7th INTERNATIONAL BIENNIAL CONGRESS OF IRANIAN SOCIETY OF KNEE SURGER, ARTHROSCOPY, AND SPORTS TRAUMATOLOGY

ABSTRACTS BOOK

Deep Dives in Debates

ISKAST 2024

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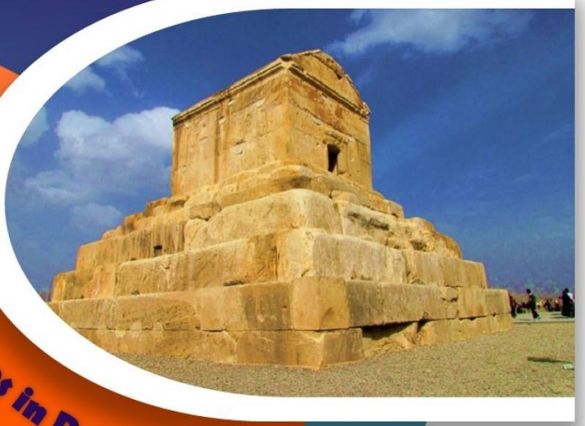
ORAL ABSTRACTS

Deep Dives in Debates



Tomb of Cyrus the Great
The founder of the ancient Achaemenid Empire
Pasargad, Fars Province, Iran

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Does stemming improve the survivorship of short-keeled cemented tibial prosthesis in total knee arthroplasty?

Hamidreza Yazdi MD, Mohammad Razi MD, Mansour Abolghasemian MD, Mohammad Mahdi Sarzaeem MD, Ataollah Moshirabadi MD, Mehdi Mohammadpour MD, Sina Talebi MD

Keywords: Keywords. Total Knee Arthroplasty; Persona; short-keeled tibial component; short stem; asepticloosening; cemented

Background. Aseptic loosening of the tibial component is a major complication in total knee arthroplasty (TKA), particularly concerning short-keeled implants. To address this, stem augmentation has been proposed to enhance tibial component fixation. Methods. This study retrospectively investigated aseptic tibial loosening in patients receiving short-keeled prostheses, comparing stemmed versus non-stemmed versions. The cohort included primary osteoarthritis TKA patients using Persona prostheses within a fouryear period, with at least 2-year follow-up and thorough radiological assessment. Evaluation involved 932 knees, with mean 49.3-month follow-up (25 to 76) and mean age 68.6 years (± 7.58). The cohort was stratified based on tibial stem usage, comparing aseptic loosening,

complications, and patient satisfaction.

Results.Results showed 203 knees (21.8%) with cemented short stems, and 729 knees (78.2%) without stems. Rates of tibial component loosening were 2.06% for non-stemmed cases and 0.99% for stemmed cases, with insignificant disparity ($p = 0.551$). Preoperative osteoporosis and smoking were risk factors for failure across the cohort. Patient satisfaction slightly favored the non-stemmed group ($p = 0.042$).

In conclusion, this study is a comprehensive analysis, assessing stem impact on tibial component loosening in short-keeled prostheses. While no clear advantage was seen in adding a cemented short stem, potential biases emphasize the need for future prospective studies to accurately assess this effect.

Complete characterization of Sol–Gel Silver-Fluoride-Hydroxyapatite Coatings on External Fixators for Orthopedic Surgery Applications: structural, biological, and in vitro evaluations

Mohmmad Hossein Ebrahimzadeh MD, Ali Moradi MD, Nafiseh Jirofti

Keywords: External Fixators, Trauma, Silver, Hydroxyapatite, Orthopedic

External fixator pins (EF) have many applications in orthopedic surgeries in the field of trauma. Infection is a well-known problem associated with EF pins. The infection, occur by creating a biofilm on the surface of EF pins due to planktonic bacteria adhere to EF and therefore, loosening of the EF embedded in the bone. Coating the surfaces of EF pins with antibacterial materials has been identified as the most effective method for improving the interface between the bone and EF to prevent the formation of biofilms and reduce the risk of infection. Accordingly, the current study has been centered on the creation of a coating of Silver-Fluoride-Hydroxyapatite (Ag-FHA) on Stainless Steel Substrates through the sol-gel method. The FESEM images and Mapping analysis have confirmed the nano-scale size and homogeneous dispersion of particles in the Ag-FHA structure, respectively. The FTIR results indicate the hydroxyapatite formation in obtained structure. A comprehensive antibacterial study was conduct on the synthesized powders. The results indicated that Ag 0.4-FHA exhibits significant inhibitory effects on the growth of both Staphylococcus aureus and Escherichia coli. In Ag 0.4-FHA structure, the minimum inhibitory concentration (MIC) was determined to be 2000 mg/ml against Staphylococcus aureus bacteria and 500 mg/ml against Escherichia coli bacteria. The effectiveness of 0.3 and 0.4 percent by weight was confirmed against the growth inhibition of the investigated microorganisms through the agar well diffusion method. The cytotoxicity test results confirmed that the synthesized structures had no toxic effect. Also, the morphology of NIH/3T3 cells showed the normal morphology of the cells with intact membranes. The obtained results of this project demonstrate that structures containing 0.3 and 0.4 Ag are highly effective in preventing the growth of both bacterial strains. These structures can be suitable candidates for covering orthopedic implant to reduce the risk of infection in surgery.

Phenotyping of Coronal Alignment of Knees in Patients Undergoing TKA

Seyed Mohammad Javad Mortazavi MD, Mohammadreza Razzaghof MD, Mohammad Ayati Firoozabadi MD, Mohammad Soleimani MD,

Keywords: Alignment, Anatomical alignment, FMA, HKA, Knee, Mechanical alignment, Phenotype, TMA, Valgus, Varus

Purpose: Total knee arthroplasties (TKAs) are currently aimed at neutral mechanical alignment. However, this leaves many patients unsatisfied as the neutral alignment is not the natural anatomy in all cases. We describe the phenotypes of knee coronal alignment of patients undergoing TKA according to the classification of Hirschmann et al.
Methods: This cross-sectional study included 1266 knees and 941 patients with knee osteoarthritis who were candidates for TKA. Hip–knee–ankle (HKA) angle, femoral mechanical angle (FMA), and tibial mechanical angle (TMA) were used to describe the phenotypes. Phenotypes included a mean value and covered ± 1.5°. The mean value represented 3° increments of the angle starting from the overall mean value (HKA: 180°; FMA: 93°; TMA: 87°). The phenotypes were described by the alignment direction (NEU, VAR, VAL), the measured angle (HKA, FMA, and TMA), and the deviation from the mean value.
Results: The mean age of the patients was 65.40 ± 8.09 years. There were 795 women (84%) in the study, and the left knee was the injured one in 655 cases (51.7%). The mean HKA, FMA, and TMA were 166.04±8.09, 88.88±2.99, and 85.79±3.32 degrees. A total of 574 phenotypes were found in the participants of this study. The most common phenotype was VAR HKA9°+VARFMA3°+NEUTMA0°.
Conclusion: All patients in our study had moderate to severe varus in HKA, and mild varus in FMA, while TMA was mostly neutral or showed mild varus. Also, we observed more phenotypes among our participants than in previous studies.

Functional outcome of bucket handle medial meniscal tear repair in concomitant ACL reconstruction using hybrid technique

Rebar Khaffaf MD, Hounar Ali MD

Keywords: ACL, Meniscus, Ligaments, Bucket handle, Knee instability, Hybrid technique, Articular cartilage

Introduction: A well-known tear pattern is called a bucket handle meniscal tear (BHMT), which is characterized by a meniscal tear that runs vertically and moves the torn inner fragment into the intercondylar notch region. Neglected BHMTs are those that experience locking and spontaneous unlocking during knee extension numerous times per year. Bucket handle tears are difficult to repair because they are unstable and fragile and deformed; it is mostly associated with a chronic ACL tear. Because the preservation of meniscal tissue might prevent further joint deterioration, it is crucial to handle BHMTs well in younger patients. The rate of meniscus repair failure is still high, especially for "bucket handle" tears. However, all types of meniscal tears should be saved if they are repairable.

Purpose: This study's goal was to evaluate the failure rate, clinical and functional outcomes, and risk factors for failure following arthroscopic BHMM tear repair in conjunction with ACL reconstruction, repair conducted with a hybrid technique, combining (all inside, inside out) or (all inside and outside in) techniques Study design: retrospective study.

Method and Material: Patients with bucket handle meniscal tears were evaluated retrospectively with hybrid technique at a single institution (Twy Malik Hospital/Sulaymaniyah City/Iraq) from 2019 to 2021. A total of 58 menisci were examined in sequential order for the collection of data. On the basis of age, sex, tear laterality, BMI, and concurrent anterior cruciate ligament repair, careful propensity matching was performed, as well as preoperative and postoperative (IKDC), Tegner scores and Lysholm scores.

Result: 58 patients (52 men and 6 women) met the inclusion criteria and underwent arthroscopic BHMT repair of the medial meniscus combined with ACL reconstruction using the hybrid technique (all inside and inside out) or (all inside and outside in), with all ACL grafts being Hamstring grafts. The mean age of the patients was 34.78 ± 4.46 years old, ranging from 28 to 45. The majority of the patients were between 30 and 40 years old, which was 72.4% of the total; 58.6% of the patients were overweight; and regarding the mechanism of injury, 38 (65.5%) of the patients were due to playing football. The mean follow-up period was 29 months, with ranges of 15–43 months. The clinical success rate was 86.2%. Regarding the functional outcome scores, the mean of IKDC in pre-operative was 42.89; it was improved to 81.18; the mean of Lysholm in pre-operative and post-operative were 37.13 and

84.27, respectively; the highest mean of the Tegner score was pre-injury, which was 6.55; and the lowest mean of the Tegner score was 3.03, which was pre-operative.

Conclusion: The term "saving meniscus" implies to all different kinds of meniscal injury because it does not only improve knee joint degeneration but also improves knee joint stability, there should be offered hope for repair even in chronic BHMTs. Regardless of the technique used, 3-5 stitches can still functional as 8 stitches.

Arthroscopic Management of Femoroal Cam Impingement; Case Series

Shahram Shirvani Boroujeni MD, Sadra Haji MD

Keywords: Femoral CAM deformity, Impingement, Arthroscopic treatment

Aim: FAI (femoroacetabular impingement syndrome) is a common cause of hip pain, resulting in a decreased life quality. One of the types of impingement syndrome is CAM deformity.This case series aims to investigate the outcome of the treatment of these patients by arthroscopic method.

Methods: Thirteen patients of 23 patients invited to study, with radiographic and clinical demonsterated FAI, and (only cam type)imported in this study

Exclude pincer type and combined type They were managed with hip arthroscopy

Outcomes were measured with the FABER and FADIR tests, modified Harris Hip Score , pain score on a visual analog scale and alpha angles Pre-op and postop 6 months and 12 months after surgery.

Results: There were 10 men and 13 women

The mean age was 36.3

Acetabular chondroplasty with shaving and puncture with owl carried for three cases

A comparison of preoperative scores with those obtained at 2- steps follow-up showed a significant improvement ($P < 0.02$) for all outcomes.

Harris Hip Score (65.5 v 88.4)

visual analog score for pain (7.3 v 2.3)

and positive FADIR test (100% v 15%)

The alpha angle was also significantly improved after resection osteoplasty. (57.1 vs 48 degrees)

Conclusion: This study showed that arthroscopic treatment of patients with femoral CAM impingement can significantly increase the Harris Hip Score and improve patients' performance.

Posterior Knee Arthroscopy Facilitates The Safe And Effective All-Inside Repair Of Locked Bucket-Handle Medial Meniscal Tear Using A Suture Hook Technique

Sohrab Keyhani MD, Mohammad Movahedinia MD

Keywords: Bucket-handle medial meniscal tears, Medical meniscus, Meniscal repair, Posterolateral portal, Posteromedial porta, Transseptal portal

Aim: This study reported the outcomes of locked bucket-handle medial meniscal tear (BHMMT) repairs using an arthroscopic posterior approach during anterior cruciate ligament (ACL) reconstruction.

Methods: Between 2011 and 2014, 48 patients with BHMMTs and ACL tears who met the eligibility criteria were enrolled in the present study. BHMMTs were assessed using a posterolateral transseptal portal and repaired using a posteromedial portal. Transportal ACL reconstruction was performed using hamstrings autograft. Patients were assessed based on their IKDC and Lysholm scores and Tegner activity level. Meniscal healing was clinically evaluated based on the absence of swelling, joint line tenderness, locking, and catching; McMurray test results; and the need for meniscectomy.

Results: According to follow-up assessments, the average IKDC and Lysholm scores improved significantly after 3–5 years ($P< 0.001$)

Conclusion: Excellent clinical outcomes were obtained when locked BHMMTs were repaired using an all-inside suture technique that employed posteromedial and posterolateral transseptal portals.

Navigation of Femoral and Popliteal Artery around the Knee with CT Angiography; implications for surgical interventions

Seyyed-Morteza Kazemi MD, Sohrab Keyhani MD, Mehrdad Sadighi MD, Seyyed-Mohsen Hosseininejad MD

Keywords: Computed Tomography Angiography, Computer-Assisted, Femoral artery, Osteotomy, Popliteal artery, Surgery

Aim: Uncertainty about the exact position of the femoral and popliteal arteries in the medial thigh and posterior knee might increase vascular complications in surgical procedures. This study aimed to document femoral and popliteal arteries in the medial thigh and around the knee to assist surgeons in developing safer surgical approaches.

Methods: The study included 120 patients-180 lower limbs- who underwent CT angiography (CTA) of the lower extremity. The distance from the femoral artery to the anterior border, midsagittal axis, and posterior border of the femur and the popliteal artery to the medial, lateral, and midpoint posterior cortex of the proximal tibia was measured in two and three-dimensional CTA images.

Results: The femoral artery was found to be on average 236.93±29.61mm, 195.34±26.12mm, and 146.28±33.18mm away from the adductor tubercle at the anterior, midsagittal axis, and posterior borders of the femur, correspondingly. The popliteal artery was to be located on average 5.40±2.50 mm posterior to the midpoint of the plateau tibia at the joint line.

Conclusion: Considering the mentioned femoral/popliteal artery distances to the femur and proximal tibia would direct surgeons to the safe zones for more accurate surgical approaches in the medial thigh and around the knee when performing osteotomies, knee arthroplasty, arthroscopy, and trauma surgeries, to reduce possible vascular damages.

Predictors of Lower Limb Coronal Malalignment following Conventional Total Knee Arthroplasty with Mechanical Concept

Seyed Mohammad Javad Mortazavi MD, Sadegh Hasani Satehi MD, Mohammadreza Razzaghof MD, Amirhossein Rahimnia MD, Seyed Saeed Tamehri Zadeh MD, Milad Salehi MD

Keywords: total knee arthroplasty; coronal malalignment; alignment; predictor; Hip-knee-ankle axis;mechanical axis

Aim: Restoring the neutral limb mechanical axis after total knee arthroplasty (TKA) plays an important role in the functional postoperative outcomes. We aimed to identify the risk factors of coronal malalignment (CM) following conventional TKA and to develop a model to predict its risk.

Methods: We retrospectively reviewed all conventional primary TKAs with cemented posterior stabilized prosthesis in our institute from January 2017 to 2019. The following variables were extracted from our patients' database: demographic data, varus classification, flexion contracture, pre- and postoperative Hip-knee-Ankle angle (HKAA), mechanical lateral distal femoral angle (LDFA), mechanical medial proximal tibial angle (MPTA), joint-line congruency angle (JLCA), femoral and tibial bowing, Caput-CollumDiaphyseal (CCD) angle. Multiple logistic regression was used to develop a model for predicting post-TKA CM.

Results: After exclusions, 402 TKAs were analyzed, of which 172 (42.79 %) were outside the acceptable postoperative HKAA range (180°±3°). Of 17 factors studied, multiple regression analysis showed that flexion contracture >10° (OR=2.95, P<0.001), femoral bowing >4.9° (OR=1.89, P=0.006), tibial bowing >2.2° (OR=2.00, P=0.002), preoperative MPTA ≤85° (OR=1.68, P=0.037) or HKAA ≥20° varus (OR=5.07, P=0.017), preoperative JLCA 4°-10° (OR=2.49, P=0.023), and CCD ≤131° (OR=1.62, P=0.044) were statistically associated with a greater risk of postoperative CM. The results remained almost the same even after excluding the extreme HKAA outliers (>±6° varus/valgus).

Conclusion: The probability of post-TKA CM can be estimated based on these risk factors. Thus, we should consider modifying them or using more advanced techniques like patientspecific instrumentation or navigated systems in those with higher risks.

Biomechanical Assessment of Novel Loop Post and Two Other Suturing Techniques for Medial Meniscus Root Tears, with Meniscus Extrusion Comparison

Arash Sharafat Vaziri MD, Seyedeh Reihaneh Hosseini, Ehsan Mahmoudi MD, Morad Karimpour, Mohammad Naghi Tahmasebi MD

Keywords: biomechanical testing, knee, meniscal extrusion, meniscus root, root tear; pull-out repair

Aim: The study aims to assess the efficacy of a novel loop-post (LP) suture technique in comparison to established methods for repairing medial meniscus posterior root tears (MMPRTs). The meniscus plays a pivotal role in knee joint stability, bearing loads, and absorbing shocks. Radial tears, especially MMPRTs, are significant due to their biomechanical impact and association with extrusion and osteoarthritis progression. While various suturing techniques have been introduced over the years, the need persists for techniques that can restore meniscus hoop tension.

Methods: The investigation compares the LP technique to two simple suture (TSS) and modified Mason-Allen (MMA) through a biomechanical study in fifteen bovine knee specimens. These specimens were subjected to uniaxial cyclic compression using a universal axial testing machine. Each sample underwent consecutive testing under three conditions: intact meniscus, injured meniscus, and post-reconstruction meniscus. Meniscus extrusion was measured using digital image correlation (DIC) under each of these loading conditions.

Results: After 350 cycles, the study found that the MMA group exhibited the highest displacement, while the LP configuration displayed the lowest displacement. Importantly, LP's displacement was not significantly different from TSS (0.0038±0.0032 mm-1 for MMA, 0.0033±0.0015 mm-1 for TSS, and 0.0014±0.0006 mm-1 for LP). Notably, there were no instances of suture failures during cyclic loading.

Conclusion: The study concludes that the novel LP technique shows promise in repairing MMPRTs. The LP method demonstrated superior displacement resistance and promising biomechanical properties. While limitations involving biomechanical testing with bovine models and nonabsorbable sutures were identified, the LP technique appeared favorable for posterior meniscus root repair.

Frequency of anterolateral ligament (ALL) and Kaplan fiber injuries in patients with traumatic complete anterior cruciate ligament

Mohammad Ayati Firoozabadi MD, Davood Dehghani MD, Shahriar Kolahi MD, Mohammad Javad Mortazavi MD

Keywords: , The anterolateral structures Iliotibial Band (ITB)

Purpose: frequency of anterolateral ligament and Kaplan fiber injuries in patients with traumatic complete anterior cruciate ligament tear and their association with other imaging findings evaluated in patients.

Method: retrospective MRI images of patients with knee pain who attended orthopedic clinics and underwent knee MRI at our facility. Patients with primary ACL tear who underwent MRI within 6 weeks of injury were included.

