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Clinical Connect

Fostering a culture of innovation and excellence

Orthopedics & Joint Replacement Special

Better Bone Health

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Leadership Message

Dr Bishnu Panigrahi
Head – Medical Strategy and Operations
Fortis Healthcare, Corporate Office

Dear Fortisians,

It gives me immense pleasure to introduce this latest issue of Clinical Connect focusing on Orthopedics and Joint Replacement. Over the last two years, Fortis Healthcare has been fortunate to gather insights from our esteemed clinicians across various specialties and share them through Clinical Connect.

This edition spotlights Orthopedics, one of the key focus specialties for Fortis Healthcare. Through collaboration and dedication, we have been able to receive articles of significant interest, showcasing our skill and talent in Orthopedics care at Fortis. On a pan India level, across the Indian Corporate Healthcare landscape, Fortis Orthopedics stands as a frontrunner. Our orthopedics clinicians have set new standards in the industry, consistently delivering cutting-edge interventions with excellent outcomes. Notably, they have been pioneers in the Industry in capturing clinical outcomes for Total Knee Replacements, setting a benchmark for the field.

I extend my heartfelt gratitude to the entire Clinical Connect team, the Secretariat and the Editorial Board for their unwavering commitment to excellence.

I take this opportunity to acknowledge and appreciate the invaluable support provided by the MSOG team members.

As we continue to advance in the realm of healthcare, let us take pride in our achievements and remain steadfast in our pursuit of providing exemplary patient care. Together, we reaffirm our commitment to innovation and clinical excellence.

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2. Having TKR (Total Knee Replacement), THR (Total Hip Replacement), PKR (Partial Knee replacement) Software's.
3. Having Haptic Technology.
4. less soft tissue damage
5. Improved recovery times and faster hospital discharge.
6. Improved mechanical alignment and prosthesis.
7. Reduced pain after surgery
8. Higher patient satisfaction

Dr Harsimran Singh
Chair
Director – Orthopedics
Fortis Hospital, Mohali

The Clinical Connect, a unique initiative of the Fortis Healthcare team, serves as a vision document for dissemination of new information and progress in the various specialties of health sciences. In the current issue, the spotlight is on Orthopaedics and Joint Replacement.

The past decade and half have seen a phenomenal evolution in the use of technology in Orthopaedics, especially Joint Replacement Surgery. According to a recent AIIMS study, over 2.5 lac knee replacements were performed in India in 2022. An ever-increasing number of patients are accepting joint replacement surgery, thanks to significantly improved patient outcomes, reduced recovery times, and elevated overall quality of life.

The advent of Computer Navigation and now Robotic assistance for knee replacement, allows for precision and personalization, as surgeons can create 3D models of a patient's joint, facilitating meticulous surgical planning and execution. There is still some scepticism in accepting new technology as data is still awaited regarding statistically significant improvement in outcomes or cost-effectiveness compared to conventional surgery. Nevertheless, computer navigation and robotic assistance, still stand as a ground-breaking advancement, with the potential of revolutionizing this field.

Recent years have seen the development of innovative materials for knee and hip joint replacement implants, such as ceramic and advanced metals. These materials offer durability, reduced wear, and enhanced biocompatibility, contributing not only to extended implant lifespan but also to a more natural feel and improved range of motion for patients.

Advancements in surgical techniques have given rise to minimally invasive procedures for joint replacement. Smaller incisions result in less trauma to surrounding tissues, reduced pain, and quicker recovery times. Patients undergoing minimally invasive joint replacement often experience shorter hospital stays, allowing them to resume daily activities sooner than those undergoing traditional open surgeries. Improvements in OT sterilization and theatre discipline are helping to reduce the incidence of Prosthetic Joint Infections to less than 1 percent.

Researchers are exploring biological approaches to stimulate joint regeneration and repair damaged tissues. Techniques such as stem cell treatments show promise in promoting healing and reducing inflammation. These innovations hold the potential to delay or even eliminate the need for knee and hip joint replacement surgery in certain cases.

The landscape of orthopaedics and joint replacement is undergoing a remarkable transformation, driven by advancements in technology, materials, and surgical techniques. These innovations not only enhance the success rates of joint replacement surgeries but also elevate the overall patient experience. As the field continues to evolve, the future promises even more ground-breaking developments, offering hope for individuals with musculoskeletal disorders to lead healthier, more active lives. The Clinical Connect remains committed to providing a comprehensive insight into these transformative strides in healthcare.

Cori Smith - Nephew Ortho Robot
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4. less soft tissue damage
5. Improved recovery times and faster hospital discharge.
6. Improved mechanical alignment and prosthesis.
7. Reduced pain after surgery
8. Higher patient satisfaction

Dr Vikramjit Singh
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Fortis Healthcare Limited has established itself as one of the largest healthcare providers offering world-class, cutting-edge medical infrastructure. With a wide spectrum of advanced technology, Fortis has revolutionized healthcare and is able to cater to the growing demands of patients for comprehensive care.

Fortis has been consistently delivering personalised healthcare and has always been a front runner in the healthcare industry. We offer the most advanced, world-class treatment options under various specialties including Trauma, upper and lower extremity reconstruction, Arthroplasty, Sports Medicine and Arthroscopy, Foot and ankle surgery, Spine, Hip replacement, fracture management, hand surgery and Ortho onco-surgery, and Rehabilitation at our hospitals.

In this special edition of Clinical Connect, our prime focus is on the latest, path-breaking advancements in the field of Orthopedics, new surgical procedures, innovative knowledge, perspectives and rare feats achieved by our highly skilled and experienced doctors.

Besides offering a detailed insight into the recent technological advancements in Orthopedics care, this special edition will prove to be a benchmark for aspiring doctors.

At Fortis, we undertake relentless efforts to achieve perfection and remain committed to leaving no stone unturned in bringing global standards of best patient care.

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Advanced Techniques in Orthopedics Surgery

Management of Lateral Femoral Condyle Non-union with Autogenous Bone Graft in CAS Total Knee Arthroplasty

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Introduction

Neglected distal femur fractures often present with significant uncontained bone defects of the lateral femoral condyle (LFC) leading to a valgus deformity and lateral compartment arthritis.

Case Report: Bone defect can be managed with the help of autogenous bone graft harvested from a distal femur cut and shaped in the form of an augment. The objective of using bone graft along with the primary femur was to restore bone stock in a young patient and prevent the use of an augment with a revision femur and intramedullary rod.

Conclusion

The use of computer navigation helped in getting accurate components and overall alignment thus facilitating compression at the bone graft site and early union.

Case Report

Case 1: A 42-year-old male presented with non-union of the distal LFC (Fig. 1). The fracture was managed conservatively elsewhere and the patient presented

Figure 1: (a-c) Pre-operative radiographs showing vulgus deformity and nonunion lateral femoral condyle with end-stage arthritis.

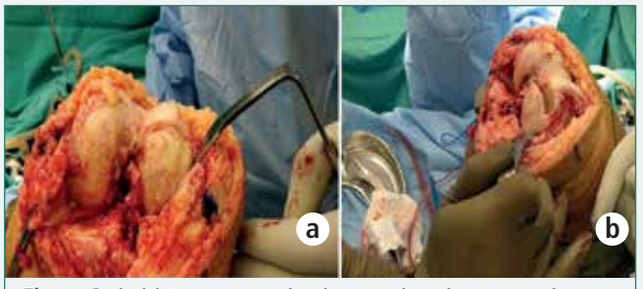

Figure 2: (a-b) Intraoperative image showing nonunion lateral femoral condyle.

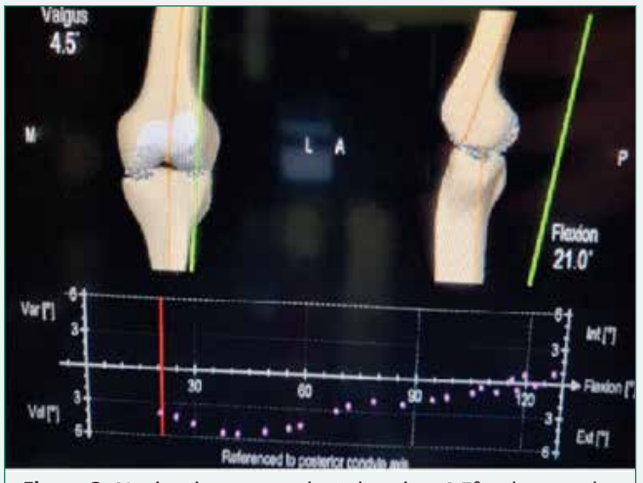

Figure 3: Navigation screenshot showing 4.5° valgus and 21° fixed flexion deformity

with progressive valgus deformity and inability to bear weight. On examination, the pre-operative range of motion was 25–100°. His knee society score (KSS) was 49 and Western Ontario and Macmaster Universities Osteoarthritis Index (WOMAC) was 31.

TKA was performed with image-free Ci navigation system (Brain Lab, Munich, Germany) using a cemented, posterior cruciate substituting design (Legion®, Smith and Nephew, USA). Pins were inserted inside the incision, through a standard medial parapatellar approach (Fig. 2). The pre- operative kinematics navigation graph demonstrated a fixed flexion deformity of 21° with 4.5° of valgus deformity (Fig. 3). Valgus deformity was gradually corrected with progressive knee flexion. An additional 2 mm of distal femur cut was planned to correct severe fixed flexion deformity. Then femur was prepared with size 7 and rotation was checked with the help of navigation. 8 mm of tibia was cut with 3° of posterior slope. Lateral tibial osteophytes were removed and mediolateral gaps were analysed. The residual deformity was corrected with the release of the iliotibial band in extension.

Surgical technique for bone grafting of the LFC

The primary femu r was trailed on the prepared bone cuts and the bone defect of the LFC was measured with a scale. It was 7 mm in case 1 and 10 mm in case 2. The distal femur cut from the medial femoral condyle was shaped in the form of an augment and used to bone graft the defect of the LFC. Cartilage was removed from the graft and shaped according to the defect with the help of saw (triangular in case 1 and rectangular in case 2). Drill holes were made in the bed of the LFC and the bone graft was fixed with 2 cortical screws (Fig. 4). The distal part of the screw heads was over- drilled and countersunk to achieve compression at the bone grafting site. The bone graft was well fixed and had no motion after screw fixation. The primary femur trial did not have any movement and was very stable after the bone graft. It was ensured that cement did not percolate between the bone graft and host bone at the time of cementing the final implant. There was a complete correction of the biplanar deformity as demonstrated by post-operative kinematics graph. Post-operative anteroposterior and lateral radiographs showed well- placed femoral and tibial prosthesis components with correct limb alignment and bone graft fixed with two cortical screws.

The KSS improved from 49 to 98 and the WOMAC score improved from 31 to 90. At 2 years follow up X-ray showed a union of the bone graft with no evidence of loosening of the femoral prosthesis (Fig. 5). The patient had ROM of 0º–110º. His post-operative KSS improved to 98 and WOMAC score to 90 at 2 years' follow-up.

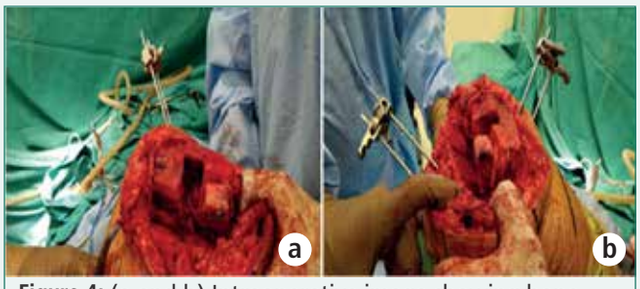

Figure 4: (a and b) Intraoperative image showing bone graft fixation.

Figure 5: (a and b) Two-year follow up X-ray showing union of bone graft with well-aligned components.

Case 2 : A 43-years-old male presented with a history of right lateral femoral condylar fracture operated elsewhere in March 1999. He had progressive valgus deformity with the inability to ambulate. The right knee had ROM from 2° to 90°. The pre- operative anteroposterior and lateral radiograph show non-union of the LFC along with valgus deformity (Fig. 6).

Navigation showed pre-operative deformity of 24° valgus with 2.5° of fixed flexion deformity. Kinematic graph (right side of screen) showed tight lateral gap in extension and flexion (Fig. 7).

Cemented, posterior cruciate substituting design was planned. The femur was prepared first with a 9.5 mm distal femur resection. The extension gap was assessed and femur was prepared with size 6 anterior-posterior chamfer cutting jig. Tibia was prepared using an extramedullary jig under navigation control. After tibial preparation lateral osteophytes were removed. Flexion and extension gaps were again reassessed and residual deformity was analysed. There was 3° of residual valgus deformity, which was corrected with release of iliotibial band in extension and popliteus tendon in flexion. The advantage of using computer navigation in this case was obliteration of intramedullary cavity by the screw inserted 20 years back. It was not possible to remove the screw as it was deeply embedded in the bone.

Figure 6: (a-c) Pre-operative radiographs showing valgus deformity with malunited lateral femoral condyle.

Figure 7: (a and b) Navigation screenshot showing pre- and post-operative kinematic graph.

A lateral condyle bone defect was visualized, for which bone graft was harvested from distal cut of medial femoral condyle and was shaped in the form of an augment. The bone graft was fixed with the help of two cortical screws (Fig. 8).

After fixation of the bone graft, the primary femur had good stability and hence there was no need to add metal augment with revision femur and a rod. The purpose in this case was to restore bone in a young patient and avoid the need for revision femur and intramedullary rod. Patellar resurfacing was done and appropriate patellar tracking was achieved.

The post-operative radiographs show well-placed femoral and tibial prosthesis components with correct limb alignment. At 2 years' follow–up, the x-ray showed a union of the bone graft with no radiolucent lines in any of the zones around femur and tibia (Fig. 9).

We observed increase in KSS from 49 to 100 and WOMAC scores from 30 to 92. The final range of motion achieved was 0°–120° flexion.

Post-operative rehabilitation and follow-up: Static quadriceps strengthening exercises with gentle ROM were started for both patients from the immediate post-operative day. Patients were made to walk full weight bearing from the next post-operative day. Both the patients were followed up with radiographs at 2 months, 6 months, and 1-year interval.

Discussion

The main aim of this case report is to share the technique of using autogenous bone graft for

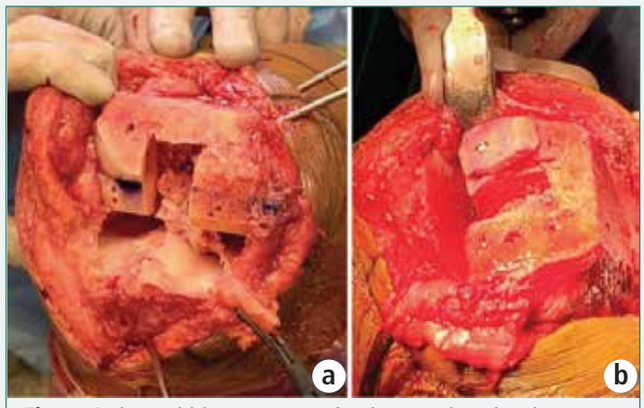

Figure 8: (a and b) Intraoperative image showing bone graft fixation for distal lateral femoral condyle defect.

Figure 9: Two-year follow-up X-ray showing union of bone graft with well aligned components.

uncontained defect of the LFC in computer-assisted TKA.

Neglected lateral condyle femur fractures as shown in the two cases present with significant bone defect of the LFC leading to valgus deformity and lateral compartment arthritis. One method to reduce the bone defect as often practiced in tibia is to resect 2–3 mm more bone and use a thicker poly but this method cannot be used in the femur as it would increase the extension gap selectively. While the bone grafting technique is well described in literature for uncontained defects on the tibial side, there are no studies suggesting bone grafting on the femoral side in primary TKA.

We have used bone grafting on the femoral side as it is cost- effective method when compared to using an augment, revision femur, and an intramedullary rod. The cost of using bone grafting with a primary femur is almost half when compared to the revision set. The bone grafting technique restores bone stock in young patients and will facilitate revision whenever required.

A common way to handle such a situation is to build the bone defect with a metal augment.

However, whenever a metal augment is used a revision femur along with an intramedullary stem has to be used to prevent component failure. We have taken a contrarian approach and used autograft shaped in the form a distal augment and fixed with two cortical screws. We have used a primary femur thus eliminating the use of an intramedullary stem.

The graft was completely incorporated at 2-year follow-up and there were no signs of loosening of the femoral component. This along with the use of computer navigation in both cases ensured complete correction of deformity in both coronal and sagittal planes, thus leading to accurate alignment and ligament balance. This could also be a factor in early incorporation of the bone graft as the weight-bearing axis passing through the center of the knee joint would lead to compression forces prompting the union of the bone graft.

Current controversies and future considerations: Our technique of using autograft for uncontained defect of the LFC in neglected lateral condyle femur fractures is unique and leads to restoration of bone stock along with use of primary femur in young patients. We continue to follow-up on these patients with the objective of detecting any loosening of the femoral component in the mid-term.

Biological Stabilisation vs Mechanical Fixation: Do We Always Require Instrumentation in Anterior Decompression Surgeries for Thoracolumbar Spinal Tuberculosis?

Source : doi: 10.1007/s43465-023-00827-4

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Keywords- Anterior decompression; Kyphosis; Paraplegia; Potts spine; Spinal tuberculosis; Strut grafting.

This study delves into the debate surrounding the necessity of instrumentation in anterior decompression surgeries for thoracolumbar spinal tuberculosis. By comparing the outcomes of biological stabilization and mechanical fixation, the research aims to provide insights into whether instrumentation is always essential in these procedures. The study considers factors such as surgical efficacy, complications, and long-term stability to contribute valuable perspectives to the evolving landscape of spinal tuberculosis management.

Introduction: Anterior decompression surgeries are integral to the treatment of thoracolumbar spinal tuberculosis, aiming to alleviate neurological compromise and promote spinal stability. The longstanding question of whether instrumentation is imperative in achieving successful outcomes remains a topic of discussion. This study explores the comparative efficacy of two approaches—biological stabilization and mechanical fixation—in anterior decompression surgeries, shedding light on the necessity of instrumentation.

Methods: A comprehensive analysis was conducted, involving patients undergoing anterior decompression surgeries for thoracolumbar spinal tuberculosis. Two distinct cohorts were studied: one subjected to biological stabilization techniques, emphasizing the body's natural healing processes, and the other employing mechanical fixation with instrumentation. Surgical outcomes, complications, and postoperative stability were meticulously assessed through a combination of radiographic evaluations, clinical follow-ups, and patient-reported outcomes.

Results: Preliminary findings suggest that both biological stabilization and mechanical fixation approaches demonstrate efficacy in anterior decompression surgeries for thoracolumbar spinal tuberculosis. The study reveals that biological stabilization techniques, leveraging autografts or allografts to promote natural fusion, exhibit favorable outcomes in terms of neurological recovery and infection control. Conversely, mechanical fixation provides additional stability, reducing the risk of postoperative deformities and enhancing the chances of successful fusion.

Discussion: The study's results prompt a nuanced discussion on the necessity of instrumentation in anterior

decompression surgeries for thoracolumbar spinal tuberculosis. While biological stabilization techniques showcase promising outcomes, especially in terms of infection control and neurological recovery, the additional stability provided by mechanical fixation cannot be overlooked. Surgeons must carefully weigh the benefits of each approach against potential complications and patient-specific factors.

Conclusion: This study contributes to the ongoing discourse on anterior decompression surgeries for thoracolumbar spinal tuberculosis, questioning the conventional assumption of the obligatory need for instrumentation. The comparative analysis of biological stabilization and mechanical fixation provides a nuanced perspective, emphasizing the importance of tailoring surgical approaches to individual patient needs. Further research, including prospective studies and randomized controlled trials, is warranted to validate these findings and guide the development of personalized treatment strategies in the realm of spinal tuberculosis management.

A Novel Technique for Reducing Sagittal Unstable Intertrochanteric Hip Fracture"

Source:https://ejmcm.com/issue-content/a-novel-technique-for-reducing-sagitally-unstable-intertrochanteric-hip-fractures-967

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Abstract

Introduction: Intertrochanteric fractures are common fractures which needs to be reduced and fixed appropriately for optimum outcome. Poor reduction increases the chances of its failure by multiple times. Sagitally, split fractures are notorious due to the associated flexion and sagging of distal fragment. Indirect reduction techniques have been used but with less reliability.

Methods: This study tries to evaluate and put forward a technique to fix these fractures adequately translating into good clinical outcome. the fracture reduction was tried under traction. A stab incision was put anteriorily to manage the flexion of the proximal fragment.

Conclusion: it is a simple and effective technique. Digital palpation by the operating surgeon aids in reduction and gets the idea of spatial orientation of the neck and thus it is easy to direct the guide wire along the direction of the neck which otherwise may take multiple trials and increased radiation exposure.

Operative Technique

After intubation the patient is placed on a fracture table in supine position with the non- affected leg kept in well leg holder with the hip and knee in flexion, external rotation and abduction to provide passage for the C arm. A well-padded perineal post is kept to avoid undue pressure on the labia or the scrotum while giving traction. The affected leg is kept and strapped adequately in a boot present on the end of the fracture table (Fig. 1).

The trial of closed reduction is given i.e. linear traction and adduction with internal/external rotation of the limb. AP and Lateral views are taken using C arm. If found un-reduced in the sagittal plane (Fig. 2) the following technique is followed after painting and draping the patient.

The anterior superior iliac spine (ASIS) is marked and a line is drawn from the ASIS along the femoral axis. A point around 9cm distal to the ASIS is marked which corresponds to the inferomedial aspect of the proximal fragment. After confirming the point on C arm with an artery forceps a 2cm stab incision is given at this point

and a finger is inserted by blunt dissection till it reaches the fracture site. (Fig. 3)

The finger pushes the flexed proximal fragment posteriorly as the assistant lifts the distal fragment thereby reducing the fracture site, which is then confirmed under C arm. After it is confirmed that the fracture gets reduced with this technique, the finger is removed and standard procedure of cephalon-medullary nailing is carried out. We use PFN A2 for all our cases. Guide wire is inserted after locating proper entry point and confirming it under C arm (Fig. 4). This step is very crucial for doing a PFN surgery and should be given adequate consideration. Proximal reaming is done and un-reamed/ reamed nail of appropriate length and diameter is inserted.

The reduction maneuver is done again and sagging of the distal fragment is now corrected by lifting the insertion handle of the nail while the finger through the anterior incision reduces the flexed proximal fragment (Fig. 5). The finger in the proximal fragment also guides us about the spatial orientation of the neck of femur (i.e. anteversion) and helps us direct the guide wire in the lateral view.

The proximal lag screw of appropriate size is inserted after passing the guide wire in centre- centre position in both AP and Lateral views. Distal locking is done and the wound is closed in layers after a thorough wash (Fig. 6).

Discussion

Intertrochanteric fractures are one of the most common fractures encountered in Orthopaedic practice. The fracture pattern, bone quality (osteoporosis), quality of reduction and adequacy of fixation are the crucial factors that determine the successful outcome of these fractures. Out of these the last two are in control of the Orthopaedic surgeon and should never be compromised.

Unstable Intertrochanteric fractures are often difficult to reduce by closed reduction techniques because of the deforming forces acting at the fracture ends. The proximal fragment tends to go in flexion, more so in the cases where the lesser trochanter remains attached to the proximal fragment, due to the pull of iliopsoas muscle. Also depending upon the fracture pattern, it can be externally rotated due to the action of short external rotators. The distal fragment is pulled proximally and medially due to the adductors and hip flexors/extensors leading to varus deformity and shortening. Thus, there is a need for indirect reduction techniques or open reduction. Open reduction leads to disruption of local blood supply, leads to more blood loss, increases chances of infection, delay union and increases the operative time and thus it is often kept as the last resort necessitating the use of indirect reduction techniques.

Various indirect reduction techniques have been illustrated in the literature each having its benefits and drawbacks and it remains the operating surgeon's choice depending upon his familiarity of the technique and his ease. Aktseliset al. and Carr et al. used the standard proximal incising to slide either a Hohmann retractor, Wagner raspatory or a Jocher elevator anteriorly along

Figure 1: The patient positioned on the fracture table as described in text and the parts painted and draped. Note that the C arm is covered with sterile technique and placed on the opposite side with the monitor

Figure 4: Entry point marked by a guide wire and confirmed under C arm on both AP and Lateral view

the proximal fragment and exert downward pressure on it. In addition to this Kovalet al. used another elevator posteriorly in the distal fragment and lifts it to correct the deformity. Ruecheret al. and Ban et al.used pointed reduction clamps, bone hooks and bucking bar to correct the reduction by splitting the lateral musculature bluntly and passing these devices. These techniques however pose difficulty in maintaining reduction throughout the procedure, increase the chance of injury to soft tissue and vasculature and needs multiple exposures of C arm to confirm the reduction.

