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Case Report

Treating the fractured femur along with an arthritic knee-A Novel two hit surgery

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ABSTRACT:

Introduction: Distal femur fractures accounts to about 0.4% of all fractures. Nevertheless, despite the progress made in treatment choices and surgical procedures, there is still no agreement on the appropriate kind of implant to be utilized in certain situations for the management of these fractures. In scenarios like our cases with combined grade IV osteoarthritis with shaft of femur peri implant fracture the surgical approach, implant of choices remains the game changers.

CASE REPORT:

In this case report, we present to you a 72 years old female, diagnosed to have peri implant fracture with grade IV primary osteoarthritis of knee , who underwent femur retrograde IMIL nailing and total knee arthroplasty in the same sitting. The treatment of this case was challenging because of the associated knee osteoarthritis with the fracture. Early mobilization was started after regular physiotherapy.

Conclusion:

The surgical method we had adopted minimized further soft tissue disturbance around the fracture site, especially the blood vessel disruption, by using the same approach as the arthroplasty. Early rehabilitation and a post op care plays a vital role next to a good fixation.

Keywords: Distal femur fracture, Knee OsteoArthritis, Arthroplasty, Femur nailing

INTRODUCTION:

Distal femur fractures are a kind of fracture that is both uncommon and severe, occurring in around 0.4% of all fractures. Men in their 30s have a high incidence, while elderly ladies also have a peak incidence[(1)]. Distal femur fractures are the prevailing and intricate problem among elderly patients in orthopedic emergency clinics. Nevertheless, despite the progress made in treatment choices and surgical procedures, there is still no agreement on the appropriate kind of implant to be utilized in certain situations for the management of these fractures. There are several issues and difficulties in union that often arise, making the effectiveness of treatments tough. Therefore, it is crucial to carefully choose the appropriate therapy for each patient based on factors such as the site and pattern of the fractures. This decision-making process is aided by a classification system that guides us in determining the necessity for surgical intervention.

According to the Arbeitsgemeinschaft für Osteosynthesefragen (AO) classification of fractures, the femoral shaft begins at the inferior border of the lesser trochanter. It ends proximal to the condyles at a distance equal to the greatest width of the femoral condyles.[(2)]

A useful addition to the internal fixation armementarium for the treatment of AO Type 33-A and some C supracondylar femoral fractures is the retrograde intramedullary locking nail.

The potential benefit of intramedullary treatment for these fractures is that it preserves the periosteal blood supply while permitting early mobility.

In this case report, we present to you a 72 years old female with history of multiple fractures in her bilateral lower limbs , came with a peri-implant fracture of right femur who was treated with femur retrograde IMIL nailing and total knee arthroplasty in the same sitting and approach.

CASE REPORT:

A 72 year old female , known diabetic, hypertensive and a case of coronary artery disease on anti platelets, morbidly obese as per her BMI presented to us with complaints of pain over right thigh. Patient noticed a sharp pain while she stood from sitting posture at her residence. The pain was acute in onset. Following the event, she was neither able to do weight bearing and walk nor move her right lower limb. She also complained of severe knee pain for so long period which constrained her to be domestic ambulant with difficulty in doing her day today household chores. Her plead was independent ambulation with painfree unassisted full weight bearing.

She gave history of multiple episodes of trivial trauma and multiple surgical procedures for the fractures thus incurred. She had a past history of undergoing left hip bipolar hemiarthroplasty in 2018, followed by right hip bipolar hemiarthroplasty in later half of 2018 , followed by right femur open reduction and internal fixation with peri-prosthetic dynamic compression plate and screws in 2022 following a peri-prosthetic fracture . She had also underwent left total knee replacement in 2019.

On examination, she had healed surgical scar over the lateral aspect of hip. The scar seemed healthy. Diffuse swelling and tenderness was present over the mid thigh. Range of movements at knee and hip were restricted due to pain. Distal neurovascular status of the right lower limb was intact.

Radiological investigation in the form of a plain radiograph of the right femur and knee joint was done, which showed right femur peri-implant fracture (AO-32A12/Vancouver type C) with with no evidence of bipolar implant loosening. The fracture was just below the dynamic compression plate and there was no evidence of screw backout or prosthesis loosening.

The knee radiograph showed features suggestive of grade IV osteoarthritis which stood evidential with regards to patients complaints of severe knee pain and restriction of routine house hold chores. She was community ambulant before the occurence of fracture.