Result: Mean age of patients was 31.8±7.8 years [18-49] and 44 were male. All of the patient had ACL tear and only one patient had PCL tear simultaneously Among all of our patients 21.6% shows ALL injury and 33.3% proximal or distal Kaplan Fiber injury. The rate of medial and lateral femoral condyle contusion was 2 and 21 the rate of medial and lateral tibial condyle contusion was 16 and 25. Among these patients, 15 had both lateral and medial involvement of tibial condyles.

We considered lateral femoral and tibial condyle contusion as imaging manifestation of suspected pivot mechanism injury. when we considered pivot injury in specific subgroup, we found that 71.4% had Kaplan Fiber injury despite only 28.6% ALL injury We also found that in patients with lateral meniscus injury rate of Kaplan injury is higher than in intact lateral meniscus, although it is not statistically significant

Conclusion: we hypothesis that in anterior cruciate ligament tear, when we identify bone contusion at the lateral femoral and tibial condyle as a pivotal mechanism of injury, surgeons need to be more cautious with Kaplan fiber injuries than ALL.

Advantages of Using 3D printed Patient-specific Porous Titanium Cones in Revision Total Knee Arthroplasty

Arash Sharafat Vaziri MD, Ghazaleh Moradkhani, Morad Karimpour, Mohammad Naghi Tahmasebi MD, Fardis Vosoughi MD, Maryam Salimi MD

Keywords: 3d printing, Customized implants, Patient-specific, Porous Cones, Revision Total Knee Arthroplasty, Titanium cones

Effectively managing bone defects is crucial for the success of revision total knee arthroplasty (RTKA), ensuring implant stability while dealing with inherently weak bone that needs to withstand prosthesis removal. Among several reinforcement techniques metal cones have garnered significant attention due to their ability to reconstruct substantial bone defects. Yet, a major hurdle with off-the-shelf cones lies in their inadequate fit for Asian and particularly Iranian anatomies, with even the smallest sizes proving unsuitable for most patients owing to their narrower medullary canals. A novel solution lies in using customized 3D-printed porous cones, tailored to individual patient anatomies. This study aims to employ patient-specific (PS) porous Titanium cones for bone defect reconstruction through additive manufacturing in RTKA candidates.

After conducting 3D pre-operative planning using CT scans, porous cones were designed based on each patient's anatomy. Notably, the designed porous cone innovatively balances bone ingrowth promotion and prevention of cement seepage into the porous structure. The manufacturing process involved SLM (Selective Laser Melting) using medical grade Ti6Al4V. Single-use polyamide trials were also 3D-printed to aid in host bone preparation during surgery.

A total of eleven cases successfully received designed diaphyseal, metaphyseal, and metadiaphyseal femoral and tibial cones/half cones: six diaphyseal, thirteen metaphyseal, and three meta-diaphyseal cones. Each cone was meticulously designed according to the patient's specific anatomy.

Patient-specific (PS) porous cones offer not just the advantages of off-the-shelf cones, like promoting osseointegration and ensuring long-term biological fixation through their porosity, but they also possess the ability to effectively address complex metaphyseal or diaphyseal defects.

The Effect of Using Tourniquet and Tranexamic Acid on Clinical Outcomes and Surgeon Visualization after Unilateral Primary Total Knee Arthroplasty: A Randomized Clinical Trial

Mohammadhosein Ebrahimzadeh MD, Arash Heidari MD, Mahla Daliri MD, Reza Ganji MD, Naeimeh Kalali

Keywords: Total knee arthroplasty, Tourniquet, Tranexamic acid, Visualization, Knee function

Aim: In this clinical trial, we aim to compare various factors, including hemoglobin level, hematocrit percent, intraoperative blood loss, knee function, and surgeon visualization among the four cohorts of patients who underwent primary TKA as follows; 1. Without tourniquet and TXA use, 2. With both tourniquet and TXA use, 3. With tourniquet and without TXA use, and 4. With TXA and without tourniquet use.

Methods: This parallel-designed randomized clinical trial enrolled 140 patients (35 per group) undergoing primary unilateral TKA. In groups A and D, TXA (1000 mg) was intravenously administered 30 minutes pre-incision, supplemented by 1000 mg of intra-articular TXA at surgery's conclusion. For groups B and C, the tourniquet was applied at 100-150 mm Hg above systolic pressure during the procedure. Surgeon visualization was assessed using a VAS scale post-surgery. Hemoglobin (Hgb) and hematocrit (Hct) were measured preoperatively and on the second postoperative day. Follow-ups at 2 months included clinical examinations, VAS pain assessments, and knee surgery-specific scoring (WOMAC, Oxford Knee score).

Results: Basic demographic data showed no differences among the four groups. Surgeon visualization scores were higher in groups B and C (9.00 and 9.09) compared to groups A and D (7.20 and 7.75) ($P < 0.001$), alongside reduced intraoperative blood loss in groups B and C (122 and 113 ml) versus groups A and D (325 and 279 ml) ($P < 0.001$). Group B exhibited a significantly greater change in WOMAC score compared to group A ($P = 0.046$). Pain VAS score, Oxford score, Hct, and Hgb changes postoperatively showed no significant differences among the groups.

Conclusion: Combined tourniquet and TXA application appears to enhance knee function, with tourniquet use proving more effective than TXA in improving surgeon visualization and reducing intraoperative blood loss.

Assessment of the correlation between femoral component external rotation and angular parameters in alignment view in patients undergoing total knee arthroplasty with a mechanical concept

Omid Salkhori MD

Keywords: External Rotaion, TKA, three joint view

According to our investigation, there was no relationship detected between the three joint angles and the degree of external rotation. This research aimed to determine if there was a connection between the three joint angles and the amount of external rotation of the femoral implant. If we can identify this relationship, then it could help predict the amount of external rotation needed for the femoral component.

This study was designed as a retrospective cross-sectional study on 1208 Patients who underwent primary TKAs by a single specialized orthopedic surgeon, during 2018-2020 at Imam Khomeini Hospital Complex, Tehran, Iran. Valgus knee, Revision and conversion surgeries, and hemophilic patients were excluded. Three joint alignment parameters and the extent of external rotation cut based on documented intraoperative measures were derived from the patient's files.

The results of the Spearman correlation test showed that external rotation has a significant correlation with LDFA, JCA/LFDA, MPTA, JCA/MPTA, VA, and JCA/VA so with the increase in LDFA and MPTA, the amount of external rotation decreases significantly, and with the increase in with JCA/LFDA, JCA/MPTA, VA, and JCA/VA the amount of external rotation increases significantly ($P < .05$).

The outcomes of shoulder arthroscopy before open Laterjet surgery in patients with recurrent shoulder dislocation

Mohammad Nasir Naderi MD, Mehdi Rahimi MD, Nima Mohseni MD

Keywords: Arthroscopy, open Laterjet, shoulder dislocation

Background: Decision making and treatment of recurrent shoulder dislocation in patients with bipolar lesion can be challenging for orthopedic surgeons trained in shoulder surgery. Open Laterjet is an accepted method to treat these patients. We did diagnostic arthroscopy before open Laterjet procedures in our case series and evaluated our results.

Method: Between 07/2017 and 01/2021, we did open Laterjet in forty cases who had anterior shoulder instability with bony defects. Diagnostic arthroscopy was performed in all cases prior to the open Laterjet and after it. In a one-year period, follow-up short-term outcomes were obtained.

Results: Of these 40, three patients had failed previous arthroscopy repair. Three patients were female and 37 patients were male. The mean age was 29.8 (range from 17 to 47 years). The majority of the patients had shoulder dislocation more than 10 times.

Before open Laterjet, we did arthroscopy evaluation in all patients. Our arthroscopic findings showed that there were posterior Bankart lesions in seven patients for whom arthroscopic repair was done. In one patient, there was glenohumeral DJD. In sixteen patients the Hill - Sachs lesion was big (> 20%) and we did arthroscopic remplissage repair in addition to open Laterjet. In two patients, there was SLAP lesion that was repaired through arthroscopy.

After the operation, the shoulder was put on arm sling for 4 weeks. Physiotherapy and range of motion started after 4 weeks. The mean follows up was 12 months (range: 6 months to 4 years).

Most patients regained nearly full strength and range of motion of shoulder 12 to 15 weeks after operation. Recurrence of dislocation did not occur in any patents.

Conclusion: It seems that diagnostic arthroscopy before open latejet is a safe and easy procedure that helps to define and treat concomitant lesions in recurrent shoulder dislocation. We suggest a diagnostic shoulder arthroscopy for patients who are candidate for open laterjet.

Posterolateral Approach to posterolateral tibial plateau fractures: Why When?

Asghar Elmi MD

Keywords: posterolateral tibial plateau, surgical approach, tibial plateau fracture

Introduction: Management of the posterolateral tibial plateau fracture was a very challenging in orthopedic surgery. The posterolateral corner complex and the proximity of the common peroneal nerve restrict both the exposure of posterolateral column fractures and stable fixation. The purpose of this study was to evaluate the safety and clinical efficacy of posterolateral approach for the treatment of posterolateral tibial plateau fractures.
Materials and Methods: Between 2012 and 2022, patients with Posterolateral tibial plateau fractures were treated with open reduction and internal fixation via the posterolateral approach. The patients underwent surgery in a prone position, with the injured limb maintained in a slightly flexed position. All patients were assessed clinically and radiographically. Union or assessment of reduction of fracture fragments was assessed in the follow-up radiographs or CT scan in some patients.
Results: Average follow up was 25 months. All incisions healed with no cases of vascular injury, peroneal nerve injury or paraesthesia and compartment syndrome. All fractures were healed, as manifested by painless weight bearing without a brace and by radiographic assessment. At the final follow-up no signs of instability of the knee were demonstrated and all returned to their preinjury work.
Conclusions: Open reduction and internal fixation of posterolateral tibial plateau fractures with posterolateral approach can attain a satisfactory clinical outcome. However a thorough understanding of the anatomy and available approaches is essential when treating these fractures. Approach selection should be based on fracture pattern, the surrounding soft tissue envelope, and the patient's clinical conditions.

Comparison Of The Effect Of Combined Administration Of Intravenous And Intraarticular Tranexamic Acid Versus Their Administration Alone In The Management Of Blood Loss In Total Knee Arthroplasty: A Retrospective, Multi-Center Cohort Study In Iran

Amir Mohsen Khorrami MD

Keywords: Total knee arthroplasty, blood loss, blood transfusion, hemoglobin, intra-articular., intravenous, tranexamic acid

Background: TKA is associated with significant blood loss. Antifibrinolytic agents such as TXA are widely used to manage blood loss during TKA. This study aimed to compare the efficacy of three different administration approaches of TXA in TKA.

Methods: In this prospective multicenter study, 285 patients with osteoarthritis who underwent TKA between 2020 and 2022 in three hospitals were included in the study. To manage bleeding during TKA, one of the three methods of intravenous administration (IV), intra-articular injection (IA), and combination administration of TXA was performed for the patients. The number of filled red blood cells and hemoglobin injected were evaluated for all patients in all three groups at 4-time points, including before surgery, 12, 24 and 72 hours after surgery. Postoperative blood loss was calculated using blood volume and change in hemoglobin level from preoperative measurement to postoperative day 3.

Results: The mean baseline Hb was not significantly different between the three study groups ($p>0.05$). The mean postoperative Hb of 12h, 24 h, and 48h after the surgery was not significantly different between the three study groups ($p>0.05$). The mean intraoperative blood loss in the combined TXA group was significantly lower compared to IV and IA groups. (0.025) The number of blood transfusions in the three study groups was not statistically significant ($p>0.05$). No side effect was recorded in any group, as well.

Conclusion: Blood loss in the combination TXA group was significantly less than in the other two groups. Combination TXA can help reduce blood loss after TKA surgery.

Arthroscopic findings in one hundred patients with anterior shoulder instability

Mohammad Nasir Naderi MD, Mehdi Rahimi MD, Nima Mohseni MD

Key words: shoulder, instability, arthroscopy

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.

Material and 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.

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.

Correlation of Patellar Bone Deviation on the Range of Motion after Total Knee Arthroplasty

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Keywords: Patellar bone deviation; Range of motion; Total Knee Arthroplasty.

Introduction: This study aimed to compare the improvement of the activity content and pain reduction in patients with patella displacement after total knee arthroplasty surgery with and without correction.

Methods: This study was conducted on all patients over 18 years of age refer to Baqiyatallah Hospital suffering from patella displacement, on patellar view radiography, were candidates for knee joint replacement, and underwent joint replacement. Thirty-five patients with deviation and required removal of the patella bone, whose problem was corrected after total knee joint replacement, with 35 patients whose deviation and displacement of the patellar bone was not restored after total knee joint replacement. Reducing the VAS and improve the range of motion (ROM) was assessed in the follow-up periods of 1, 2, and 4 months postoperative. Evaluation of the presence of deviation and displacement of the patella and its correction was done based on the radiograph of the patella view at an angle of 90 degrees.

Results: In examining the range of motion, the results showed that the patients in the cases and control before surgery had no significant difference in the range of motion (P=0.001). This is while a statistically significant difference was reported in the patient's range of motion between the two groups at one month, two months, and four months after surgery (P=0.001). The average pain before surgery was similar in the two groups (P=0.953). The average pain in one, two, and four months after surgery in the modified group was lower than in the non-modified group (P=0.001).

Conclusion: This study showed that the range of motion in the modified group was higher one month, two months, and four months after surgery. Also, the average pain one, two, and four months after surgery in the modified group was lower than in the unmodified group.

Aspirin is as effective as low molecular weight heparins in preventing symptomatic venous thromboembolism following arthroscopic anterior cruciate ligament reconstruction

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Keywords: Anterior Cruciate Ligament Reconstruction, Venous Thromboembolism, Prophylaxis, Aspirin, Low Molecular Weight Heparin

Aim: Little evidence exists on the optimal agent for thromboprophylaxis following arthroscopic anterior cruciate ligament reconstruction (ACLR). This study was conducted to compare the effectiveness of aspirin and low molecular weight heparins (LMWHs) to prevent symptomatic venous thromboembolism (VTE) following arthroscopic ACLR and their safety of use.

Methods: In this retrospective study, we investigated patients who underwent ACLR surgery between March 2016 and March 2021 based on inclusion and exclusion criteria with at least three months of follow-up. High-risk patients were excluded (n=33) from the study based on established criteria, which included factors such as cardiac disease, pulmonary disease, Diabetes Mellitus, previous history of VTE, Inflammatory Bowel Disease, active cancer, and BMI > 40. The emphasis was placed on selecting individuals with a low baseline risk for VTE. Detailed chart reviews, surgical reports, and pre-operative assessments were performed. Telephone follow-ups were conducted at 3 months post-surgery to evaluate patients' experiences and complications. The primary outcome was the incidence of symptomatic VTE (deep vein thrombosis and pulmonary thromboembolism), with secondary outcomes including other complications related to thromboprophylaxis and surgery. Statistical analysis included descriptive statistics, univariate logistic regression models, and calculations of incidence rates.

Results: 761 patients (761 knees) were included. 458 (60.18%) and 303 (39.82%) patients had received aspirin and LMWH, respectively. The two groups showed no significant differences in demographic factors except for age. Five patients in the aspirin group (1.09%) and five patients in the LMWHs group (1.65%) developed a symptomatic VTE event (p=0.53). The two groups were not significantly different in terms of other complications, such as hemarthrosis or surgical site infection (p>0.05). Results of logistic regression analysis showed no statistically significant difference in VTE risk between the two groups.

Conclusion: This study, focusing on isolated ACLR in patients with a low baseline risk for venous thromboembolism, demonstrated that aspirin is equally effective as low molecular weight heparins for VTE prophylaxis following this surgery.

Propylene surgical mesh augmentation of induced membrane technique in the management of comminuted open intra—articular distal femur fractures with significant bone loss; A case series

Seyed Hadi Kalantar MD

Keywords: bone loss, distal femur fracture, open fracture

Introduction: Management of comminuted open intra-articular distal femur fractures when accompanied with bone loss have always been one the biggest challenges for any orthopedic trauma surgeon. Intra-articular comminution fractures limit the surgeons in using retrograde nails. The use of primary induced membrane known as the Masquelet's technique has been reported in previous studies. In this study we observed the results of the treatment of 5 patients with OTA/AO C3 open distal femur fractures with significant bone loss managed by primary Masquelet technique augmented by propylene surgical mesh Methods: We managed 5 patients with OTA/AO C3 distal femur open fractures with mean 9.4 cm of meta-diaphyseal bone loss without soft tissue loss by irrigation and debridement, acute primary plate fixation in the second look surgery combined by Masquelet technique with antibiotic beads which was augmented by propylene surgical mesh to contain cements. In the second stage of the surgery bone grafting and mesh augmentation to contain bone grafts were done 6 to 8 weeks Results: all fractures were healed after a mean 159 days. There were no fracture-related infections in any of these patients. Mean knee ROM was 0-5-92. There was no need for reoperations after the second stage of masquelet and the bone healing and hard callous formation on the radiographs appeared to be faster than conventional masquelet technique.

Conclusion: primary fixation of open C3 distal femur fractures with significant bone loss can be managed by acute plate fixation followed by membrane-induced technique augmented by propylene mesh with good results.

Evaluation of the Pain, Functional Improvement, and Stability in Patients with Chronic Lateral Ankle Instability Using the Modified Brostrom Repair

Kavous Vaziri MD, Mohammad Majid Aliakbari MD

Keywords: Modified Brostrom Repair, ankle, ankle instability

Introduction: Injury to the lateral ankle ligaments caused by inversion of the ankle joint significant lower limb damage. This study aimed to assess patient with chronic lateral instability of the ankle and the return of movement function and stability of their operated ankle using the corrected Brostrom method at Baqiyatallah Hospital.

Methods: In this retrospective study, patients diagnosed with chronic lateral ankle instability from October 2019 to October 2022 were candidates for surgical treatment using the modified Brostrom method at Baqiyatallah Hospital. Information regarding age, gender, occupation of the patient, type of sport, the patient's anterior drawer examination (ADt), American orthopedic foot and ankle society (AOFAS) score, the range of motion (ROM) of the ankle joint, the pain, was recorded before surgery, three months and nine months after the operation.

Results: Forty patients were included, and 70% were men. Improvement in the AOFAS scores from pre-operation (55.97±6.97) to 3 and 9 months after surgery (73.60±7.07 and 90.27±8.57) was significant ($P < 0.001$), and also, the AOFAS scores significantly improved between the 3 and 9 follow-ups ($P < 0.001$). The decrease in the pain was significant between pre-operation and three and nine follow-ups and also significantly reduced between the three-month follow-up and the nine-month follow-up ($P< 0.001$). The increase in the ROM was significant between pre-operation and three and nine follow-ups ($P<0.001$). There were significant differences between preoperation and 3-month and 9-month follow-ups after surgery in ADT and sprain ($P<0.001$).

Conclusion: This study showed that significant improvements in the AOFAS scale, pain, ROM, ADT, and sprain modified Broström repair could cause satisfactory results.

Comparing the effect of using a large diameter allograft with a small diameter autograft on knee performance after ACL reconstruction reconstruction

Hosein Hajitaghi MD, Amirhosein Barati MD, Esmaeil Asan MD, Negar Iranmanesh, Amin Rasouli

Keywords: Allograft, Autograft, Knee, ACL

Aim: The purpose of this study was to compare the effect of using a large diameter allograft with a small diameter autograft on knee performance after ACL reconstruction reconstruction.