Langford et al. used a posterior reduction device (PORD) to correct the posterior sag. This device remains attached to the fracture table and does not hinder the movement of C arm. Though it corrects the posterior sag of the distal fragment but it cannot correct the flexion deformity of the proximal fragment.

De Palma et al. introduced a novel device; the pneumatic patient positioner (PPP), which they placed beneath the hip at the time of closed reduction and inflated it so as to correct the external rotation and posterior sag of the distal fragment. Still this technique alone cannot correct the posterior sag of distal fragment and flexion of the proximal fragment.

Some authors used cerclage wiring to hold the reduction achieved by clamps or other methods throughout the nailing and removed it or left it depending upon the fracture stability. They advocated the use of wire secures decreases assistant dependence of holding the reduction, secures the posterior fragments and protects the lateral wall. But this technique increases the operating time, disrupts the blood supply leading to delay in fracture healing and increases blood loss.

Some surgeons have used a sterile draped crutch below the thigh to correct the posterior sagging, but in many cases, they encountered slippage of the crutch requiring an additional assistant to hold the distal fragment.

In the study by Young et al., they used a mallet, which was held by an assistant to lift the distal fragment while the surgeon pushes down the proximal flexed fragment using a Steinman pin inserted anteriorly. Similarly, Kalia etal., used a stab incision anteriorly similar to our technique and reduced the proximal fragment by an artery forceps or a ramrod type device. Additionally, they used a crutch to correct the posterior sag of the distal

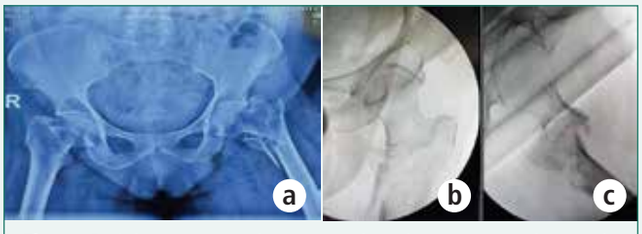

Figure 2: (a) Pre-operative X ray showing Intertrochanteric fracture of the left femur. (b) After attempt of closed reduction AP view and (c) Lateral view on C arm showing the characteristic sagittalplane deformity with the proximal fragment going in flexion and the distal fragment sagging posterioly

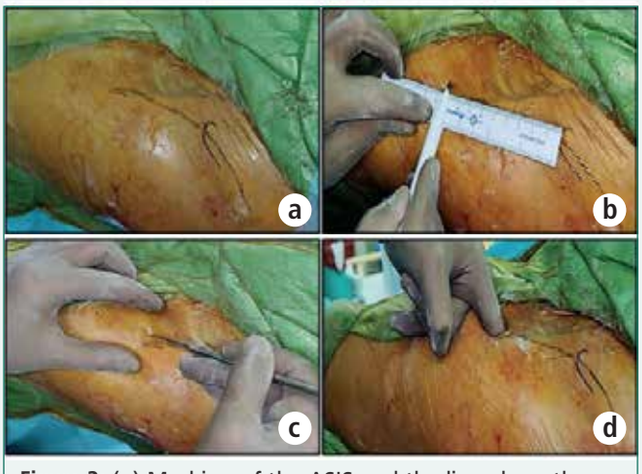

Figure 3: (a) Marking of the ASIS and the line along the femoral axis. (b) Marking the point 9cm distal to the ASIS on the line. (c) Stab incision after confirming under the C arm. (d) Finger inserted through the anterior stab incision by blunt dissection till it reaches the fracture site.

Figure 5: (a) The operating surgeon reducing the flexed proximal fragment while the assistant lifts the insertion handle to correct the posterior sag thereby reducing the fracture. (b) The Lateral view and (c) The AP view on C arm showing accurate reduction by the finger marked by * and guide wire being inserted in the centre-centre position

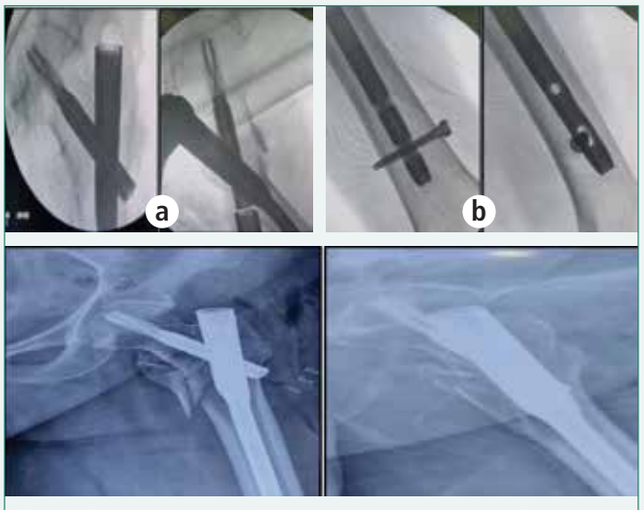

Figure 6: (a) Final AP and Lateral view of C arm after passing the proximal lag screw showing good anatomical reduction and (b) C arm picture AP and Lateral view after passing the distal locking bolt (c) Post-operative X-rays AP and Lateral view

fragment. Though they reported successful results with this technique we feel that passing sharp instruments anteriorly can be a risk and there may be slippage of the crutch leading to loss of reduction.

In our technique the chief surgeon used a finger/thumb to correct the deformity of the proximal fragment. This serves the advantage of preventing any injury to soft tissues and vessels that can be caused by using sharp instruments.

Additionally, by digital palpation the operating surgeon gets the idea of spatial orientation of the neck and thus it is easy to direct the guide wire along the direction of the neck which otherwise may take multiple trials and increased radiation exposure. We feel that it is not necessary to maintain the reduction throughout the nailing. Once the guide wire is passed in the distal fragment we can remove the reduction maneuver. Only after the nail is inserted were achieve the reduction, and this time, lifting up the insertion handle of the nail by the assistant helps us in correcting the posterior sag of the distal fragment. Also, if the reduction is lost in between it can be felt easily as we have a finger placed at the fracture site and this leads to decrease in the C arm exposure as well.

Though there are multiple reduction maneuvers described in the literature we feel our technique is safe, easy for the operating surgeon as well as the assistant, less time consuming, decreases C arm exposure, does not disrupt local blood supply and leads to acceptable reduction in all the cases. We did not find the need for open reduction or adding any other technique in dealing with such fractures. Thus, we recommend the use of this technique rather than trying for multiple trials of closed reduction or going for open reduction.

Average Indian Glenoid Sizes are Smaller than all Commercially Available Glenoid Components: A Systematic Review

Source : 10.1007/s43465-023-00885-8

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Abstract

Background: Despite the variability in glenoid sizes geographically, most of the currently available commercial glenoid component designs are based on the glenoid parameters of the Caucasian population which may not be suitable for the Indian population due to a mismatch between the prosthesis and native anatomy. The aim of the present study is to systematically review the literature to determine the average glenoid anthropometric parameters in the Indian population.

Methods: A comprehensive literature search was conducted using preferred reporting items for systematic reviews and meta-analyses guidelines in the PubMed, EMBASE, Google Scholar, and Cochrane Library databases from the date of inception to May 2021. Any observational study conducted on the Indian population measuring the glenoid diameters, glenoid index, version, inclination, or any other glenoid measurements were included in the review.

Results: A total of 38 studies were included in this review. The glenoid parameters were assessed on intact cadaveric scapulae in 33 studies, on 3DCT in three studies, and 2DCT in one study. The pooled average of glenoid dimensions are as the following- the supero-inferior diameter or height was 34.65 mm, anteroposterior1 diameter or maximum width was 23.72 mm, anteroposterior2 diameter or maximum width of the upper part of the glenoid was 17.05 mm, the glenoid index was 67.88, and the glenoid version was 1.75-degree retroversion. Males were having a mean height of 3.65 mm and maximum width of 2.74 mm larger than the females. A subgroup analysis revealed no significant difference between different parts of India in glenoid parameters.

Conclusion

The glenoid dimensions in the Indian population are smaller compared to the average European and American populations. The average glenoid maximum width of the Indian population is 1.3 mm smaller than the minimum glenoid baseplate size available in reverse shoulder arthroplasty. Glenoid components specific to the Indian market need to be designed to reduce glenoid failure attributable to the above findings.

Keywords

Anthropometry; Glenoid; Glenoid diameter; Glenoid version; India; Systematic review

Result of Total Knee Replacement Done with Limited Tourniquet Application

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Key Words

Limited tourniquet, TKA, blood loss

Introduction

Use of tourniquet is a standard practice while performing total knee arthroplasty (TKA). However, studies have shown that the use of tourniquet is associated with several complications like Post-operative thigh pain which can last for many weeks, deep venous and arterial thrombosis, pulmonary embolism, nerve injuries, superficial and deep infections due to hematoma formation and compartment syndromes. Due to above mentioned complications, we have changed our clinical practice to minimize the tourniquet time during TKA since 2020. In this study we aim at presenting the outcome of limited use of a tourniquet only during cementation of implant.

Methods

A retrospective analysis of 100 patients (Number of Knees) was performed to analyse the outcome of limited use of tourniquet during Primary total knee arthroplasty in patient undergoing bilateral or unilateral TKA over the period of 12 months. In our study we have excluded the patients with inflammatory and autoimmune disorders and revision TKAs. This study investigates the efficacy and safety of using tourniquet strictly during the time of cementation of implants. The tourniquet pressure was kept at 3 times of the value of mean blood pressure. We deflated the cuff right after the implantation without waiting for the curing of the cement, thus reducing the average tourniquet time to 8 minutes only. Post operatively, patients were evaluated for fall of hemoglobin, number of transfusions, superficial or deep infection, need for opioids, day of mobility, post-operative average length of stay, thigh pain and straight leg raise.

Results

The average fall of hemoglobin was 0.9gm/dl and 1.7 gm/dl in unilateral and bilateral TKA respectively. Post operatively none of the patients required blood transfusions. None of our patient reported incidence of superficial or deep infection post operatively. There were no complaints of thigh pain by these patients at 6 weeks follow-ups. Post-operative average length of stay was 2.2 days in unilateral and 3.4 days in bilateral TKA. Only 22 patient required opioids for pain management out of which 20 % were given Injection Tramadol and only 2 patients were given fentanyl infusion. Every patient was able to mobilize on post op day 1 under physiotherapist guidance using walking aids.

Conclusion

In our opinion limited tourniquet application during

TKA is a safe and effective practice without any increase of blood loss and need of transfusion and with reduce post-operative pain and no untoward complications. It should be regarded as a standard practice for patient undergoing TKA.

Peroneus Longus Graft Harvest

Source : https://doi.org/10.1007/s43465-023-00847-0.

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Abstract

Multiple graft options are available for knee ligament surgeries, one of the latest being peroneus longus grafts. Despite, an increasing usage of PL for graft harvest there is a scarcity of technique guides for its harvest, finding mention in only a few case studies. The following is a technical note dedicated to peroneus longus graft harvest.

Patient Positioning

We perform this surgical procedure with the patient in a supine position under spinal anaesthesia. A non-sterile padded tourniquet is placed at the mid-thigh level on the operative limb and the operative limb is prepared and draped in the standard fashion. Both lower limbs are prepared if graft harvesting from the opposite limb is anticipated, as in cases of multi-ligament knee injuries or when graft diameter from the ipsilateral limb is insufficient.

Skin Incision Placement

Once the anatomical landmarks are identified, we mark a 1–2 cm skin incision, positioned 2–3 cm proximal to the lateral malleolus tip and 1 cm posterior to the fibula's posterior border. Despite initially using a larger incision, we found that the same dissection can be done through a smaller one. The foot is kept in inversion for easy access, stretching the peronei and making them palpable. Using a No.20 scalpel blade, we perform superficial dissection through the skin and the subcutaneous tissue. A superficial vein over the lateral malleolus must be avoided during dissection. (Fig. 2).

Deep Dissection

Once the peroneal tendons are palpated, we dissect the tendons' fascia using artery forceps and STILLE scissors, avoiding the vein. Minimal dissection exposes the peronei tendons, emphasizing that the superficial tendon is peroneus longus, and the deep tendon is peroneus brevis. Artery forceps are placed deep into each tendon for suture passage. (Fig. 3).

Tenodesis

We use Fiberwire (Arthrex©, USA) for tenodesis of the PL and PB tendons at the skin incision's distal end. Typically, we take three running sutures with Fiberwire, positioning the knot anteriorly (Fig. 4). The necessity of tenodesis remains debatable, but we observe slightly better eversion strength with PL tenodesis. Non-absorbable sutures are preferred over absorbable ones for tenodesis, opting for Fiberwire over coarser Ethibond due to its thinner profile, improved strength, and less bulky knot, reducing knot irritation. The knot placement is shifted to the junction between the tendon and fibula for added protection against irritation.

Graft Harvesting

Once the tenodesis is complete, remove the artery forceps from beneath the peroneus brevis tendon and open up the artery forceps beneath the peroneus longus tendon (Fig. 5). This separates the PL from the PB further and pulls the PL out of the skin while pushing the PB inside the wound. We now take running whipstitch using Ethibond suture through the peroneus longus tendon. This is started 1 cm proximal to the tenodesis suture. Usually 3–4 throws are adequate to prevent pull out during harvest (Fig. 6). The peroneus longus tendon is then cut between the tenodesis knot

and the whipstitch using a NO.11 scalpel blade. An artery forceps is now used to dissect bluntly between the PL tendon and the overlying skin into the proximal leg. The artery forceps is pushed in closed between the tendon and the subcutaneous tissue and then opened as it is withdrawn. This will create a space for the tendon stripper to harvest. A curved retractor is placed between the skin and PL tendon at the proximal border of the incision to expose the proximal part of tendon. There is thick superficial fascia here running between the PL tendon and the posterior fibula overlying the muscle belly of the PB tendon which needs to be released at this point with the help of Metzenbaum scissors (Fig. 7) and then the free tendon is pulled into the wound to check the mobility which ensures adequate release. The Ethibond sutures are now grasped with arthroscopic forceps through the hole of the closed tendon stripper. Strip the tendon proximally with the help of the closed tendon stripper and cut the graft. The peroneus tendon autograft is now successfully harvested. This typically yields a graft with a minimal 7 mm diameter in most patients and a minimal 200–220 mm length in most patients. Minimal muscle is present on the tendon making preparation smooth. It should be noted that while inserting the tendon stripper for the harvest, it should stop 5 cm below the fibula head level to avoid injury to the deep peroneal nerve and it should also be kept superficial and parallel to the fibula to avoid injury to the superficial peroneal nerve.

Final Steps

Once the procedure is completed, the wound is washed and the subcutaneous tissue is closed with 1–2 inverted sutures with No. 3–0 Vicryl and skin is closed with vertical mat- tress sutures with 3–0 Ethilon or a subcuticular closure is performed with No. 3–0 Monocryl. The harvested tendon is prepared on the tendon table (Fig. 8). Total surgical time for the procedure is typically 5–10 min.

Figure 1: Intraoperative photograph showing skin Incision marking

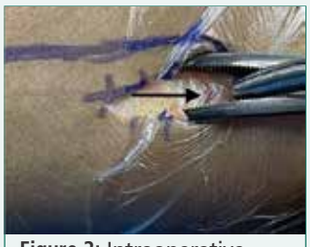


Figure 2: Intraoperative photograph with an arrow showing vein encoun- tered in superficial dissection

Figure 3: Intraoperative photograph showing both the peroneal tendons delivered with the help of artery forceps. a-peroneus longus b-per- oneus brevis

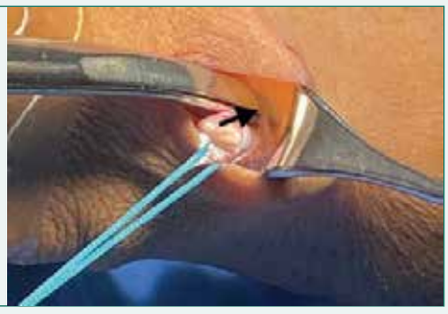
Figure 4: Intraoperative photograph showing tenodesis done with the help of Fiberwire (Arthrex®, USA)

Figure 5: Intraoperative photograph showing peroneus Longus tendon separated and exposed

Figure 6: Intraoperative photograph with an arrow showing running suture taken in peroneus longus tendon

Figure 8: Final peroneus longus autograft

Figure 7: Intraoperative photograph with an arrow showing thick super- ficial fascia running between the PL tendon and the posterior fibula overlying the muscle belly of the PB tendon



Evaluation of Suture Bridge Anchor Technique in the Repair of Acute Distal Tendoachilles Ruptures

Source : International Journal of Life Sciences Biotechnology and Pharma Research (ijlbpr.com)

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Introduction

Commonly achilles tendon ruptures are seen in mid-substance around 5-6 cm above from its insertion over the calcaneum[1, 2]. Acute distal achilles tendon ruptures (<1cm from insertion site) are a rare entity 3 and literature lacks evidence on the best technique available for such distal ruptures [2, 4]. These distal ruptures, leave behind little or no stub of the tendon, making the traditional end-to-end repair difficult[5]. An ideal technique should be safe enough to have minimal soft tissue complications, effective enough to provide a stable construct, and reliable enough to have eliminated chances of re-ruptures. Suture anchor tenodesis is being utilized in various newer techniques and has shown promising results. This study aims to evaluate the outcome of a novel technique, in these acute distal ruptures.

Material and Methods

This prospective interventional study was conducted at Fortis Hospital, Shalimar Bagh, New Delhi from August 2018 and August 2020. The diagnosis was made in terms of history and physical examination including pain, difficulty in walking, weakness in dorsiflexion or a previous history of clicking sound on sudden dorsiflexion and Thompson test.

The study included tendoachilles rupture within 1 week of injury. Only distal ruptures of the tendon, (< 1 cm from the insertion) were included in this study. Patients with a non-ambulatory lifestyle, compound injuries, peripheral artery disease, pregnancy, age less than 18 years, post carcinoma treatment were excluded from the study. X-ray was done in all the cases to rule out any bony avulsion. Detailed local and systemic examination and documentation were done by the same investigator in terms of age, sex, mechanism of injury, duration of the injury.

The suture bridge anchor technique, described later, was used in all the repairs. Check dress was done at 48 hours and the patient was discharged in a below- knee anterior slab in plantar flexion. Suture removal was done at 2 weeks. Patients were followed up at 4 weeks, 6 weeks, 8 weeks and 12 weeks following surgery. The Visual Analog Scale (VAS) and American Orthopaedic Foot & Ankle Society (AOFOS) scoring was done preoperatively and at 12 months post-surgery.

Surgical Technique

Patients were operated on in a prone position with a towel folded and kept beneath the ankle, under spinal anaesthesia. Surgery was performed by the same surgeon in all the cases. A tourniquet cuff was applied at the proximal thigh to minimize blood loss. All patients received prophylactic antibiotics before the cuff was inflated. A 10 cm vertical incision (Figure 1) at the posteromedial border was taken proximal and distal to the palpable defect. The Posterolateral approach was avoided to preserve the sural nerve which usually lies at the lateral border of the tendon. Full-thickness skin flaps were elevated.

The paratenon was excised sharply to expose the torn ends of the tendon. Proximal tendon margin was freshened and locking Krackow loops were passed through it with ortho cord suture later to be used as pulling suture (Figure 2).

Distal stub was excised and the footprint on the calcaneum was freshened. 2 holes were made in the calcaneum over the tendon footprint. The holes were directed towards the midline in a convergent fashion and 5.0 mm FASTIN RC w/ORTHOCORD w/Needles Titanium Anchor was screwed in each hole. The proximal stump of the tendon was pulled distally with the Orthocord sutures to cover the area where suture anchors were placed. The foot was held in plantar-flexion to avoid excessive stretching of the tendon. The threads of the suture anchors were passed

Figure 1: Posteromedial incision to expose the torn stump of the tendon

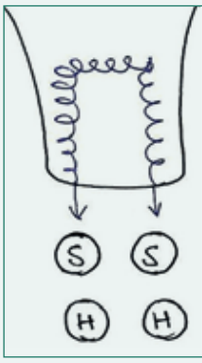

Figure 2: Schematic representation of krackow sutures in the tendon stump. The sutures along with the tendon stump is pulled distally. Calcaneum is prepared with 4 suture anchors as shown. to be pulled distally over the calcaneum. S placement of 5.0 mm FASTIN RC w/ORTHOCORDw /Needles Titanium Anchor in calcaneum. H: placement of 4.75 HEALIX ADVANCETM Knotless peek Anchors in calcaneum

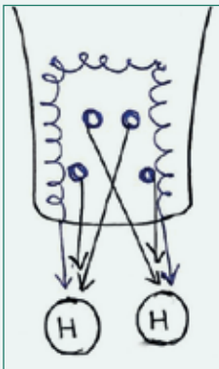

Figure 3: Tendon stump pulled and suture strands from the proximal row suture(S) anchors passed through the substance and are tied indicated as small circles. The suture strands are fixed to the distal row suture anchors (H) as shown

Figure 4: Strength of the repair is checked on the table

Figure 5: Check X-ray post-surgery

Figure 6: Patients were able to stand on toes and hop and perform heel rise test

through the substance of the tendon. Sutures strands were tied to each other in a criss-cross fashion. The suture threads from suture anchors and 2 ends of the Orthocord were tightened and tensioned into the calcaneum with two 4.75 HEALIX ADVANCE™ Knotless peek Anchors, 1 cm distal to the end of the proximal stump of the tendon over the calcaneum as shown in (Figure 3). On table, passive movements were checked (Figure 4). The wound was closed in layers after copious irrigation. Aseptic dressing was done and a below- knee anterior slab was applied. Check X-rays were done (Figure 5).

Postoperative Protocol

Postoperatively, below knee slab support, was continued for 2 weeks after which suture removal is done. Passive mobilization without weight-bearing was started in a removable Controlled Ankle Motion (CAM) boot post suture-removal. The same boot was used to reduce the plantar-flexion gradually over the next 4 weeks. At the end of 6 weeks, partial weight- bearing (toe touch mobilization) was initiated. Patient was made to walk with full weight-bearing at 8 weeks and allowed to resume activities at 12 weeks. Final clinical outcomes were evaluated at 12 months (Figure 6).

Results

History Related

The study included 10 patients out of which 8 were male and 2 females. The mean age of the patients was 54.4 years (range 36-64 years). 7 out of 10 patients experienced a clicking sound on sudden and forceful dorsiflexion of the foot. 4 patients had diabetes mellitus as a co-morbidity and 3 patients had a thyroid disorder.

Surgery Related

The mean time from injury to the procedure was 3.4 days (range 1-7 days). The mean duration of surgery was 24 minutes (range 17- 34min). The average blood loss was 24.8 ml (range 20-42ml).

Complications

None of the patients experienced any major complications in the current study. The sutures were healthy and the wound healed well even in the diabetic patients without any infection. The recovery was smooth and uneventful. No re-rupture, nerve injury, venous thrombosis was observed.

Functional Outcome

From pre-operative stage to 1 year of follow-up the mean VAS score improved from 6.1 to 0.2 and the mean AOFOS score from 48.3 to 98.4. All the 10 patients started full weight-bearing at 8 weeks and returned to activity at 88.4 days (range 84-91 days). At the final follow-up, they were able to perform walk brisk, perform heel rise test and hop comfortably.

Discussion

Distal ruptures have been thought as sequelae of insertional tendinopathy of the Achilles tendon. Such ruptures, leave behind minimal tendon tissue at the distal end6. Since the strength of the repair depends directly on the tendon length, conventional tendon repair constructs in these cases is weak. Also, this short stump usually has degenerative changes and often was incompetent of hold sutures.

Different configurations and techniques have been studied for the effective tenodesis of the Achilles tendon. Teuffer et al. used peroneus brevis tendon in a trans calcaneal tunnel to achieve a bony fixation but had significant skin necrosis. Besse et al.harvested patellar tendon along with a small piece of tibial tuberosity with or without rectus femoris muscle in the trans calcaneal tunnel with fewer skin complications, polyethylene etc. have been tried. Apart from the need to have a trans calcaneal tunnel they were not well tolerated antigenically.

Hanna et al.13used suture anchors in acute rupture of tendoachilles as early as 1993 and thereafter it has been used extensively. Boin et al. compared suture- only to suture-anchor augmented repairs in such ruptures and found the latter to be superior biomechanically. Suture-only repairs tend to break at the knots whereas suture anchors bypass the short distal fragment and give a strong bony fixation. The lack of a knot further added to the credibility of suture anchors. Cottom et al.found suture anchors to be more effective than the conventional Krackow or minimally invasive repairs alone.

