, Omid Sheykhhasani, Hamidreza Aslani

Total knee Arthroplasty (TKA) is one of the most common surgeries in orthopedic. Infection in joint arthroplasty implants is one of the most detrimental and important complications in orthopaedic surgery and is the second cause of surgical revision. Prosthetic infection due to Brucella is a rare event and not quickly diagnosed. Majority of cases diagnosis is serological and positive anamnesis, combined with an antibiogram of the joint liquid and a high serum antibody titre, can lead to a certain diagnosis. In this study, we describe management and treatment a patient who underwent a TKA after which the knee became infected with Brucella resulting in prosthesis loosening and also review similar cases with this infection after joint arthroplasty.

Keywords: Knee Arthroplasty, Infection, Brucellosis

Poster Presentation

72- **Title**: The Effect of Lateral Wedge on Balance, Pain and Function in the Sound Side of Unilateral Trans-Tibial Amputees

Author: Mohammadjavad Moghadam, Fatemeh Mirzaei, hamidreza Aslani

Aims: Individuals who have involved amputation of a unilateral lower limb are at greater risk than the normal people for many health obstacles. These people have asymmetrical gait and massive external knee adductor moment on the sound side limb. This asymmetry can be due to composition of muscle faint, lack of sensory feedback, instability of the affected limb and pain in the loading segment of the residual limb which is result of functional and balance impairment. The aim of this study is to investigate the instant and medium-term traces of pre-fabricate insoles with a lateral wedge on people who had unilateral below knee amputation and bow leg malalignment.

Method: Our study design was before-after trial with 3 months follow up. 10 participants with painful intact knee and varus malalignment (8 males, 2 females, mean age 62.4 years, mean BMI 33.0 kg/m) were prescribed pre-fabricate insoles with arch support and a 5.0° lateral wedge. At first, we evaluated the clinical properties before and after intervention, and follow-up (3 months) assessments of pain, balance control, physical function, and physical activity. The baseline and 3month WOMAC score (pain, and physical activity), speed walking test, stair-climbing test, and chair-raising test were observed in participants.

Results: The participants only demonstrated significant improvement of the WOMAC subscales for pain (p=0.039), and no significant improvement was observed of function and balance test after intervention.

Discussion and Conclusion: These results demonstrate using lateral wedge provides a medium-term pain reduction in unilateral amputees, people with varus knee for 3 months, but no improvement of biomechanical factories were founded. Use of lateral wedge insole is a reliable method in unilateral trans-tibial amputees; however, more extensive research is needed in this field.

Keywords: Below knee amputee, Prosthesis, lateral wedge, Insole, Trans-Tibial amputees

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