Methods: The sample size is 32 people who are divided into 2 groups of 16 people. In the surgery of one group, an allograft with a diameter of more than 9 mm was used, and an autograft with a diameter of less than 7 mm was used in the other group. In order to check the knee function, questionnaires of 2000 Subject IKDC, Osteoarthritis and Patellar Femoral Consequences Questionnaire (KOOS-PF), Tempa Fear of Movement Questionnaire (TSK), VAS scale to check the pain level, and a tape measure to check the swelling level were used. The validity and reliability of all these questionnaires were checked both in the original language and in Persian, and all of them had acceptable validity and reliability. In the statistical analysis, descriptive statistics were used to describe the variables, and inferential statistics were used to evaluate the hypotheses. All statistical operations were performed by SPSS version 26. At first, the Shapiro-Wilk test was used to check the normality of data distribution. Independent t-test was used to compare possible differences between the results of 2 groups.

Results: By examining the results of the questionnaires, it was observed that the people who used large allografts in their ACL reconstruction had better knee function, less pain and fear of movement, and a faster return to life, and the amount of swelling in them was also lower than the autograft group.

Conclusion: The results of the present study showed that the use of allografts with a larger diameter is superior to the use of autografts in all the studied scales and it is recommended that surgeons and people involved use this method if possible.

A 12-Month Follow-Up Of Early Repair And Late Reconstruction Of Pectoralis Major Muscle Rupture In Professional Athletes With The Aim Of Evaluating Shorter Return To Sport Time And Better Chest Symmetry

Reza Shirvani bakhtiyari MD

Keywords: Pectoralis major-rupture-reconstruction _ sport injury

A 12-Month Follow-Up of Early and late Reconstruction of Pectoralis Major Muscle Rupture In Professional Athletes With The Aim of Evaluating Shorter Return To Sport Time And Better Chest Symmetry Reza Shirvani Baktiyari1*, Azin Banihashem Rad1, Sepehr Shafiee2 *Corresponding Author 1 Department of orthopedics, Noor Afshar Hospital, Tehran, Iran 2 School of Medicine, Shahid Beheshti University of Medical sciences, Tehran, Iran Introduction Pectoralis major muscle rupture is one of the most common injuries in professional athletes and bodybuilders that can occur during weight lifting exercises such as bench presses. One of the major challenges for reconstructing such injuries is the return to sport time and aesthetics of the chest wall after the repair. Herein, we compare the effectiveness of using Achilles tendon allograft in the late reconstruction of a chronic pectoral muscle tear to early reconstruction.

The effect of iliotibial band tightness and its release on postoperative pain after total knee arthrplasty in patients with varus gonarthrosis

Mohammad Zarei MD, Hossein Ali Hadi MD

Keywords: Total knee arthroplasty, iliotibial band, pain

Aim: The aim of this study is to investigate the effect of iliotibial band release on postoperative pain following total knee arthroplasty in patients with varus gonarthrosis.
Materials and methods: This study is a clinical trial study in which patients who underwent total knee arthroplasty were included in the study after meeting the inclusion criteria. These patients were divided into three intervention groups: loose iliotibial band without release it (group A), tight iliotibial band with release it (group B), and tight iliotibial band without release it (group C).
The study groups in which the release of the iliotibial band was performed compared to the groups in which this action was not performed were compared in terms of Knee Society Score (KSS)(Knee score-Function score), and Oxford knee score (measures of knee pain and function). Finally, the data were statistically analyzed by SPSS version 26 software.
Results: There was no significant difference between the three study groups in terms of age and gender ($P>0.05$). The lowest average KSS-Knee score at the beginning of the study belonged to group B ($P=0.017$), and after the follow-up time, it showed the highest mean compared to other groups ($P<0.001$). There was no significant difference in the mean KSSfunction score at three time point measurements in the study groups ($p=0.468$). There was no significant difference in the mean Oxford knee score in three time point measurements in the study groups ($p=0.194$).
Conclusions: Iliotibial band release improved KSS-Knee score in participating patients compared to not releasing it.

Medial Tibial Condyle Wear Patterns in Varus Osteoarthritic Knees: The Role of Anteroposterior and Rosenberg Radiographs

Mohammad Poursalehian MD, Moein Khoori MD

Keywords: AP view radiograph, Knee arthroplasty, Rosenberg view, ligament status, radiographic measurements, wear patterns

Objective: To investigate the wear patterns of the medial tibial condyle in varus osteoarthritic knees undergoing total knee arthroplasty (TKA) and their correlation with full extension anteroposterior (AP) and Rosenberg radiographs.

Methods: A cohort of 363 knees from 318 patients with varus knee OA undergoing total knee arthroplasty was analyzed. Wear patterns of the medial tibial condyle were categorized into five groups. Preoperative AP and Rosenberg views were investigated. Associations between wear patterns and preoperative radiographic findings were analyzed.

Results: Five distinct wear patterns were identified. Antero-medial osteoarthritis (AMOA) wear patterns were associated with younger patients and intact anterior cruciate ligaments (ACLs). Rosenberg view radiographs were found to underestimate OA severity in AMOA wear patterns. In contrast, AP full extension view radiographs were found to be more beneficial in detecting the AMOA wear pattern. A multinomial logistic regression analysis revealed a significant relationship between wear patterns and the examined predictors (joint space width and ACL status).

Conclusion: Our study provides valuable insights into the wear patterns of the medial tibial condyle in varus osteoarthritic knees and their correlation with full extension AP and Rosenberg radiographs. Our findings demonstrate that the superiority of one radiographic view over the other may be dependent on the specific wear pattern present in the medial compartment. Both AP and Rosenberg radiographs should be utilized in preoperative evaluation to better identify wear patterns.

Surgical Planning in Drop-Flail Foot: Focusing on Patient Needs, Including Sport Activities

Alireza Mousavian,MD, Mohammad Abdollahi

Keywords: Flail foot, Foot drop, Hindfoot fusion, Tendon transfer

Introduction: Flail foot, a common paralytic complaint across age groups, involves weakness in ankle and foot dorsiflexors, leading to impaired walking. The severity varies, and patients may experience a constant or dynamic form of weakness. This dynamic form, seen in early nerve involvement, may appear normal in physical examinations but requires intervention. Surgical planning in drop-flail foot, with a focus on patients' needs, including sports activities, is crucial because Drop-flail foot is a common issue in athletes, and Patients with flail drop foot aim to improve function, ensuring continued participation in sports postoperatively. Fusion strategies, while compensating for motor loss, pose risks of imbalance or ulcers in a stiffer, insensate foot. This paper will specifically explore adult drop-flail foot, patient needs, and available treatment options.

Drop-flail foot definition: The definition of drop-flail foot involves a spectrum of muscle weaknesses affecting sagittal foot and ankle motion. It includes drop foot, calcaneus foot, and flail foot, with the latter being the most disabling. The lack of specific limits to differentiate between drop and flail foot is evident in the literature, possibly due to similar initial complaints. The heterogeneity is more pronounced with concomitant sensory involvement, especially plantar sensation.

While a drop foot case exhibits complaints of catching the ground and uneasiness, a flail case with loss of plantar sensation arrives with a cane, presenting sensory ataxia and imbalance. This article introduces the categorization of drop-flail foot, aligning with available evidence, as all types share the same primary complaint.

Etiologic factors: Identifying the etiology is crucial for treatment decisions, prognosis, and addressing patient needs. Unfortunately, the etiologic pathology is often untreatable or irreversible at diagnosis, emphasizing the importance of early detection and prevention. Drop-Flail foot can result from various factors like peroneal nerve injuries (sport injuries), sciatic nerve palsy, brain lesions, polyneuropathy, and spinal cord lesions at the thoracic-lumbar junction, as well as palsy of lower lumbar roots due to degenerative diseases. The growing population seeking treatment for foot drop falls into one of these groups:

- Peripheral nerve injury (sport traumas)
- Traumatic injuries to the spine
- Post total knee nerve injury
- Lumbar spine like disc prolapses
- Spondylolisthesis
- Degenerative lumbar disease

• Lumbar canal stenosis
• Compression neuropathy

Treatment options: Treatment aims to fully restore function to paralyzed muscles, utilizing methods such as nerve decompression, nerve repair, or graft/neurotization in specific cases. The strategy involves nerve decompression and a wait-and-see approach, with functional return progressing over three months, and initial improvement signs expected within the first week. In cases requiring nerve repair or graft, it's crucial to note the peroneal nerve's poorer outcome and regeneration, emphasizing a graft length less than 5cm. Non-operative options, though not the main focus here, involve two phases: early treatment during the acute injury or post-operative period. The objective is to preserve joint and muscle function before active muscle contracture, utilizing measures like ankle-foot orthosis (AFO) and functional electrical support (FES). These modalities prevent muscle atrophy and maintain joint mobility, with transcutaneous electrical stimulation considered irrelevant and implantable neurostimulation devices no longer supported.

Operative options, considered as a last resort, involve three main approaches:
1. Repair Options: The primary aim is to restore muscle function through nerve repair, decompression, or graft, with a decision-making window of approximately 48 hours for effective decompression. Beyond this timeframe, recovery may be less effective. Peripheral peroneal nerve shows poorer regeneration, both spontaneously and post-surgery.
2. Restorative Options: When repair is not feasible, efforts focus on restoring function through neurotization or tendon transfer, especially when only one nerve or muscle unit is affected. Decision-making involves prioritization based on available functioning muscles and deficit muscle functions.
3. Salvage Options: In cases where restoring nerve or muscle function is not feasible, salvage options address individual complaints or needs. Fusion procedures, such as ankle fusion or Lambrinudi-type fusion, are preferred to address foot and ankle deformities. Tibiotalocalcaneal fusion may provide more stability but is indicated only in severe, noncorrectable deformities.

For patients content with ankle-foot orthosis but aiming to eliminate it, extensor tenodesis is a favorable option, providing stability without compromising foot flexibility. Despite potential complications like tibial fractures and recurring drop position, two suggested modifications aim to enhance benefits and reduce risks:
1. Tenodesis of the extensor digitorum longus (EDL) without a bone tunnel in the tibia.
2. Partial tenodesis of the tibialis anterior tendon (about one-third).
3. Distal advancement of the tibial tendon to the base of the second metatarsal to prevent recurrence.
4. Limited Lambrinudi fusion combined with tenodesis.

5. Posterior tibial tendon transfer with maximal tension, proving more robust against recurrence
compared to anterior tibial tendon tenodesis in our experience.

In cases requiring both Achilles power for propulsion and preserved dorsiflexion ability, a posterior ankle bone block offers a viable solution. The procedure involves a posterolateral incision, reaching the deep compartment between flexor hallucis longus and peroneus brevis. A 1.5 mm wire in the talus limits plantar flexion, creating a trough in the posterior talar body filled with a 2-3 cm tricortical iliac crest bone graft secured by screws. Anterior extensor tenodesis is added for toe clearance. Two years of follow-up with around 10 cases showed satisfactory outcomes, addressing concerns about graft absorption and posterior impingement pain.

Decision making: In gait analysis for paralytic foot conditions, evaluating deformities and muscle weaknesses is crucial. Pure drop foot presents challenges, particularly after prolonged hospitalization, leading to equinus deformities. Conversely, flail foot, more disabling in quadriceps weakness, requires tailored interventions like ankle or subtalar fusion. Understanding patients' functional needs is essential, considering factors such as stability for a laborer or motion preservation for a climber. Ataxia complaints in flail foot may indicate central nervous system issues not improved by stabilization. Power balancing isn't the goal in biomechanics; muscle transfer to the Achilles and Lambrinudi-type arthrodesis are considered for limited muscle cases. A three-month brace trial aids accurate decisionmaking, guiding surgical options or non-intervention choices. Examination during walking phases reveals specific issues, emphasizing the necessity of specialized paralytic foot clinics for comprehensive care.

A novel AI-powered approach to personalized root management plan tract (PROMPT) for musculoskeletal disorders (MSDs) for daily use in orthopedic clinics in Iran

Hamid Farokhi MD, Faezeh Kalhory, Maryam Kalhory

Keywords: artificial intelligence machine learning personalized medicine musculoskeletal disorders patient outcomes healthcare system

Aim: This study reports the development of a novel AI-powered system called SMART PROMPT (Personalized Root Management Plan Tract) for the development of personalized treatment plans for MSDs in Iran. SMART PROMPT uses a combination of clinical data, patient-reported outcomes, and AI algorithms to generate personalized treatment plans that are tailored to the individual patient's need Method: The development of SMART PROMPT was conducted in four phases. In the first and second phases, a local system with a simple treatment plan was used from 2013 to 2019. In the Third phase, PROMPT was used to develop treatment plans for a larger cohort of patients with MSDs with a simple online platform from 2020 to 2021. In the final phase, the development of SMART PROMPT began in 2022.

Results: In the first and second phases, 5,000 treatment plans were created, of which 980 were personalized. In the Third phase, 6,000 treatment plans were created, of which 3,000 were personalized. In the final phase, 2,000 treatment plans were created with the SMART PROMPT framework in the final stage of final phase 30 patients with knee disorders start SMART PROMPT Conclusion: The results of this study suggest that SMART PROMPT has the potential to revolutionize the treatment of MSDs in Iran. SMART PROMPT is also more cost-effective than traditional treatment options, making it a more sustainable solution for the Iranian healthcare system.

Intraarticular Injection of Tranexamic Acid for Pain Relief and assessing functional outcomes Following Arthroscopy ACL reconstruction surgery, Randomized Clinical trial

Behzad Nezhadtabrizi MD

Keywords: Arthroscopy ACL reconstruction, intraarticular injection, pain relief, tranexamic acid

Background: In recent years, the use of intraarticular injections has gained attention as a potential adjunctive therapy for pain management following knee arthroscopy. One such agent is tranexamic acid (TXA).

Method: A prospective, randomized controlled trial was conducted on patients undergoing Arthroscopy ACL reconstruction surgery. Participants were randomly assigned to either the TXA group or the control group. The TXA group received an intraarticular injection of TXA (1gr) immediately after arthroscopy, while the both group (intervention and control) received a ketorolac (30mg) and morphine (5mg) that All of which reached a volume of 40 cc with normal saline.

Results: A total of 68 patients were enrolled in the study, with 34 patients in each group. The intraarticular injection of TXA resulted in a significantly improved KOOS score compared to the control group at 3month follow up. The TXA group also demonstrated lower pain scores, improved range of motion, and higher patient satisfaction compared to the control group.

Conclusion: Intraarticular injection of TXA shows promise as a viable option for pain relief following Arthroscopy ACL reconstruction surgery. Its potential benefits include reduced postoperative pain (e.g., visual analog scale), improved functional recovery such as range of motion, knee function scores (e.g., Knee Injury and Osteoarthritis Outcome Score). While the risks associated with TXA, such as thromboembolic events and allergic reactions, should be considered, current evidence suggests a favorable safety profile. Further investigation is warranted to establish the long-term effects and optimal dosing strategies of TXA in this context.

MRI-Based Examination of Shoulder Stiffness: Frozen Shoulder vs. Stiff Shoulder

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Keywords: Frozen shoulder, Shoulder MRI, Shoulder Stiffness

Objective: "frozen shoulder" is defined as idiopathic shoulder stiffness, indicating the absence of a known cause. In contrast, "secondary stiff shoulder" is utilized to characterize shoulder stiffness attributed to a known underlying cause such as rotator cuff tear. The aim of this study is to examine the differences in some MRI findings in frozen shoulder (FS) and secondary stiff shoulder (SSS) to rotator cuff tear patients.

Methods: Twenty patients (47.70 ± 3.79 y, 16F/4M) with (fs) and twenty patients (47.50 ± 3.77 y, 11F/9M) (sss) accompanied by rotator cuff tears were included in the study. The analysis of the fluid surrounding the biceps tendon involved evaluating the axial fat-suppressed PD image while the assessment of the height of the axillary pouch was conducted using a coronal fat-suppressed proton density (PD) image in the MRI examinations.

Results: The height of the axillary pouch of the FS group (2.80 ± 3.94) was statistically significantly lower than the SSS group (11.6 ± 3.85, $p<0.001$). Although effusion around the biceps tendon was less in the FS group (3.95 ± 3.98) than in the SS group (6.17± 3.13), it was not statistically significant ($p>0.05$).

Conclusion: reduction in the height of the axillary pouch is associated with contracture of the inferior glenohumeral ligament .Although there was a restriction of motion in patients with SSS, the axillary pouch height was found to be higher than in FS cases.

Unsolved Medial Release in Severe Fixed Varus Deformity TKA - The new trend does not seem to be promising

Rashid Ganji MD

Keywords: Fixed Varus Deformity TKA, Medial Release, Medial Release in Severe Fixed

Introduction: Soft tissue balancing, particularly in severe fixed varus deformity, has always been a controversial challenge in total knee arthroplasty, affecting short term and long-term results as well as patient satisfaction.

Within recent years, despite remarkable advances in implant designs and materials, surgical techniques and the growing use of computer-assisted and robotic surgery, instability resulting from poor soft tissue balancing is the most common mode of failure, even more than infection and loosening.

Recently there has been a tendency in literature towards recommending postero-medial corner (PMC) release instead of sMCL.

As this technique helps preserve distal sMCL adhesion and is claimed to prevent medial joint widening, it might seem logical in theory, but according to my practical experience of more than 1500 knee replacements per year, it is not as effective as recommended.

Methods: In a prospective randomized study, 61 knees with fixed varus deformity were studied. 20 of them reached balancing in the first steps without the need for further releasing and were excluded from the study.

5 more cases were also excluded, 1 due to popliteus tendon cut and 4 more because of switching to a semiconstrained prosthesis at the time of surgery.

Out of the remaining 36 knees, 5 cases were less than 15 degrees varus, 16 of them were between 15-25 degrees, 11 cases were between 25-35 degrees and 4 knees were more than 35 degrees varus.

14 out of 36 knees (7 patients) had simultaneous bi-lateral TKA, and the rest had staged TKA, 18 (9 patients) of which were spaced 1-2 days and 4 were postponed to at least three months later.

surgical technique In cases in which reaching a balance and correcting varus deformity in a step wise fashion was not possible via the first steps of release and required pm release or sMCL release, digital measuring and video recording were performed at the time of release. Then, widening of the medial space and alignment were measured in the post-operative xrays, and patient walking was analyzed.

As a general approach, based on the recent literature written by renowned researchers, we first performed PMC release, then measured medial widening and, if not sufficient, released the sMCL, with measuring the gap and recording the whole process.

Results: In our study, we could not reach balancing through PMC release and had to approach to sMCL release or pie crusting. Trough keeping the posterior adhesion of sMCL to Posterior

oblique ligament and Soleus fascia and remaining subperiosteally while releasing, no widening of the medial space and laxity were observed.
conclusion: Contrary to recent literature recommendations, the release of PMC does not work sufficiently, and instead we recommend a lower threshold for sMCL release.

A Novel Graft Expander Implant Device in Anterior Cruciate Ligament Reconstruction: An in-vitro and finite element modeling study

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Keywords: ACL Reconstruction, Experimental, Finite element, Hamstring graft, Implant design, In-vitro

Introduction: Anterior cruciate ligament (ACL) injuries pose a significant burden on healthcare systems, with a considerable annual incidence rate among young individuals. ACL reconstruction surgery has emerged as a clinically beneficial approach for managing ACL injuries.

However, graft-related complications, such as graft tunnel mismatch (GTM), can compromise the outcomes. This study introduces a novel implant device designed to address the challenges associated with graft-tunnel mismatch in ACL reconstruction. This “graft expander device” aims to overcome the limitations of conventional methods by providing a solution for insufficient graft diameter, ensuring proper fixation within the tunnel. This study includes mechanical assessment of the prototype by both finite element (FE) modeling and in-vitro bovine experimentation.