Table 1 summarizes few recent studies which dealt with such injuries. Our study used a combination of Krackow sutures along with 4 suture anchors. We believe, the combination of suture anchor fixation along with the Krackow sutures provide a strong biomechanical construct. This technique to the best of our knowledge has not been used earlier in such ruptures. Our study didn't encounter any case of re- rupture. There was no limitation to dorsiflexion of foot. Restricted dorsiflexion is an uncommon complication in these repairs. Most studies quote lengthening of the tendon during healing Don et al. proposed the lengthening conceivably accounts for decreased calf muscle strength even at 2 year follow up. This finding was inconsistent with our study. None of the patients complained of weakness in walking or dorsiflexion and was comparable from the uninjured side.

The study however has its limitations. The AOFOS score was satisfactory at the end of the final follow-up but it was not compared with the contralateral healthy side. This novel technique in such distal ruptures has promising outcome but the possibility of complications being underrated can't be ruled out in the given the small cohort of patients.

Conclusion

This suture bridge technique is simple and effective. The construct is biomechanically strong. It has eliminated the knots otherwise known to cause irritation of soft tissue. The author believes, fixation of tendon to the bone provides confidence in initiating post-operative rehabilitation. This study appears to be the first to report suture bridge technique in repairing distal acute Achilles tendon ruptures.

Table 1

S. No.	Study	Year of study	Sample size	Operative intervention used	Remarks
1.	Longoet al. [15]	2020	1	Percutaneous Modified Bunnel suture+ 2 suture anchors	Less skin and wound complications
2.	Isıket al. [2]	2017	21	Krackow + knot suture anchor (novel technique) Versus Only suture anchor	Better outcome in combination group
3.	Boinet al. [6]	2017	18	Suture only Versus Suture anchor augmented repairs	Suture anchorbiomechanically superior

Limb Salvage in Recurrent Synovial Sarcoma Of Knee (Proximal Tibia) With Mega Prothesis In A Young Female – A Rare Case Report

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A 30 years old female presented to OPD with complaints of pain, swelling in right knee over posterior aspect since few months which got aggravated since last 3 months along with difficulty while walking with limp & increase night pain. No history of any constitutional symptoms.

Past history: Right knee diagnostic arthroscopy was done for suspected meniscal injury in 2018 which came normal, but the pain was persistent, for which MRI was done. MRI suggestive of soft tissue mass in posteromedial aspect of knee over tibia, for which she had undergone soft tissue mass excision with local debridement & excisional biopsy in November 2022.

HPE report revealed synovial sarcoma with positive for SS18, CK (focal) with no Tumour free margin. Subsequently follow up MRI was done in February 2023 which showed no recurrence of Tumour.

Physical examination: right knee no local rise of temperature, no deformity, tenderness presents over posteromedial aspect of proximal tibia medial condyle with diffuse swelling, scar over posteromedial aspect over knee crease, SLRT normal, knee flexion up to 100 further movement was painful.

Radiological investigations: Plain X ray right knee with leg was normal.

MRI with contrast revealed ill-defined heterogeneously enhancing lesion in the posterior aspect of medial tibial condyle with thinning of overlying cortex & cortical erosions. Enhancing soft tissue mass lesion in the adjacent popliteus muscle belly small T2 hypointese area, representing hemosiderin deposition? (Nature). (Fig 1 & 2)

PET CT scan suggestive of faintly metabolic lucency / lytic changes in metaphyseal region of medial tibial condyle of right knee with diffuse uptake in adjacent popliteus muscle could be suspicious for recurrent disease in present clinical context. No definitive evidence of any

Figure 1: X – ray Right knee Ap & Lateral

Figure 2: MRI right knee – showing lesions involving medial tibia condyle (black arrow) & popletius mass (blue & orange arrow), lesion both intra osseous & extra osseous

Figure 3: Intra Operative Images – Showing Tumor en Mass Excision of Proximal Tibia With Popliteus Muscle Excision, Limb Salvage With Mega Prothesis Of Proximal Tibia Reconstruction With Patellar Tendon Repair.

Figure 4: Post Operative X-ray - AP & Lateral view.

other hypermetabolic lesion in other region of body.

Based on Contrast MRI, PET CT scan patient is planned for USG guided biopsy, which revealed synovial sarcoma (recurrent from history).

Synovial sarcoma was involving both intra osseous & extra osseous compartment with communication, because of which wide excision with curettage was not possible. Limb salvage with tumor en mass excision and proximal tibia mega prothesis of knee with popliteus excision with medial gastrocnemius flap for coverage & patella tendon reconstruction was performed.(Fig 3)

Macroscopically tibia measures 10.0 x 7.0 x 5.0 cms with attached soft tissue mass to posterior aspect of tibia with popliteus measuring 8.5 x 7.5 x 2.5 cms. Histopathological, the Tumour revealed neoplastic cells, spindled vesicular nuclei, increased mitotic activity. HPE revealed synovial sarcoma FNCLCC grade 2 (Recurrent by history). (Fig 4)

Diagnosis of Recurrent Synovial Sarcoma of bone was done based on HPE & imaging & margins were free of tumour. Patient was made ambulatory with knee brace immediately. Suture line healed well with no complications. Passive knee range of motion was allowed after 3 weeks post-surgery with good outcome.

Precision in Motion: Unravelling the Impact and Advancements of Robotics in Modern Knee Replacement Surgeries: A Systematic Review

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Introduction

Total Knee Arthroplasty (TKA) is an established and highly effective treatment for patients with symptomatic end- stage knee osteoarthritis. Accurate implant positioning, balanced flexion-extension gaps, proper ligament tensioning, and preservation of the peri-articular soft tissue envelope are important surgeon-controlled variables that affect functional outcomes, implant stability, and long-term implant survivorship.3-10

This introduction aims to provide an overview of the current landscape surrounding robotic total knee transplant, exploring the key technological aspects, clinical implications, and emerging trends in this rapidly evolving field. As orthopedic surgeons seek to optimize surgical techniques and patient experiences, robotic assistance in total knee replacement stands at the forefront, promising a paradigm shift in the approach to this common orthopedic procedure.

Over the last decade, robotic TKA has gathered momentum as an avenue for improving the accuracy of implant positioning and reducing outliers in limb alignment compared to conventional jig-based TKA.11-15 Current literature recognizes the early success of robotic- assisted total knee arthroplasty (RA-TKA) to decrease variability in implant positioning, increase successful joint alignment, lower revision, and complication rates, and improve patient outcomes.

Potential drawbacks to implementing robotic-assisted technology include cost increases, disruptions to the operating room efficiency, and the associated learning curve. 16-21

Since component positioning, alignment and equal soft tissue balance are critical for a successful TKA,23 malalignment in the coronal, sagittal and rotational planes continues to increase implant failure rates and cause poor clinical outcomes.22-25 Bone cutting inaccuracies up to 4° in the coronal plane and 11° in the sagittal plane have been reported to occur during conventional primary TKA, with guide movement contributing to 10–40% of the total cutting error.23,26-28 Therefore, TKA technological development, including computer-assisted navigation (CAN), has focused on surgical technique improvement to reliably identify overall limb alignment and to assist in guide placement for bony cuts.

Limitations of conventional Jig based system

Conventional jig-based TKA uses preoperative radio-graphic films, intraoperative anatomical landmarks, and

manually positioned alignment jigs to guide bone resection and implant positioning. However, these techniques are poorly reproducible and accuracy of achieving the planned implant position is dependent on the skill and expertise of the operating surgeon.29-33 Human anatomy varies widely, and a one-size-fits-all approach in conventional TKR may not fully address individual variations in joint morphology, potentially affecting the overall success of the procedure.

Achieving balanced flexion-extension gaps and proper medio-lateral ligamentous tensioning is dependent on subjective intra- operative gap assessments with limited capacity for fine-tuning bone resection and implant positioning. Intraoperative tensioning devices may help to guide soft tissue releases but there is often inter-surgeon heterogeneity with their positioning in the joint and overall dis- traction forces applied.

Conventional jig-based TKA does not provide real-time feedback on the thickness or orientation of the bone cuts. The use of intramedullary referencing guides for bone resection during conventional jig-based TKA may also increase the risk of thromboembolic events and cardiorespiratory complications. 34-35

The limitations in precision and longevity of conventional TKR may contribute to an increased likelihood of revision surgeries over time, imposing additional challenges and risks on patients.

Stages of Robotic TKA

Robotic TKA uses computerized systems at different stages for accurate execution of the patient-specific surgical plan.

Imaging: High-resolution imaging, such as CT scans or MRI, is utilized to create a detailed 3D model of the patient's knee anatomy.

Virtual Simulation: Surgeons use specialized software to plan the surgery, determining optimal implant size, position, and alignment based on the patient's unique anatomy.

Mapping Anatomy: During surgery, the robotic system maps the patient's unique anatomy, aligning the virtual plan with the actual knee structure.

Reference Markers: Reference markers, often attached to the patient's bone, aid the robotic system in real-time tracking and adjustment.

Bone Preparation

Robotic Guidance: The robotic system guides the surgeon in precise bone cuts and shaping, ensuring accurate implant placement and alignment.

Haptic Feedback: Some robotic systems provide haptic feedback, allowing surgeons to feel resistance and make real-time adjustments for optimal bone preparation.

Implant Placement

Real-Time Monitoring: The robotic system continuously monitors the surgical site, providing real-time feedback to the surgeon to ensure precise implant placement.

Adjustments: Surgeons can make intraoperative adjustments based on the robotic system's feedback, optimizing alignment and balance.

Accuracy of implant positioning

Robotic TKA is associated with improved accuracy in implant positioning and limb alignment compared to conventional jig-based TKA.36-38 Song et al conducted a prospective randomized study on 50 conventional manual TKA versus 50 robotic TKA, and found robotic TKA improved accuracy of mechanical alignment and reduced outliers of greater than 3° in planned alignment compared to conventional manual TKA.17 Bellemans et al reviewed outcomes in 25 patients undergoing robotic TKA and reported femoral and tibial implant positioning within 1° of the planned positions in all three planes.[12] Several studies have reported high levels of accuracy in various aspects:-

Alignment Precision: Robotic systems enable surgeons to achieve optimal alignment, reducing the risk of malalignment-related issues.Studies have demonstrated a significant improvement in achieving target alignment compared to conventional techniques.

Implant Sizing: Precise preoperative planning and intraoperative adjustments in robotic TKR contribute to accurate implant sizing.This accuracy in implant sizing is crucial for achieving optimal joint kinematics and reducing wear on the implant.

Soft Tissue Balancing: Robotic systems provide real-time feedback on soft tissue tension, allowing surgeons to make precise adjustments for optimal balance. Accurate soft tissue balancing can contribute to improved joint stability and overall function.

Reduction in Outliers: Studies have reported a reduction in the number of outliers (implant positions deviating from the planned parameters) when using robotic assistance.This reduction in outliers contributes to more consistent and predictable outcomes.

It's important to note that while robotic-assisted TKR offers improved accuracy, the ultimate success of the procedure also depends on factors such as surgical skill, patient-specific characteristics, and proper integration of technology into the surgical workflow. As technology continues to advance, ongoing

AUTHOR	YEAR	FINDINGS
Kayani et al. [39]	2019	Inflexion point of proficiency after seven cases for operative times (p = 0.01) and surgical team anxiety levels (p = 0.02) Cumulative robotic experience did not affect accuracy of implant positioning (n.s.) limb alignment (n.s.) posterior condylar offset ratio (n.s.) posterior tibial slope (n.s.) and joint line restoration (n.s.) Utilising the Surrogate Anxiety Inventory (STAI) questionnaire, Kayani et al. demonstrated that confidence level of surgical team improved in a pattern similar to the learning curve for operative times, with an inflexion point at seven cases. After this point, there was no difference in the overall STAI scores amongst team members between RATKA and mTKA
Marchand et al. [40]	2020	The data indicate a significant decrease in the mean RATKA operative times from 1 month to 1 year of using robotic technology (81 vs. 62 min, p < 0.00001) The mean surgical times continued to decrease after 6 months of RATKA. In 1 year, the surgeon was performing 88% of the RATKA between 50 and 69 min. The initial cohort and 1-year robotic-assisted mean operative times were 81 and 62 min, respectively (p < 0.00001) Mean 6-month robotic-assisted operative times were similar to manual times (p = 0.12)
Naziri et al. [41]	2019	Proposed point of proficiency as 20 cases Intraoperative EBL was comparable between RATKA and traditional TKA cohorts (42.4 vs. 49 ml, p = 0.448) The RATKA cohort required slightly greater overall surgical time than the traditional TKA cohort (82.5 vs. 78.3 min, p = 0.002)There was no significant difference in surgical time when comparing the mean surgical time of the second 20 cases of RATKA to the traditional TKA group (81.1 min vs. 78.3 min, p = 0.254)
Savov et al. [42]	2019	Inflexion point of proficiency after 11 cases for operative time The mean surgery time in the robotic group after finishing the learning curve was 66 min (± 4.2) and in the total manual group 67 min (± 3.5) (n.s.)
Sodhi et al. [43]	2017	Shortening of operative time from 99 min (cases 1–40) to 84 min (cases 81–120) No significant differences compared with mTKA in last 40 cases, 84 min vs 81 min

research and clinical experience will further refine the understanding of the accuracy and long-term outcomes associated with robotic-assisted total knee replacement.

Learning Curve

The learning curve of robotic TKA is important for under- standing the impact of this procedure on the surgical workflow, scheduling of operative cases and theatre lists, and establishing any additional risks or complications during the acquisition of surgical proficiency. Proponents of robotic TKA claim that this technology helps to produce a more streamlined procedure than conventional jig-based TKA by reducing the need for instrument trays, alignment guides, and cutting blocks, enabling more rapid computer-guided bone resections, and reducing the need for trialling due to the high accuracy of preoperative surgical planning. However, existing studies show that operative times are increased in the learning phase of robotic TKA, and comparable between the two treatment techniques after the proficiency phase for robotic TKA has been achieved.

A total of five studies reported on the learning curve for RATKA (Table 1). All five studies assessed the learning curve for operating time which ranged from 7 to 80 cases.

Image free Robotic Systems

The next generation of robotics was introduced to further reduce the amount of outliers. An image-free handheld robotic sculpting system enables the surgeon to plan the implant position in six degrees of freedom preoperatively without the need for preoperative imaging. Intra- operative adjustments allow the surgeon to optimize soft tissue balancing and bony alignment. Implant placement accuracy of this image-free approach has been demonstrated in a cadaveric study [50]

One such system includes CORI surgical system. The CORI Surgical System uses handheld robotics-assisted technology that helps the surgeon plan and perform unique procedure. This robotics-assisted approach is efficient and more accurate than traditional knee surgery.[51,52,53]

At the beginning of the surgery, the surgeon uses the CORI system to create a customized 3D digital model of the knee. This three-dimensional view helps the surgeon finalize and verify the selection of knee implant and create a plan for surgery without the need for either a CT scan or MRI. The system sends precise information about the knee to the robotics-assisted handpiece more than 300 times per second, allowing the surgeon to remove damaged surfaces, balance the joint and position the implant with accuracy. [54,55,56]

A study of 154 cohort group was done by P. Bollars et al. to look at the limb alignment and orientation of components in TKA using a novel image-free handheld robotic sculpting system. The most important finding of the study was the ability of a novel image-free handheld robot sculpting system to accurately achieve the planned mechanical axis (MA) in TKA with few outliers. There were significant but no clinically relevant differences between the two groups regarding the radiographic outcome measures. In literature, conventional TKA have a risk of outliers of up to 30% [57, 58]. A meta-analysis studying computer-assisted surgery (CAS) for TKA showed that outliers occurred in 9% of the cases [57]. The most recent robotic-assisted TKA established outliers in just 3% of all cases [59]. The outliers (6%) found in this study with the robotic system are in line with the other robotic systems. The results illustrate that an image-free handheld robot for TKA can help to restore the desired limb alignment and accurate tibial implant position.

Functional Outcomes

Improved preservation of the periarticular soft envelope secondary to reduced intentional soft tissue releases and decreased iatrogenic periarticular soft tissue injury in robotic TKA may help to limit the local inflammatory response, decrease pain, and reduce postoperative swelling compared to conventional jig-based TKA.

There were several clinical studies reporting the functional outcomes following RATKA compared to mTKA [39, 44, 45, 46]. Different outcome scores were utilised across the included studies, with the Knee Society Scores (KSS) being the most reported followed by Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores. The authors found that robotic TKA was associated with reduced postoperative pain, decreased analgesia requirements, shorter time to straight leg raise, increased knee flexion at discharge, and reduced need for inpatient physiotherapy compared to conventional jig-based TKA. Median time to hospital discharge in robotic-arm-assisted TKA was 77 hours (inter- quartile range (IQR) 74 to 81) compared with 105 hours (IQR 98 to 126) in conventional jig-based TKA ($p < 0.001$). Improved accuracy of implant positioning and enhanced postoperative rehabilitation in robotic TKA have not trans- lated to any differences in medium- to long-term func- tional outcomes compared to conventional jig-based TKA.

Limitations of Robotic TKA

Robotic technology is associated with substantial installation and maintenance costs for the robotic device. Further costs are incurred with additional preoperative imaging, increased operating times during the learning phase, training the surgical team, updating of computer software and servicing contracts, and consumables. Costs may be partially offset as robotic TKA is associated with reduced opi- ate analgesia consumption, decreased need for inpatient physiotherapy, earlier time to hospital discharge, reduced readmission rates, and fewer discharges to rehabilitation units or skilled nursing facilities compared to conventional jig-based TKA.47 Robotic systems can require percutaneous pins for optical tracking arrays which creates stress risers and risk for periprosthetic fractures, especially if placed in diaphyseal bone.48 Inadvertent pin placement can also theoretically cause neurovascular laceration.48 Although robotic platforms are designed to make precise bone cuts with- out deviation from the planned template, some systems such as the older ROBODOC did not routinely recognize periarticular soft tissue, as studies have reported a 5% incidence of patella tendon rupture.49 Although newer designs have evolved to become more cognizant of surrounding soft tissues, it is still imperative to place retractors in the appropriate position to prevent any iatrogenic ligamentous or neurovascular compromise.

Conclusion

Robotic TKA has shown improved reproducibility and precision in mechanical alignment restoration with improvement in early functional outcomes and 90-day episode-of-care cost savings compared to conventional TKA; however, its added value is still to be determined. The use of robotic TKA is associated with lower femoral coronal, lower femoral sagittal and tibial sagittal resection error compared to conventional TKA. Improved radiological outcomes in robotic TKA have not translated to any differences in long- term functional outcomes compared to conventional jig-based TKA. Limitations of robotic TKA include substantial installation and maintenance costs, additional radiation exposure with image-based platforms, and increased operative times during the learning phase. In today's paradigm shift towards

increased emphasis on quality of care while curtailing costs, providing value-based care is the primary goal for healthcare systems and clinicians.104 As robotic technology continues to develop, longer-term studies evaluating implant survivorship and complications will determine whether the initial capital is offset with improved outcomes.

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Joint Preservation Surgery in Grade 2 and 3 Giant Cell Tumors of Bone Around the Knee

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Keywords

Giant cell tumor, Curettage, Joint preservation, Bone grafting, GCT, Musculoskeletal Tumor Society score

This retrospective study aimed to evaluate the clinical and functional outcomes of joint preservation surgery in high-grade giant cell tumors (GCTs) around the knee joint. Twenty-five patients with Campanacci grade 2 and 3 lesions involving the proximal tibia or distal femur underwent extended curettage, bone grafting, and stabilization with a knee-spanning external fixator between 2016 and 2018. The study assessed radiographic outcomes, functional results using the Musculoskeletal Tumor Society (MSTS) score for the lower limb, and complications, including donor site morbidity.

Methods

A comprehensive retrospective review was conducted on 25 patients with high-grade GCTs around the knee. The inclusion criteria were Campanacci grade 2 and 3 lesions involving the proximal tibia or distal femur. All patients underwent joint preservation surgery, which consisted of extended curettage, bone grafting, and stabilization with a knee-spanning external fixator. The study period spanned from 2016 to 2018.

Results

The mean age of the patient cohort was 24.04 years, with an average follow-up period of 30.24 months. Fourteen patients had GCT involvement of the distal femur, while 11 had proximal tibia involvement. Sixteen cases were classified as grade 2 lesions, and 9 cases as grade 3 lesions. Radiological evaluation revealed that 24 out of 25 patients achieved consolidation of the graft, while one patient experienced graft subsidence. Functionally, 22 out of 25 patients achieved full knee extension, and knee flexion exceeded 100 degrees. The mean MSTS score was 25.2. Three patients had an MSTS score under 20, all of whom exhibited extension lag and restricted range of motion.

Conclusion

Joint preservation surgery, following the fundamental principles of tumor surgery, demonstrated favorable radiographic and functional outcomes in patients with grade 2 and 3 giant cell tumors around the knee. The majority of patients achieved successful graft consolidation and maintained satisfactory knee function. This study supports the recommendation that joint preservation surgeries should be considered before replacement surgeries, emphasizing the importance of adherence to tumor surgery principles for optimal results.

Clinical Excellence at Fortis

Robotic Direct Anterior Total Hip Replacement

(First time in India)

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Abstract

A 66-year-old lady with disabling right hip pain underwent total hip replacement using direct anterior approach (DAA) and Mako robotic technology in Fortis Hospital, Bannerghatta Road, Bangalore. This is the first case of direct anterior hip using a Mako Robotic Technology in India. Direct anterior approach provides a minimally invasive, muscle sparing approach to hip replacements. Mako robotic technology which is recently introduced in Fortis Hospital, functions using a 3D Computerised Tomogram Virtual model and achieves precise bone preparation and accurate placement of components. This patient underwent total hip replacement using two technological advances simultaneously.

Keywords

Robotic total hip arthroplasty, Mako total hip, Direct Anterior approach (DAA) Robotic Hip, First Robotic DAA in India.

Introduction

Total hip arthroplasty (THA) is one of the best medical interventions to improve the quality of life and has been a boon for those patients with end-stage osteoarthritis. Recently robotic technology has been introduced to improve the alignment, minimise human errors and complications. Robotic arm functions using a pre operative virtual 3D CT model. Anatomically hip joint is located deep and hence most of the traditional approaches involve larger incisions and damage to different groups of hip muscles. The direct anterior approach (DAA) utilises smaller incision, might have a quicker recovery, a shorter hospitalization and can start with an earlier rehab program.[1-3]

Case report

A 66-year-old lady, a housewife, presented with a severe pain in her right hip pain since last 2 years. On examination she was limping, and her hip movements were painfully restricted. Radiographs of the hip showed severe degenerative changes (Fig 1.) A CT scan was performed using Mako Robotic protocol (Mako Robotic Arm assisted Total Hip™, Stryker, Warsaw, Indiana USA) to create a 3D virtual model of the hip (Fig. 2).

This is a semi-automatic process called segmentation. This was used to identify the various bony landmarks around the hip and to create a personalised plan for component positioning in sagittal, coronal and axial planes. She was operated on 19 November 2022. Patient was poisoned supine under spinal anaesthesia. A direct anterior approach to hip was utilised. Hip joint was approached without detaching any musculature around the hip. During surgery bony anatomy was mapped and matched to the virtual 3D model using a tracker system placed on the patient's pelvis. This process is called registration (Fig 4).

Once the plan is finalised Mako robotic arm was brought to the surgical field. Mako robotic arm was utilised for bone preparation and placement of acetabular components. A normal surgical table was used in this case. During the preparation of the femur, foot end of the operating table was lowered, to hyperflex the hip joint. This manoeuvre will improve the access to proximal femur and preparation of the medullary canal for the insertion of the femoral component.

A post-operative X ray showed satisfactory component position (Fig 4). She was mobilised on the next day. She was discharged on the 3rd post-operative day (22 November 2022), after she was trained to walk and perform basic daily activities. She recovered well and resumed all normal activities in 4 weeks' time. After a follow up of 12 months, she is doing extremely well and satisfied with the outcomes of the surgery.

Discussion

Total hip arthroplasty has been the treatment of choice for the patients suffering from severe pain due to a variety of conditions affecting the hip joint which includes osteoarthritis, rheumatoid arthritis, secondary degenerative arthritis and a few selected cases of fracture neck of femur etc. Total hip replacements have shown to be successful in long term with revision free survival of over 90% over about 20 year and over 80% over 25 years.[3,6,7] However, some patients can have complications due to technical errors such as dislocations, leg length discrepancies, and early revisions.[4,5,6] There is a need for technical advancement and innovations to prevent these complications.