She was admitted and routine blood parameters were analysed. Specific blood parameters which indicate the presence of osteoporosis was also done revealing normal levels of serum total vitamin D (32.24) , calcium and PTH. No specific etiology could be evidently attributed to the multiple episodes of trivial trauma causing fragility fractures.

Following multidisciplinary team discussion, and cessation of antiplatelets for 5 days, she was taken up for the surgery. Under spinal and epidural anaesthesia, patient in supine position, left lower limb was fully painted and draped. Incision was made over the lateral aspect of thigh through the previous surgical scar and the distal most three cortical screws were removed. Then through conventional midline anterior knee incision and medial parapatellar approach, right knee joint exposed, knee flexed to 90 degrees and with the help of intramedullary jig, distal femur cut was taken with 5 degree valgus.

Through the distal femur cut, the awl entry was made followed by guide wire introduction, for retrograde intramedullary nail under fluoroscopic guidance. With the aid of a hand reamer, distal femur reamed until size 12 mm. Following reduction with the help of bone holding ratchet, a supracondylar nail of size 11 x 220 mm was introduced such that it crossed the fresh periimplant fracture but ended just at the level of previous shaft of femur fracture and locked with proximal and distal locking screws with the help of fluoroscope. The distal screw holes in the dynamic compression plate were filled with unicortical screws.

Then, anteroposterior cuts of distal femur taken and was sized to be 2 . With the help of extra medullary jig and referencing , proximal tibia cuts were taken and tibial preparation was done. Femur was fixed with femoral component (cruciate retaining) size 2.5 prosthesis, tibia with size 2 tibial tray and poly insert of size 12 mm inserted following cementation. Full range of motion of the right knee was checked and flexion- extension gap were also found to be satisfactory. Thorough wash was given and the cut iliotibial band, quadriceps tendon were repaired.

Post operatively she was maintained on full knee extension on a long knee brace for 2 days following which gentle active knee ROM exercises were started. She was also started on Non weight bearing mobilisation with walker support on the right side which she tolerated well.

Periodic wound inspections were done and the wound was found healthy. Post operative check radiograph was taken which showed a fair reduction of the peri- implant fracture , ideal prosthesis placement with deformity corrected and good bone-cement-prosthesis interface.

Figure 1: Presenting radiograph showing peri implant fracture of the shaft of the femur distal to the plate with Grade IV osteoarthritis.

Fig: 1.1 **Fig:1.2**

Figure 2: Intraoperative image showing femoral condyles with intramedullary jig in place.