Materials and Methods: Experimental tests: Four implants were created through 3D printing using PEEK filaments. Bovine digital flexor and extensor tendons were harvested to replicate human hamstring tendons. These tendons were standardized to 200 mm length and 8 mm diameter as an appropriate graft choice. The harvesting was ethically certified at Sharif University's Biomechanics Laboratory.

Two groups with two samples each were created. In the first group, two tendon grafts formed a four-strand double bundle by looping through a suspensory loop and were sutured to the graft expander with Dacron whip stitches. Conventional samples were similarly passed through the suspensory loop, with 25 mm of their femoral side sutured using Dacron sutures. Samples were attached to a testing machine using an Endobutton for femoral fixation and a bench vise for tibial fixation. A cylindrical rod suspended the femoral side to simulate suspensory fixation, while the tibial side was secured with the 20mm sutured portion. This setup replicated graft compression similar to the interference screw, eliminating variations in tibial fixation quality and facilitating precise tendon slippage measurement (Fig. 1).

The specimens underwent a two-stage mechanical test. First, a preconditioning test removed fixture clearances by subjecting the graft to 10 cycles of cyclical preload (10 to 50 N) at 0.1 Hz. Then, a major pullout test followed, simulating early rehabilitation and ACL load-bearing, involving 200 cycles of cyclical loads (50 to 200 N) at 1 Hz. If the specimen survived, a pullout force of 20 mm/min was applied to determine the fixation's ultimate

strength. Failure modes were recorded, with fixation failure and tendon tearing as the expected failure modes.

Finite element modeling: Five -strand hamstring autograft was used for the purpose of biomechanical analyses. In FE modeling, the first step was to assign the material property for tendons, bone, and expander. Expander and cancellous bone were assumed homogeneous and isotropic, with Young's moduli of 72 and 0.5 GPa, respectively, and a Poisson's ratio of 0.3 for both. The nonlinear characteristics of the fibers were assumed for the tensile stress–stretch ($\sigma f - \lambda$) relationship. Moreover, a horn-shaped bony tunnel was used to model the femoral hole to allow the graft bundle's deformation. In the first step, the process of graft insertion into the tunnel was carried out, and the 3-dimensional meshing network was updated after each 20 increments of the numerical simulation. After entering the graft into the tunnel, a step with a total time of 10 seconds was defined to create stress relaxation in all system components. The details of the FE model are presented in Fig. 2.

Results: Experimental tests: It was shown that no failure occurred during the preloading and cyclic loading stages. Also, no failure associated with tendon tissue damage was recorded in the fixation with the implant. However, one conventionally prepared graft failed due to tendon laceration at the suspensory loop-tendon contact surface, while the remaining three samples failed due to suspensory loop rupture. Table. 1 represents the mean mechanical properties of the fixation.

Finite element model results: The maximum von Mises stresses in the tendons and the expander are shown in Fig. 3. There was no significant difference in the maximum stress in different tendon strands. Hamstring tendons did not differ in maximum stress value, and the insertion pressure was distributed symmetrically.

Conclusion: The present study aimed to analyze the biomechanical characteristics of a newly designed graft expander for ACL reconstruction surgery. The experimental results demonstrated that the device had reduced the chance of exerting tendon tissue laceration due to the tension centralization at the suspensory loop-tendon contact surface. Moreover, the mechanical properties of grafts prepared with the device and the conventional method were comparable. It should be mentioned that all of the specimens of group II (the group with graft expander) had FiberWire rupture, and other parts of graft remained intact. Therefore, it seems that the maximum pullout load for the graft prepared with this device will be much higher acquiring stronger FiberWires for the suspensory loop.

The obtained results from the finite element modeling also showed that our newly designed graft expander could successfully reverse the graft-tunnel mismatch and be a viable option for making surface contact between tendons and bony surfaces. This method could be used as a firm fixation for ACL reconstruction surgery with proper design and geometrical optimizations.

Fixed vs. Mobile Bearing Medial Unicompartmental Knee Arthroplasty: A Comprehensive Analysis of Radiographic Angles

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Keywords: Fixed-Bearing (FB), Medial Compartment Osteoarthritis, Mobile-Bearing (MB), Radiographic Angles, Unicompartmental Knee Arthroplasty (UKA)

Objective: To compare radiographic angles and clinical outcomes between fixed-bearing (FB) and mobile-bearing (MB) medial unicompartmental knee arthroplasty (UKA) in patients with osteoarthritis limited to the medial compartment of the knee.

Methods: A retrospective comparative study utilizing data from patients who underwent medial UKA surgery at Imam Khomeini Hospital Complex, Tehran, Iran, between January 2019 and December 2022. Preoperative and postoperative weight bearing radiographic images were analyzed to measure lateral distal femoral angle (LDFA), medial proximal tibial angle (MPTA), mechanical femorotibial angle (MFTA), and joint line convergence angle (JLCA). Clinical outcomes were evaluated using the Knee Society Score (KSS) and revision rates.

Results: No significant differences were observed in the preoperative or postoperative LDFA, MPTA, MFTA, or JLCA between the MB (n=89) and FB (n=118) groups. Significant improvements in postoperative MPTA, MFTA, and JLCA were seen in both MB and FB groups compared to their preoperative values ($p<0.001$). No significant difference was found in the change of LDFA between preoperative and postoperative measurements for either group. Clinical outcomes assessed by KSS and revision rates were similar between the MB and FB groups.

Conclusion: This study found no significant differences in radiographic angles or clinical outcomes between FB and MB medial UKA. Both bearing types demonstrated significant improvements in postoperative alignment parameters through correction of MPTA and JLCA, with comparable KSS scores and revision rates.

Two-Stage Primary Total Knee Arthroplasty for Refractory Septic Arthritis

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Keywords: TKA, refractory infection, septic arthritis

Background: The knee is the commonest native joint to develop an infection. Traditional treatments of septic arthritis consist of decompression, systemic antibiotics, debridement, irrigation under arthroscopy or arthrotomy. However, these treatments are time consuming and unpredictable. Some infections are difficult to control completely. These uncontrolled or recurrent infections often cause disability and predispose patients to life-threatening sequelae. The management of this condition is challenging, and a multidisciplinary approach is recommended. A two-stage primary knee replacement, with an interim stage of debridement and cement spacer application, modelled after two-stage revision for periprosthetic joint infections (PJI) is an option in these cases.

Material and methods: This retrospective study included 7 patients with severely infected knees who have failed surgical treatment of septic arthritis. We used aggressive debridement of the knee and implantation of static antibiotic cement spacers after performing of distal femoral and proximal tibial cuts. This was followed by TKA as a second stage once soft tissues had healed and return of laboratory parameters to within a normal range. The post-operative functional score as well as range of motion were assessed.

Results: Elimination of infection was achieved in all patients. C-reactive protein & ESR returned to normal levels. The knee scores and final range of motions improved. There were no recurrent infections.

Conclusion: Two-stage primary knee replacement is a safe, effective and reliable procedure with good results in the short to medium term for management of failure of previous surgical treatment in patients with septic arthritis.

Comparison of the effects of preoperative celecoxib and gabapentin on pain, functional recovery, and quality of life after total knee arthroplasty: A randomized controlled clinical trial

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Keywords: Celecoxib, gabapentin, knee function, pain, quality of life, total knee arthroplasty

Background: the present study was performed to evaluate the preventive effect of preoperative celecoxib and gabapentin on reducing patient pain as a primary outcome after TKA surgery.

Materials and Methods: This randomized, double-blind controlled clinical trial was performed on 270 patients with osteoarthritis that were candidates for TKA surgery allocated into three groups. In the first group, 900 mg of gabapentin was administered orally on a daily basis for 3 days before surgery. In the second group, 200 mg of oral celecoxib was administered twice daily for 3 days before surgery. In the third group, oral placebo was administered twice daily for 3 days before the surgery. The patients' pain score and knee and its functional score were recoded. Results: The mean of reduction pain in gabapentin and celecoxib groups was significantly lower than that of the control group at 12, 24, and 48 h after surgery ($P < 0.001$); however, two groups were not significantly different from each other ($P > 0.05$). Furthermore, the two medication groups were not significantly different in this regard ($P > 0.05$). . Conclusion: According to the results of the present study, the preventive administration of gabapentin and celecoxib showed a significant and similar effectiveness on reducing patient pain after TKA surgery and on improving the KSS and quality of life scores.

Evaluation of the relative frequency of return to the preinjury activity level in patients who underwent anterior cruciate ligament reconstruction surgery: a cohort study

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Keywords: activity, anterior cruciate ligament, anterior cruciate ligament reconstruction, autografts, kinesophobia.

Introduction: Anterior cruciate ligament (ACL) injury has an incidence of 0.05-0.08 per thousand. An inappropriate treatment plan could lead to articular cartilage damage and early knee osteoarthritis. There are some surgical reconstruction techniques using different graft types, all of them trying to restore the patient's pre-injury activity levels. The current study aims to evaluate the efficacy of ACL reconstruction (ACLR) using an autologous hamstring tendon.

Methods: This is a retrospective one-center cohort study performed on consecutive patients with an ACL injury who underwent ACLR using semitendinosus and gracilis autograft. The post-surgical activity and fear were measured using Marx's scale and Tampa's scale of kinesophobia, respectively, during a follow-up of 18 months.

Results: From a total of 76 patients included in our study, 40.8% were female. The mean age of the participants was 26.25-year-old. Five patients from those with kinesophobia (12.5%) and 34 patients from those with no-kinesophobia (94%) returned to the pre-injury activity level (p-value < 0.001). Marx's scale six months after the surgery was significantly lower than the score before the surgery, but as expected, it improved during the 18-month follow-up.

Conclusion: The current study showed that kinesophobia reduces the rate of return to the pre-injury levels. Maybe, overcoming this fear will help these patients to reach better results. However, we suggest implementing further trials in larger sample sizes before reaching a solid conclusion.

Can Leukocyte Esterase Predict Failure Following Reimplantation for Chronic PJI?

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Keywords: LE, chronic pji, two stage reimplantation

Introduction: Several studies have demonstrated the reliability of leukocyte esterase (LE) in the diagnosis of chronic periprosthetic joint infection (PJI). The purpose of this study is to determine the prognostic utility of LE in predicting failure following a two-stage protocol for chronic PJI.

Method: This retrospective study identified 156 patients (47 hip, 109 knee) undergoing reimplantation in two-stage protocol for chronic PJI with a LE test result. A standard chemical test strip was used to detect the presence of LE. The primary outcome of this study was failure after reimplantation per Delphi criteria.

Results: The cohort had a mean age of 64.8 years and BMI of 31.1 kg/m2.Among the 26 patients with positive LE tests, 12 individuals (46.2%) experienced failure as per the Delphi criteria. In comparison, among the 130 patients with negative LE tests, 28 patients (21.5%) met the criteria for failure ($p<0.05$). The LE strip test demonstrated an AUC of 0.623 with a sensitivity, specificity, positive predictive value, and negative predictive value of 46.2% , 78.5% , 30.0% , and 87.9% , respectively.

Conclusion: In our study, we found that the reimplantation failure rates were comparable between patients with a positive leukocyte esterase (LE) test and those with two positive cultures (46.2% vs. 45%, respectively). However, the LE test offered advantages in terms of speed and affordability when compared to culture. Notwithstanding, future studies with larger sample sizes are needed to validate these findings.

Arthroscopic treatment of Kienböck's disease: mid-term outcome of arthroscopic lunate core decompression

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Keywords: Core decompression, Kienböck disease, lunate bone osteonecrosis, wrist arthroscopy.

Purpose This study evaluated the mid-term functional and radiological results of arthroscopic lunate core decompression for treating Kienböck disease.

Methods In a prospective cohort study, 40 patients with a confirmed diagnosis of Kienböck disease (Lichtman stages II to IIIb) underwent arthroscopic core decompression of the lunate bone. A cutting bur was used through the trans-4 portal with visualization from the 3-4 portal after synovectomy and debridement of radiocarpal joint using a shaver from the 6R portal.

Disabilities of Arm, Shoulder, and Hand and visual analog scale scores, wrist range of motion, grip strength, radiological changes of Lichtman classification, carpal height ratio, and scapholunate angle were evaluated before and two years after the surgery.

Results The mean of Disabilities of Arm, Shoulder, and Hand score improved from 52.5 13 to 29.2 16.3. The visual analog scale score also improved from 7.6 1.8 to 2.7 1.9. There was also an improvement in hand grip strength from 6.6 2.7 kg to 12.3 3.1 kg. Wrist range of motion in flexion, extension, ulnar deviation, and radial deviation improved significantly. Lichtman classification remained the same in 36 (90%) patients. Carpal height did not change. Intergroup evaluation showed no functional difference in response to surgery for different radiological Lichtman stages. More improvement was observed in patients with Lichtman stage II, but was not statistically significant.

Conclusions Arthroscopic lunate core decompression appears to be an effective and safe surgery for treating Kienböck disease on the basis of mid-term follow-up.

Arthroscopic Biceps Tenodesis: Midterm Clinical Results of a New Anchor Suture Technique in Patients with Single-Row Rotator Cuff Repair

Hossein Saremi MD

Keywords: Biceps tenodesis; anchor suture technique; shoulder arthroscopy; rotator cuff repair.

Objective. This study evaluated the midterm clinical results of doing the arthroscopic proximal long head of the biceps tenodesis with an anchor suture of subscapularis or supraspinatus repair in patients with arthroscopic rotator cuff repair.

Methods. We evaluated the clinical results of long head of biceps tendon tenodesis in patients with single-row rotator cuff repair. They were all treated with our technique in which we did the tenodesis with anchor suture of rotator cuff repair in a manner that provides both bony and soft tissue attachment for the tendon. We evaluated the results of the long head of the biceps (LHB) tenodesis in all patients by looking for Popeye deformity, anterior shoulder tenderness, asking for anterior shoulder pain, and measuring elbow flexion and forearm supination force compared to the normal side as a primary goal, and compared results of LHB tenodesis with subscapularis or supraspinatus tendon suture as a secondary goal too.

Results. A number of 131 patients participated in the final follow-up: 34 patients had LHB tenodesis with subscapularis tendon suture and 95 patients with supraspinatus tendon suture. Mean of follow-up time was four years (24 to 71 months). Two patients had the Popeye deformity (1.5%), five patients had the anterior shoulder tenderness (3.8%), and seven patients suffered from anterior shoulder pain (5.3%). Elbow flexion and forearm supination forces were measured in the affected and non-affected limbs. There was no significant difference between the two limbs. Those who had LHB tenodesis with supraspinatus anchor suture had better results and less complications. Conclusions. Arthroscopic tenodesis of the LHB tendon incorporated into single-row rotator cuff repair is a cost-efficient method, leading to better results for implant or soft tissue tenodesis too. Fixing to supraspinatus tendon seems to have better results and fewer complications compared to subscapularis tendon.

Surgical versus non-Surgical management for minimally displaced greater tuberosity in shoulder fracture dislocation

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Keywords: Greater tuberosity, Minimally displaced fracture, Proximal humerus, Shoulder dislocation, Surgical treatment

Purpose: There is a lack of consensus regarding the optimal management of minimally displaced GT fractures after reduction. This study evaluated the functional outcomes of non-surgical vs. surgical treatments for fractures with less than 5mm displacement.
Method: This retrospective study evaluated adult patients with less than 5mm displacement after close reduction who had shoulder fracture-dislocation for a minimum of two years, and shoulder function was assessed using the American Shoulder and Elbow Surgeons (ASES) and Simple Shoulder Test (SST) questionnaires after a minimum of two years of follow-up. We also examined the factors that contributed to the functional scores.
Result: Our study involving 43 patients revealed no significant difference in functional scores between the surgical and non-surgical groups, as assessed by ASES and SST. However, patients with comminuted fractures and split-type fractures had lower functional scores.
Three cases of treatment failure that required surgical management occurred; all were comminuted fractures. patients with comminuted or split-type fractures had significantly lower scores. The dominant side of the injury, level of education, and job status had no significant impact on the patient's functional outcome.
Conclusion: Our study found that GT fragment displacement under 5mm in patients with a shoulder dislocation and concomitant GT fractures did not significantly affect functional outcomes, regardless of non-operative or ORIF treatment, after a minimum of two years of follow-up. However, patients with comminuted or split-type fractures had lower functional scores, indicating that treatment decisions should be made individually, considering the degree of displacement and associated soft tissue damage.

Kinematic Alignment versus Mechanical Alignment in Simultaneous Bilateral Total Knee Arthroplasty; a Prospective Study

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Keywords: Knee Arthroplasty; Knee Replacement; Kinematic Alignment; Mechanical Alignment; Outcome

Aim: The aim of this study was to compare the clinical results of kinematic alignment (KA) with those of mechanical alignment (MA) in single-stage bilateral total knee arthroplasty (TKA).

Methods: In this double-blinded randomized controlled trial, 65 patients with bilateral knee osteoarthritis underwent simultaneous bilateral TKA. One knee was randomly selected to be operated on with the calipered-KA method and the other with MA. The participants were assessed via the Oxford Knee Score (OKS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) questionnaire, and Visual Analogue Scale (VAS) before the surgery and the same plus the Forgotten Joint Score (FJS) at their last follow-up visit, 2 years postoperatively. The time to maximum knee flexion, named the recovery time, was also recorded. Hip-knee-ankle (HKA) angle, medial proximal tibial angle (MPTA), and lateral distal femoral angle (LDFA) were measured before and after the surgery using three-jointview radiographs.

Results: There were significant differences between the KA and MA methods in terms of duration of surgery, recovery time, and final WOMAC, FJS, and maximum flexion range in favour of KA ($P<0.05$), but no significant difference in VAS score and OKS (n.s.). The KA knee was preferred over the MA knee by most patients.

Conclusions: The KA method yields non-inferior functional outcomes compared to MA method, however, is associated with a shorter surgery time, faster recovery time, and higher patient satisfaction in the short term.

Return to Sports Activity in Anterior Cruciate Ligament Reconstruction: 4-Strand Hamstring vs Quadriceps Tendon

Mohsen Mardni-Kivi MD

Keywords: ACL tear, Anterior cruciate ligament, Autograft, Hamstring, Quadriceps

Introduction: Graft type selection is still a controversial issue in anterior cruciate ligament (ACL) reconstruction. It seems that the type of graft is a determinant of return to sport and its quality. This study aims to evaluate results and rate of return to sport using quadriceps autograft compared to hamstring autograft.

Methods: The present prospective cohort study investigated the results of using quadriceps and hamstring autografts in athletes with an ACL tear. The records of the patients who underwent ACL reconstruction with 4-Strand Hamstring and quadriceps autograft during 2013-2016 were extracted. primary information was recorded. Then, KT-1000, IKDC, and Lysholm score were evaluated 3, 6, 12, and 24 months after surgery. Return to sports activity was evaluated at final follow up.

Results: A total of 71 patients were operated on hamstring autografts and 68 patients by quadriceps autografts. The patients showed no significant differences (P>0.05) in terms of age, sex, BMI, sports group, and meniscus tear. In the final follow-up, the chondral lesion was 26.47 vs 16.90, anterior knee pain was 5.8 vs 2.81 in the quadriceps group vs the hamstring group. The scores of the IKDC and knee KOOS, the Lysholm test, KT-1000, the Lachman test and return to sports activity had no significant differences in the two groups.

Conclusion: The results of the study indicated that the use of both quadriceps and hamstring autografts was appropriate for the ACL tear. It seems that the return to sports activity is not related to the type of graft (4-strand hamstring vs quadriceps tendon).