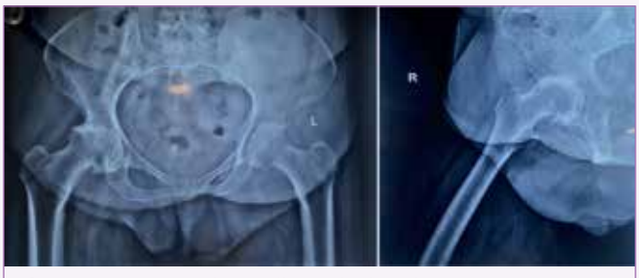

Figure 1: Preoperative radiogaph showing sever degeneration of right hip.

Figure 2: 3D Virtual CT Model and personalised implant planning

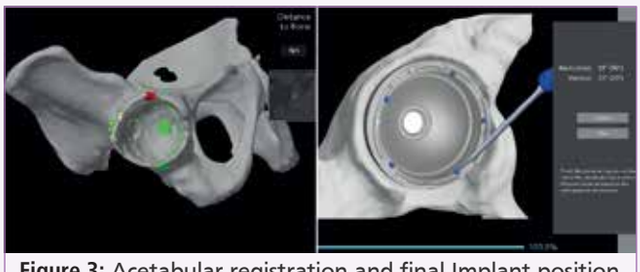

Figure 3: Acetabular registration and final Implant position.

Figure 4: Immediate postoperative radiograph

Figure 5: 5. OT set up.

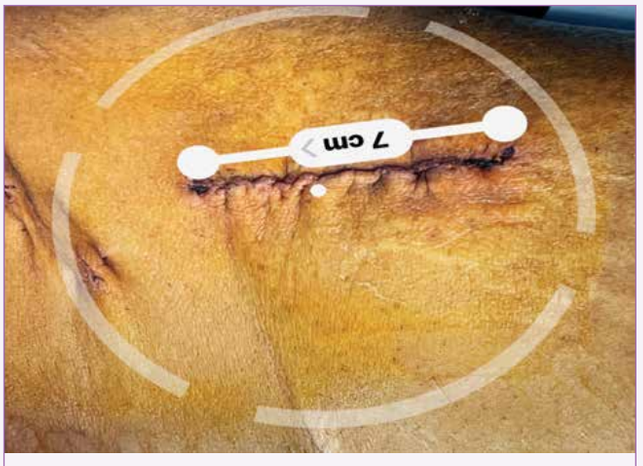

Figure 6: Typical scar after a Direct anterior Approach

THA is performed using several surgical approaches. Commonly used surgical approaches are posterior approach (Moore or Southern), the lateral approach (Hardinge), and the anterolateral approach (Watson Jones). These approaches are extensively used since many years. In these approaches surgical incision can be as long as 14 to 18 centimetres.8 These approaches also involve detaching important muscles around the hip. In the posterior approach, short external rotators and occasionally gluteus maximus muscle are detached from

their insertions. In the lateral approaches gluteus Medius muscles, the main abductor of the hip is detached.7,8 Other than the disturbances in the normal functioning of these muscles, these approaches can lead to more bleeding, post operative pain, larger scar, and limping at least in the immediate post operative period.[4,7]

Although the direct anterior approach to hip is popularised more recently, original technique was described by Carl Heuter as early as 1881. Later Smith-Peterson used this approach extensively for operating variety of hip conditions.[2,3,4] This approach uses the interval between the tensor fascia-lata and the sartorius muscles. Therefore, there is no damage to the important muscles around the hip. This approach is also performed on supine position, compared to a lateral position used in many other approaches. Advantages of the supine position include, easy and quick positioning of the patient, convenient for the anaesthetic procedures and more comfortable for the patient and smaller a scar (Fig. 6). Surgeons can also easily assess the leg length in supine position and also perform an intra operative radiograph easily.[2,3,5,8]

Direct anterior approach can be done on a normal surgical table (as in our case) or using specialised traction tables to improve the access to proximal femur. DAA needs, specialised retractors, breakable surgical table and arthroplasty instruments with offset handles for easy insertion7. Some studies have shown decreased hospital stay after DAA. Studies also have shown improved function al outcomes after 6 weeks and 3 months postoperatively. But the difference is not seen in long term.[4,8]

Mako Robotic arm is a semi active robot, which was recently introduced in India. This is the only robot currently available in the country which has all three applications; namely total knee, hip and partial knee arthroplasties. Robotic technology allows creating a personalised surgical plan using a pre-operative CT scan. Robotic arm also assists in bone preparation and precise placement of the implants. Mako robotic system also helps surgeon to adjust the component position depending on the spino-pelvic relationship[1,4,5]. In a meta-analysis, Chen et al8 compared the complication rates between the conventional and robotic total hip arthroplasties. They studied 1516 patients (522 robotic vs. 994 conventional) during the period between 2005 to 2017. Intraoperative periprosthetic femoral fractu were significantly higher rate in the conventional group. Other complications including infection, nerve palsy, deep vein thrombosis, and dislocation were similar.[8]

The purpose of this study is to report a case of direct anterior approach to hip arthroplasty using a mako robotic arm. Two advanced techniques are used simultaneously and has resulted in great recovery. The concept of minimal invasive approach used in this case has not only reduced the size of the incision, but also the muscle damage. Robotic arm helps to create a personalized surgical plan and precise positioning of the hip components.

Even though several prototypes of robots were introduced in India recently, only Mako system can perform total hip arthroplasties. To the best of our knowledge, this is the first reported case where direct anterior approach is used in combination with a Robotic total hip arthroplasty in India.

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Outcome Analysis of Fixed Angle Locking Plate in Patella Fractures: A Single Centre Experience from North India

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Keywords

Patella fracture · Comminuted · Osteoporotic · Locking plate · Osteosynthesis

This study presents a thorough examination of the outcomes associated with the utilization of fixed-angle locking plates in the treatment of patella fractures. Drawing from a single-center experience in North India, the research investigates factors such as fracture healing, postoperative complications, and functional outcomes, aiming to contribute valuable insights to the evolving landscape of patella fracture management.

Introduction

Patella fractures, though relatively infrequent, pose a unique challenge in orthopaedic trauma due to the pivotal role of the patella in knee function. Traditional treatment methods, including tension band wiring, have exhibited variable results, prompting the exploration of alternative approaches. Fixed-angle locking plates have emerged as a promising solution, offering stable fixation and facilitating early mobilization. This study seeks to dissect the outcomes associated with fixed-angle locking plates, shedding light on their efficacy in treating patella fractures.

Methods

The retrospective nature of this study involved a meticulous analysis of patients with patella fractures who underwent treatment with fixed-angle locking plates at a singular orthopaedic center in North India. Patient demographics, fracture characteristics, surgical details, and postoperative complications were systematically recorded. Follow-up assessments included radiographic evaluations, functional outcome scores, and patient-reported outcomes.

Results

Preliminary findings from this single-center experience provide compelling evidence supporting the effectiveness of fixed-angle locking plates in patella fracture management. Notably, the study identifies high rates of fracture union, indicating the stability conferred by the locking plate system. Furthermore, the incidence of postoperative complications, such as implant failure or infection, is observed to be relatively low. Functional outcomes, gauged through validated scoring systems, showcase satisfactory results in terms of knee range of motion and patients' reported quality of life.

Discussion

The outcomes unveiled in this study align with emerging literature supporting the utilization of fixed-angle locking plates in the management of patella fractures. The inherent stability offered by these implants appears to play a pivotal role in fostering successful fracture union while simultaneously minimizing complications. The advantages of early mobilization and a reduced risk of implant-related issues contribute to the appeal of this surgical approach, suggesting its potential as a preferred option in the intricate landscape of patella fracture management.

Conclusion

This study adds a significant layer to the ongoing discourse surrounding the treatment of patella fractures, specifically focusing on the outcomes associated with fixed-angle locking plates. The findings suggest that this surgical technique holds promise in achieving favorable fracture healing and functional recovery. While these results are promising, the study underscores the need for further research and prospective studies to corroborate and solidify the role of fixed-angle locking plates as a preferred choice in the surgical repertoire for managing patella fractures. The exploration of innovative solutions continues to shape the trajectory of orthopaedic interventions, promising improved outcomes and enhanced patient care.

Outcome of Oxford Uni-Compartmental Knee Arthroplasty in Younger Patient (< 55yrs)

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Introduction

Oxford uni-compartmental knee arthroplasty (UKA) is an effective treatment for antero-medial osteoarthritis (AMOA), however, its functional outcome in younger patient with age less than 55 years remains unclear. The purpose of this study is to analyze the outcome of oxford UKA in the given age group treated for anteromedial osteoarthritis using oxford knee score.

Keywords

AMOA, Oxford UKA, OKS

Methods

The inclusion Criteria were as follows: Patient with Primary advanced AMOA of age less than 55 years, Functionally intact Anterior and posterior cruciate ligaments and medial collateral ligament, correctable Varus deformity (Varus <15 degree), flexion deformity <15 degree and active range of motion till 100 degree and Intact lateral compartment.

Patient with Prior surgery on the same knee, Rheumatoid arthritis fixed Varus and flexion deformity were excluded. Obesity, high activity or degenerative patellofemoral joint were not considered as absolute contra-indications.

The demographic data and variables were recorded and compared on the basis of oxford knee score (OKS) and postoperative complication were recorded.

The patients were enquired telephonically using the Oxford Knee Score questionnaire on 6 monthly follow-ups. Outcome was measured as 0 being the worst score and 48 being the best.

Result

The mean follow-up duration is of 42 months. Out of 40 patients, 38 patients responded to telephone enquiry and 2 patients were lost to follow-up. Total 33 patients were females and 7 were males out of which 20 were bilateral, 12 were right knee and 8 were left knee. The average post-operative OKS of 38 patients was 41.3. Out of 38 patients scored excellent, scored good and zero patient scored moderate or poor. No patient required revision surgery till the period of follow-up.

No patient had complications like dislocation of poly insert, deep infection, delayed wound healing and DVT.

Conclusion

Oxford uni-compartmental knee arthroplasty for AMOA shows favorable results in young patients on short term follow-up using OKS. Therefore, oxford UKA can be considered as a viable option in younger patients with AMOA. However, further long-term studies or meta-analysis are required with bigger sample size of population.

DVT Audit

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Background

Deep Vein Thrombosis (DVT) may be associated with life threatening Pulmonary Embolism (PE) following major Orthopaedic surgeries. Normally there is balance of pro-coagulant and anticoagulant factor in blood which prevents thrombus formation. The Virchow's Triad—consisting of venous stasis (Immobilization, CHF), endothelial injury (surgery, trauma), and hypercoagulability (OCP, cancer) —highlights factors contributing to DVT. Prophylaxis against DVT in orthopedic surgery involves the use of drugs (LMWH, apixaban, rivaroxaban, warfarin, heparin), mechanical measures (IPC, GCS/TED stockings), and early mobilization.

Risk Stratification

For Hospitalized patients planned for surgical procedure, Caprini DVT risk scoring has classically been done which incorporates 40 individual VTE risk factor. Patient with score (> or =5) have significant reduction in rate of perioperative VTE with chemoprophylaxis.[1]

Data

Incidence of DVT range up to 40 - 60% in major orthopaedic surgery in Western patients.[2] VTE prophylaxis is given only in 13-70% patients in most of the studies.[3-4] PE is responsible for 5-10% of deaths in high-risk hospitalized patients without prophylaxis.[5] Incidence of PE in orthopaedic patients has been reported to be 2-3% after elective hip replacement2 and 4-7% after hip fracture surgery[2]. Death within one month of diagnosis occurs in 6 % of DVT and 12% PE patients.[6]

AAOS Guidelines 2011 Key Recommendations

- No prophylaxis is required for low risk patients[7](Caprini score<2)
- In patients with high to moderate risk – Pharmacological / mechanical prophylaxis is required.
- Mechanical prophylaxis is recommended patients at high risk of bleeding, and chemoprophylaxis should be avoided.[8]
- Duration- Patients undergoing major orthopaedic surgery should be given thrombo- prophylaxis for a minimum period of 10-14 days' post operatively.[9-10]
- Extended prophylaxis is recommended up to 35 days for major orthopaedic surgeries like THR and TKR in high risk cases.[11]
- LMWH is to be started 12 hours pre-operatively and to be continued for 12 hours or more post-operatively[10] till the patient regains preoperative mobility.
- During hospitalization, the use of dual prophylaxis with an IPCD device and drugs is recommended for at least 18 hours daily in high risk cases.[10]

Need of Audit

Conducting 500 knee/hip surgeries annually, a substantial number of patients receive inadequate doses. Over the past two years, three patients developed lower limb DVT, with two cases of clinically symptomatic PE requiring readmission and prolonged hospital stay.

Objective

- Objective of this audit is to check effective implementation of VTE prophylaxis guidelines in our department.
- To enhance coordination amongst inter professional team, against VTE and improved patient outcome.

Material and Methods

A retrospective audit was conducted at Department of Orthopedic Surgery, Fortis Escorts Hospital, Faridabad. Data was collected from case sheets of patients who underwent hip and knee replacements and hip fracture surgeries over three months from Oct 2021 to Dec 2021.

Parameters of Study

The study assessed the use of VTE prophylaxis according to risk stratification, post-op VTE chemoprophylaxis,

mechanical prophylaxis, and early mobilization. Post op VTE chemoprophylaxis - given/ not given/ inadequately given. Mechanical prophylaxis- given/ not given/ inadequately given. Early mobilization – within 24 hours/ >24-hour post-surgery.

Findings of study

Demographically, 31 patients underwent knee & hip arthroplasty and hip fracture surgeries, with a mean age of 63 years. There were 10 male and 21 female patients with mean BMI of patients was 26.6 kg/m2.

Risk stratification

All the patients were evaluated with the help of Caprini scoring system. Caprini score risk assessment was done as shown in table 1.

Table 1

	Caprine Score	No. of Patient
Very low risk	0-2	0
Moderate	3-4	0
High risk	5-8	2
Very High risk	>8	29

Use of mechanical prophylaxis

- Out of 31 patients 24 received adequate mechanical prophylaxis for more than 18 hours/day for 5 days. DVT pumps were used as mechanical prophylaxis in all the patients.

  Early mobilization

- Twenty-six patients were mobilized within 24 hours of surgery and five after 24 hours of surgery. **Chemoprophylaxis**

No patients received chemoprophylaxis in pre-op period. 5 patients received chemoprophylaxis after 12hour of surgery. 4 received within 12-24 hours of surgery and 7 patients received oral chemoprophylaxis on discharge.

Adherence to guidelines

Use of mechanical prophylaxis was close to optimum time period i.e. for 18 hours per day in 77.4% of our patients. 83% of patients (26/31) were mobilized within 24 hours of surgery which is good adherence to guidelines. Only 29% of patients (9/31) received adequate chemoprophylaxis within 24-hour of surgery.m 6.4% patients (2/31) received inadequate regime due to bleeding from surgical site. Less than 25% of patients (7/31) received oral chemoprophylaxis on discharge due to ongoing wound soakage.

Recommendation

The audit suggests utilizing Caprini scores for risk assessment of VTE in surgical patients, classifying all patients to low, moderate and high-risk group, emphasizing strict adherence to adequate mechanical and chemoprophylaxis, vigilant monitoring for bleeding risk, and stressing early mobilization.

Re Audit

Reinforcement of VTE prophylaxis was explained amongst the Orthopaedic team, nursing and paramedical staff and Re-audit done.

Material and Methods

Following the initial audit, a prospective audit was conducted from Jan 2022 to Mar 2022. The re-audit of 35 patients of knee & hip arthroplasty and hip fracture surgeries with mean age of 67 years was conducted at Fortis Hospital, Faridabad. Data was collected from case sheets. Out of 35 patients 12 patients were male and 23 patients were female with a mean BMI of patient was 28.2 kg/m2.

Risk stratification

All the patients were evaluated with the help of Caprini scoring system. Assessments shown in table 2

Table 2

	Caprine Score	No. of Patient
Very low risk	0	0
Moderate	3-4	0
High risk	5-8	1
Very High risk	>8	34

Use of Mechanical Prophylaxis

Out of the 35 patients, 34 received adequate mechanical prophylaxis for more than 18 hours/day using DVT pumps. This mechanical prophylaxis was consistently applied in all patients. Additionally, early mobilization practices were observed, with 33 patients being mobilized within 24 hours of surgery, and 2 patients mobilized after 24 hours of surgery.

Chemoprophylaxis

During the preoperative period, none of the patients received chemoprophylaxis within 12 hours of surgery. However, postoperatively, 25 patients received chemoprophylaxis after 12 hours of surgery, 7 patients received it between 12-24 hours, and 29 patients were prescribed oral chemoprophylaxis on discharge. Notably,

6 patients had their prophylaxis withdrawn due to wound soakage.

Adherence to Guidelines

In terms of mechanical prophylaxis, close adherence to the recommended time period (18 hours per day) was observed in 97.14% of patients. Furthermore, a high adherence rate to guidance for early mobilization was noted, with 94.28% of patients mobilized within 24 hours of surgery. Regarding chemoprophylaxis, 91.42% of patients received adequate prophylaxis within 24 hours of surgery, but 8.57% received inadequate chemoprophylaxis due to bleeding from the surgical site. For discharge, 82.85% of patients received oral chemoprophylaxis.

Recommendations for Re-audit

1. Implement training for paramedical and nursing staff to ensure proper application of pneumatic devices and compliance with the dose regime.
2. Foster coordination between physiotherapy and nursing staff to enhance the early mobilization of patients.
3. Establish regular meetings involving medical, paramedical, and nursing staff to improve implementation and adherence to guidelines.
4. Maintain vigilance for limb signs and respiratory symptoms in high-risk patients.
5. Consider implementing a single-dose LMWH 12 hours preoperatively for patients admitted the night before, with no contraindications as per the risk of bleeding.

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Mental Health

Mental Health Impact on Rehabilitation Post Orthopedics Surgery

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The experience of a serious injury or orthopaedic surgery can take a significant toll on our mental health and emotional well-being. While we all understand the experience of pain that accompanies surgeries, what is often missed out is how the lack of mobility can render a person feeling helpless and dependent. It can give rise to fears around the future and the likelihood of full recovery. With its impact on our day-to-day life, it can also hamper work productivity, lead to social isolation and impact our very sense of self and identity.

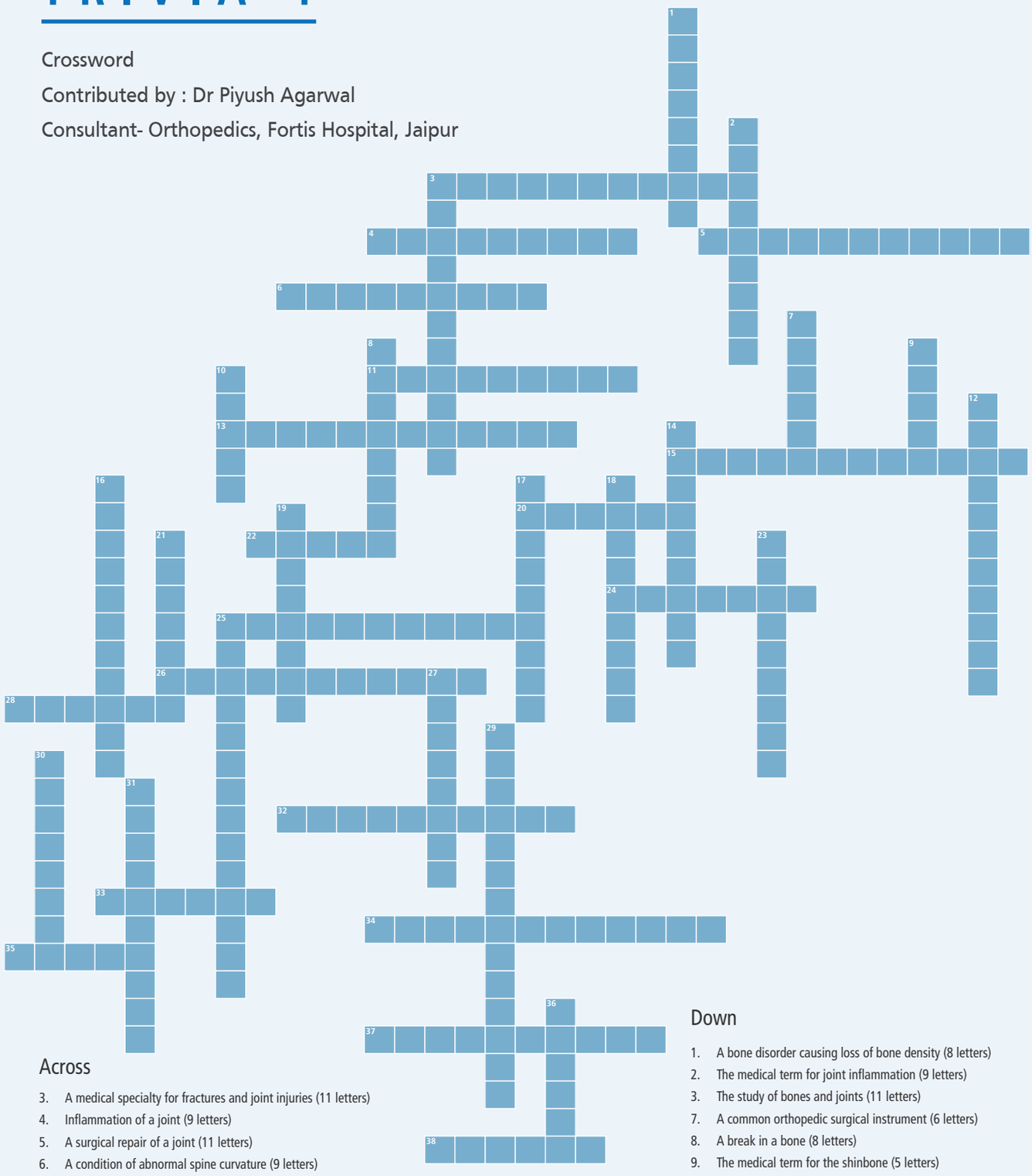
At the same time, recovering from an orthopedic surgery is often a long and arduous journey – one that requires active participation and compliance from our patients. When it comes to building this trust and compliance, our communication is key. Keeping patients informed of their progress and providing realistic timelines can significantly ease distress. Breaking down the recovery pathway into smaller milestones and simpler tasks, and encouraging patients to co-create recovery goals can help build a sense of control and confidence that may have been previously lost. A compassionate approach to rehabilitation tasks may also go a long way in preventing under or over training, both of which can be detrimental to overall recovery.

In helping patients mitigate their perception of pain, psychological techniques such as breath work, muscle relaxation and imagery may also play an important role. Encouraging patients to participate in activities of daily living to the best of their abilities, and falling back on hobbies or activities that they previously enjoyed can also be helpful in restoring their sense of identity and staying mentally engaged. Most of all, it is important that patients stay connected with their social support systems – be it their friends, families or peers - spending time with loved ones is the most effective way to stay positive and motivated in difficult times like these.

TRIVIA-1

Crossword

Contributed by : Dr Piyush Agarwal
Consultant- Orthopedics, Fortis Hospital, Jaipur



Across

3. A medical specialty for fractures and joint injuries (11 letters)
4. Inflammation of a joint (9 letters)
5. A surgical repair of a joint (11 letters)
6. A condition of abnormal spine curvature (9 letters)
11. A technique to realign broken bones (9 letters)
13. A surgical procedure to remove damaged cartilage (12 letters)
15. The process of joint replacement surgery (12 letters)
20. A device to stabilize a fractured bone (6 letters)
22. A type of joint allowing limited movement (5 letters)
24. The process of bone healing (7 letters)
25. A medical professional specializing in orthopedics (11 letters)
26. A surgical procedure to reshape bones (11 letters)
28. Surgical fusion of two or more vertebrae (6 letters)
32. The surgical removal of a portion of a bone (10 letters)
33. The outer layer of dense and hard bone (6 letters)
34. A procedure to replace a damaged joint (12 letters)
35. The largest bone in the human body (5 letters)
37. A type of fracture with multiple bone pieces (10 letters)
38. A device to support and align fractured bones (6 letters)

Down

1. A bone disorder causing loss of bone density (8 letters)
2. The medical term for joint inflammation (9 letters)
3. The study of bones and joints (11 letters)
7. A common orthopedic surgical instrument (6 letters)
8. A break in a bone (8 letters)
9. The medical term for the shinbone (5 letters)
10. The longest and strongest bone in the human body (5 letters)
12. The surgical removal of a joint (11 letters)
14. The soft, gel-like material between bones (9 letters)
16. The branch of medicine dealing with skeletal disorders (11 letters)
17. A surgical procedure to correct a deformity (9 letters)
18. The central part of a long bone (9 letters)
19. A device used to hold bones in place during healing (8 letters)
21. A type of joint movement reducing the angle between parts (7 letters)
23. Invasive A minimally invasive orthopedic procedure (9 letters)
25. A common orthopedic procedure for fractured bones (14 letters)
27. The surgical reorthopaedictorn muscle or tendon (8 letters)
29. A procedure to repair torn ligaments in the knee (14 letters)
30. The medical term for collarbone (8 letters)
31. A common orthopedic imaging technique (10 letters)
36. The process of fusing bones together (6 letters)

Clinical Case Conversation

Bilateral Shoulder Replacement in a Challenging Patient: A Case Report

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This case report highlights the successful management of bilateral cuff tear arthropathy in a challenging patient.