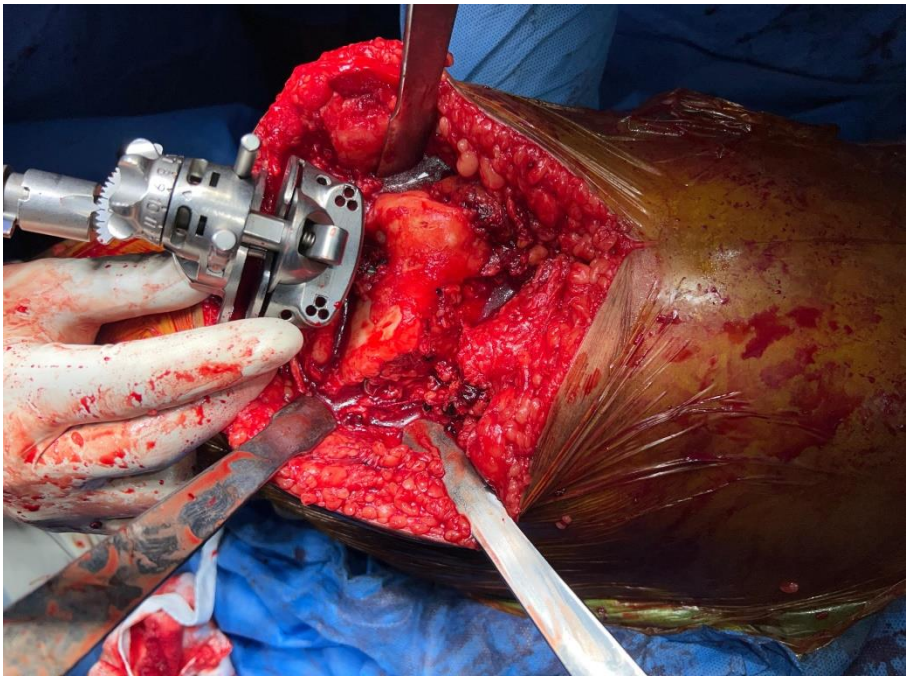
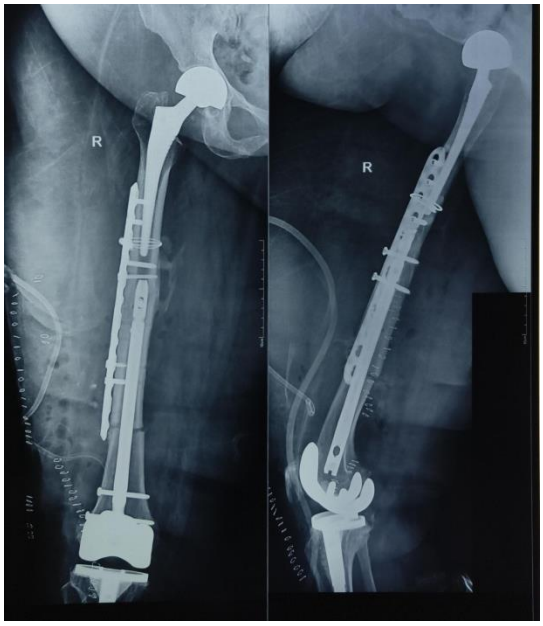
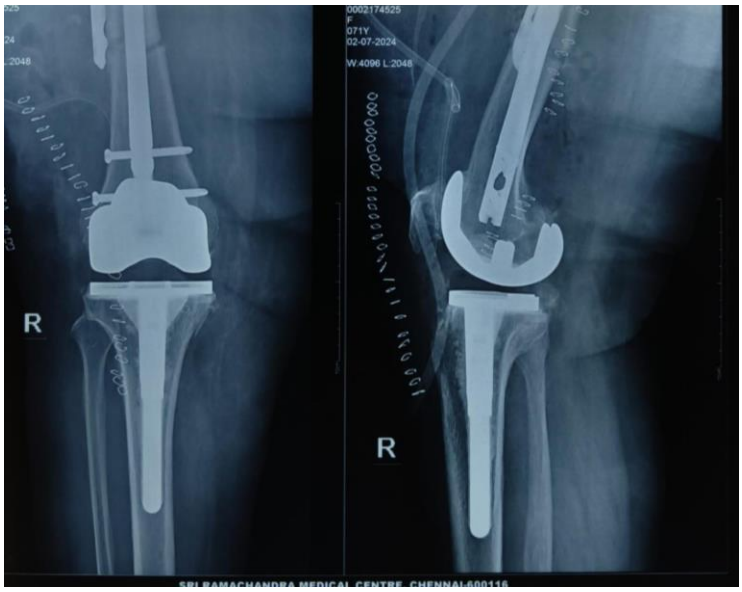


Figure 3: Post-Operative Radiographic Images:





DISCUSSION:

Because of the significant diversity in total knee replacement prosthesis designs regarding the femoral component variant and inter condylar distance, it might be difficult to ascertain the compatibility of TKRs with intramedullary nailing in such cases.

Hence, possessing knowledge about the kind of prosthesis and its compatibility with a nail is essential information to consider during preoperative preparation. The surgical method minimizes further soft tissue disturbance around the fracture site, especially the blood vessel disruption, by using the same approach as the arthroplasty which stand out as an added advantage.

In addition, this allows for the precise examination of the extension of fracture lines into the joint and the removal of any bone fragments that can cause third-body wear of the polyethylene.

The treatment of this case was challenging because of the associated grade IV osteoarthritis with the distal femur fracture. Patient had equally severe pain over the knee preoperatively as that of the distal femur fracture. Addressing both the entities in single surgery necessitates detailed preop work up.

The key planning strategy for this case was employing the intramedullary jig as a reduction guide. The nail length was measured post distal femoral cut. A rare nightmare in such compliczted case could be, the possibility exists that the rod may extrude back into the joint as a result of insufficient rod fixation distal to the fracture, which might lead to metallosis or faster polyethylene wear.

CONCLUSION:

Although In current clinical practice, supracondylar or retrograde nailing of femur is not commonly done as compared to the conventional intramedullary nailing where entry is taken through the proximal femur, it confers the technical advantage of making the patient lying supine and is the treatment of choice in stabilising peri-prosthetic fractures of femur. Furthermore, the supracondylar nail provides adequate stability for knee mobility to be possible early in the postoperative phase.

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