Management of Congenital/Developmental Multiple knee ligaments Deficiency

Hossein Aslani MD

Keywords: developmental, knee, ligament

Literature includes only case reports that discusses about anterior cruciate ligament (ACL). Untreated multi-ligament deficient knees (MLDK) usually will lead to significant instability and intraarticular deformities.

The aim of study is report of a prospective cohort of MLDK, its treatment and outcome. Methods: A total of 17 cases of MLDK enrolled in study. All had difficulty in their daily activities and significant limitations. Preoperative evaluation was orthogonal X-rays, alignment view, MRI. All patients had at least 2 ligament deficiency that required surgical intervention. In cases of extraarticular deformity osteotomy was done. Before skeletal maturity combined intra-extraarticular reconstruction have been done. In children near skeletal maturity epicondylar advancement osteotomy for collateral ligament deficiency and conventional open ACL reconstruction have been done. In 12 case anterior dislocation and tethering of iliotibial band and medial hamstrings have been resolved. Results: 13 had ACL, 5PCL , 9LCL, 5MCL deficiency and 3 had discoid meniscus. Mean age was 12 years old (range2-24).7 had bilateral involvement. There were 6 female and 11 male patients. All deficient ligaments repaired/reconstructed.3 patients underwent femoral and 5 tibial osteotomy. Knee functional score improved from 32 preoperatively to 77 postoperatively. Mean follow up was 5.8years.

Discussion: untreated MLDK will lead to progressive deformities and significant disability. Published data about the topic are single case reports of only ACL deficiency. This is the first study of MLDk with largest reported number.

Conclusion: In MLDK reconstruction should be done earlier before intraarticular deformity development. The outcome of surgical treatment is excellent.

Evaluation Of Short-Term Outcomes Of Anatomic Acl Reconstruction With Hamstring Autograft In Patients With Generalized Joint Laxity

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Keywords: Anterior cruciate ligament reconstruction, Generalized joint laxity, Hamstring autograft

In a retrospective case–control study, 36 patients with generalized joint laxity (GJL), who underwent ACLR surgery, were included. Forty-four group-matched non-GJL patients were included in the control group. The mean follow-up of the patients was 20.65 ± 6.93 months. Results The results of the Lachman and pivot shift test were not significantly different between the GJL and non-GJL patients (P = 0.67 and P = 0.27, respectively). The mean anterior tibial translation was 7.06 ± 1.41 mm in the GJL group and 6.11 ± 1.53 mm in the non-GJL group (P = 0.006). The mean KT-1000 side-to-side difference was 2.25 ± 1.31 mm in the case and 2.5 ± 1.44 mm in the control group (P = 0.42). The mean IKDC score of the patients was not significantly different between the GJL and non-GJL groups (66.1 ± 20.6 vs. 69.9 ± 16.1, P = 0.35). ACLR failure occurred in 2 (5.5%) patients of the GJL group and no patients of the control group (P = 0.21).

Conclusion The present findings suggest ACLR with quadruple hamstring autograft as an adequate treatment for GJL patients, at least in short-term follow-up.

Algorithmic Approach to Developmental Patellofemoral Instability

Hossein Aslani MD

Keywords: Patella, Patelloplasty, Trochleoplasty, quadricepsplasty

The aim is to evaluate the outcome treatment of PFI by to methods of soft tissue realignment alone(STR) or combined soft tissue and bony procedures including trochleoplasty and or patelloplasty(CPTP).

Method: In children of six years old or younger we used STR(group1) even in patients with trochlear and or patellar dysplasia in hope of the subsequent development. All patients with dislocation in flexion underwent quadriceps plasty, lateral release. Thereafter knee put in full extension if there is lateral instability, we reef the medial patellofemoral ligament. At the next step we bring the knee in more than 90 degrees of flexion while externally rotating the leg. In this position any PFI is addressed by distal STR that medializes the patellar tendon attachment.

In children older than six years with trochlear or patellar dysplasia in addition we did trochleoplasty and or patelloplasty(group2).

Results: Total37 patients operated on for PFI.20 cases in group1,17 in group2. The mean age of patients in group1 were4.8 years and9.6 in group2.Reoperation for recurrent instability is required in 2 of group1. Growth arrest has not occurred.Pooled scores improved from57.9 to 83.8 in group1 and from56.8 to 84.3 in group2. All patients were able to participate in sport. Mean follow up was 5.6years in group1 and4.9 years in group2.

Discussion: There is lack of high-quality evidence that until what age development of patella and trochlea can be anticipated. Literature denotes wider age range from5 to 11 years.Our results is similar to other studies. It seems CPTP has additional benefits in comparison to STR.

Tibial Stem Extension versus Standard Configuration in Primary Cemented Total Knee Arthroplasty: Systematic Review and Meta-analysis on Post-Operative Clinical Outcomes and Complications

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Keywords: Total knee arthroplasty, TKA, Stem extension, Tibial loosening, Clinical outcome, Prosthesis

Aim: To enhance the stability in total knee arthroplasty (TKA), intramedullary stem extensions have been developed for the femoral and tibial components. The aim of this systematic review and meta-analysis is to address the critical knowledge gap on 1. post-operative outcomes and 2. complications associated with tibial stem extension compared to the standard configuration in primary TKA.

Methods: We conducted a comprehensive search of online databases, including Pubmed, Embase, ISI Web of science, Cochrane Library, and Scopus, using the following MeSH terms, (total knee arthroplasty) OR (TKA) OR (total knee replacement) AND (Tibial stem) OR (stem extension) OR (long stem). We included clinical studies that compared the tibial stem extension with no tibial stem (standard configuration) in primary cemented TKA. Knee Society Score (KSS) functional and clinical scores were considered as clinical outcomes along with tibial loosening and implant survival rate. The retrieved studies were assessed for methodological quality. Weighted mean difference (WMD) with 95% confidence interval (CI) was calculated using random-effects meta-analysis taking into account for heterogeneity.

Results: The risk of tibial loosening is 60% lower on average in the TKA long stem group in comparison with standard stem group (RR: 0.40; 95% CI: 0.25 to 0.65). KSS functional and clinical score increased 3.85 score (95% CI: 1.52 to 6.18), and 1.24 scores (95% CI: -0.22 to 2.70) among patients operated with long stem extension, respectively. The survival rate was 1.04 times greater in stem-extension group. There was no notable difference in terms of knee deformity (hip-knee-ankle angle) correction and complications rate between the two groups.

Conclusion: The meta-analysis of post-operative functional scores and tibial loosening rate indicates a preference for long stem extension over the standard configuration in primary cemented TKA.

POSTER ABSTRACTS

Deep Dives in Debates

Falak-ol-Aflak (Shapur Khast) Castle
Khorramabad, Lorestan Province, Iran

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Long-Term Clinical Results of Using a Posteromedial All-Inside and Anteromedial Outside-In Approach to Repair Unstable or Irreducible Bucket-Handle Medial Meniscal Tears

Mohammad Movahedinia MD, Sohrab Keyhani MD

Keywords: All-inside, Bucket-handle medial meniscal tear, Chronic, Posterior arthroscopy, Provisional fixation, Unstable

Aim: This study presents the clinical and radiological outcomes of chronic irreducible and unstable locked BHMMTs. Radiological outcomes were also evaluated using magnetic resonance imaging (MRI).

Methods: This is a retrospective study of 37 patients with 11 cases of irreducible BHMMT and 26 cases of reducible but unstable chronic BHMMT who underwent operations between 2011 and 2016. Posterior arthroscopy was performed after temporary meniscus fixation using a provisional needle fixation technique. After the posterior repair with vertical mattress sutures was completed using an all-inside technique, the classic outside-in technique was performed for the anterior third of the meniscus. The Lysholm, International Knee Documentation Committee (IKDC), and Tegner activity scores were obtained from all patients before surgery and at the latest follow-up. Radiological evaluations were performed using MRI before surgery and at 6 months postoperatively.

Results: Between 2011 and 2016, a total of 37 consecutive patients with irreducible and chronic BHMMTs underwent surgery. The average postoperative follow-up was 7.2 ± 1.4 years (mean ± SD). Postoperative Lysholm (89.57 ± 2.7) and IKDC (87.22 ± 3.2) scores improved significantly at the last follow-up when compared with the pre-operative scores (38.44 ± 4.5 and 23.52 ± 7.8, respectively). According to the Tegner activity scale, patients' postoperative activity levels remained unchanged compared to preoperative levels at the last follow-up.

Conclusion: Posterior knee arthroscopy with the all-inside posterior suture and inside-out anteromedial suture technique presented in this study yielded excellent clinical outcomes when used to repair chronic irreducible or unstable
BHMMTs.

Recent Trends and Hotspots in Knee Arthroplasty: A Bibliometric Analysis and Visualization Study of Last 5-Year Publications

Mohammad Poursalehian MD, Seyed Mohammad Javad Mortazavi MD

Keywords: bibliometric analysis, knee arthroplasty, knee replacement, trends, visualization

Objective: Bibliometric analysis is one of the most prevalent methods for analyzing and predicting the research trends of particular subjects. Through a bibliometric analysis, this study sought to look into and depict the hotspots and research trends in knee arthroplasty research over the previous five years.

Method: The Web of Science Core Collection database was used to find research articles on knee arthroplasty published between 2018 and 2022. The VOSviewer, CiteSpace, and Bibliometrix were used to carry out the bibliometric study and network visualization.

Results: During the previous five years, 7,422 included knee arthroplasty publications were cited 57,087 times. The top 10 global high-impact documents were determined using the citation ranking and citation burst. The most frequently referenced article revealed that the epidemiological characteristics of knee arthroplasty, perioperative care in knee arthroplasty, prosthetic joint infections, and opioid medications were the hot topics in knee arthroplasty research. Keyword burst analysis showed that the research trends in knee arthroplasty through 2022 were racial disparity, limb alignment, tibial slope, and meniscectomy. The analysis of the subject areas revealed the close connections and relationships between different subject areas.

Conclusions: TKA research community is very productive and highly centralized. Recent hotspots in knee arthroplasty research were unicompartmental knee arhroplasty (UKA), periprosthetic Joint Infection (PJI), kinematic alignment (KA), outpatient total knee arthroplasty (TKA), bariatric surgery, payment model, tranexamic acid (TXA), RoboticAssisted TKA, patient-reported outcome measures (PROM), metaphyseal cone, opioid use, and patient-specific instrumentation (PSI). Research trends in knee arthroplasty research were racial disparity, limb alignment, tibial slope, and meniscectomy.

Numerical Analysis of the Required Insertion Torque for the Custom-Designed Interference Screw and Cortical Screw into the Human Cortical Bone By Using Johnson-Cook Damage Model

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Keywords: Cortical, Custom-designed, Finite Element Analysis, Self-Tensile screw, interference screw

Aim: Custom-designed interference screw (CDI screw) which we called Self-Tensile screw, based on the extracted geometric parameters like diameter, thread pitch and thread depth from literatures can generate a higher insertion torque compared to standard cortical screw, resulting in prediction of better fixation in bone.

Method: In this study, we conducted a numerical investigation into the insertion of two bone screw models using the Johnson-Cook damage parameters. In this simulation, the bone model is represented as human cortical bone measuring 30 mm x 30 mm. For this purpose, an interference screw was designed and compared to a conventional cortical screw (4.5mm 2.1mm pitch 46mm length stainless steel 316). Finite element simulations were carried out using Abaqus software to analyze the behavior of screws during insertion.

Result: The results demonstrated that the cortical screw requires a lower insertion torque (2.53 N.m) compared to the custom-designed interference screw (4.2 N.m). The results of stress distribution show that the maximum stress on bone surface is approximately the same for both models. The maximum misses stress is slightly better for cortical screw (190.2Mpa) than custom-designed interference screw (205.6Mpa).

Conclusion: Our study confirmed the findings of previous research regarding the influence of geometric and dimensional features of screws such as diameter, thread pitch and thread depth on the insertion torque for screw insertion into bone. As our screw showed higher insertion torque we can predict that custom-designed interference screw has better fixation in bone than conventional cortical screw.

Simultaneous Management of Knee Arthritis and Tibial Osteotomy Using Patient-Specific Solution

Arash Sharafat Vaziri MD, Morad Karimpou, Mohammad Naghi Tahmasebi MD, Seyedeh Reihaneh Hosseini, Ghazaleh Moradkhani, Sina Javidmehr MD, Fardis Vosoughi MD

Keywords: elderly; female; malunion; osteoarthritis; OA; total knee arthroplasty; TKA; sagittal tibial deformity; bifocal deformity; tibial osteotomy; patient-specific instrumentation; PSI; 3D print technology; patient-specific guide; PSG; cutting guide; 3D planning; virtual computer planning; pain; instability; knee dislocation

A 70-year-old woman presented with knee pain and instability and was diagnosed with advanced knee osteoarthritis and bifocal tibial deformities.

The case's complexity challenged our team to perform a significant sagittal correction (> 60°) and restore her ability to walk independently.

We performed ipsilateral total knee arthroplasty and anterior closed-wedge tibial osteotomy employing virtual planning and 3D-printed patient-specific instrumentation.

Utilizing two separate 3D-printed patient-specific cutting guides for this patient with a complex deformity and managing the whole planning process in close collaboration between the surgeons and engineers resulted in a satisfactory postoperative outcome, optimal implant positioning and leg alignment, and minimal soft-tissue damage.

Tibial defect in total knee arthroplasty: which one is more important? defect depth or defect surface

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Keywords: Finite element method (FEM), Tibial posteromedial defect, Total Knee Arthroplasty, tibial component loosening

Aim: Medial tibial defects are common in patients who underwent TKA for varus deformity. According to the zonal fixation concept, these defects potentially affect the epiphyseal fixation of the tibial component and need to be addressed. Previous clinical studies have categorized tibial defects according to the depth of the defects and recommended different ways of addressing them. We hypothesized that the tibial defect's surface area would affect the tibial component's epiphyseal fixation. We performed a finite element study to investigate the role of depth and surface area of the medial tibial plateau defects in the stability of the tibial component and resulting micromotion.

Methods: Forty posteromedial tibial defect models with eight different depths and five different surface areas were used to create the FE models. A standard static load with 70-30 % mediolateral distribution was applied to the tibial tray, and the tibial component's micromotion was extracted for each model.

Results: For defects with less than 20% surface involvement, the number of micromotions was approximately constant at different depths with minimal variations; in more significant percentages of surface involvement of the medial tibial plateau, especially in 50%, the analyses revealed a direct correlation between the depth and the micromotion.

Conclusion: The surface area rather than the depth in the posteromedial defect of the tibia more significantly affects the epiphyseal fixation of the tibial component. For the defects less than 20% of the medial tibial plateau surface area, the depth would not affect the component stability at the level of epiphyseal fixation.

Conversion Total Knee Arthroplasty: What to Do with Periarticular Hardware

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Keywords: Conversion TKA, Hardware removal, Knee arthroplasty

Introduction: It is not infrequent to encounter patients undergoing total knee arthroplasty (TKA) who have periarticular hardware in place from prior surgical intervention(s). This study compares the outcome of TKA in patients with hardware in place who underwent simultaneous or staged TKA.

Material and Method: This retrospective study included 267 patients undergoing conversion TKA between 2000 to 2023. Simultaneous TKA was performed in 170 patients while 96 patients underwent staged TKA. Primary outcomes included rate of 90-day postoperative infection and postoperative complications. Type of hardware removal was delineated as major hardware versus minor hardware.

Results: There were no statistically significant differences in patient age, sex, body mass index (BMI) and comorbidities between the two cohorts. Patients with previous infection were more likely to have a staged procedure ($p=0.002$), with no significant difference in the rate of infection in the staged cohort (6.25%) compared to the simultaneous (2.35%) ($p=0.176$). The overall rate of TKA complication was not significantly different between the groups (13.5% in simultaneous, 20.8% in staged, $p=0.167$). Simultaneous procedures were more likely to include minor hardware removal (52.9%) compared to major hardware removal for staged procedures (67.7%) ($p<0.001$).

Conclusion: Based on the outcome of this study, it appears that removal of hardware and performing TKA in two separate operations may not be necessary in all patients. Only those patients with prior or active infection around the knee may be candidates for staged conversion TKA. Future studies with larger cohorts are needed to validate these findings.

The Distribution of Functional Knee Phenotypes Based on Coronal Alignment in Patients with ACL Injury

Seyed Mohammad Javad Mortazavi MD, Mohammadreza Razzaghof MD, Mohammad Ayati Firoozabadi MD, Mohammad Soleimani MD

Keywords: Alignment, Anatomical alignment, FMA, HKA, Knee, Mechanical alignment, Phenotype, TMA, Valgus, Varus

Purpose: Neutral alignment is not the natural anatomy in all patients. The current classification for coronal alignment only describes neutral, varus, and valgus knees. A better understanding of knee alignment variability seems necessary. We aimed to describe the phenotypes of the anterior cruciate ligament (ACL)-injured knees and compare them with normal knees.

Methods: This cross-sectional study included 388 knees and 194 patients with unilateral acute ACL injury. The contralateral knee was used as the normal group. Phenotypes were reported using hip–knee–ankle (HKA) angle, femoral mechanical angle (FMA), and tibial mechanical angle (TMA) based on Hirschmann's classification. Phenotypes consisted of a mean value and covered ± 1.5° from this mean, starting from the overall mean (HKA: 180°; FMA: 93°; TMA: 87°). Phenotypes were described by the alignment direction (NEU, VAR, VAL), the measured angle (HKA, FMA, and TMA), and deviation from the mean value. HKA, FMA, and TMA were compared between the two groups.

Results: Mean HKA, FMA, and TMA were 176.29±3.32 (P=0.063), 91.99±2.71 (P=0.018), and 86.66±5.01 (P=0.820) degrees, which showed FMA being higher in the ACL-injured group. We found 78 phenotypes among the participants. The most common phenotype was VAR HKA3°+NEUFMA0°+NEUTMA0° and NEUHKA0°+NEUFMA0°+NEUTMA0°, in the ACL-injured and normal groups, respectively. Most common phenotypes between the two groups were not significantly different (P=0.246).

Conclusion: The phenotypes were not different in the ACL-injured or normal knees. Our patients had a mild varus, possibly due to susceptibility to ACL injury or ethnicity. We report more phenotypes than previous studies.

The best time of weight bearing after ACL reconstruction, immediately or delayed? A randomized clinical trial

Mohsen Mardni-Kivi MD

Keywords: Anterior cruciate ligament, Partial Weight-Bearing, Rehabilitation, Weight bearing

Introduction: Weight bearing (WB) after anterior cruciate ligament reconstruction (ACL-R) is one of the important issues. This study was conducted with the aim of determining the results of WB immediately after surgery compared to partial WB with a brace after ACL-R.

Methods: In this randomized clinical trial (registration number: IRCT20110809007274N17), 84 patients were divided into two groups, including patients who were allowed to have full WB after surgery (group 1), and the group 2, including patients who were asked to use braces after surgery, and they were divided into partial WB for one month and then full WB. Primary information were recorded. Lachman test, anterior knee pain and kneeling pain before surgery and 1 months after surgery were recorded. Knee function was evaluated using IKDC and KOOS before surgery and 1, 3, and 6 months after surgery.

Results: Most of the patients were men under 30 years old. There was no statistically significant difference in the primary information of the patients in the two groups. Kneeling pain, anterior knee pain and the Lachman test after one month of surgery did not differ between the two groups. There was no difference in the scores of IKDC and KOOS in the 6 months follow up in the two groups. All the examined indicators in each group have improved over time.