Case Presentation

The patient, a 78-year-old male, presented with more than a decade of debilitating shoulder pain. His reluctance to undergo surgery was compounded by multiple medical issues, severely limiting his daily activities. Upon evaluation at Fortis Hospital, Bannerghatta Road, bilateral cuff tear arthropathy was identified as the underlying cause. Given the bilateral involvement, a staged approach to shoulder replacement with a gap of a couple of months was considered appropriate.

Surgical Procedure

The surgeries were performed with thorough attention to the patient's unique challenges. The thin physique and limited deltoid muscles posed additional complexities, requiring a tailored approach to ensure successful outcomes. The surgical team at Fortis Hospital, Bannerghatta Road collaborated seamlessly to execute the planned staged bilateral shoulder replacements. Following both surgeries, the patient underwent a carefully monitored postoperative period. Close attention was paid to managing potential complications arising from the patient's medical issues.

Discussion

Shoulder arthroplasty is not yet a widely performed surgery in India for various reasons and one of the reasons being the lack of training and confidence in achieving good results with this surgery. This patient was especially difficult because he was thin with little deltoid muscles, medical issues that could potentially complicate recovery from surgery and anaesthesia.

Conclusion

This case report highlights the successful staged bilateral shoulder replacement in a patient with bilateral cuff tear arthropathy, emphasizing the importance of a comprehensive and tailored approach in challenging scenarios. The collaboration of an excellent surgical team at Fortis Hospital, Bannerghatta Road played a pivotal role in achieving this successful outcome, providing valuable insights for surgeons addressing similar cases in the future.

Fatal Late Onset Ogilvie's Syndrome Causing Caecal Perforation after Unilateral Total Knee Arthroplasty

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Abstract

Acute colonic pseudo-obstruction (Ogilvie's syndrome) is a disorder characterized by acute dilatation of the colon in the absence of an anatomic lesion that obstructs the flow of intestinal contents. It is characterized by massive dilatation of the cecum and right colon on abdominal X-ray. The main clinical feature in patients with acute colonic pseudo-obstruction is abdominal distension. We present a case of an elderly male who developed late Ogilvie's syndrome after a month of unilateral total knee arthroplasty (TKA). He was managed conservatively but later developed caecal perforation and was operated upon. However, he succumbed to his illness. The diagnosis and management of the case and Ogilvie's syndrome is discussed.

Keywords

Total knee arthroplasty; abdomen distention; Ogilvie's syndrome; bowel dilatation; caecal perforation.

Discussion

We present an uncommon postoperative complication following an elective TKA in a 68- year-old man who developed Ogilvie's syndrome 25 days post TKA, which was managed conservatively and later developed caecal perforation and succumbed to postoperative complications.

Ogilvie syndrome is a rare complication of surgery and is reported to occur after obstetrical/gynaecologic, abdominal/pelvic, and orthopedics procedure. However, recent data confirms that patients undergoing orthopaedic and spinal procedures are at higher risk but the surgical procedure most commonly leading to Ogilvie's syndrome is coronary artery bypass surgery. Drugs that disturb colonic motility (e.g., anticholinergics, opioid analgesics, phenothiazines, calcium channel blockers, alpha-2-adrenergic agonists, epidural analgesics) contribute to the development of this condition.

Though reported in children acute colonic pseudo-obstruction appears to be more common in men and in patients over the age of 60 years. It can occur acutely or as a chronic condition. In patients with acute colonic pseudo- obstruction, increasing colonic diameter increases the risk of colonic ischemia and perforation. The risk of colonic perforation increases when caecal diameter exceeds 10 to 12 cm and when the distention has been present for greater than six days. The duration of dilation is probably more important than the absolute diameter of the colon. In the case presented the caecal diameter was 7.5 cm but it persisted for almost two weeks and lead to caecal perforation.

The incidence of post-operative ileus (POI) after total joint arthroplasty (TJA) is small, yet not uncommon, and it has been reported to range from 0.3% to 4.0%. It is reported even higher (5.6%) after revision in total hip arthroplasty. Although the precise mechanism remains unclear, a number of factors may act together in the development of acute colonic pseudo- obstruction.

The Ogilvie's syndrome is reported to be associated with increased age, prolonged bed rest, blunt abdominal, spinal and multiple extremity trauma, continuous level narcotic use (PCA), systemic sepsis, vaginal delivery or caesarean section, abdominal or retroperitoneal malignant disease, cardiac and pulmonary insufficiency, intoxication, medications (phenothiazines, calcium-channel Blockers, steroids) and metabolic abnormalities such as diabetes, uraemia and hypokalaemia. However, patients undergoing orthopaedic and spinal procedures are at higher risk, but the surgical procedure most commonly leading to Ogilvie syndrome was reported to be coronary artery bypass grafting.

This patient had increased age, prolonged immobilization after TKA, dyselectrolytemia, and orthopaedic surgery as the risk factors. Though advised to be ambulant he was just reluctant to ambulate because of postoperative pain or apprehension except

for short periods of supervised physiotherapy.

This patient was later readmitted after 25 days as POI with electrolyte abnormalities. POI is distinguished by an accumulation of gas and secretions resulting from a lack of bowel movements. If not recognized early or improperly managed, it may result in more severe complications such as bowel perforation, peritonitis, sepsis, multiorgan failure, and even death. Though managed conservatively, despite persistent bowel dilatation with Caecal diameter of 7.5 cm for two weeks, possibility of Ogilvie's syndrome was not considered and no decompressive colonoscopy was attempted. In a large series of 400 patients, all patients with a Caecal diameter of >12 cm perforated as compared to 3 of 17 patients with a diameter of <9 cm. Most perforations were diagnosed between day 3 and day 5. The risk of colonic perforation increases when caecal diameter exceeds 10 to 12 cm and when the distention has been present for greater than six days. The duration of dilation appears to be more important than the absolute diameter of the colon. In this patient, though the Caecal diameter was < 9 cm, it persisted for two weeks further emphasizing that duration of Caecal dilatation is more important than Caecal diameter.

The exact cause of POI remains unknown. The sympathetic over activity and/or parasympathetic dysfunction is believed to be the main abnormality. Once abdominal distension has been noted in a patient with underlying risk factors, the diagnosis of Ogilvie's syndrome should be considered at earliest. Initial management include nothing per oral (NPO) withdrawal of narcotic analgesics, administration of intravenous balanced electrolyte solution, placement of a nasogastric tube and management of metabolic abnormalities, including electrolyte disturbances. All these were done in the present case but diagnosis of Ogilvie's syndrome wasn't considered. By the time he was referred he had bowel distention of almost two weeks and had developed caecal perforation, peritonitis, and sepsis and multi organ dysfunction syndrome.

The definitive management of Ogilvie's syndrome involves direct mechanical decompression of colonic gaseous distension. For those with a benign abdomen, colonoscopy or percutaneous tube colostomy decompression is reasonable alternatives. Colonoscopy decompression for Ogilvie's syndrome has become the most widely applied first-line treatment. All these were not done as the diagnosis of Ogilvie's syndrome wasn't considered.

Unfortunately, delay in the diagnosis of Ogilvie's syndrome is common, as patients still accept and tolerates oral feeds with no abdominal distress. Delay in diagnosis is a significant factor contributing to the adverse outcome and even death as in the present case.

Conclusion

Cardio-thoracic surgeons, orthopaedic surgeons and neurosurgeons should be vigilant of this complication in the patient whose abdomen becomes distended in post-operative period. It should be recognized timely and treated appropriately, POI will resolve in most patients. Frequent monitoring with clinical and radiologic abdominal examinations is crucial. We thus emphasize the need for early identification and appropriate management of Ogilvie's syndrome to improve patient safety.

Case Study and Review of Literature for Pin Tract-Induced Stress Fracture Femur After Robotic Total Knee Arthroplasty

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Abstract

Robotic assisted Total Knee Arthroplasty (TKA) Is growing in popularity as an alternate method for assistance for total knee arthroplasty. Robotic assisted surgery is a cutting-edge technology. However, it requires use of tracking pin fixed to femur and tibia to mount robotic tracing system. Although periprosthetic fracture at the pin site is rare, with the increase in popularity of robotic total knee arthroplasty the frequency of stress fracture related to pin-tract will increase. We report a case of a 66-year old male who suffered stress fracture midshaft femur through pin-tract site two months after the surgery.Therefore, the case study is to do systematic review of clinical literature concepts regarding tracking pin fixation in robotic total knee arthroplasty.

Introduction

Robotic assisted Total Knee Arthroplasty (TKA) is growing in popularity as an alternate method for assistance for total knee arthroplasty. The role of robotic total knee replacement is to assist the surgeon in giving a better-balanced knee by taking care of the implant positioning and limb alignment. This will improve the implant life and reduce the chances of early revision of total knee arthroplasty.[1-4]

However, robotic total knee arthroplasty has few complications related to it. One such complication is stress fracture through

pin tracts. These pins are used to mount robotic tracking system. These pins are inserted in femur and tibia, in diaphysis or metaphysis part of the bone. These pin tracts can cause complications like infection or fracture at that site. Literature suggests very few cases have been recorded related to fracture at the pin tract site which ranges from 1 to 1.4% [5-6] and a total of 30 cases reported.[7-8]

Case Report

A 66-year old healthy male underwent robotic assisted total knee arthroplasty elsewhere for advanced osteoarthritis of right knee. Patient was ambulated with walker post-surgery and was walking full weight bearing with the help of a walker first, then was walking with support of stick. Patient started having pain over the thigh region two months after the surgery which used to increase with ambulation. Patient went for follow up consultation for the pain and X-rays (Fig 1) were done which showed pin tracts in shaft of femur.

Patient was advised conservative treatment. However, patient continued to have worsening pain, so MRI for thigh was done (Fig 2).

MRI showed stress reaction around proximal pin site suggestive of un-displaced stress fracture at the midshaft femur at the pin tract site. Femoral implant for total knee replacement was found to be intact. Patient was told non-weight bearing walking with walker and to follow up after 2 weeks. Patient started walking non-weight bearing with walker. However, one day patient had severe pain and heard cracking sound from the thigh region while getting down from bed. Patient showed to our OPD for further management. Repeat X-rays were done which showed displaced midshaft femur fracture at pin tract site (Fig 3). Patient was admitted and underwent closed reduction internal fixation with antegrade nail (Fig 4) and was mobilized non-weight bearing on post-operative day one.

Discussion

Preoperative osteoporosis, femoro-tibial malalignment are usually the key aggravating factors for stress fracture found in Total knee arthroplasty. Stress fracture through pin insertion site in robotic total knee replacement is not very common. Usually risk factor for stress fractures e taking place in femur can related to the placement of the pin, width of the pin inserted, inserted pin path, shape of the bone, multiple attempts for insertion.[9] In this case reported stress fracture was seen due to placement of the pin, width of the pin, shape of the bone.

Femur bone is a strong bone in human body and can withstand extreme axial and angular and torsional stress. Fracture in femur can occur due to high energy trauma or pathological fracture.[10] Studies suggest biomechanical difference in stress results between femur and tibia. The femur bone experiences substantial torsional stresses, while tibia is primarily stressed in compression.[11] Due to increased torsional

Figure 1: Pin tracts visible

Figure 2: MRI of Thigh showing stress fracture are pint tract site

Figure 3: Showing displaced fracture through pin tract site

Figure 4: Post Operative X-Ray after Antegrade Nailing

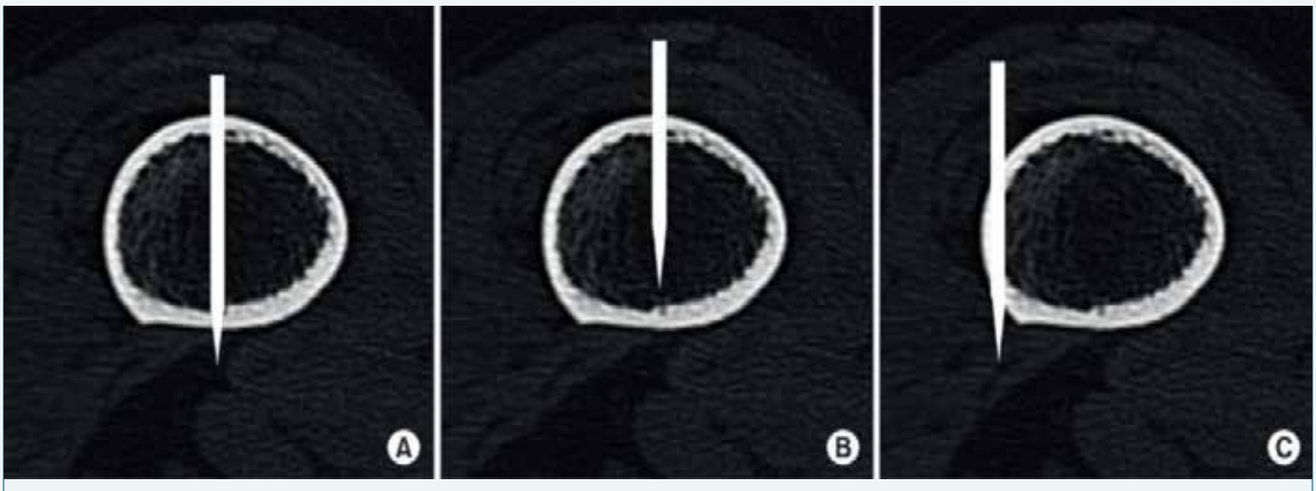

Figure 5: Jeong, Hwa-Jae & Park, Yong-Beom & Lee, Han-Jun. (2018). Computer-Assisted Navigation in Total Knee Arthroplasty. Journal of the Korean Orthopaedic Association. 53. 478.10.4055/jkoa.2018.53.6.478.

stresses over femur the cortical bone loss is higher in femur, increasing the chances of femur fracture.[12] Increasing number of stress fractures cases post robotic total knee arthroplasty due to diaphyseal pin insertion now more stress is on metaphyseal placement of pin.[7] Femur bone goes through mechanical stress during torsion and flexion. Due to placement of the pin in the diaphysis there is a cortical bone loss in the cortical bone and due to stress in such instance there is a very high chance of stress fracture, this bone loss is much less in distal femur. Second advantage of using metaphyseal pin is that these pins can be placed directly through the incision taken for total knee arthroplasty, so the chances of neurovascular injury when pin is inserted in diaphysis reduces and the chances of transcortical path of the pin reduces.[5,11]

Torsional and compressive stresses on the bone with different pin diameter varies for 3.0mm versus 5.0mm. Kim[13] demonstrated 10%, 10% and 100% greater maximum stresses with 5.0mm pins when placed unicortically, bicortically, and transcortically, respectively. Study was suggestive of effects of pin diameter on fracture risk in biomechanical study.

Pins can be placed bicortical, unicortical or transcortical in the bone for robotic total knee arthroplasty. Unicortical pins transverse only one cortex, bicortical pin traverses both the cortex through medullary canal, transcortical pin passes through cortex obliquely not going through medullary canal. Bicortical path of the pin is associated with maximum number of pin site fracture and may cause neurovascular damage.[15] Tomas et al.[14] retrospectively reviewed 321 consecutive TKA patients and found unicortical pins to be sufficient to provide stability and minimizes complication of bicortical pin placement. Jung et al[15] suggested transcortical pin placement of pins increase higher chance of fracture as bicortical pin makes 2 distinct defects, but transcortical pin creates larger defect of cortical bone in single pathway and also causes thermal necrosis. And this may result in higher chances of fracture.[16]

Conclusion

Post robotic Total Knee Arthroplasty if the patient complaints of thigh pain or leg pain surgeon should consider chances of impending stress fracture at the pin insertion site to avoid displacement of the fracture and to manage the stress fracture earlier to avoid complications. Therefore, according to literature, we recommend avoiding diaphyseal pin insertion and putting the pins in metaphyseal region, as that is a cortical stress riser and the torsional and angular stress may result into stress fracture at the pin site.

Transcortical pin insertion or bicortical pin insertion shoulder be avoided as that can cause higher chances of pin site fracture due to more cortical loss at the pin site. Drilling should be avoided as that can cause more thermal necrosis. Self-tapping can be done for insertion and unicortical pin should be inserted.

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The 'Wind Surf' Deformity-Correcting Fixed Flexion Deformity and Hyperextension in Bilateral CAS TKA'

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Severe knee arthritis can result in complex coronal and sagittal angular deformities. Windswept deformity is used to describe a Varus deformity and contralateral valgus deformity. We recognized a new sagittal pattern at the time of computer-assisted surgery (CAS) in total knee arthroplasty (TKA) in which one knee has a fixed flexion deformity (FFD), while the contralateral knee has a hyperextension deformity. We propose to define it as "wind surf" deformity mimicking the opposite pull of the wind and a surfer. The incidence of "wind surf" deformity in this series was 0.96% among a cohort of 2,291 bilateral TKAs performed between 2013 and 2018. Twenty-two patients were identified with an FFD of 5° to 20° on one knee and recurvatum of —5° to —20° on the contralateral knee. Additional bone resection and soft-tissue releases were performed for the FFD with a goal to maintain residual 1° to 3° of flexion. Minimal bone resection and soft-tissue disruption were performed on the knee with hyperextension with a goal to maintain 5° to 7° of flexion. These opposite strategies applied with the help of CAS prevented recurrence resulting in satisfactory clinical results at 2-year follow-up. The "wind surf" deformity variant should be identified in patients presenting with severe knee arthritis to guide surgical treatment, prevent recurrence, and obtain favourable clinical patient outcomes.

Keywords

Windswept Deformity, wind surf deformity, navigation, TKA, FFD, recurvatum

Hip Replacement Success: A Clinical Case Analysis

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Case Presentation

A 24-year-old gentleman from Yemen presented with a discharging sinus in the thigh and difficulty walking. His medical history revealed more than six surgeries on his hip to salvage a blast injury to the left femur. A left total hip replacement in Germany unfortunately resulted in infection. Upon presentation, the patient sought a stable functioning hip replacement along with infection eradication. A collaborative effort with the infectious diseases team included spacer surgery, six weeks of IV antibiotics, repeat debridement, and four more weeks of antibiotics. Subsequently, the patient underwent a successful hip reconstructive surgery, regaining independence and resuming desired activities.

Conclusion

This case underscores the success achievable through a comprehensive, multidisciplinary approach in addressing complex hip issues complicated by recurrent infections. Tailoring the treatment plan to the patient's unique challenges resulted in not only infection eradication but also the restoration of functional independence. The collaborative effort played a pivotal role in achieving a positive outcome for this challenging case, offering hope for individuals facing similar complexities in hip reconstruction.

Figure 1: Infected THR at presentation

Figure 2: After implant removal and spacer surgery

Figure 3: After 2nd debridement and spacer exchange

Figure 4: Final X ray after constrained hip replacement

Severe Equinocavovarus Deformity in a 13-Year-Old Boy: Single-Stage Correction

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Complex foot and ankle deformity is a multiplanar deformity with or without shortening of foot. It includes deformed feet which are relapsed or neglected cases.

We present a case of a 13-year old male with progressive difficulty in walking, and problems with shoe wear attributable to deformity in foot. His physical examination revealed a normal appearing right foot but Equinocavovarus deformity of the left foot (fig .1) .

On evaluation it was found to be a rigid Equinocavovarus deformity with tight Achilles, decreased girth of calf, along with neurological compromise. No spinal deformity was noticed or present at the time of birth. He visited us after meeting many Orthopaedics Surgeons.

We diagnosed it as Equinocavovarus deformity due to neurological compromise. We obtained radiographs of foot and ankle and CT scan of foot to plan the case and EMG & NCV were performed to document the neurological compromise.

Procedure

Our patient underwent surgical correction under tourniquet consisting of radical plantar release and via posterior approach to Ankle Achilles. Z-lengthening was performed along with that subtalar and ankle joint capsule release and lengthening of FDL AND FHL performed.

Via medial and lateral approach to foot mid foot Cole osteotomy done in a Dorsolateral close wedge fashion. After that tibialis posterior tendon detached from the navicular insertion site and transferred under the flexor retinaculum across the osteotomy site.

Osteotomy was closed using bone stapler on medial and lateral side. After thorough washing, closure done. Below the knee, slab was applied. Suture removal done on 21 days post-op. After 6 weeks, partial weight bearing was initiated and at 12 weeks, the patient started walking full weight-bearing. Overall, he had improved function and activity with a plantigrade foot. (Fig .2)

Conclusion

We report our experience of treating severe Equinocavovarus deformity with one stage correction using osteotomy and soft tissue release. Shortening the treatment period and decreasing possible complications which can happen due to multiple stage procedures or ring fixators are the main benefits of this technique.

Figure 1: Preoperative Severe Eqinocavo Varus Deformity

Figure 2: Postoperative Plantigrade

Acute, Chronic, and Latent Infection with (Re)Activation Melioidosis

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Abstract

Melioidosis can present as an acute as well as chronic disease and can be fatal. Type 2 diabetes mellitus is one of the most common risk factors for acquiring this infectious disease. We present a case of a 36-year-old diabetic male patient who presented in March 2022 with acute severe melioidosis and later developed chronic melioidosis. He did not take complete treatment and presented again in January 2023 with features of Latent infection with reactivation. The blood and pus culture showed positive results for Burkholderia pseudomallei (B. pseudomallei). The use of granulocyte colony-stimulating Factor (G-CSF) in addition to antimicrobial treatment with meropenem and later ceftazidime therapy played an effective role in the recovery of the patient. In this case report we present the acute and chronic manifestations with which he reported along with management of the case, review the literature on the impaired immunity in type 2 diabetic patient in melioidosis, latent infection with (re)activation, the suggested role of G-CSF and antimicrobial therapy.

Keywords

Eradication Phase, Intensive Phase, Latent Infection, Osteomyelitis

Challenging Case of TKA in Extra Articular Deformity Distal Tibia with Laterally Translated Mechanical Axis causing Valgus Deformity and Lateral Compartment Arthritis

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Introduction

Total Knee Replacement surgery has significantly improved quality of life of afflicted patients in terms of painless mobility. Anatomical alignment in all 3 planes (coronal, sagittal and axial) is crucial for preventing instability, excessive stress across the polyethylene insert, and patient satisfaction. Complex primary knees due to deformities, which can be intra and extra articular poses a challenge. Most of the intra articular deformities can be managed with bony cuts. An EAD is associated with high rates of under correction in upto 78.6% and substandard implant positioning in over 21% cases. The deformity may exist in one, two or all three planes and is most commonly a consequence of malunited fractures. These may need prior correction before taking up replacement surgery. We hereby present a case where due to post traumatic extra articular deformity, there was altered mechanical axis in sagittal plane which was also the cause for OA. This is such a rare case that there is no precedence in medical literature.

Clinical Presentation

- 67 years old Male Presented with Pain, Deformity Rt Knee with difficulty in ADL
- Comorbidities DM, HT – under control
- H/o 40 yrs back RTA resulting in Compound Fracture Midshaft Right Tibia Fibula with multiple surgeries for ORIF and subsequent infection.
- Left TKR 2016 with No complaints.

Figure 1: Right Leg and Knee

- HIP and SPINE NAD
- Quads 4+
- Knee flexion 120, No FFD/Ext Lag
- Valgus deformity at knee Partially correctable
- Scarred soft tissue over lower leg
- 4/5 dorsiflexors right ankle
- Shortening of 2 cms
- No NV Deficit

Figure 2: Xray Both Knees AP view

- Left TKA Prosthesis, well aligned, with no evidence of radiolucencies
- Right Knee shows Valgus Deformity with lateral compartment arthritis

Figure 3: Long Leg Standing Xrays Both Lower Limbs Valgus deformity Grade 3 at Right Knee Joint with lateral compartment arthritis Cross Union(Synostosis) of Tibia fibula Mechanical Axis of lower limb lying lateral to knee joint.

Patient was counselled for total knee arthroplasty with patellar resurfacing. He was informed about no change in limb length, correction of valgus deformity with stable knee, possibility of compartment syndrome, wound complications and early failure due to translated mechanical axis based proximal tibial cut.