Conclusion: It seems WB immediately after surgery compared to partial WB at 1, 3, 6 months after ACLR do not differ from each other; Therefore, patients can bear full weight if they tolerate it.

Improving Quality of Life for Transfemoral Amputees: Results from a Two-Year Study of the OPRA Implant System and Rehabilitation Protocol

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Keywords: Osseointegration Amputation Reconstruction, amputation

Introduction and method: This article presents the experience of using Osseointegrated prostheses in transfemoral amputations, aiming to showcase the benefits and limitations of this approach. The retrospective study was conducted on 22 patients between 2019 and 2021, using the OPRA implant system for prosthetic devices. Patient outcomes were evaluated through regular visits and examinations, with pain measured using a Visual Analogue Scale (VAS) and patient performance assessed using the Q-TFA questionnaire.

Results: The study found that one year after surgery, patients reported an average pain score of 2.3, with only two patients experiencing pain above 4 and requiring over-thecounter painkillers. At the two-year follow-up, the Q-TFA scores demonstrated significantly improved prosthetic use, mobility, and global outcomes, with fewer reported problems. Regarding complications, 15 patients (67.5%) experienced minor discharge surrounding the prosthesis, and one patient experienced a periprosthetic fracture and underwent fixation surgery by plate and wire. No instances of prosthesis aseptic loosening or parts separation were observed.

Conclusion: Our experience with this method and device offers valuable insights into managing transfemoral amputations, emphasizing the necessity for personalized treatment plans and diligent monitoring of patient progress. The study demonstrates the favorable outcomes of utilizing the surgical technique and OPRA implant system for enhancing patient outcomes and quality of life following transfemoral amputations. We hope this article will contribute to the growing body of literature on this topic and inform future research and clinical practice in this area.

Prediction of Soft Tissue Release in Varus Knees for Soft Tissue Balancing in Total Knee Arthroplasty with Mechanical Concept Based on Angular Parameters in Alignment View

Seyed Mohammad Javad Mortazavi MD

Keywords: total knee arthroplasty

Background: This study aimed to predict soft tissue release in varus knees for balancing in total knee arthroplasty based on angular parameters in alignment view with a mechanical concept.

Method: This is a retrospective cohort study of non-traumatic and non-hemophilic patients with varus knees between 2018 and 2020 that have undergone total knee replacement surgeries, with revision or conversion surgeries as exclusion criteria. The three joint imaging was taken from the medical decimation and records that were archived in the Imam Khomeini Hospital archive.

Result: Out of 1260 patients 1218 (96.7%) were varus, the range in varus knees (0^o-48^o±6.984). In mild varus knees (<10^o) the release stage of 1, 2, and 3 (93.2%, 3.8%, and 3%). In moderate varus knees (10^o and -20^o) the release stage of 1, 2, and 3 (69.2%, 27.8%, and 3%), and in severe varus knees (>20^o) the release stage of 1, 2, and 3 (68.5%, 27.3%, and 4.2%). The mean of JLCA/VA in release stages 1, 2, and 3 (0.764±0.619827, 0.390±0.090940, and 0.148±0.124002) ($P < 0.001$). In varus knees 89.2% of stage release 1 JLCA/VA (≥0.51), 94.5% of stage release 2 JLCA/VA (0.31-0.50), and 100% of stage release 3 JLCA/VA (≤0.30).

Conclusion: We can predict pre-operative soft tissue release based on JLCA/VA if it is ≥ 0.51,0.31-0.50 and ≤ 0.30 the release stage will be 1,2 and 3 respectively, increasing VA doesn't indicate increasing in soft tissue release.

The Impact of Depression, Personality and Mental Health on Outcomes of Total Knee Arthroplasty

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Keywords: Depression, Mental health, Outcome, Personality, Total knee replacement

Methods: Fifty-two patients undergoing unilateral TKA were assessed preoperatively with Oxford Happiness Inventory, Eysenck Personality Inventory, 12-item short form health survey (SF-12), and Knee Injury and Osteoarthritis Outcome Score (KOOS) for evaluating depression, personality traits, physical and mental health, and function, respectively. At 1 year after surgery, health-related quality of life (HRQL) and function were assessed using the SF-12 and KOOS.

Results: HRQL and function of all personality traits increased significantly after TKA, without significant difference among them. Extroversion and neuroticism did not have significant correlation with subjective well-being, HRQL, and function before and after surgery. Subjective well-being and the baseline physical and mental health scores were correlated strongly and directly with postoperative physical component summary, mental component summary, and KOOS scores and their improvement. Among many factors that significantly affected the outcomes of TKA, the only independent predictor of physical, mental, and functional outcome was depression.

Conclusions: Outcomes of surgery were not significantly different among diverse personality traits. Patients with less depressive symptoms and higher baseline mental and physical scores had significantly greater improvement in HRQL after surgery. The only independent factor affecting the physical, mental, and functional outcome was depression.

Total Knee Arthroplasty with or Without a Tourniquet, Which One Is As the Matter of Choice? A Systematic Review

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Keywords: Tourniquet; total knee arthroplasty, cement mantle; periprosthetic joint infection (PJI); Systematic Review

Background: A tourniquet is commonly used during knee replacement surgery to reduce bleeding. However, recent evidence questions its effectiveness and potential long-term impact on the knee prosthesis. The author conducted a systematic review to evaluate its role in total knee arthroplasty.

Methods: To this end, a comprehensive literature search of electronic databases comprising PubMed, Cochrane, and Embase was established from inception to April 2022. The methodological quality assessment of the eligible studies was appraised using the Newcastle-Ottawa Scale (NOS) and the Cochrane Collaboration Risk of Bias Tool. All eligible subjects allocated in the tourniquet and the non-tourniquet group were compared using the cumulative bone cement penetration, soft tissue swelling, postoperative blood loss, surgical time, length of hospital stay (LOS), and pain level as well as knee range of motion (ROM) following TKA. Further parameters were also applied, including the required time yielding complete ROM reestablishment, periprosthetic joint infection (PJI), postoperative-related non-thrombotic complication rate, and knee extensor force.

Results: Only 16 out of 441 identified studies containing 7923 patients met our eligible criteria. Tourniquets in surgery improve bone cement thickness but can lead to longer post-op recovery time, pain during movement, and soft tissue swelling. No significant differences in blood loss, pain levels, or pain medication usage were found among the groups.

Conclusion: Using a tourniquet during TKA doesn't improve bone cement thickness around the knee prosthesis. TKA without a tourniquet results in less pain, discomfort, and complications, as well as faster recovery time and greater knee mobility.

Introducing a New Technique to Treat Patellar Instability Following Total Knee Arthroplasty

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Keywords: TKA, new technique, patellar instability

Background: Patellofemoral instability (PFI) following total knee arthroplasty (TKA) is an uncommon but devastating complication.PFI is a frequent cause of TKA failure. etiology of PFI following TKA is either implant-related, soft-tissue-related, or a combination of both. In cases of post-arthroplasty patellar instability, the medial structures may be damaged .When implant position is satisfactory, addressing the soft-tissue imbalance is required. The aim of this study is to present new technique for patellofemoral ligament reconstruction (MPFLr) to treat PFI following TKA.

Material and methods: This is a retrospective case series of two patients treated for PFI after TKA. Patients were included if they had radiographic documentation of patella dislocation or subluxation and component position was adequate. Each patient underwent MPFL reconstruction using the achilles tendon allograft. After passing around the extensor mechanism, the Achilles graft is fixed in femoral tunnel using interference screw. A functional scores, joint range of motion and patellar tilt on X-rays were analyzed preoperatively and at the last follow-up.

Results: All patients had improved clinical and radiographic outcomes postoperatively. none of the patients experienced a recurrence of the patellar dislocation. The patellar tilt was reduced in all patients.

Conclusion: In properly selected patients, the use of this surgical technique for the treatment of PFI following TKA has been accompanied by satisfactory results.

Neuromuscular training program for treatment of male basketball players with medial tibial stress syndrome: emphasis on attentional focus and external cues in functional movement training

Mojtaba Jahanshahi, Amir Letafatkar, Robert L Baker, Michael Fredericson

Keywords: Athletes; Medial Tibial Stress Syndrome; External Focus; Kinematic; Kinetic

Aim: Medial tibial stress syndrome (MTSS), one of the most common causes of exercise-induced lower leg pain in sports such as basketball and volleyball, is thought to be caused by excessive and repetitive impact loads on the tibia.

Methods: Seventy-eight basketball players with MTSS were randomly allocated to the NMEF, TE, and control groups (26 individuals for each group). Subjects in experimental groups passed 6 weeks, 3 sessions per week (60-90 minutes) of NMEF and TE. Results: The kinematic variables included flexion, adduction, internal rotation hip, flexion, abduction knee, dorsi flexion, and eversion ankle angles.

The results showed that although both interventions could significantly improve all kinematics compared to the control group, in both, NMEF was more effective than TE ($p \leq 0.005$). Significant differences ($p \leq 0.005$) were observed between NMEF and TE compared to the control group in kinetic outcomes. Between the two NMEF and TE groups, NMEF was more effective than TE ($p \leq 0.005$).

Conclusion: The purpose of this study was to determine the effects of six-week NMEF with TE on selected kinematics and kinetics in basketball players with MTSS.

Due to the effectiveness of NMEF, it is possible that it reduces some of these risk factors and improves the activity and stability of the ankle muscles (helping the arch of the foot, as well as increasing the strength of the ankle muscles and improving the strength between the large and small muscles of the lower limb).

The Effect of Intra- vs. Extramedullary Tibial Guides on the Alignment of Lower Extremity and Early Functional Outcomes following Total Knee Arthroplasty: A Randomized Clinical Trial

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Keywords: Total knee arthroplasty; Intramedullary guide; Extramedullary guide; Functional outcome; Osteoarthritis; Function

Aim: We aimed to compare the functional outcomes and accuracy in providing neutral alignment after TKA using intra- (IM) and extramedullary (EM) tibial guides.
Methods: In a randomized, double-blinded clinical trial, we studied 98 patients undergoing primary TKA in two groups of IM and EM. We measured the medial proximal tibial angle (MPTA), varus angle (VA), and joint-line convergence angle with normal ranges of 90°±3°, 0-2°, and 0±3°, respectively, on a three-joint alignment view after three months. We also assessed functional outcomes at the last follow-up. Finally, we compared these outcomes between groups.
Results: Eighty-four patients (IM=42, EM=42) were included in the final analysis (16 males, 68 females; mean age: 63.9±8.6 years; mean follow-up: 13±2.9 months). The mean postoperative alignment angles showed no significant difference, although MPTA outliers were significantly more frequent in the EM group (26.2% vs. 9.5% in IM, P=0.04). None of the functional outcomes showed a significant difference between groups. However, the mean increase in ROM was significantly higher in the knees with VAs within ±3° of normal than those outside it (30.8 vs. 27.4, respectively; P=0.039).
Conclusions: We conclude that both techniques were not different in terms of the mean alignment angles and functional outcomes. However, fewer MPTA outliers can be seen with IM. A postoperative mechanical axis within ±3° of neutral can result in a more ROM increase after one year.

Effectiveness of Intra-Articular Injection of Ceftazidime/Vancomycin Combination during Total Knee Replacement: Prevention of Periprosthetic Joint Infection

Mohammad Ayati Firoozabadi MD

Keywords: ceftazidime, prosthetic joint infection (PJI), total knee arthroplasty (TKA), vancomycin.

The occurrence of prosthetic joint infection subsequent to total knee arthroplasty also known as total knee replacement, is a highly detrimental complication. Some studies have concluded that intra-articular antibiotic injection was an effective approach to prevention of PJI, while others have reached the opposite conclusion. However, there is no study performed in one center, by one surgeon, one surgical team, or one type of prosthetic device.
Methods:This was a historical cohort study on patients who underwent primary TKA with vancomycin and ceftazidime and were compared with a cohort of patients also treated with TKA but without using antibiotic injection The incidence of PJI was followed for two years in each group by chart review.
Results:Study groups were matched for age , gender (BMI) (P-value 0.136), and radiologic features of their knees (P-value > 0.05). Prosthetic joint infection was developed by only three patients: one (0.18%) in the case group and the remaining two (0.32%) in the control group (P-value 0.615); all three patients had a positive response to the treatment which included debridement, antibiotics, implant retention (DAIR) surgery and a course of antibiotics.
Conclusion:To our knowledge, this is the most precisely matched cohort of TKA subjects in this era. Intra-articular injection of vancomycin and ceftazidime during TKA showed no significant difference in reducing the risk of PJI in the case group. However, although PJI is a rare event in joint replacement surgery, it should be prospectively investigated in a study with even larger sample sizes

Nasal MRSA Screening in Orthopedic Patients: What About MSSA?

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Keywords: MRSA SCREENING, MSSA SCREENING

Background: Staphylococcus aureus (S. aureus) is a common cause of surgical site infections (SSI) in orthopedic patients. It is a common practice to screen patients for methicillin resistant Staph aureus (MRSA). However, little to no attention is usually paid to the presence of methicillin sensitive Staphylococcus aureus (MSSA) in patients who are screened. The purpose of this study was to: a) document the prevalence of MSSA and MRSA in orthopedic patients undergoing nasal screening, 2) identify risk factors for colonization, and 3) examine the association between S. aureus colonization and postoperative infection.

Methods: Prospectively collected data on 3,606 patients undergoing orthopedic procedure in a single institution between 2017 to 2023 was analyzed. The result of nasal screening and detailed demographics of the patients were reviewed to identify the prevalence of MRSA and MSSA colonization as well as associated factors. Decolonization protocol was utilized prior to surgery.

Results: The prevalence of MSSA and MRSA colonization were 26.3% (949 patients) and 7.7% (276 patients), respectively. A higher Charlson Comorbidity Index (CCI) ($p=0.002$), underlying cardiac disease ($p=0.001$), poorly controlled hypertension ($p<0.001$), and history of coagulopathy ($p<0.001$) were significant factors for S. aureus colonization. The decolonization appeared to be effective as the incidence of 90-day postoperative infections was not different between those with and without S. aureus colonization ($p=0.687$).

Conclusion: Given the relatively high prevalence of MRSA and MSSA colonization, universal decolonization of patients undergoing orthopedic procedures may be warranted.

Repair of Popliteomeniscal Fascicles Tear Using a Posterior Transseptal Portal Fixes Hypermobile Lateral Meniscus

Mohammad Movahedinia MD, Sohrab Keyhani MD

Keywords: Hypermobile lateral meniscus, Lateral meniscus, Popliteomeniscal fascicles, Posterolateral portal, Posteromedial portal

Aim: This study investigates the effects of the all-inside repair of posterosuperior popliteomeniscal fascicle (PMF) on lateral meniscus stabilization using a posterior arthroscopic approach.

Methods: Between 2015 and 2018, 17 patients with hypermobile lateral meniscus (HLM) underwent posterior knee arthroscopy for PMF repair. The all-inside repair was performed through posteromedial transseptal and posterolateral portals using a suture hook technique. Patients were clinically assessed based on IKDC and Lysholm scores.

Results: Both IKDC and Lysholm scores improved significantly after an average follow-up of 3.5 years ($P < 0.001$). No patients underwent reoperation, and no complications associated with posterior knee arthroscopy were reported.

Conclusion: The all-inside suture hook technique using posterolateral and posteromedial transseptal portals fixes HLM with excellent IKDC and Lysholm scores.

Correlation of Short Knee and Full-length X-rays in Evaluating Coronal Plane Alignment in Total Knee Arthroplasty

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Keywords: Anatomical Alignment, Full Length X-rays, Mechanical Alignment, Short X-rays, Total Knee Arthroplasty

Background: Coronal alignment after total knee arthroplasty (TKA) would influence the implant survival. Coronal alignment could be measured on short and full-length X-rays. The goal of the current study was to assess the correlation of short and full-length X-rays to accurate prediction of the true Hip-Knee-Ankle alignment after TKA in the Iranian population.

Methods: Lateral distal femoral and medial proximal tibial angles, FTA, HKA, in 180 Iranian patients (243 knees without extra-articular deformities) were measured and compared on short and full-length standing X-rays of primary TKA pre/postoperatively.

Results: The correlation between the preoperative FTA-short and FTA-long, FTA-short and HKA, and FTA-long and HKA values in degrees were fair, good and good (r= 0.64) (r= 0.73), (r= 0.76) respectively.

This correlation for postoperative aMPTA and mMPTA (r=0.73), and FTA-short and HKA(r=0.76) values were good and significant (P=0.001).

Also, assessing coronal alignment based on short and full-length measurements would result in varying pre/postoperative alignments (varus, neutral and valgus).

Conclusion: Full length x-rays could not be replaced by short knee X-rays to asses true coronal alignment in TKA; considerable portion of our cases were missorted as varus, neutral or valgus based on the FTA versus the HKA.

Intraoperative fixed 5° valgus angle cut of distal femur did not result in postoperative favorable neutral alignment in all cases.

Distal Kaplan Fiber Tenodesis Surgical Technique

Seyed mohammad javad Mortazavi MD

Keywords: knee ACL reconstruction kaplan fiber tenodesis

Anterior cruciate ligament (ACL) tears are a common knee injury, and even after reconstruction, some patients may still experience instability in their knee. To address this, extra-articular reinforcement may be necessary to prevent anterior translation and internal rotation of the tibia. Kaplan fibers (KF), which are the attachments of the iliotibial band to the distal femur, can help improve anterolateral rotatory stability in the knee, especially in greater degrees of knee flexion.

Our technique for KF reconstruction involves making a 10 cm incision in the skin and subcutaneous tissue of the distal and lateral thigh. We release a 10 cm x 1 cm strip of the iliotibial band while maintaining its tibial insertion, and then stitch the free end of the strip before attaching it to the distal femur using a ToggelLoc . The advantage of this technique is that the tension of the ITB strip can be adjusted using the ToggelLoc, allowing the surgeon to increase tension in the graft as needed to achieve ideal tension in knee flexion.

Prediction Of Hamstring Tendon Autograft Diameter Using Preoperative Measurements With Different Cut-Offs Between Genders

Mohammad Movahedinia MD, Mostafa Shahrezaee MD, Bentolhoda Salehi MD

Keywords: ACL reconstruction, Cross-sectional area, Hamstring tendon autograft, Sensitivity, Speciicity

Aim: Studies have suggested some predictors for hamstring tendon (HT) autograft diameter based on anthropometric factors and preoperative magnetic resonance imaging (MRI) with variable results. Some authors have attributed the variability to gender differences. This prospective cohort reports the sensitivity and specificity of anthropometric and MRI predictors in males and females separately to determine the difference.

Methods: Forty-two eligible patients who underwent anterior cruciate ligament reconstruction (ACLR) and MRI in our center were included. ACLR was performed by the senior surgeon using a 4-stranded HT autograft for all patients. A blinded musculoskeletal radiologist measured the cross-sectional area (CSA) of gracilis and semitendinosus tendons using the free-hand region of interest tool for all patients. An orthopedic resident (PGY4) collected anthropometric factors and measured intraoperative autograft diameter.

Results: Mean intraoperative autograft diameter was 8.0 mm. Females had a significantly lower autograft diameter (7.4 vs. 8.2, $P < 0.001$), smaller gracilis (6.9 vs. 7.9, $P = 0.003$), and semitendinosus CSA (11.5 vs. 12.8, $P = 0.014$) compared to males. ROC curve analysis resulted in diferent cut-off values with high sensitivity and specificity for semitendinosus and combined CSA regarding gender.

Conclusion: Based on the results of this study, CSA of either isolated or combined HTs on preoperative axial MRI, height, and weight are the strongest predictors of intraoperative autograft diameter. It is suggested to consider diferent cut-of for males and females to have a better clinical guide for surgeons.

Intra-Articular Injections for Pain Relief Following Knee Arthroscopy: A Literature Review

Behzad Nezhadtabrizi MD

Keywords: Intra-Articular Injections, Knee Arthroscopy, pain

Arthroscopy procedures for the knee are excellent and tend to be outpatient procedures. Pain control after arthroscopic surgery is an important aspect of patient satisfaction and quicker return to daily activities following surgery. The objective of this article was to review the current literature regarding pain management after knee arthroscopy using intra-articular (IA) injections. Our goal in this article is to review the drugs that have been suggested in various articles for IA injections following knee arthroscopy to control pain. In conclusion, the current evidence suggests that combining IA lidocaine and morphine with tranexamic acid (TXA), in addition to ketorolac, is effective for pain relief after arthroscopic knee surgery.

A Comprehensive Study of Cementing Techniques: Impact on Implant Longevity in Persona and NexGen Knee Arthroplasty

Arash Sharafat Vaziri MD, Mohammad Naghi Tahmasebi MD, Hoseinali Hadi MD, Sina Javidmehr MD, Sohrab Keyhani MD, Zahra Vahdati MD, Hossein Nematian MD

Keywords: Total knee arthroplasty; Aseptic loosening; NexGen; Persona; Revision; Cementing techniques;Tibial component; Knee

Aims: The primary aim of this study was to investigate whether our modified cementing technique can reduce the rate of aseptic tibial loosening for Persona implants compared to Persona implants placed with conventional cementing technique. The secondary aim was to compare the rate of aseptic tibial loosening for the Persona implant placed with a modified cementation technique and NexGen implants.

Patients and Methods: All patients who underwent primary TKA between August 2014 and September 2018 with a minimum of two-year follow-up using one of three implants were included: Persona + conventional cementing technique; Persona + modified cementing technique; and NexGen LPS-Flex. The modifications applied in our cementing technique include better preparation of the bone surfaces and the cancellous bone cavities, pressurizing the cement and interstitial fluid suction at the same time, applying a layer of cement on the surfaces of the tibia and implant, and immobilizing the limb. Kaplan-Meier analyses were performed to estimate survivorship.

Results: A total of 988 of 1039 primary TKAs (95.1%) were included with a follow-up of 65.86±6.84 months. 28 (2.83%) TKA required revisions due to aseptic tibial loosening; 3 (1.1%) in the NexGen group, 21 (6.9%) in the conventionally cemented Persona group, and 4 (0.9%) within the modified cemented Persona group. Aseptic loosening occurred at a mean of 69.00±2.65, 34.57±22.90, and 68.50±3.42, respectively. Survivorship for aseptic loosening was 98.9%, 93.1%, and 99.1% at six years, respectively. The revision rate for early (during the first 24 months) aseptic loosening was 4.6% in the conventionally cemented Persona group. No cases of early aseptic loosening were reported in the other two groups.

Conclusion: At mid-term follow-up, using the meticulous cementing technique while using tibial components with shorter keel, such as Persona in TKA, represented a revision rate due to aseptic loosening similar to the NexGen prosthesis with the standard keel.

Innovative Treatment of Stage Four Arthritis and Nonunion Using a Personalized 3D-printed Porous Cone

Arash Sharafat Vaziri MD, Ghazaleh Moradkhani, Morad Karimpour, Mohammad Naghi Tahmasebi MD, Soodabeh EsfandiaryMD, Fardis Vosoughi MD, Seyedeh Reihaneh Hosseini MD

Keywords: 3d printing, customized implants, porous titanium, tibial nonunion, total knee arthroplasty

The nonunion's type is a crucial factor in how we decide on the treatment plan. There are different options available, and using personalized 3D printed structures has become more popular. This approach lets us bypass the defect, add support, and help with bone integration. Not only do customized porous titanium implants made through 3D printing give enough structural support, but they also prevent stress sheilding because their elastic properties are similar to bone. This is important because stress is a major reason why implants become loose. Moreover, the interconnected channels in these implants create more surface area and space for cells adhesion and proliferation, which means better bone healing.

This study will present recalcitrant aseptic atrophic nonunion in the tibial proximal metaphysis in a 62-year-old woman with concomitant knee osteoarthritis. Because the nonunion site is close to the knee joint, we couldn't just skip treating it – that would make the tibial component unstable. Regular methods like plating weren't possible due to space constraints. To deal with these challenges, we went for a new approach: we managed both the knee osteoarthritis and nonunion at the same time. We used a unique customized 3Dprinted porous titanium cone that helps strengthen the bone where it's needed while avoiding the troubled nonunion area. This aspect is the standout feature of our study.

Efficacy of intra-articular injection of vancomycin and ceftazidime during total knee arthroplasty: prophylaxis of prosthetic joint infection

Mohammad Ayati Firoozabadi MD, Seyed Mohammad Javad Mortazavi MD

Keywords: TKA PJI Vancomycin Ceftazidime

Introduction: Prosthetic joint infection (PJI) is a very disastrous complication of total knee arthroplasty (TKA). Some studies have considered intra-articular antibiotic injection to be effective in the prevention of PJI, but several articles have the opposite opinion. However, there is no study performed in one center, by one surgeon, one surgical team, or one type of prosthesis.

Material & Methods: In this retrospective case-control study, the patients who underwent primary TKA with vancomycin and ceftazidime (652 cases from September 2019 to the end of December 2020) were compared with a cohort of patients with the same TKA method without antibiotics injection (620 cases, from March 2018 to the end of August 2019). The incidence of PJI was followed for 4 years.

Results: Study groups were matched for age (P-value=0.193), gender (P-value=0.913), body mass index (P-value=0.136), and radiologic features of patients (P-value> 0.05). In the case and control groups, one (0.18%) and two (0.32%) patients had PJI, respectively. All patients experiencing PJI were subjected to Debridement, antibiotics, and implant retention (DAIR) surgery and antibiotic therapy due to the time interval of fewer than six weeks from the surgery, which fortunately responded to the treatment (P-value=0.615).

Conclusion: Intra-articular injection of vancomycin and ceftazidime during total knee arthroplasty in the case group showed no significant difference concerning decreasing PJI risk; while for such a rare event of PJI, a study with even larger sample sizes is needed. While, prospective randomized studies are required to evaluate its efficacy.

One-stage total knee arthroplasty for the treatment of acute tibial varus stress fracture: A technical note

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Keywords: Keywords: stress fracture, tibia, total knee arthroplasty, varus deformity

Treatment of acute tibial varus stress fracture secondary to osteoarthritis is a significant challenge. There are several available options with their cons and pros. In this technical note, describe our in-house approach for the treatment of acute tibial varus stress fracture using one-stage long-stem total knee arthroplasty, without open reduction, plating and bone graft. We have also examined this technique in the treatment of almost 15 patients. No case of non-union or other complications were recorded until the date of writing this article.

Therefore, this technique could be suggested as the treatment of choice for the tibial stress fractures in elderly patients with degenerative changes of the knee and associated deformity.

Simultaneous Knee Arthroplasty and Tibial Osteotomy Guided by 3D Planning and Patient-Specific Instrumentation, a Case Report

Arash Sharafat Vaziri MD, Morad Karimpour, Mohammad Naghi Tahmasebi MD, Seyedeh Reihaneh Hosseini, Ghazaleh Moradkhani, Sina Javidmehr MD, Fardis Vosoughi MD

Keywords: 3D-printing, bi-level osteotomy, digital planning, patient-specific surgical guides, total knee arthroplasty

Aim: Breakthroughs in 3D printing enhanced corrective osteotomies, particularly in complex cases. The study presented a 70-year-old woman with a neglected dislocated knee and tibial deformity, necessitating patient-specific instrumentation (PSI). Meta-analyses suggest PSI's precise alignment benefits across different planes, elevating surgical success.

Case: Her history revealed bilateral knee pain and instability. Physical examination indicated left tibial anterior bowing, causing 6 cm limb shortening. Globally unstable knee motion (-40, 120 ROM) and bifocal tibial deformities were evident, warranting a rotating hinge knee (RHK) prosthesis.

Method: Advanced software processed X-rays and CT scans, constructing 3D models. A complete 3D replica of the affected limb and two customized 3D surgical guides, including proximal tibial and osteotomy cutting guides, were designed and printed. These guides ensured accurate cuts for bone realignment. The surgery combined cemented and uncemented fixation to prevent non-union.

Conclusion: Post-surgery radiographs validated proper alignment and bone union, enabling complication-free weight-bearing. The study emphasized PSI's vital role in tailored planning, enhancing patient outcomes by achieving precise alignment for complex orthopedic deformities.

Stitch Abscess following Total Hip Arthroplasty and Total Knee Arthroplasty: Is Conservative Treatment Successful?

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Keywords: suture reaction, total hip arthroplasty, total knee arthroplasty, wound complications.

Aim: Local tissue reaction to absorbable suture materials after TKA or THA has been rarely reported. It should be differentiated from deep infection. Herein we aimed to study the incidence of stitch abscess and the results of conservative treatment in 100 consecutive patients undergoing primary TKA and THA.

Material and methods: In a prospective cohort study from February 2021 to October 2021, 100 consecutive patients undergoing primary THA and TKA were followed. Those with medical comorbidities, inflammatory arthritis, revision arthroplasties were excluded. Any erythema, wound dehiscence, superficial skin necrosis, and wound drainage was defined as stitch abscess and recorded. The patients were followed at one week, four weeks, and three months following surgery. If the patients did not have peri-prosthetic joint infectionPJI, they were followed with conservative treatment, i.e., daily dressing change without administering antibiotics. The onset of stitch abscess, time to heal, PJI, and need for surgery were recorded.

Results: Eight patients (2 hips and 6 knees) developed stitch abscess. Almost all the cases (seven) occurred around the knots at the end of suture lines, and all occurred between postoperative weeks 3 and 4. No PJI was found in these patients. All the patients had uneventful recovery with conservative treatment.

Conclusion: Stitch abscess around suture line is a benign clinical entity with an incidence of 8% following THA and TKA. A reaction to absorbable suture material may cause it. Conservative treatment without antibiotic therapy can lead to uneventful recovery with no further complications.

The Effect of Adding Corticosteroid to the Periarticular Injection Cocktail for Pain Control after Total Hip and Total Knee Arthroplasty: A Double-Blinded Randomized Clinical Trial

Amir Mohsen Khorrami MD

Keywords: Periarticular corticosteroid injection, Postoperative pain control, Total hip arthroplasty, Total knee arthroplasty

Background: The impact of periarticular corticosteroid injection for pain control after total joint arthroplasty is controversial. The present study aimed to investigate this controversy in patients undergoing THA and TKA.

Methods: A total of 42 THA and 42 TKA patients were included in this study. The patients of each group were randomly allocated into group A (cocktail+Depo-Medrol) and group B (cocktail alone). The outcome measures were a Visual Analog Scale for pain at five different time points for both THA and TKA, as well as the knee range of motion and straight leg raise for the TKA group only. Patients were followed for three months to observe infection, wound complications, and any thromboembolic event.

Results: In the THA group, the preoperative VAS, 12, 24, 48, and 72h postoperative VAS were not statistically different between groups A and B (P=0.49, P=0.5, P=0.96, P=0.15, and P=0.11, respectively). In the TKA group, the preoperative VAS, 12, 24 48h, and 72h postoperative VAS were not statistically different between groups A and B (P=1.0, P=0.47, P=0.82, P=0.92, P=0.5, respectively). The mean scores of ROM and ability to perform SLR were not significantly different between TKA patients in the steroid and non-steroid groups (P=0.18 and P=0.58, respectively).

The only observed complication was one surgical site infection in the non-steroid group of the TKA.

Conclusion: The obtained results did not support the benefit of including a steroid (DepoMedrol) in the periarticular injection cocktail for pain control after the THA and TKA.

Investigating the effect of aspiration with and without tranexamic acid and lidocaine injection in hemophilia patients with knee hemarthrosis

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Keywords: Hemophilia - transamic acid - lidocaine - acute hemarthrosis of the knee joint

Title: Comparison of the effectiveness of aspiration with and without intra-articular injection of tranexamic acid and lidocaine in adult hemophilia patients with acute hemarthrosis of the knee joint in the first 24 hours Aim: Investigating the effect of aspiration with and without tranexamic acid and lidocaine injection in hemophilia patients with knee hemarthrosis Methods: Hemophilia patients with acute hemarthrosis of the knee (first 24 hours) undergo an ultrasound examination to confirm hemarthrosis. The first group was treated under ultrasound guidance in the operating room. the relevant joint that should be aspired and lidocaine injection be done .In addition to aspiration, patients in the second group were injected with tranxamic acid and lidocaine. Ultrasound confirmed the lack of fluid in the intraarticular space.. Tranexamic acid and lidocaine were injected as follows: 1 ml of lidocaine 2%; tranexamic acid: The safe dose for intra-articular injection of tranexamic acid is 20 mg/ml. 1.5 g tranexamic acid in 75 ml of normal saline serum was injected intraarticularly.

Results: According to the VAS questionnaire, pain was shorter in the second group that received lidocaine with transamic acid aspiration and ROM increased,too ($P<0.05$). Patients in the second group returned to work and school faster than the first group.

Conclusion: In this study, we aim to reduce the pain level and ROM of the knee in patients with hemophilia who have acute hemarthrosis of the knee joint by injecting transamic acid and lidocaine.

Marginal resection, aggressive debridement followed by immediate intramedullary fixation, and local antibiotics can be curative in patients with infected non-unions of the lower extremities caused by multi-drug resistant germs

Seyed Hadi Kalantar MD

Keywords: antibiotic resistance, bone defects, osteomyelitis

Introduction: Management of osteomyelitis and infected non-unions of lower extremities, especially when the patient struggles with multi or extended drug-resistant germs, can be challenging.

Method: We operated on 86 patients with lower limb infected non-union. Sixteen patients struggled with infected non-unions caused by extended or multi-drug resistant bacterial infections. All patients were treated by single session aggressive debridement and bone resections with a margin of 1-2 cm beyond the so-called “Paprkia’s sign” on each side of the affected area resulting in significant bone loss (ranging from 5 to 18cm). In the same session, we used immediate intramedullary fixation in all cases and local antibioticimpregnated cement around the device and in the bone loss region.

Result: We managed to cure 14 patients with need for recementing and debridement in three patients during follow-up. The mean follow-up was 16 months. The CRP levels were reduced to the normal range within a mean of 34.2 days in 13 patients, and it was not reduced in two patients because of the reinfection and failure of the treatment. We performed debridement and recementing in one patient, and his non-union was eventually treated. All bone defects were managed uneventfully, and the union rate was 100 percent within 90-240 days after bone grafting surgery regarding radiological and clinical criteria.

Conclusion: Based on our study, multi/extended-drug resistant induced osteomyelitis of the long bones can be managed by an aggressive debridement and bone resection with wider margins, immediate internal fixation, and local antibiotic cement beads followed by later bone defect management can lead to successful treatment.

Primary total knee arthroplasty with hinge prosthesis

Mohammad Ayati Firoozabadi MD

Keywords: Primary total knee arthroplasty, hinge knee prosthesis

Background: rotating hinge knee prosthesis (RHK) is a high constrain prosthesis that usually used in revision surgery. But in rare situation, RHK is indicated as primary total knee arthroplasty.

Method: in this study we conclude 11 patients (5 males and 6 women) with 15 knees. we followed them between 1 to 4 years (mean 2.6 years). They were accessed by X-ray, physical examination and functionally before and after surgery (in the time of last follow up). complications were followed as well.

Result: Range of motion (ROM) and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score have been improved significantly. 7 of 11 patients experience mild anterior knee pain. valgus, varus and recurvatum deformities have been improved as well. except one of patient with skin necrosis, no complications have been found.

Conclusion: RHK prosthesis can be used in patient with current indication as primary total knee arthroplasty

Clinical Outcomes Of Fixation Of Depressed Posterolateral Tibial Plateau Fractures Using A Direct Lateral Approach

Mohammad Movahedinia MD, Bentolhoda Salehi MD, Reza Noktehsanj MD

Keywords: Plateau posterolateral fracture · Tibia plateau · Tricortical autologous bone graft · Peroneal nerve · Lateral approach

Aim: Fixation of plateau posterolateral fracture (PLF) is challenging because the fracture site is mostly covered by vital neurovascular structures. We operated on 15 cases of PLF using a direct lateral approach. This study aims to report on clinical results.
Material: and methods Between 2017 and 2019, 15 cases of PLFs were fixed with a direct lateral approach and a tricortical autologous bone graft from the iliac crest. A depression of more than 2 mm was indicated for the surgical treatment. Clinical evaluation included Lysholm score, International Knee Documentation Committee Score (IKDC) score, and Tegner activity scale after two years of follow-up.
Results: The last follow-up was at 24 months after the operation. The mean postoperative Tegner activity scale did not change significantly compared to before the injury (6.5 (6–7) vs. 7 (6–8, $p = 0.5$)). The postoperative IKDC and Lysholm scores improved significantly compared to before the operation ($p < 0.001$). The full range of motion was seen in all patients except one who was manipulated after three months.
Conclusions: Surgical treatment using a direct lateral approach is a safe procedure for PLFs that results in good, short-term clinical and radiologic outcomes without fibular osteotomy or compromising the important neurovascular structures.

New classification of periprosthetic distal femur fracture in total knee arthroplasty

Mohammad Ayati Firoozabadi MD, Davood Dehghani MD, Mohammad Javad Mortazavi MD, Homayoon Khaledian MD

Keywords: periprosthetic distal femur fracture total knee arthroplasty

Purpose: The incidence of femoral periprosthetic fractures following total knee arthroplasties (TKAs) is on the rise as the number of TKAs performed increases. The aim of this review is to propose a novel classification system focused on surgical interventions for femoral periprosthetic fractures.

Method: Through an extensive literature review, we examined the existing classifications and prevailing treatment methods for femoral periprosthetic fractures occurring after total knee arthroplasty (TKA).

Result: Several studies have documented positive outcomes fixation methods, for the surgical management of femoral periprosthetic fractures. Nevertheless, it is evident that only a limited number of existing classifications for these fractures sufficiently encompass the latest developments in surgical treatment.

Conclusion: we propose surgical intervention as the preferred original approach for managing femoral periprosthetic fractures following total knee arthroplasty (TKA). Our newly introduced classification system provides a straightforward surgical treatment choice for these fractures, aiming to facilitate shorter recovery periods, cost-effectiveness, and reduced postoperative complications.