Surgical Procedure consisted of following steps

- Tourniquet use was restricted to cementing procedure only
- Approach, Medial Parapatellar
- Distal femur cut in 4-degree valgus
- Proximal Tibia Cut using IM Jig in proximal tibia at 0 degree
- Valgus Correction by Pie crusting of IT Band
- Lateral Patellar Release with pie crusting and Replacement
- Semi Constrained Implants obtained

Figure 4: Tibia cut was made using IM jig in proximal tibia as external tibial jig could not be used as distal landmark had shifted laterally

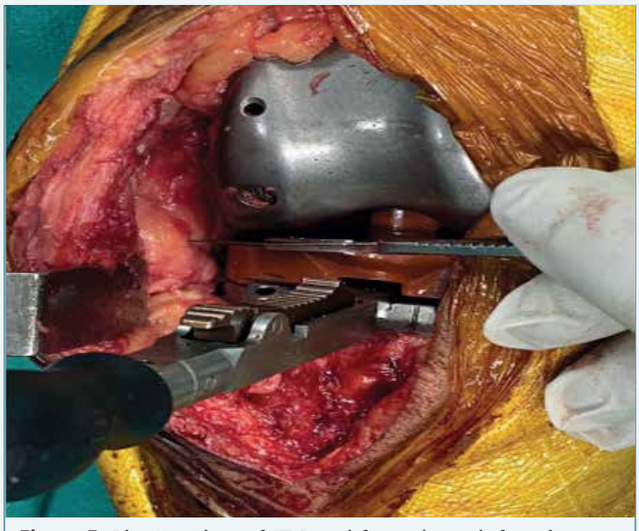

Figure 5: Pie Crusting of IT Band for valgus deformity correction with trial implants in place

Figure 6: Patella replacement and balancing of patellar tracking with pie crusting technique of lateral patellar retinaculum

Figure 7: Semi constrained implant was used as MCL was stretched out. Attenuated MCL usually gives way after some years in active partient.

Figure 8: Postoperative Picture after 2 weeks

Figure 9: Pics of patient walking with a single stick 4 weeks post-surgery on right knee.

Discussion

Tibialisation of fibula has been an acceptable treatment option since long. This can be achieved conservatively in walking cast as well as surgically with transfer of fibula in the tibial gap. Conservative measures more likely to cause cross union between tibia and fibula with lateralized mechanical axis of tibia as in present case. Patient was walking well though on shortened limb. This led to early onset OA in opposite knee and was surgically corrected with knee joint replacement surgery in 2016. Patient did well but right knee due to altered mechanical axis had progressive valgus deformity and started affecting his ADL. Due to good experience of left TKA, he hoped for same outcome in right knee as well. Surgical principles and Navigation softwares suggested correction of mechanical axis first and then TKA in second stage. Correction of axis would entail major surgery with inherent complications. Poor healing potential due to age, comorbidities, and compromised soft tissue cover was another deterrent. After much discussion it was decided to do TKA with existing extra articular deformity. Meticulous surgical technique for valgus knee correction and Semi constrained and thick tibial Insert were used to take care of late onset instability and early wearing off insert.

It's been three and half months and patient is doing well and quite pleased with outcome.

Rare Communication Between Ulnar Nerve and MACN: A Case Report

Source : https://doi.org/10.1016/j.jorep.2024.100309

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Abstract

Background: There are very few reports of abnormal connections between medial antebrachial cutaneous nerve (MACN) and ulnar nerve (UN) of the upper extremity. This article describes an atypical ulnar nerve and medial antebrachial cutaneous nerve connection that was seen during an ulnar nerve transposition for tardy ulnar nerve palsy.

Case report: A 28-years-old male presented with claw hand of left side. He reported feeling weaker in his hands while exercising, as well as medial sided elbow pain and ulnar sided hand numbness. Transposition of ulnar nerve anteriorly was difficult, as intraoperatively an ulnar nerve branch was found to be continuing towards the medical antebrachial cutaneous nerve. The branch was divided in order to transpose the ulnar nerve anteriorly. The recovery period was uneventful and no further complications were noted.

Conclusion: These anatomical variations should be considered when performing upper limb surgeries, since abnormal connections may cause misidentification of the nerve, which may result in damage or inadequate treatment.

Case report: A 28-years-old man with a left-sided claw hand is dvepicted in Fig. 1. He complained of numbness on the ulnar side of his hand, medial sided elbow pain, and hands that got progressively weaker with activity. Froment's sign was positive. Additionally, Tinel sign was found in the proximal back of medial epicondyle.

The elbow radiograph (Fig. 2) revealed a case showing tardy ulnar nerve paralysis owing to the non-union of an old lateral condyle humerus fracture. Nerve conduction study revealed that the F wave over the left ulnar nerve was non-recordable; while the F wave, compound muscle action potential (CMAP), conduction velocity recorded over the right median and ulnar nerve were within normal limits. Although there was no sensory nerve action potential (SNAP) over the left ulnar nerve, the SNAP over the other nerves in the left and right upper limbs was recorded within normal limits. Axonal demyelinating lesion of the left ulnar nerve was reported in the NCV (Nerve Conduction Study) report. Anterior transposition was planned. Under pneumatic tourniquet control, an incision was made from 5 cm proximal to 5 cm distal utilising the medial epicondyle as a prominent landmark. During the subcutaneous dissection, medial antebrachial cutaneous nerve was located and tagged with vessel tape. Ulnar nerve was located and labelled.

immediately proximal to the epicondyle. Then, it was traced proximally along the medial triceps; however, a branch of ulnar nerve that continued in the direction of the medical antebrachial cutaneous nerve was identified (Fig. 3). No pseudo-neuroma was observed. Anterior transposition was challenging as a result. The senior author decided to divide the cutaneous branch in order to transpose the ulnar nerve anteriorly. Following anterior transposition, and the ulnar nerve's stability was assessed under dynamic conditions and the wound was closed in layers. The recovery of ulnar nerve sensation was observed six weeks following surgery, and the postoperative period was uneventful. Ten months following the surgery, the clawing subsided.

Discussion

Anatomical variations are important[3–6,7,8] as these can cause nerve compression syndromes and explain unusual clinical signs and symptoms[9,10] make complex regional pain syndrome management more difficult,[11] avoid iatrogenic injuries during surgery[12,13,14] be beneficial while performing nerve block procedures[15,16] be helpful for nerve grafting,[17] be valuable in detecting peripheral nerve lesions through

neurophysiological evaluation[18] and for neurogenic tumor surgeries.[19]

According to Masear et al.,[7] the medial brachial nerve and the ulnar nerve in the upper extremity communicated with the MACN in 4 % and 6 % of cases, respectively. None of the reports, however, referred to the communicating branch's motor supply.

Notably, the anatomical samples from the two studies conducted by Lowe et al.[20] and Benedikt et al.,[21] differed greatly in terms of number of passing branches of MACN because they were from different racial backgrounds. Persistent median artery to superficial palmar arch varies significantly amongst populations, with 1 % of Caucasians and 40 % of Black people having this condition, according to Feigl et al.[22]

As per our collective knowledge, none of the studies 23–29 that have examined the variation in ulnar nerve anatomy in the Indian population have looked into the relationship between ulnar nerve anatomy and MACN. Further research on this should be prioritized as it appears to be a significant void in the literature.

In conclusion, it is crucial to record and be aware of significant possible branches because of the nerve's variable anatomy and the fact that even minor nerve injuries can result in pain and discomfort.

Figure 1: Claw hand of Left Side

Figure 2: AP Radiograph of Elbow region showing old non-union of lateral condyle humerus

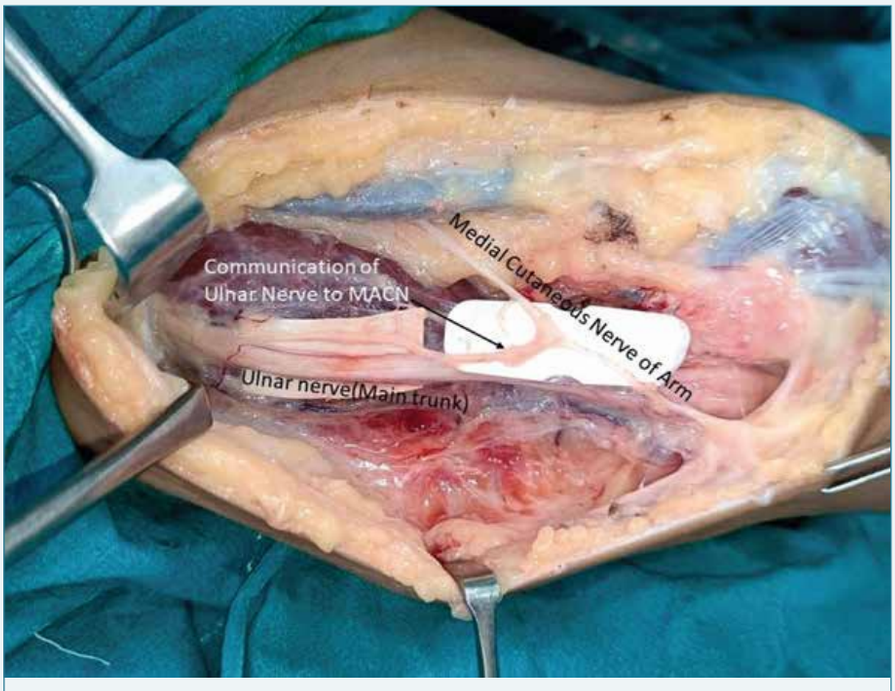

Figure 3: Intraoperative image showing communicating branch of ulnar nerve to MACN.

Rare Case Presentation

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S.L. Raheja, A Fortis Associate

Case Study 1

Case 1

Synovial chondromatosis is a rare condition characterised by formation of pebble or stone like loose bodies within the joint. Usually, these are small, centimetre sized nodules made of cartilage and/or bone. Rarely, large giant-sized osteochondromata may be present in the joint. We present two cases of giant synovial osteo chondromatosis affecting one knee joint in the first patient, and both the knee joints in the second patient.

Case 1 - Patient 1

70 years male patient presented with longstanding right knee swelling and arthritis. The swelling was due to a giant osteochondromata measuring 12 x 6 x 5.5 cm. in size which was surgically removed. Multiple smaller osteochondromata along with the synovial lining of the knee joint were removed and a total knee replacement was performed at the same time. To our knowledge, this is the largest reported stone from the knee joint in India and second largest in the world. The patient was relieved of his pain and swelling and is back to his routine life.

Case 1 - Patient 2

71 years male patient presented with bilateral knee swelling, deformity, and arthritis. This patient was suffering from multiple giant synovial osteochondromatosis affecting both the knee joints. He underwent osteochondromata removal, synovectomy and complex prosthetic reconstruction of the knee joints in a staged manner. The largest osteochondromata in the left knee measured 6 x 4.5 x 2.5 cms and 5.5 x 4 x 2 cm in the right knee. His pain, swelling, and deformities are now corrected and he is able to walk normally.


SUNDAY TIMES OF INDIA

Docs remove 12cm 'stone' from 70-yr-old patient's knee

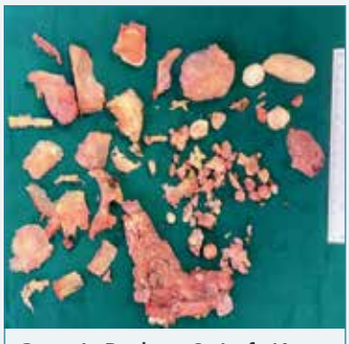
Case 1- Patient 1


mid-day

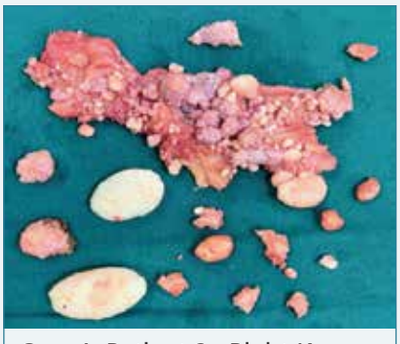
Rare surgery has 71-year-old back on his feet

9TH

Case Study 1- Patient 2



Case 1- Patient 2- Left Knee



Case 1- Patient 2 - Right Knee

Case 1 - Patient 2 - Legs before and after surgery

Case study 2

A 30 years female, mother of a one year old child, resident of Chandrapur, Maharashtra presented with pain in both the hips and severe leg deformities. She was unable to walk and nearly bed-bound. She was suffering from advanced avascular necrosis (bone death) of both the hips.

She is one year post delivery. She started having pain in both her hips a few days after her delivery. Initially, she resorted to indigenous treatments and medicines, locally. About 7 months after her delivery, she visited the Orthopaedics department of a medical college where she was diagnosed to have avascular necrosis (bone death) of both her hips. She came to our hospital for further treatment.

Total hip replacements on both sides were performed for her and her deformities were corrected. The surgery was complex due to the severe nature of deformities. Also, due to her short stature, small-size implants had to be arranged and used in her case. Such small sized implants are not routinely used or available.

She had no history of Covid infection or having taken steroids. She had pregnancy induced hypertension which has resolved after delivery. She is a 'sickle cell' carrier but does not have sickle cell disease.

लोकमत

नेक्रोसिसग्रस्त तरुणीला जीवनदान

रक्तपुरवठा कमी झाल्याने लागण; सात महिन्यांनी बाळ कुशीत

लोकमत न्यूज नेटवर्क

मुंबई : रक्तपुरवठ्याअभावी हाडांमधील पेशी कमी झाल्याने चंद्रपूरच्या जीन मोहे यांना नेक्रोसिस या आजाराचे निदान झाले. या आजाराला 'बोन डेथ' असेही म्हणतात. या रुग्णास माहीम येथील खासगी रुग्णालयात यशस्वी शस्त्रक्रिया करण्यात आली. यामुळे सात महिने अंथरुणाला खिळलेल्या या तरुणीला जीवनदान मिळाले आहे. एक वर्षापासून बाळ अकलेल्या या महिलेने सात महिन्यांनी आपल्या बाळाला कुशीत घेतले.

नेक्रोसिस आजारात हाडामधील लहान-लहान पेशी हळूहळू हाडाचे नुकसान होऊ लागते. सुरुवातीला: नितंबावर अधिक परिणाम होतो. या आजारात खासगत जोखीम घटकांमध्ये स्टेरॉइडचे सेवन, जास्त प्रमाणात मद्यपान, आघात, रेडिओथेरपी, सिकलसेल आणि आर्थर ट्रमॅटिक प्रकरणांमध्ये गर्भधारणा यांचा समावेश होतो.

या रुग्णाला दोन्ही नितंबांमध्ये वेदना होत होत्या आणि चालणे शक्य झाले होते. या वेदनांमुळे ती खरंच उभी राहू शकत नव्हती आणि झोपूही शकत नव्हती. सुरुवातीला स्थानिक डॉक्टरांच्या सल्ला घेतला आणि स्वदेशी उपचार आणि औषधांचा अवलंब केला पण, प्रकृती बिघडली आणि शिरा चालता येत नव्हते. तिचा पाठीचा कणा वाकलेला होता आणि ती सरळ झोपूही शकत नव्हती. या वेदनांमुळे तिला अंथरुणावरच खिळून राहावे लागले आणि तिच्या सात महिन्यांच्या मुलाची काळजी घेणे तिच्यासाठी अशक्य झाले. खचत तिच्यावर भावनिकदृष्ट्याही परिणाम झाला.

X-ray showing bilateral avascular necrosis of femoral heads

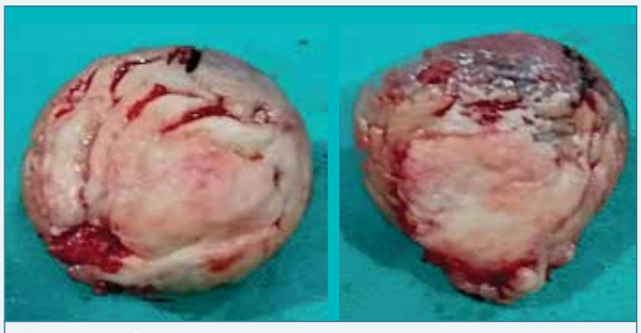
Pregnancy is an extremely rare cause of avascular necrosis and has been reported in only about a 100 cases, worldwide. It is thought to happen due to increased blood coagulability, increased blood cortisol (steroid hormone) levels or due to mechanical compression of iliac veins during pregnancy.

Carriers of sickle cell, also known as sickle cell trait rarely have any symptoms. The reported number of cases of sickle cell trait causing avascular necrosis are in single digits. (PS- patients of sickle cell disease have a high risk of avascular necrosis but carriers of sickle cell rarely have symptoms).

Our patient is an extremely rare presentation of bilateral hip avascular necrosis related to pregnancy with underlying sickle cell trait; a scarcely reported condition.

Pelvic and hip pain is common after childbirth. Rarely, a serious condition like avascular necrosis could be the underlying cause. If diagnosed early, it can be treated with simpler treatments and potentially avoid a hip replacement.

Following surgery, the patient is able to stand up and walk and is recovering well. Due to correction of her deformities, there was an apparent increase in her height of about 3.2 cms.



Damaged femoral heads due to avascular necrosis which were removed during surgery.

Patient unable to stand straight before surgery due to bent spine and hips. After Surgery, patient able to stand straight. She was unable to separate her thighs before surgery which is possible to do with surgery.

Total Knee Replacement in Malunited Distal Femur Fracture

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Introduction

This article presents the case of Pahala Devi, a 61-year-old female who sought medical attention for a five-year history of knee deformity and pain, primarily affecting the left knee. Despite previous conservative management of a distal femur fracture in 1996, the patient experienced a malunited fracture, leading to increasing pain and difficulty in daily activities. The article details the clinical examination, pre-anaesthetic assessment, and the successful total knee replacement (TKR) procedure performed on 07/11/2023.

Clinical Presentation

This patient's presentation included insidious onset and gradually progressive pain, exacerbated by activities, and impaired ambulation with support. The left knee exhibited swelling, tenderness at the medial joint line, and a limited range of motion (10 to 60 degrees) that was not passively correctible. A healed scar from the previous fracture was evident on the anterior aspect of the knee.

Preoperative Planning

After routine pre-anaesthetic check-up and fitness, the patient was scheduled for TKR surgery. The procedure involved a 16 cm midline skin incision, conventional medial parapatellar arthrotomy, and rectus snip for patellar exposure. The femoral preparation utilized an intramedullary jig with a unique entry point. Tibial preparation involved stem augmentation due to an impending stress fracture. To address patello-femoral issues, a V-Y quadriceps plasty was performed, achieving an intraoperative range of motion of 0-120 degrees.

Postoperative Care and Rehabilitation

Following surgery, patient was observed for two days in the Joint Replacement Care Centre, and a long knee brace was applied for support. Partial weight-bearing was allowed for four weeks using a knee brace and walker, progressing to full weight-bearing at six weeks. Passive range of motion exercises began at 50 degrees, with a progressive increase of 10 degrees per week until reaching 90 degrees. Static quadriceps exercises commenced after three weeks. The patient's postoperative course was uneventful, and she was discharged on the fourth postoperative day.

Outcome and Follow-up

Patient underwent routine suture removal and exhibited no external deformity at the two-month follow-up. Full weight-bearing was maintained, highlighting the success of the TKR procedure in alleviating pain and restoring function in the patient's daily life.

Conclusion

This case study emphasizes the successful management of a complex knee condition through total knee replacement, showcasing the importance of tailored surgical approaches and postoperative rehabilitation in achieving favourable outcomes for patients with malunited fractures.

Management of Tibial Condyle Defects in Total Knee Arthroplasty

Dr Arun Partani
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Fortis Escorts Hospital, Jaipur

Introduction

For Advance stage osteoarthritis TKR surgery is done in which some uncommon Tibial bone defect may encounter. Because of which stability and angular position of implant may become crucial. Therefore, bone defects of tibia should be addressed properly for implant stability and limb alignment which affect longevity of TKR surgery (1,2).

Bone cementing, Bone grafting, insertion of thick polyethylene implant after the resection down to bone defect etc are various options explained in literature (3-9). In recent literature metal wedge or block augmentation methods are introduced, but advantage and disadvantages of these methods are still controversial (10-12).

Case 1: Varus knee, with uncontained defect:

A 60 Year Male presented with pain, difficulty in walking for last 1 Year 6months. Pain was gradual in onset and slowly progressive. On examination, patient was having 30 degree of Varus which was not correctable passively. FFD- 15 Degree, ROM-15-100-degree, crepitus Present, painful ROM. Pre-operative planning- biplanar knee radiograph was done which showed 30-degree Varus, uncontained MTC (Medial Tibial Condyle) defect and severe osteophytes in ML and AP planes.

TKA was planned with cemented PS un-constrained design. Standard medial parapatellar approach used and femur prepared. Tibia Cut- 11mm tibial cut was taken from unaffected side (LTC- Lateral Tibial Condyle) with 3 degree posterior slope. MTC had 1.50 x 3x5 Cm uncontained bone defect on MTC. Tibial base plate measured and trial with 5 mm x 3 wedges on MTC was taken. ML gap balancing was done by MCL pie crusting and reduction osteotomy. after Tibial reduction osteotomy center of tibial plateau shifted towards lateral so finding center of canal of tibia is crucial. Bed prepared with zigs. 5mm x 3 metal wedged used to manage MTC uncontained defect. final trial with femoral component and tibial component with 5mm x 3 wedges was done, which was stable with no movement. Final unconstrained implant with 3 x 5mm wedges used with central tibial stem.

Complete correction of Biplanar deformity was insured intra operatively. Post-operative X-ray AP & lateral view showed well placed implant with correct limb alignment. 30 Months follow-up radiograph showed no evidence of loosening of prosthesis. Patient have ROM 0 to 135 degree.

Case 2: Varus, contained defect with Bone Tumor

A 54 Year Male presented with pain, difficulty in walking for last 3 to 6 Months. Pain was out of proportion to the deformity and increasing rapidly. on examination patient was having 10-degree Varus deformity which was slowly progressive and passively not correctable, painless full ROM present. no FFD or hyper extension was present.

Pre-operative planning - Biplanar knee radiograph was obtained which showed lytic lesion in MTC. So, we went for MRI which suggested bone tumor with size 3x3x5 cm with no neuro vascular involvement, possibly a benign tumor. Intra operative biopsy was taken and sent, reports showed chondromyxoid fibroma.

TKA was planned with cemented PS non-constrained design. Standard medial parapatellar approach used to expose knee. Femur prepared. 8mm tibia cut was taken with 3-degree posterior slope. Tibia base plate was measured. ML gap was analyzed. Medial structure tightening was present. Soft tissue balancing and reduction osteotomy to correct varus deformity.

Surgical technique for tibia bone defect : Primary tibia was trialed on a prepared tibial cut and MTC bone Tumor was exposed. Bone tumor was excised en-mass. Curettage of extremities was done. Care was taken not to convert a contained defect into uncontained defect. margins of defect was chemically cauterized with phenol. So that future recurrence of tumor can be avoided. Bed was prepared so that bleeding bone can be achieved, so that bone graft impaction and union can be achieved. Bone cement should not go in between bone graft and host bone. It created a contained defect on MTC measuring 3x3x5 cm.

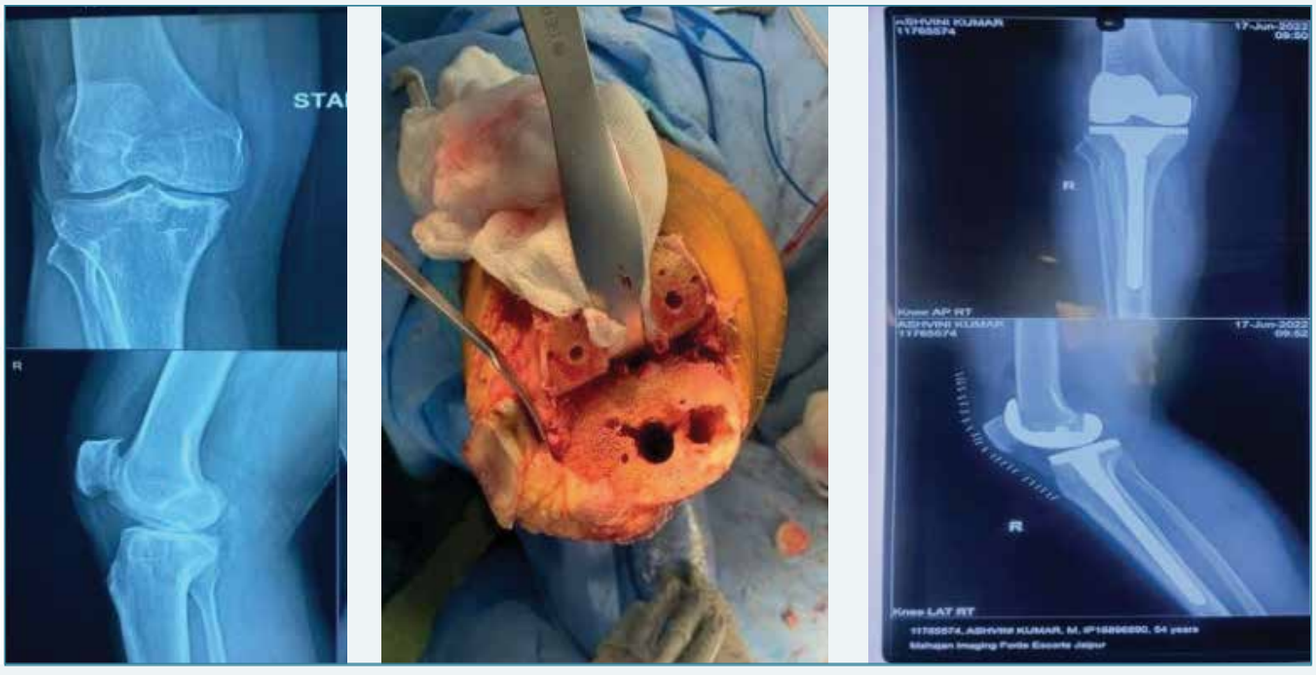
Defect was managed with bone graft taken from distal femoral cut. We used central stem in tibia as the use of central stem in tibial component helps to reduce compressive forces and shear loading across bone graft.