Current Paradox Regarding Prosthetic Joint Infection Occurrence Due to Dysbiosis of Gut Microbiome: A Review

Mohmmad Hossein Ebrahimzadeh MD, Naeemeh Kalali, Ali Moradi MD, Nafiseh Jirofti

Keywords: Gut Microbiota; Prosthetic Joint Infection; PJI; Gut dysbiosis; Biomarkers; Zonulin, LPS; sCD14

Introduction: Periprosthetic joint infection (PJI) is a serious complication that can occur after total joint arthroplasty. Recent research has suggested an association between the gut dysbiosis and PJIs. The gut microbiome may have a significant impact on the development of PJI. The composition of gut microbiota is shaped and modified by various factors, including genetics, nutrition, smoking, obesity, diabetes, and Inflammatory bowel diseases. Gut microbiota plays an important role in maintaining the host's health, and alterations in its balance can lead to gut dysbiosis, which can contribute to the onset of a wide range of infections, especially PJI. The loss of the mucosal barrier in the gut may be linked to acute and chronic PJI. An increase in biomarkers such as zonulin, soluble CD14 (sCD14), and lipopolysaccharide (LPS) in patients undergoing arthroplasty and suffering from PJI confirms the hypothesis that the loss of the mucosal barrier in the gut may be associated with PJI. There are many modifiable risk factors for PJI; antibiotic prophylaxis is one of the most crucial risk factors that can alter the gut microbiota and shift it to dysbiosis, which can lead to the development of PJI. This review examines the relationship between gut dysbiosis and PJI and summarizes research evidence supporting the correlation between gut microbiota and PJI. A deeper understanding of how the gut microbiota affects PJI can reveal how its imbalance triggers a pro-inflammatory response, impacting the health of patients with PJI.

Purpose: This review examines the relationship between gut dysbiosis and PJI and summarizes research evidence supporting the correlation between gut microbiota and PJI. A deeper understanding of how the gut microbiota affects PJI can reveal how its imbalance triggers a pro-inflammatory response, impacting the health of patients with PJI.

Study design: Review

Method and Material: not capable.

Result: Gut microbiota plays an important role in maintaining the host's health, and alterations in its balance can lead to gut dysbiosis, which can contribute to the onset of a wide range of infections, especially PJI. The loss of the mucosal barrier in the gut may be linked to acute and chronic PJI. An increase in biomarkers such as zonulin, soluble CD14 (sCD14), and lipopolysaccharide (LPS) in patients undergoing arthroplasty and suffering from PJI confirms the hypothesis that the loss of the mucosal barrier in the gut may be associated with PJI. There are many modifiable risk factors for PJI; antibiotic prophylaxis is one of the most crucial risk factors that can alter the gut microbiota and shift it to dysbiosis, which can lead to the development of PJI.

Conclusion: In summary, we acknowledge that PJI is a complex disease influenced by numerous factors, including genetics, environment, and immune response. Based on evidence, we hypothesized that the gut microbiome and permeability may play a role in shaping the body's immune response. The results of this comprehensive review suggest that there is a link between gut dysbiosis and an increased risk of PJI in both humans and murine. Although the evidence is limited, patients with PJI were found to have altered gut permeability and higher levels of inflammation markers, indicating an underlying dysbiosis. The risk of PJI is associated with decreased gut biodiversity, the presence of IBD, increased gut inflammation/permeability, or an alteration in the healthy gut microbiota ratio. It is important to address and maintain a healthy gut microbiome to reduce the risk of PJI. These findings have practical implications and highlight the importance of considering the role of gut modulators like probiotics and prebiotics in treating patients with PJI, who often require extended antimicrobial treatment. Further research is necessary to investigate the relationship between the 'gut microbiome and PJJ and the potential impact of gastrointestinal modulators.

3D Printing Polycaprolactone-Based Scaffolds for Meniscus Tissue Engineering Applications

Mohmmad Hossein Ebrahimzadeh MD, Afsaneh Jahani, Ali Moradi MD

Keywords: Polycaprolactone ,3D-printed, meniscal repair

Aim: A meniscus defect is a medical condition characterized by damage or injury to the meniscus, a crucial piece of cartilage located within the knee joint. Meniscus defects can manifest as a result of several factors, encompassing sports-related injuries, repetitive stress, the natural aging process, or degenerative joint disease. Symptoms of meniscus defects may include pain, swelling, stiffness, and difficulty moving the knee joint. Surgical intervention is frequently necessary to address meniscal injuries, typically involving techniques such as allograft transplants or the utilization of commercial implant devices for repair. An ideal meniscal scaffold should possess mechanical properties that closely resemble those of the natural meniscus tissue, and lead to improved functional of meniscus. These scaffolds are specifically engineered to serve as replacements for damaged or missing meniscus tissue and provide support to the knee joint. Meniscal scaffolds are made of biocompatible materials synthetic and natural biopolymers, which allow for the regeneration of new meniscus. Polycaprolactone (PCL), that has the capability to fabricate a meniscus replacement customized for each individual patient. PCL is a popular The material utilized in the 3D printing method due to its biodegradability, biocompatibility, and ease of use. Accordingly, ongoing review is focusing to promote of meniscal 3D scaffolds and meniscus tissue engineering (MTE) through the utilization of advanced fabrication methods, such as three-dimensional (3D) printing base on PCL that has the capability to fabricate a meniscus replacement tailored specifically to each patient's unique needs and anatomical requirements.
Introduction: The meniscus, which is a semilunar pad of cartilage situated within the knee joint, is typically divided into two distinct parts: The medial meniscus and the lateral meniscus are two important structures in the knee joint. This tissue has several roles in the natural joint, which can be attributed to the shock absorption, distribution, and the transfer of loaded weight to the underlying bone. The meniscus has similar structure to cartilage tissue with higher strength and elasticity, that it composed of collagen I, II and fibrocartilage tissue. Treatment options range from non-surgical and surgical interventions including physical therapy, and medication, and injection, and assistive device, to surgical interventions including meniscectomy (arthroscopically), meniscus allograft transplantation (MAT) and meniscus scaffolds. Meniscectomy approach are the most common surgery which using to degeneration of damage in appropriate zone of meniscus including the red-red or red-white zone.
Although allograft transplants promote knee functionality and pain relief in the short/medium term, however, in some patients depending on the meniscus damage type it cannot be used.

In addition, angiogenesis is critical to tissue regeneration; therefore, to the lack of proper porosity, angiogenesis does not occur in the meniscal avascular zone. So, repairing of the injuries in the meniscal avascular portion is called white zone remained as important challenge due to the limited self-healing capacity is a significant factor in the need for surgical intervention. In this regard, various materials and methods are used in order to develop meniscus scaffolds that have mimic the function of the native meniscus tissue for meniscus tissue engineering (MTE). The meniscus scaffolds for have successful clinical trial must to make with a similar shape, strength, compliance, and contact mechanics with the natural meniscus. Scaffold fabrication for MTE applications has garnered significant attention due to the utilization of natural, synthetic, or natural/synthetic composite biomaterials sourced from biopolymers. The different methods such as fused deposition modeling (FDM) or three-dimension (3D) printing, melt molding, electrospinning and lyophilize were applied to mimic the mechanical and biological properties of the native meniscus. In between, the 3D printing method is a desirable process for the fabrication of scaffolds with suitable structural, mechanical and biological properties for MTE applications. Mojun et al. fabricated 3D-printed scaffolds to achieve the unique shape, architecture, and possess suitable mechanical properties. Also, the 3D printing method was employed to create a unique porous structure for the meniscus scaffolds with controlled internal structure to enable native lubrication mechanisms of the knee. The bioink, a vital component of 3D bio-printing, plays a crucial role in the promotion of meniscus tissue structures.

Different bioink polymeric are used for the meniscus scaffolds fabrication to meniscal repair.

Purpose: The 3D printing process with a controllable design, has been introduced as a suitable method for optimizing the structural, mechanical, and biological properties of the 3D scaffolds for meniscus tissues. In the context of this review article, our focus is on the examination of composite 3D-printed scaffolds for MTE applications, specifically those based on PCL.

Methods:

Study design: review article

Method and Material: Polycaprolactone (PCL) is a linear synthetic biodegradable polyester with very high strength, flexibility and toughness that is both biocompatible and aliphatic in nature. PCL with high biocompatibility, biodegradability, low melting temperature, low glass transition temperature, excellent mechanical properties, and outstanding thermal stability take many attraction in tissue engineering (TE) application. Also, PCL as semi crystalline polyester, is one of the most favorable thermoplastic polymers to produce scaffolds for MTE. The surface chemistry of PCL can be modified easily; The properties of the biomaterial can be significantly modified, including its hydrophobicity and degradation characteristics. PCL has Food and Drug Administration (FDA)-approved as surgical implants and drug delivery devices for TE and regenerative medicine applications). The mechanical properties of

meniscal scaffolds have been identified as playing a pivotal role in their function and improvement of the artificial scaffold to simulate the native meniscus is another large challenge in MTE (Murphy et al., 2019). Siddiqui et al. have achieved similar results, highlighting Poly (ε-caprolactone) (PCL) as an ideal choice for fabrication due to its exceptional structural, mechanical, and biological properties.

Result: It is confirmed that the meniscal defect is closely associated with the development of knee osteoarthritis. A potential constructive approach for addressing meniscal defects includes options such as meniscal transplant utilizing allografts, the use of artificial scaffolds, or performing arthroscopy. Synthetic scaffolds offer distinct advantages as they can be manufactured to specific requirements, including desired shapes, sizes, precise porosity dimensions, and biomechanical characteristics. This level of customization enhances their suitability for addressing meniscal defects effectively. Therefore, the 3D printing method used to fabricate 3D scaffolds for MTE applications and 3D-printed scaffolds in meniscus repair was investigated

Conclusion: PCL is a widely used polymer known for its exceptional biomedical properties, biocompatibility, slow degradation rate, and favorable mechanical characteristics. These attributes make PCL highly suitable for various TE applications such as MTE. Also, PCL was approved by the FDA for use in biomedical applications such as meniscal regeneration. According to clinical implantation, PCL is widely used in meniscus repair, although many limitations have been exposed with its use. 3D-printed PCL-based scaffolds in order to mechanical and biological properties could be conjugated with synthetic polymers such as PU, PGA, or PLGA and PEG. In addition, the combination of 3D-printed PCL-based scaffolds with natural polymers like collagen, chitosan, and SF can offer several advantages. This combination can result in more hydrophilic scaffold structures that promote cell adhesion, cell proliferation, and cell migration. Furthermore, it allows for the creation of scaffolds with tunable mechanical properties, which are crucial for meniscus repair applications. The incorporation of natural polymers enhances the biocompatibility and bioactivity of the scaffolds, facilitating tissue regeneration and improving their overall suitability for meniscal repair. Among this scaffolds, the 3D-printed PCL/silk scaffolds promote biocompatible and mechanical properties that are not observed in pure scaffolds base on PCL. Moreover, the efficiency of various materials and 3D printing of scaffolds needs to be improved in the future.

How effective is diluted povidone-iodine in preventing periprosthetic joint infection in total joint arthroplasty (TJA)? An updated systematic review and meta-analysis

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Keywords: Periprosthetic joint infection; Total joint arthroplasty; Diluted povidone-iodine; Wound irrigation

Aim: Periprosthetic joint infection (PJI) is a serious complication with total joint arthroplasty (TJA), that necessitates reoperation. Pre-closure irrigation with dilute povidone-iodine (PI) is among the preventive measures, but its efficiency is still controversial. As a result, the focus of this systematic review and meta-analysis is on the effect of dilute PI wound irrigation in the prevention of PJI following TJA.

Methods: We systematically reviewed and analyzed articles that compared PI with other agents in terms of PJI rate after TJA, searching Medline, Scopus, Web of science, and Cochrane databases. A number of 13 papers including 63,950 patients in total, were finally considered in qualitative and quantitative assessments. We have also further assessed review articles.

Results: In comparison with normal saline (NS), PI reduced post-operative infection rate (OR: 0.44; CI 95%: 0.34–0.56). However, there was no difference between PI and chlorhexidine (CHG) (OR: 1.61; CI 95%: 0.83–3.09)) or undetermined comparators (OR: 1.08; CI 95%: 0.67–1.76).

Conclusion: PI irrigation seems an efficient preventive measure for post-operative PJI and would seem to be the most feasible for TJA protocol.

Clinical Outcomes and Complications Following Hip Fusion Conversion to Total Hip Arthroplasty: A Systematic Review and Meta-Analysis

Mahla Daliri MD, Mohammadhosein Ebrahimzadeh MD, Ali Parsa MD, Reza Ganji MD, Omid Shahpari MD, Ali Moradi MD, Masoumeh Sadeghi

Keywords: Total hip arthroplasty, Hip fusion conversion, Hip arthrodesis, Hip function, Implant survival, Complication rate

Aim: Efficacy, clinical outcomes, and complications following hip fusion conversion to total hip arthroplasty (THA) surgery have been explored in several studies with controversial findings and no consensus. In order to test our hypothesis regarding that hip fusion conversion to THA can improve patient's function and quality of life, we decided to conduct an up-to-date and comprehensive systematic review and meta-analysis on the THA outcomes in patients who have fused hips, with evaluation of 1) hip function 2) leg length discrepancy, 3) range of motion, 4) pain score, and 5) complications. The findings of this review may help inform clinical decision-making and optimize patient management in this unique patient population.

Methods: Comprehensive search of online databases was performed through December 2022 for prepost clinical trials using MeSH keywords. Harris hip score (HHS), leg length discrepancy (LLD), pain score, and range of motion (ROM) were considered as clinical outcomes along with implant survival and complications. The retrieved studies were assessed for methodologic quality. Weighted mean difference (WMD) with 95% confidence interval (CI) were calculated using random effects meta-analysis taking into account for heterogeneity. Subgroup meta-analysis as well as sensitivity analysis were performed.

Results: Findings of meta-analysis on 34 trials showed that HHS increase after THA (WMD: 42.3; 95% confidence interval (CI): 38 to 47). Subgroup analyses indicated that cementless prosthesis, length of arthrodesis <12 years, age <45 years, and studies with good quality have more HHS improvement. The LLD decreased 21 mm (95% CI: 19 to 24 mm) based on 21 trials. The range of motion (ROM) reached to 89 (95% CI: 84 to 95) for flexion, 32 (95% CI: 27 to 37) for abduction, 25 (95% CI: 21 to 29) for adduction, 29 (95% CI: 25 to 33) for external rotation, and 25 (95% CI: 20 to 31) for internal rotation after surgery. The most common complication was heterotopic ossification (14%).

Conclusion: Conversion of an ankylosed hip to THA leads to improved hip function and leg discrepancy with relatively notable rate of complications. Our findings could provide a framework to guide surgeons and decision makers.

Deep Learning-Based Segmentation of Femoral Head with Non-Traumatic Lesions for a Very Small Training Set

Najmeh Eghbal, Omid Shahpari MD

Keywords: Segmentation; Femoral head; Deep learning; Avascular necrosis; Osteonecrosis; Lesion; Plain Radiography; Transfer learning.

Aim: Segmentation of organs, diseases and anomalies in medical images is one of the key tools in analysis and diagnosis of diseases. In this regard, segmentation the femoral head in a non-traumatic disease is also one of the important stages in image analysis of hip diseases. Despite the availability of many registries for hip, finding a suitable training set for learning femoral head segmentation can be easily possible, but registries containing images of the femoral head with non-traumatic lesions are very scarce or not available. Therefore, training a network for femoral head segmentation with lesions faces the challenge of data scarcity.

Methods: This study is based on segmentation of plain radiography images of patients with avascular necrosis (AVN) of the femoral head. The available dataset for these patients is very small. Initially, by augmentation, the number of images in this small dataset is tripled. Then, using a deep neural network, Detectron2, and a large dataset of hip images (with normal and abnormal femoral heads), the network is trained to segment the femoral head. This network is called the initial network. To enhance the initial network for segmentation of images of patients with AVN in the femoral head, transfer learning is used for the augmented small dataset.

Results: The proposed segmentation method shows better performance compared to the initial network on all test images. The proposed network's mean Dice score compared to the initial network is 0.91 to 0.73.

Conclusion: With the help of transfer learning, a segmentation network trained with a large and general dataset was improved to segment a small and specific dataset. Certainly, increasing the femoral head dataset with AVN lesion will help to increase the accuracy of the resulting network.

Role of Hip Arthroscopy in the Treatment of Avascular Necrosis of the Hip: A Systematic Review

Omid Shahpari MD

Keywords: Avascular necrosis of femoral head, Hip arthroscopy, Ischemic bone necrosis, Osteonecrosis

Aim: Avascular necrosis (AVN) or osteonecrosis of the femoral head occurs as a result of a vascular supply disruption that could lead to hip osteoarthritis. Recently, several joint-preserving procedures have been suggested to improve the outcome of AVN, including hip arthroscopy. This systematic review aimed to investigate the role of hip arthroscopy to preserve hip joints suffering from AVN.

Methods: This review was conducted to collect data on hip arthroscopy from the available literature for the management of AVN. The collected articles included those that were focused mainly on the management of AVN assisted by arthroscopy and published up to 2020 that were searched in four databases using such keywords as “Avascular Necrosis”, “AVN”, and “Osteonecrosis” in combination with “Hip Arthroscopy” or “Arthroscopic Hip Surgery

Results: In total, 13 articles met the eligibility criteria, and no severe complications were reported after arthroscopy in patients with AVN. Moreover, the Harris scores were higher than 79 after the operation. The majority of the assessments showed that the use of arthroscopy was effective in the diagnosis and treatment of patients with AVN, except for one study, which had been performed on patients with stage IV AVN

Conclusion: Arthroscopy can be used as an adjunct procedure in patients with early-stage AVN for both diagnostic and therapeutic purposes

Arthroscopic Bankart Repair vs. Latarjet Procedure for Recurrent Shoulder Instability: A Meta-Analysis of Clinical Outcomes and Complication Rates in General and Athletic Populations

Mohammadhosein Ebrahimzadeh MD, Mahla Daliri MD, Masoumeh Sadeghi, Rasoul Hoseinzadeh, Mahdieh Sahebi, Ali Moradi MD, Mahdieh Samei

Keywords: Shoulder instability, Anterior dislocation, Bankart, Latarjet, Recurrence, meta analysis

Aim: The age-old question of choosing between arthroscopic Bankart repair and the Latarjet procedure for recurrent shoulder instability persists. This systematic review and meta-analysis aimed to compare patient-reported outcomes, recurrence, and complications between the two procedures, considering both athletic and non-athletic populations.

Methods: Relevant clinical trials were identified through a systematic search of databases up to April 2023 including PubMed, Scopus, Web of Science, and Cochrane. Studies were included if they compared patient-reported outcomes or complications rates of open Latarjet procedure versus arthroscopic Bankart repair. Continuous data, such as patient-reported outcomes (e.g., Rowe score), were pooled as the weighted mean difference (WMD). For dichotomous data such as recurrence and revision rates, we calculated the pooled risk ratio (RR) with 95% confidence intervals (CIs) using random effects meta-analysis.

Results: 21 clinical trials were included in the meta-analysis involving a total of 13043 operated shoulders. The instability, as measured by the ROWE score, was significantly higher in the Latarjet group by an average of 4.55 points (95% CI: 2.41 to 6.68). This difference was more pronounced in athletes, with an increase of 5.47 points (95% CI: 0.16 to 10.78), compared to the non-athletic population: 4.03 (95% CI: 2.04 to 6.02). Return to sport time was shorter by 0.4 months (95% CI: -0.75 to -0.05) in the Latarjet group. Regarding recurrence and the risk of revision due to instability, patients who underwent arthroscopic Bankart had a 3.32 times higher risk (RR=3.32, 95% CI: 2.28 to 4.83) compared to those who had the Latarjet approach. The total complication rate was approximately 47% lower in the Bankart group (RR=0.53, 95% CI: 0.31-0.90). Additionally, the risk of hematoma was 75% lower in patients undergoing the arthroscopic Bankart compared to the Latarjet procedure.

Conclusion: The Latarjet procedure outperforms in patient-reported outcomes and demonstrates a lower recurrence rate and higher stability. Conversely, the arthroscopic Bankart procedure is associated with a lower incidence of complications.

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