Bone graft was used in this case as it was a contained defect, furthermore it preserves Bone stock for possibility of future revision. Bone graft should be used in young and active individual who can adhere to rehabilitation protocol.

In such cases of bone tumor curettage of extremities should be done completely and meticulously, keeping in mind of not to converting a contained defect into uncontained defect.

After placing bone graft and ensuring well impaction. femoral and tibial trial was taken which was stable with no movement. Bone cement percolation between bone graft and host bone was prevented at the time of cementing the final implant. Complete correction of Biplanar deformity was insured intra operatively. Post op biplanar radiograph showed well placed implant with correct limb alignment and bone graft well fixed in place.

18 Months follow up radiograph showed union of bone graft with no evidence of loosening of prosthesis. Patient has ROM 0 to 135 degree.



Case 3: Post TKR, fracture MTC, uncontained defect:

69 Years Female presented with complain of pain, swelling and unable to bear weight on lower limb. She had history of slip and fall. She had previous history of TKR 7 months back.

On examination- Passively correctable 20 degree varus, swelling present, tenderness present unable to move Lower limb, crepitus present, FFD absent.

Preoperative planning- Biplanar knee x-ray was done. Which showed post TKR periprosthetic fracture MTC. Femoral implant well fixed. Tibial base plate loosened. Varus 20 degree. TKA was planned with cemented PS semi-constrained design. Standard medial parapatellar approach used to exposed knee joint. Femoral implant found to be well fixed and no loosening. Decision was taken to keep the femoral component. Tibial base plate was removed and cement debridement was done. With preserving as much bone stock possible by minimum bone loss. Tibia prepared, MTC defect was of 6x4x2 cm, uncontained type. MTC bed prepared with jigs. Finding center of canal of tibia is difficult as center of tibial plateau shifted to lateral because of reduction osteotomy. 5mm x 3 wedges used to manage MTC uncontained defect. Final semi-constrained implant used with central tibial stem.

Case 4: Valgus Knee, With Contained Defect:

A 46 Year Female presented with pain difficulty in walking for last 3 to 5 Year. On examination – passively partially correctable 30-degree valgus, no FFD, ROM 0- 110 Degree, crepitus present.

Pre-op planning – AP and lateral knee radiograph was obtained which showed 30-degree valgus with contained bone defect over LTC. TKA was planned with cemented PS semi-constrained design. Standard medial parapatellar approach used. Femur prepared. 8mm tibial cut taken with 3-degree posterior slope. contained bone defect of 5x3x3 cm over LTC. Gradual valgus correction done by lateral capsule release and ITB release. Care was taken to not to convert a contained defect into un-contained defect. Bed was prepared so that bleeding bone can be achieved, so that bone graft impaction and union can be achieved. Bone graft was placed and fixed with screw. Screw head was counter sunk into bone. After ensuring well impaction of bone graft femoral tibial trial was taken which was stable with no movement. Semi-constrained implant with center tibial stem was used. Bone cement percolation between bone graft and host bone was prevented at the time of cementing the final implant. Complete correction of Biplanar deformity was ensured intra operatively. Post-operative radiograph showed well placed implant with correct limb alignment and bone graft well fixed in place. 2 Year follow up radiograph showed union of bone graft with no evidence of loosening of prosthesis.

Case 5: valgus knee with contained defect:

56-year female presented with pain, difficulty in walking from last 5 year. On examination, wind swept deformity with right knee valgus of 40 degree, passively partial correctable, ROM painful with 10-degree hyperextension.

Preoperative planning. Biplanar radiograph was done which showed 40-degree valgus with uncontained bone defect over LTC. TKA was planned with cemented PS semi constrained design. Standard medial parapatellar approach used. Femur prepared. 8 mm tibial cut was taken with 3-degree posterior slope. Contained bone defect of 30X50X45 mm. MCL found to be laxed and lateral structure tight. Gradual valgus correction done by releasing lateral capsule, ITB release and popliteus pie-crusting. Bone graft with screw was planned. Bed was prepared with taking care not to convert a contained defect in to uncontained defect. Bone graft was taken from femoral cut prepared, placed into defect and fixed with screws. Screw had counter sunk. After ensuring well fixation of BG, trial was taken which was stable with no movement. Semi constrained implant with central tibial stem used. Bone cement percolation prevented. Complete correction of biplanar deformity confirmed intra operatively as well as post operatively.

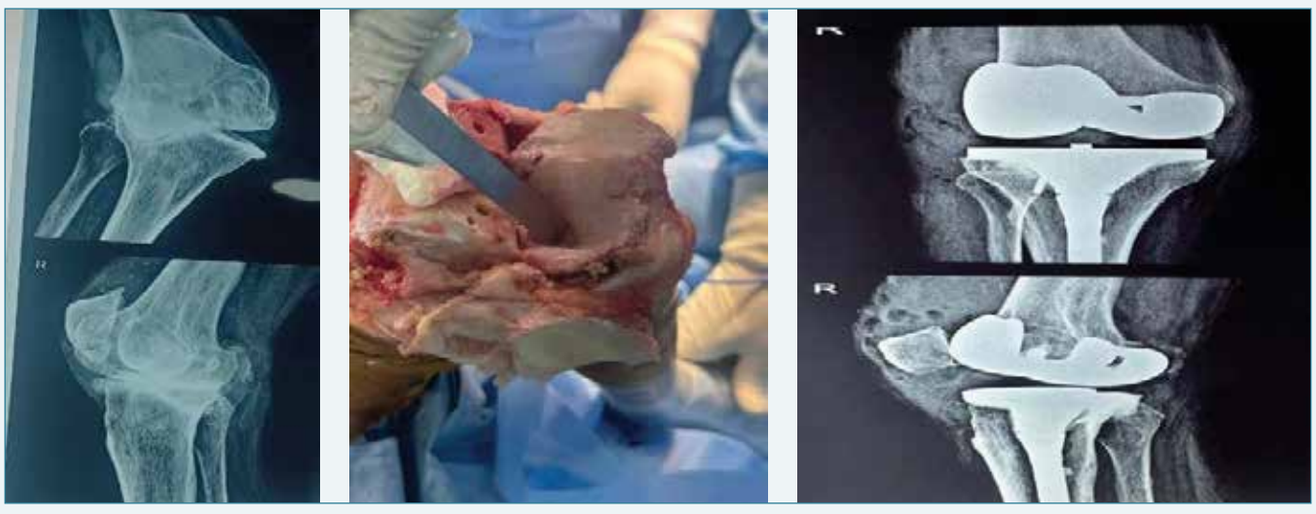
Post-operative complication- wound partial dehiscence with marginal necrosis occurred due to poor sub- cutaneous tissue, which recovered in 2 Month. CPN neuropraxia due to acute valgus correction occurred which recovered in next 4 months.

Discussion

This case report was written to present management options of various tibial defects in primary and revision TKA. Tibial bone defects present with severe ML deformity. It further debilitates functionality and contribute in progression of arthritis. Small tibial bone defects can be managed by resection of tibia 2-3 mm more and using thicker poly but this method can't be used for larger defects. In our cases we used autologous bone graft for contained defect to minimize loss of bone stock for the possibility of future revision. For uncontained defect metaphysical sleeve used. Central tibial stem used to decrease axial load and shearing forces at bone cement-bone junction. Our short-term follow-up has showed well fixed implant and correct alignment of lower limb with no evidence of prosthesis loosening. We will continue to follow-up on these patients with the objective of detecting any loosening of prothesis in mid to long term follow up.

Conclusion

Tibial bone defects can be managed by different methods as per deformity. Small bone defects of less than 5 mm in their largest dimension after tibial resection can be managed with bone cement only. Defects measuring 5-10 mm in largest dimension can be managed with bone cement and screw. Larger contained defect can be managed with bone graft and screw only in some cases. such cases central tibial stem should be used to decreased axial load and shear forces to avoid early prosthesis loosening and failure. Large uncontained defect can be managed with metal augmentation and tibial stem. Larger uncontained defect with ML instability can be managed with metal augmentation, central tibial stem and semi-constrained or constrained implant. Accurate alignment achievement aid in compression forces perpendicular to mechanical axis which facilitated bone graft union and avoid shearing forces to implant-cement and cement-host bone interface.



A Case Report of Rehabilitation of Arthroscopic Rotator Cuff Repair Patient

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Abstract

The aim of this review is to evaluate the evidence regarding the effectiveness of physiotherapy in lowering pain, improve range of motion and enhance shoulder function in patients with symptomatic rotator cuff tears patient. Rotator cuff injuries are typically followed by a gradual onset of pain, but they can also be the result of an acute injury. Chronicity, underlying anatomic and physical factors, age, and the presence and severity of tendon tears all influence how rotator cuff conditions are managed. Conservative care, such as physical therapy, is typically used as the first line of defence, but surgical repair may be required later on. Rotator cuff (RC) tears can range from partial to full thickness tears of a single tendon to massive cuff tears. Rotator cuff tearing can be caused by glenohumeral trauma as well as pathological process. As a result, Treatment necessitates a diligent diagnosis as well as a distinguished approach that considers morphological and patient specific effects. The therapeutic approach is determined by the patient's pathogenicity, tear morphology, clinical symptoms, and functional demands. The current case is about a 42-year old male who was admitted to the hospital with tear injury to right shoulder due to fall at the site where he was working. Strength, pain management and range of motion were main focus of physiotherapy intervention. The primary goal of this case study was to assess the patient's response to physiotherapy for reinforcement and functional task.

Introduction

The shoulder joint is a ball and socket joint, which means that it sacrifices stability for mobility. According to one description, the glenoid is a shallow rim similar to a golf like ball on a tee or a football on a dinner plate. The therapeutic approach is determined by the patient's pathogenicity, tear morphology, clinical symptoms, and functional demands. The rotator cuff is a group of 4 muscles that originate in the scapula and insert on the superior humeral head to provide firmness. The subscapularis is an internal rotator that connects to the humerus' s lesser tubercle. The supraspinatus muscles attach to the greater tubercle of the humerus and act as an abductor for the first 30 degrees of abduction. The infraspinatus is a slightly inferior external rotator to the supraspinatus that inserts onto the greater tubercle. The teres minor inserts inferior to the infraspinatus on the greater tuberosity and acts as an external rotator. Furthermore, they all serve as glenohumeral stabilizer Rotator cuff injuries can range from mild strains to tendonitis, partial tears, and complete tears. Age has a massive effect. Injuries scale from 9.7 percent among those under the age of 20 to 62 percent among those over the age of 80. As people age and encounter unilateral pain, a tear in the rotator cuff of the opposing shoulder is also possible. In a study contrasting individuals with unilateral shoulder discomfort, the average age of a patient without a cuff rupture was 48.7 years. After the age of 66, the likelihood of bilateral rips increases by 50%. Furthermore, age was associated to the presence and type of tear, but not tear size. Rotator cuff tears were found in 20.7 percent of the patients, and the incidence of occurrence increased with age. Rotator cuff tears were discovered in 36% of patients with present symptoms. Rotator cuff tears were most frequently

linked with elderly patients, males, affected the commanding arm, and the one who are in heavy labour, had a history of trauma, showed less active forward elevation and weak muscle strength in abduction and external rotation, and were positive for impingement sign in the general population. In a logistic regression analysis, a past of trauma, dominant arm, and age were discovered to be risk factors for rotator cuff tears. The three most common rotator cuff repair techniques are traditional open repair, arthroscopic repair, and mini-open repair. Finally, all patients are prescribed physiotherapy management for pain, strength improvement and overall fulfilment.

Patient Information

In this case, we have a male aged 42-year old working as a labour at some construction site in Jaipur resident of Beawar, presented to Fortis Escorts hospital aipur with incidence of fall and complaint of pain and difficulty to do overhead abduction of right shoulder. Patient was apparently alright till the fall. When working at a site had a fall around 1 pm sustaining injury to right shoulder, it was followed by pain which was so severe that he was unable to move his shoulder, it was aggravated by movements and relief on immobilization. Patient was taken to a local hospital where he was given some medication but no relief. No history of vomiting. No history of seizures. No history of ENT bleed. Later he came to Fortis Escorts hospital for further management and was advised for surgery.

Clinical Findings

The patient was examined at same level with both shoulder in sitting position, upon inspection, the patient find it difficult to do all the movements of affected side while there was normal range of motion found on unaffected side. Overlying skin was found to be normal. Swelling was present, no scar, Sinus and dilated veins. Shoulder contour maintained. No obvious bony deformity seen, no local rise of temperature, no bony tenderness elicited, speed test and drop arm test were found positive. Active elbow and wrist movement were seen and radial artery was palpable.

ROM (after 2 months)		
GH Joint	Rt. Side	Lt. Side
Flex.	0-90	WNL
Abd.	0-90	WNL
Ext. Rot.	0	WNL

ROM (after 4 months)		
GH Joint	Rt. Side	Lt. Side
Flex.	WNL	WNL
Abd.	WNL	WNL
Ext. Rot.	WNL	WNL

MMT (after 2 months)		
GH Joint	Rt. Side	Lt. Side
Flex.	3/5	5/5
Ext.	3/5	5/5
Abd.	3/5	4/5
Ext. Rot.	3/5	4/5

MMT (after 4 months)		
GH Joint	Rt. Side	Lt. Side
Flex.	4/5	5/5
Ext.	5/5	5/5
Abd.	4/5	4/5
Ext. Rot.	4/5	4/5

Therapeutic Management

To reduce pain, swelling and adhesions: Myo-pulse treatment was done with some specific frequencies for pain and swelling i.e. at 0.5 HZ and 80 HZ at 200 intensity and for adhesions we used 2 HZ and 6 HZ at 200 intensity. This we did for a week and after that the pain of the patient subsidised and along with that we start mobilisation which includes functional mobs with posterior glide, posterior translation, inferior glide, inferior translation and have also applied functional mobs at AC joint along with inferior glide at the distal end of Clavicle. After 5 sessions we also started soft tissue mobilisation.

Discussion

In this case report, a case of 42-year old male with rotator cuff tear is been discussed and repair arthroscopically managed. The primary goal was to prevent secondary complication and range of motion and strength of shoulder muscles. Following RC repair, postoperative rehabilitation patient was doing exercises on his own in his village and after 2 months he was referred to physiotherapy department because of the lack of proper rehab. The patient's range of motion is the same as mentioned in the chart and was having severe pain of 6 on a scale of 0 to 10. So the patient has undergone myopulse therapy with some specific frequencies to relieve pain and decrease the

scarring and adhesions followed by manual mobilisation.

Conclusion

Rotator cuff injuries are common origin of shoulder pain. Early identification plays a major role in management. Management options include conservative management, Open repair or arthroscopic repair. Physiotherapy plays an important role in management of rotator cuff repair.

Happenings @ Fortis

Fortis Organises Two-day IHH Clinical Exchange Program on "Robotic – assisted Surgery"

Medical conferences and symposiums are opportunities for clinicians to come together, connect, network, grow, and learn from each other. IHH Clinical Exchange program offers such an opportunity to clinicians across IHH network to share knowledge and their experiences for mutual benefit. Following three such symposiums, organized by Gleneagles (India), Acibadem (Turkey) and Singapore business units the fourth one in this series was hosted by Fortis on the theme "Robotic-assisted Surgery" (RAS) for soft tissues.

The two-day Symposium was held at Gurugram, India on December 08th and 09th, 2023 and focused on key Robotic specialties like Gynecological Oncology; Urology; General and Gastrointestinal Surgery; Colorectal Surgery, Head and Neck Surgery and Cardio Thoracic Surgeries. The event was addressed by Dr Ashutosh Raghuvanshi (MD&CEO; Fortis Healthcare); Dr Bishnu Panigrahi (Group Head-MSOG, Fortis Healthcare) and Dr Keith Lim (Group Head - MAQ, IHH Healthcare). It witnessed participation of leading Robotic surgeons from IHH Singapore; Malaysia, Hong Kong, Gleneagles and Fortis. The Fortis Scientific Committee, set up by the Robotic Specialty Council with MSOG and comprising of eminent clinicians, carefully crafted an Agenda which featured mix of topics to engage all participants and allow active sharing of insights on practices, innovations and advancements in the field of Robotic-assisted Surgery. The interactive scientific sessions included Video Workshops; Podium Presentations and Panel discussions on key topics. The thought-provoking scientific sessions was followed by some fun and frolic. Guests were entertained at the Dance and Musical Evening celebrating rich cultural heritage of India, followed by a day-trip to the Taj Mahal – a modern wonder and UNESCO World Heritage Site.

Overall, the event has been very well received by participants, commending the content and execution.

Dr Pradeep Jain

Dr Swapna Misra

Dr Sandeep Nayak

Dr Mohan Keshavamurthy



Fortis Cancer Summit 2024: "Advances in Precision Oncology"

Dr Niti Krishna Raizada
Organising Chairperson – Fortis Cancer Summit
Senior Director, Medical Oncology and Haemato-Oncology
Fortis Hospitals, Bangalore

The Fortis Cancer Summit held on January 26th to 28th, 2024, at the Sheraton Grand in Bangalore, was a resounding success, marking a significant milestone in the field of oncology. With a robust agenda encompassing scientific sessions, discussions, and presentations, the summit brought together a diverse array of stakeholders, including esteemed healthcare professionals, researchers, and industry leaders.

The opening day, January 26th, was dedicated to honouring the Fortis community, with senior leadership present to acknowledge and celebrate their contributions to cancer care.

27th Jan 2024 was the inaugural event with the presence of Chief Guest Sri Dinesh Gundu Rao, the Health Minister of Karnataka, our IHH CEO Dr Prem Kumar and Fortis Group CEO Dr Ashutosh Raghuvanshi sir which added prestige to the event, underscoring the importance of collaborative efforts in combating cancer.

From January 27th to 28th, the summit transitioned into scientific sessions focusing on various subspecialties in oncology. Under the theme "Advances in Precision Oncology," experts delved into ground-breaking topics, including thoracic oncology, breast oncology, head oncology, Neuro oncology, Haemato-Oncology, GU and GI oncology, gynaecological oncology, and more. The agenda was meticulously crafted to explore the latest advancements and innovations shaping the future of cancer treatment.

One of the highlights of the summit was the comprehensive discussion on precision oncology, emphasizing the implications of actionable molecular alterations, recent research findings, and emerging therapeutic approaches. Topics such as immunotherapy,

targeted therapies, and the integration of artificial intelligence in decision - making processes received significant attention, reflecting the cutting-edge landscape of modern oncology.

In addition to traditional treatment modalities, the summit explored innovative areas such as liquid biopsy, CAR-T cell therapy, new generation gamma knife, MRI Linac, Proton therapy and advanced robotic techniques. These discussions underscored the importance of embracing technological advancements to enhance patient outcomes and minimize treatment-related side effects.

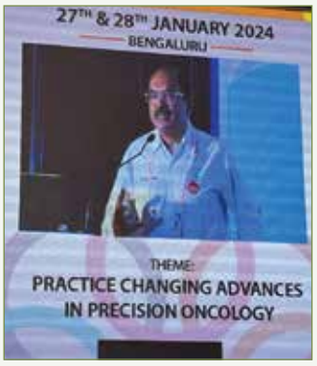
The Fortis Cancer Summit also provided a platform for young oncologists and students to showcase their research and findings through posters and podium presentations with cash awards to top presenters. This commitment to nurturing future leaders in oncology highlights the summit's dedication to fostering knowledge exchange and innovation within the field.

Furthermore, the summit facilitated discussions on the challenges and opportunities in cancer care across different geographical regions, with a particular focus on Tier 2, 3, and 4 cities. Prominent clinicians from these areas shared valuable insights, contributing to a dialogue that transcends boundaries and promotes inclusivity in cancer care delivery.

With over 300 national faculty members, 25 international faculty members, 60 international delegates, and 1200 national delegates in attendance, the Fortis Cancer Summit was a testament to the global collaboration driving advancements in oncology. Additionally, the summit garnered significant online engagement, with over 5000 attendees participating live.

CNBC News18 interacted with our industry leaders to discuss future of oncology. Some leaders/ participants at the summit who require a special mention are Mr Anil Vinayak, Dr. Bishnu Panigrahi, Dr Ritu Garg, Mr Akshay Oleti, Dr Rana Patir, Dr Nitesh Rohatgi, Dr Rahul Bhargav, Dr Ankur Bahl, Dr Manmeet Ahluwalia, Dr Dhirendra Prasad, Dr Swaminathan Iyer, Dr I Petek, Dr Vivek Radhakrishnan, Dr Mohan Keshavmurthy, Dr Mahul Amin, Dr Rajendra Singh, Dr Vritti Lumba, Ms Ekta Batra, Mr Faraz Ahmed to name a few.

In conclusion, the Fortis Cancer Summit 2024 exemplified the spirit of collaboration, innovation, and excellence in oncology. By bringing together thought leaders, clinicians, researchers, and industry experts, the summit catalysed meaningful discussions and laid the groundwork for future breakthroughs in cancer care. As we reflect on the successes of the summit, we look forward to continuing the journey towards a world where cancer is no longer a formidable adversary, but a conquerable challenge.



Project EMR – Update

Electronic Medical Record (EMR) is a digital compilation of an individual's health-related information, accessible to authorized clinicians and care providers. It encompasses details like a patient's health history, diagnoses, medications, laboratory and radiology reports, clinical notes and treatment plans. EMR represent a significant step in healthcare maturity by bringing in significant value addition in the interaction between patients and clinicians. Timely access to patient data ensures timely and informed clinical decision-making and care delivery.

As per the Project plan, Fortis EMR involves a discovery phase, solution analysis, customization, and a phased rollout across network hospitals, starting with Outpatient (OP) module and followed by In Patient (IP) module implementation.

EMR journey for Fortis has started with Fortis Memorial Research Institute becoming the first Fortis hospital to Go Live with the EMR OPD module on January 25, 2024. Fortis Mulund and Fortis BG Road in February and March respectively.

The EMR software, Cerebral Plus, has been developed by Acibadem Teknoloji (Türkiye) and is already implemented in IHH Malaysia and Singapore units. It has been customized to Fortis requirements and integrated with core applications like HIS, Lab Information System (LIS), PACS, and MyFortis platform to provide seamless transfer of information.

Key Advantages

a. Streamlining Patient Information Management - quick and easy access to relevant information across care episodes.

b. Integration of Diagnostic and Lab Results.

c. Integration of patient appointment information.

d. Option to create customizable templates for medical documentation, add favourites for medications, investigations etc.

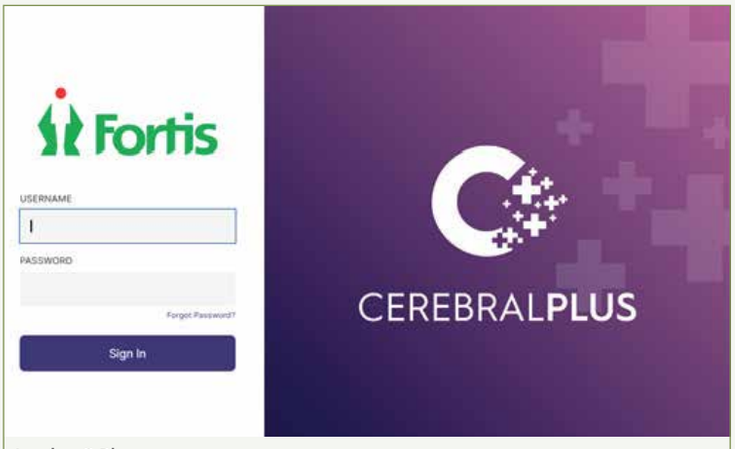
e. Provision for Team functioning, Nursing Assessments etc.

f. Data Security and Compliance

MSOG Medical IT team was stationed at FMRI a week prior to the launch along with the Turkish technical team. Intensive training of Super Users and End Users

were carried out including hands-on sessions at the on-premises Command Centre. The Go Live went off smoothly and the software has stabilized - the number of clinicians using EMR in their daily practice is witnessing a steady increase. User feedback is being taken regularly to help enhance the software.

Dr Vedant Kabra – Principal Director, Surgical Oncology and Medical IT team on 'Go live day'



Login- C Plus

Dr Amit Choudhury – Senior Consultant, Bone and Joint Institute

Dr Kiran – Associate Consultant, Bone and Joint Institute

Dr Rohit Goel – Consultant, Cardiology

Clinical Research Summit- North Chapter 1.0

Theme

Hospitals to bridge the knowledge lacunae between theory and practical exposures under aegis of CREATIVE (Continuous Research Education and Training Initiatives) program.

Fortis Memorial Research Institute, Gurugram has taken a significant stride in advancing healthcare by expanding its focus beyond conventional medical management. Recognizing the pivotal role of clinical research in shaping enhanced patient outcomes, Fortis organized the Clinical Research Summit North Chapter 1.0 - a transformative workshop on 30th Nov 2023 that attracted active participation and delivered substantial benefits to over 25 colleges, universities, students, and faculties.

This conference served as a bridge between Clinical research industry and Academia. This conference had sessions which focused on Medical writing, Clinical research operations, Development of SOPs, Functioning of Ethics Committees, followed by two panel discussions on Clinical Research opportunities and Clinical Research industry and Academia connect.

Organising committee - North Chapter 1

Clinical Trials

Comprehensive Online Database for Antimicrobial Resistance (CODAR): Creating a Data Source Linking Microbiology Laboratory Data (Including Resistance), Antimicrobial Treatment Information, and Longitudinal Clinical Data for Hospitalised Patients.

Dr Yashesh Paliwal
Director & Head –
Critical Care Services
Fortis Hospital, Anandapur

Dr Murali Chakravarty
Senior Director –
Anaesthesia, CSICU and
Pain relief
Fortis Hospitals, Bangalore
Chair, Central Infection
Prevention and Control Committee
Fortis Healthcare

Dr Anita Mathew
Director – Internal Medicine
Fortis Hospital, Mulund, Mumbai

Dr Aarti Gupta
Zonal Head –
Lab Operations
Agilus Diagnostics
Fortis Memorial
Research Institute, Gurugram

Dr Ravneet Kaur
Head – Lab Services &
Microbiology
Fortis Hospital, Noida,
Agilus Diagnostics Ltd

Dr Anu Gupta
Lab Head & Senior Microbiologist
Fortis Escorts Heart Institute, Okhla

Introduction

It is a well-known fact that microorganisms are developing resistance to antimicrobial drugs, which has becomereat a great public health concern among the scientific fraternity globally. Resistance has emerged even to newer antimicrobial agents which are being rendered ineffective in in a short span of few years.

To manage antimicrobial resistance, it is necessary to have regulations for use of antibiotics, creation of surveillance systems for antibiotic resistance, mechanism for prescription audits, provision for monitoring use of antibiotics in human, veterinary & industrial sectors and identification of specific intervention measures for rational use of antibiotics.

In our country where there is over the counter sale of antimicrobials, irrational use is a major driver for emergence of resistance.

In a hospital setting, creating awareness among clinicians, nurses and other health care providers is necessary as they are in direct contact with the patients and eventually responsible for preventing transmission of infections and control of AMR.

Although it is not possible to completely halt the emergence of resistant strains, the progress can definitely be slowed down by rational antimicrobial use.

Development of guidelines for antimicrobial therapy basis epidemiological and locally available microbiological data is a step towards optimizing antimicrobial therapy to ensure better patient outcome and do our bit for slowing down the emergence of further bacterial resistance.

Total Number of sites across Fortis – 06 sites – Dr. Aarti Gupta (FMRI), Dr Anu Gupta (FEHI), Dr Murali Chakravarty (BG Road), Dr Ravneet Kaur (Noida), Dr Yashesh Paliwal (Anandpur) and Dr. Anita Mathew (Mulund)

Total patients enrolled- 600 (100 patients from each site)

Phase of study: Retrospective Data Collection Study

Study objectives:

- Retrieve data electronically from EHRs and LIMS and link the surveillance data on current antimicrobial resistance rates to local epidemiological data and longitudinal healthcare data.
- Harmonise microbiological, clinical and epidemiological data from multiple hospital sites into one coherent database to facilitate analysis and reporting.
- Establish feasibility of linkage in Pilot programme to inform larger linkage project

PI's opinion: This study is about concurrent incorporation of microbiological susceptibility data, clinical and epidemiological data in a database to provide real time antimicrobial resistance trends at the local hospital level.

The provision to stratify data basis patient profile, will facilitate optimization of empiric antimicrobial therapy for individual cases and positively impact patient management and outcomes.

The present study has been conducted at select Tier 1 cities in India, with a very small sample size. Going forward, this has to be taken to Tier 2,3,4 cities, with involvement of Government healthcare sector and also small Nursing homes and private labs.

Data entry of microbiological, clinical and epidemiological data from multiple sites into one coherent database will help analyze and understand the data better and accordingly help prepare an action plan to tackle the growing menace of antimicrobial resistance.

MEDICATION SAFETY UPDATE
MARCH 2024

FIGHT AGAINST ANTIMICROBIAL RESISTANCE

Contributions by Fortis Hospitals

Today, the patients are being confronted with the challenges of a pan drug-resistant era, where they face with resistance to a multitude of antibiotics, spanning Gram-positive and Gram-negative bacteria. This crisis is particularly profound for clinicians managing critically ill patients. We are now in a time where there are fewer new types of antibiotics being developed. Recent studies emphasize the intricate relationship between antibiotic use, resistance, and treatment costs, highlighting the urgent need for robust antimicrobial stewardship programs (AMS) to address this escalating threat.

Fortis Hospital in Mulund, Fortis Hospital in Mohali, and Fortis Hospital in Faridabad have individually played a significant role in various research papers. Each contributing essential insight into the battle against the emergence of resistance to multiple organisms. These studies provide a roadmap for navigating the challenges posed by antimicrobial resistance (AMR) and highlight the importance of strategies for effective stewardship.

Title: Antimicrobial Stewardship Program at a Tertiary Care Hospital: A Road Less Travelled (Fortis Hospital, Mohali)

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The manuscript provides a practical overview of implementing an antimicrobial stewardship program from a very nascent stage to a well-established program in the complex setting of a tertiary care hospital. It gives the readers a road map to initiate or refine their journey utilizing many principles of quality improvement, common sense, and negotiating complex human behaviour. It also showcases a good use of the scientific principles of quality improvement and change management. Starting small with well-defined surgical prophylaxis paved the way for the complex world of empirical prescription of antimicrobials later in this journey. Various strategies like prescription audit and feedback, handshake stewardship, antimicrobial time-out, and greater mindfulness towards antimicrobial prescription have been well highlighted. Regular point prevalence surveys provided us with actionable data for multiple interventions. Moreover, it highlights the well-defined process and outcome metrics that measured the various aspects of antimicrobial prescription and were instrumental in assessing the success or challenges in implementing the program. Compliance with surgical prophylaxis improved from 34 % to 71%, while compliance with de-escalation increased from 38% to 57%.

Title: A Retrospective Review of a 2-Year Strong Antimicrobial Stewardship Program in a Tertiary Care Institute in Mumbai (Fortis Hospital, Mulund)

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Background Information: Many institutes have implemented a strict antimicrobial stewardship (AMS) program in the post-antibiotic era.

Aim: To investigate how the resistance pattern changes after implementation of a stringent AMS programme.

Methodology: It employs a defined daily dose methodology (DDD). The formulae listed below are used to compute this for two periods: October 2015 to October 2017 (Period 1) and October 2017 to October 2019 (Period 2) (Period 2).

DDD = Antibiotics used in total (g) per year

$$\text{DDD} = \frac{\text{Total antibiotics usage (g) in a year}}{\text{DDD (from WHO)}}$$

The length of stay was determined using the data from the hospital's information system (HIS). The patterns of resistance to the limited antibiotics are vancomycin, linezolid, tigecycline, and colistin. In both Periods 1 and 2, skin and soft-tissue infections, urinary tract infections, bloodstream infections, and respiratory tract infections were studied in both periods.

Results: In the year from October 2015 to October 2017, 4569 patients received limited antibiotics out of a total of 14,544 admissions. The average length of stay was 7.48 days in Period 1, however, it was reduced to 3.96 days in Period 2 out of 15,199 patients. In vitro isolate sensitivities to vancomycin, linezolid, tigecycline, and colistin were increased.

Conclusion: Some of the most common antibiotics were used less frequently. This appears to be linked to a shorter stay in the hospital and increased antibiotic susceptibility.

Title: Modification of Initial Empirical Antibiotic Prescription and its Impact on Patient Outcome: Experience of an Indian Intensive Care Unit

Scan QR Code for more

Introduction: Data on the overall impact of antibiotic modification following initial empiric prescription in both culture-positive and culture- negative critically ill patients are exiguous.

Materials and methods: In a retrospective analysis of "ANT-CRITIC" study, we classified ICU patients receiving empirical antibiotics who remained in the ICU for >72 hours or till availability of culture results (whichever is longer) into five groups based on culture results and antibiotic modification: negative culture, no change (group I), positive culture, no change (group II), positive culture, de-escalation (group III), positive culture, escalation (group IV) and negative culture, antibiotic modification (group V). Baseline variables and clinical outcomes were compared. Logistic regression analysis was performed to look for independent variables associated with mortality.

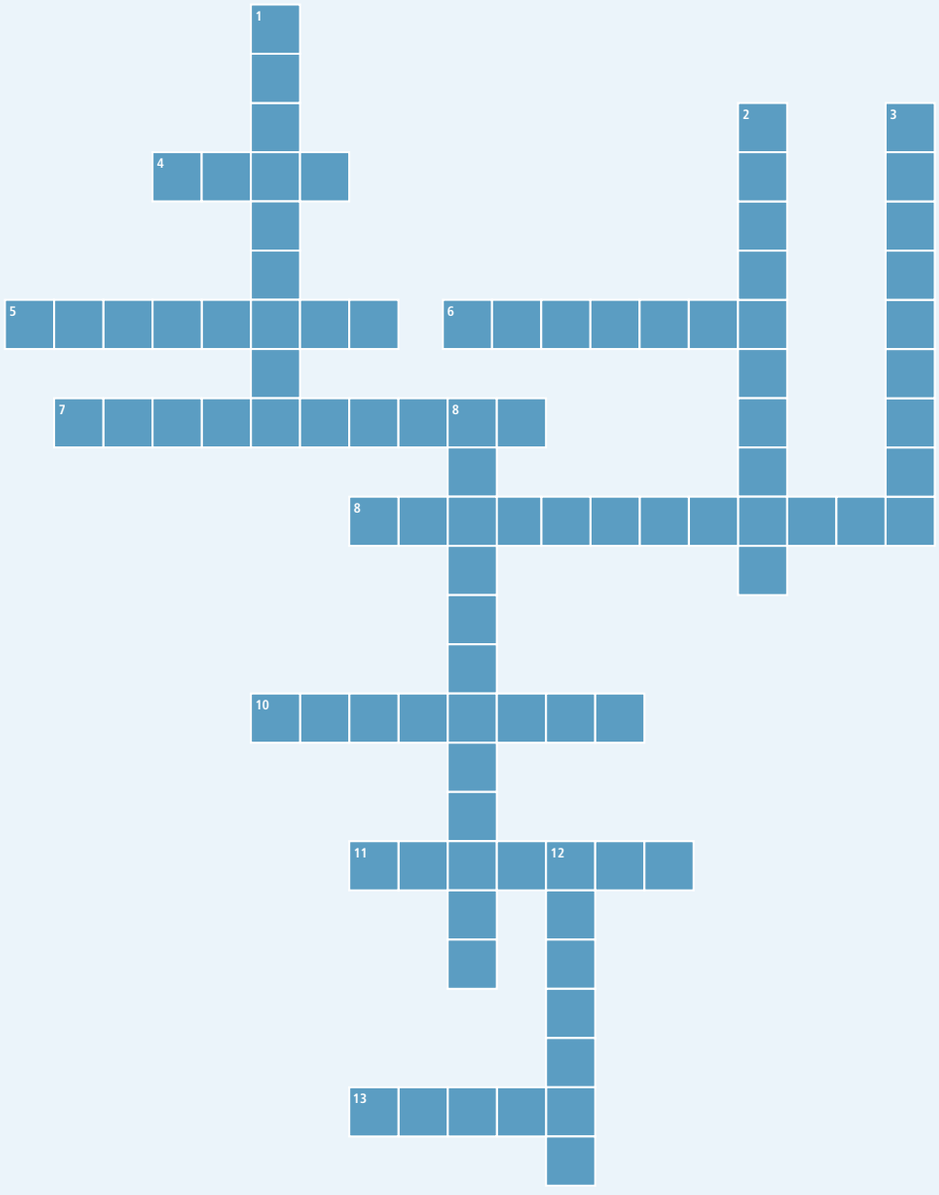
Results: 276 prescription episodes were analysed. Group II was associated with worsening organ dysfunction at 72 hours, lower clinical cure rate at day 7, and higher hospital mortality. There was an independent association between group II prescription and hospital mortality [adjusted OR 2.774 (CI 1.178–6.533), p = 0.02]. Group III received longer duration of antibiotic (mean duration = 8.27 ± 4.11 days, median duration = 7 days [IQR 5–11]).

Conclusion: Outcomes of critically ill infected patients differ significantly when they are classified based on culture result and antibiotic modification pattern. In these three papers, we embark on a comprehensive exploration of antimicrobial stewardship, antibiotic prescription patterns, and de-escalation strategies. Each study offers a unique perspective, presenting a roadmap for effective stewardship in tertiary care hospitals and intensive care units, aiming to pave the way for informed strategies in the relentless pursuit of preserving the efficacy of our antimicrobial arsenal.

TRIVIA-2

Crossword

Dr Subhash Jangid
Director - Orthopaedics and Joint Reconstruction
Fortis Memorial Research Institute, Gurugram



ACROSS

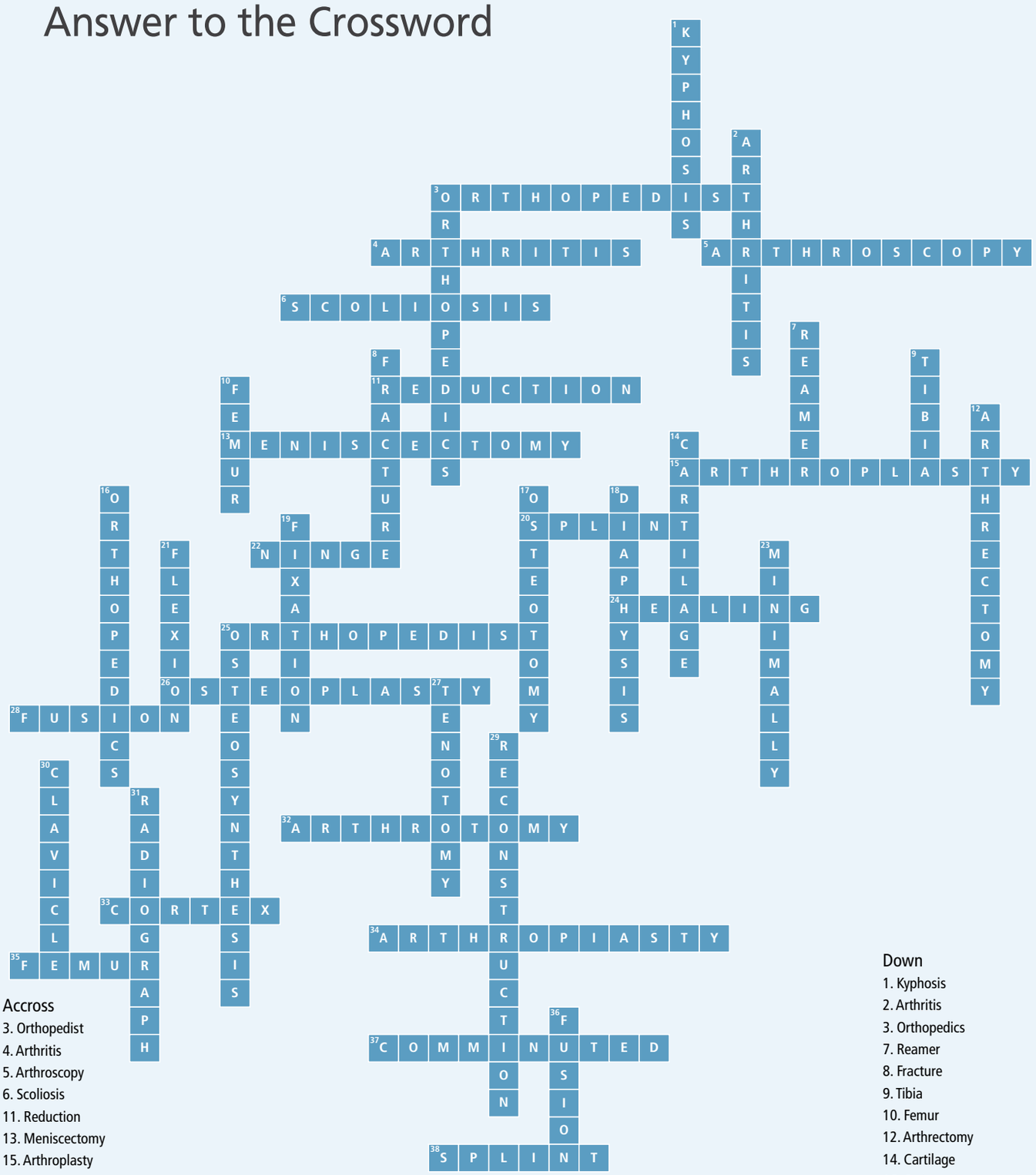
4. Deposition of monosodium urate crystals in patients with chronically elevated blood urate levels. (4 letters)
5. Healing of a fracture in an unacceptable position. (8 letters)
6. Tear in the lower rim of labrum that causes recurrent shoulder instability and dislocation. (7 letters)
7. A fracture that disrupts only one side of the bone. (10 letters)
9. Any surgically placed, non-biological material whose purpose is to promote healing of tissues or serve as a replacement of structures such as joints. (11 letters)
10. Fracture- Any fracture in which the overlying skin has been penetrated. (8 letters)
11. View-A view that passes from side to side at 90° to an AP view. (7 letters)
13. The junction between the ends of two adjacent bones that allows for movement. (5 letters)

DOWN

1. The realignment of fracture fragments to restore normal anatomy of the bone. (9 letters)
2. A generic term that encompasses all metallic implants. (10 letters)
3. A cellular tissue that, in the adult, is specific to joints, but in children forms a template for bone formation and growth. (9 letters)
8. Cartilage cells. (12 letters)
12. Skeletal deformity due to prolonged Vit D deficiency. (7 letters)

TRIVIA-1

Answer to the Crossword



Accross

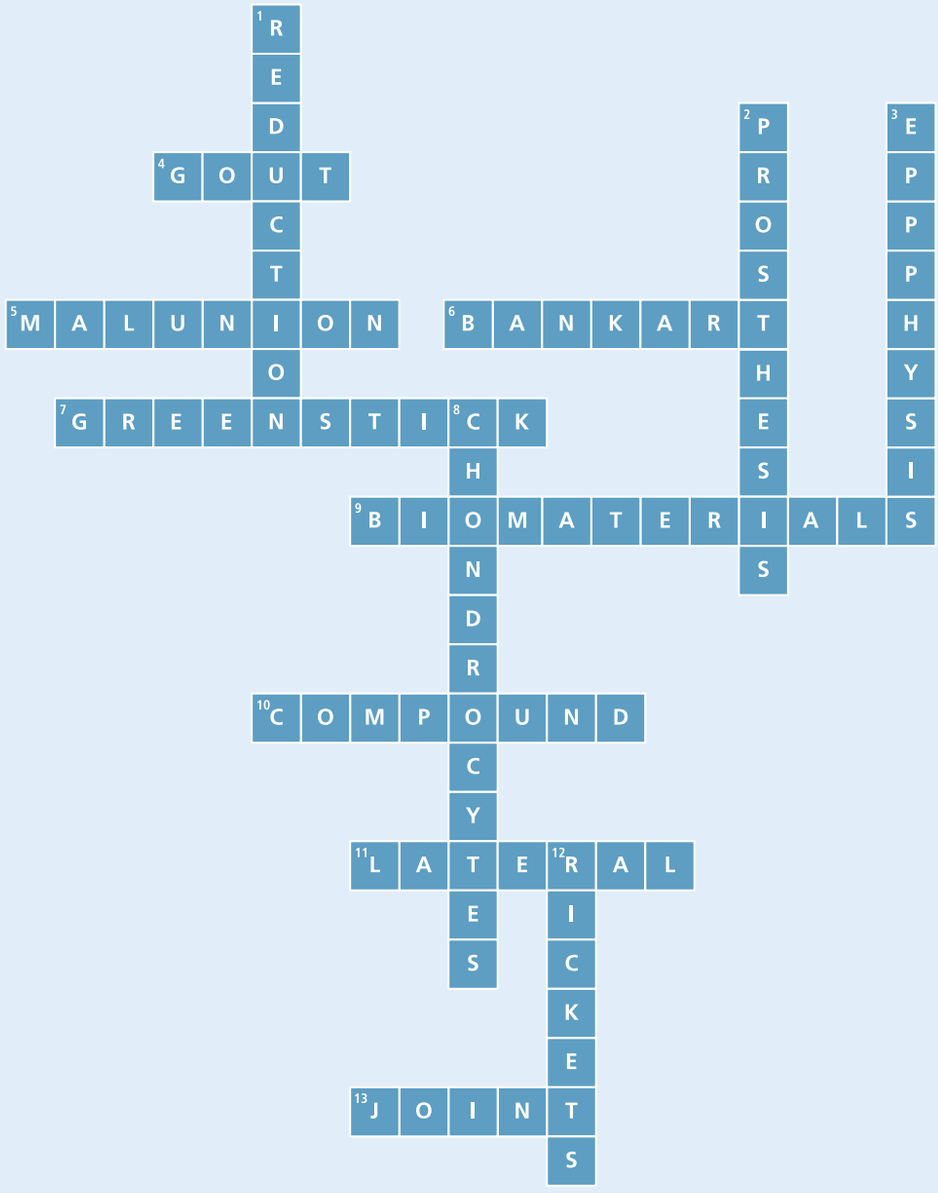
3. Orthopedist
4. Arthritis
5. Arthroscopy
6. Scoliosis
11. Reduction
13. Meniscectomy
15. Arthroplasty
20. Splint
22. Hinge
24. Healing
25. Orthopedist
26. Osteoplasty
28. Fusion
32. Arthrotomy
33. Cortex
34. Arthroplasty
35. Femur
37. Comminuted
38. Splint

Down

1. Kyphosis
2. Arthritis
3. Orthopedics
7. Reamer
8. Fracture
9. Tibia
10. Femur
12. Arthrectomy
14. Cartilage
16. Orthopedics
17. Osteotomy
18. Diaphysis
19. Fixation
21. Flexion
23. Minimally
25. Osteosynthesis
27. Tenotomy
29. Reconstruction
30. Clavicle
31. Radiograph
36. Fusion

TRIVIA-2

Answer to the Crossword



ACROSS

4. Gout
5. Malunion
6. Bankart
7. Greenstick
9. Biomaterials
10. Compound
11. Lateral
13. Joint

DOWN

1. Reduction
2. Prosthesis
3. Epiphysis
8. Chondrocytes
12. ickets

The Fortis Network

Amritsar


Anandapur, Kolkata


Bannerghatta Road, Bangalore

Chirag Enclave, New Delhi


Cunningham Road, Bangalore

Defence Colony, New Delhi


Faridabad


FEHI, New Delhi


FHKI, Kolkata


FLF Greater Kailash, New Delhi


FMRI, Gurugram


Greater Noida


Mohali

Kalyan


Ludhiana

Ludhiana, Mall Road


Mohali


Mulund, Mumbai


Nagarbhavi, Bangalore


Noida


Raigarh, Chhattisgarh

Rajajajinagar, Bangalore


Richmond Road, Bangalore

Shalimar Bagh, New Delhi


SL Raheja, Mumbai


Vasant Kunj, New Delhi


Vashi, Mumbai

Please send your comments, feedback and suggestions to
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