

Case Report

Malunion fracture of supracondylar femur sinistra with post traumatic arthritis and stiffness at genu sinistra: a case report

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ABSTRACT

Post-traumatic osteoarthritis could emerge immediately after an injury or one year after a bone fracture, ligament injury, and meniscal tears. In this case report, we present a 30 years old male who previously suffered from joint injury and thus lost the ability to flexion. This patient has already under went internal bone implantation surgery involving the implantation but was removed due to pain, and there was protruding implant on the left knee. On physical examination, there was varus deformity with flexion ranged between 0-5°. On radiological examination, malunion and narrowing of the joint surface were, as shown, clinically inhibit the flexion of the knee. We diagnose the patient with malunion supracondylar femur sinistra and post traumatic osteoarthritis genu sinistra. Liberation procedure (soft tissues release) and osteotomy of the distal femur were performed on this patient. On post-op radiological examination, the implant successfully widens the joint surface and holds the fracture fragment after it was reduced. The joint was immediately mobilize using the machine. It was shown that in a relatively short period, the range of motion could reach 90°. Three months post-op, evaluation was done, and it was clearly shown that the range of motion had not decreased.

Keywords: Malunion fracture, Supracondylar femur, Post traumatic arthritis, Stiffness of genu

INTRODUCTION

Osteoarthritis is a major cause of prevalence whose prevalence and incidence continue to increase. History of injury is an important risk factor for posttraumatic osteoarthritis and is a significant contributor to the growing population of patients with osteoarthritis. Post-traumatic osteoarthritis can occur after a knee injury and can appear up to a year after a fracture, ligament injury, or meniscus tear.¹ Treatment of OA itself is considered quite difficult. We present cases in which there was improvement in knee joint flexion ROM in patients suffering from traumatic OA.

Pain is a common problem in everyday life and a common reason people seek health care.² Joint pain is a

pain disorder that is often found in the elderly so that it limits their movement. The older a person gets; they will experience a setback or limitation of physical activity. One of the factors that can increase joint pain is physical activity.³ Sudden pain is usually caused by strenuous or unusual physical activity. Complaints of pain will be more severe after exercising or increase with activity and can improve with rest. Improper physical activity will exacerbate pain in OA.

Of the many joints that can be affected by OA, the knee is the most common joint. Osteoarthritis of the knee is a major cause of pain and disability compared to OA in other joints. Arthritis research campaign data show that more than 550,000 people in the UK suffer from severe knee OA and 2 million people visit a general practitioner

or hospital because of knee OA. More than 80,000 knee joint replacement surgeries were performed in the UK in 2000 for £405 million.⁴

Accumulating evidence supports that developmental knee OA is often driven by biomechanical forces and that the tissue's pathological response to such forces leads to structural joint destruction, knee symptoms, and decreased function.⁵ Well-known biomechanical risk factors for development include joint, malalignment, and meniscal tears. The high risk of OA after knee injury suggests an important role of biomechanical factors also in disease incidence in susceptible individuals. However, knowledge of the biomechanical mechanisms that contribute to early disease progression and their sequence of significance is limited. So that patients who come in advanced conditions need to receive special therapy to regain function of the affected joints.

CASE REPORT

Male, 30 years old, with the chief complaint of left knee bent and unable to move freely. Maximum flexion of 5°. The patient has had difficulty moving his left knee since 6 years ago after in the previous year the patient had an accident and had implant surgery performed at other hospital. Surgical removal of the implant was performed at that time because the patient felt pain in his left knee and the implant protruded in his left knee.

Physical examination revealed deformity, genu varus, and a scar on look. There is tenderness, distal neurovascular within normal limits. Limited range of movement (0-5°).

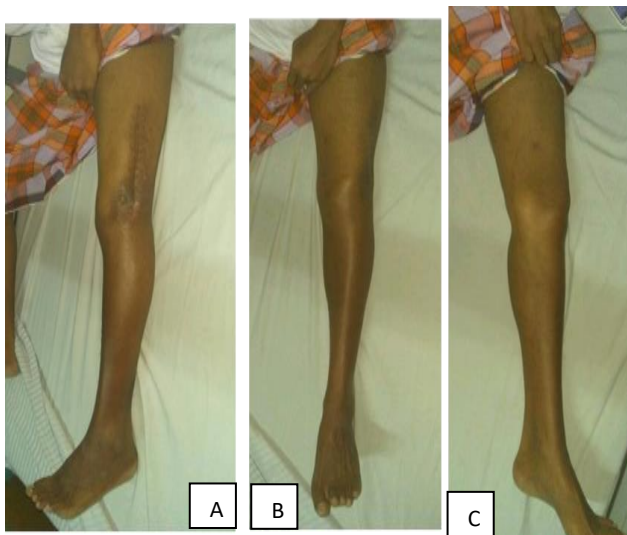


Figure 1 (A-C): Clinical left lower limb, genu flexion (-).

Radiologic features of the left femur and genu revealed a malunion and narrowing of the joint space which clinically caused limitation of genu flexion. while in cruris no significant abnormalities were found radiologically.



Figure 2 (A-C): Radiological examination of left femur, radiological examination of left knee and radiological examination of left cruris.

The patient was assessed with supracondylar malunion of the left femur and post-traumatic OA of the left genu and underwent a liberation procedure (soft tissue release) and distal osteotomy of the left femur.

On post OP evaluation, there was still tenderness, but distal neurovascular within normal limits, limited range of movement with genuflexion of 90°. In the post-op radiological evaluation, we can compare the pre-and post-op femurs, on radiological images, the use of implants appears to widen the joint space and hold the fracture fragments in position after reduction (Figure 3A). screw placement in the proximal tibia is anchoring for the ligament that underwent intra-op repair and its position radiologically shows the best position (Figure 3B).



Figure 3 (A-C): Radiologic examination of left femur post operatively and radiologic examination of left knee post operatively.

Three days post op, the patient is directly mobilized passively using a machine, can be seen in a relatively short time, the range of motion reaches approximately 90° (Figure 4).



Figure 4: Clinical 3 days post op, ROM: genu flexion 90°.

Three months post op, the evaluation was carried out again and it was found that the 90° range of motion lasted up to and did not regress (Figure 5).



Figure 5: Clinical 3 months post op, ROM: genu flexion 90°.

DISCUSSION

The results of the surgical treatment of distal femur fractures commonly depend on the restoration of the anatomical axes and the articular surface, which is not always possible, as well as the repair of regular length for the normal limb and a stable fixation that allows early rehabilitation. In addition, the fixation of these fractures with plates and screws should enable the patient to safely perform active and passive exercises of the knee.⁶ A

systematic review has compared and analyzed the management with locked plating and retrograde intramedullary nailing. Although locked plate shows trends to increase non-union rates, malunion was significantly higher with retrograde intramedullary nailing.⁷

Compared to malunion, the non-union is due to both endogenous and surgical related factors non-union and malunion are two different pathologies. Still, both have terrible outcomes that reduce the patient's quality of life.⁶ Fracture healing complications are common and result in a significant healthcare burden, especially in cases with the unsuccessful union, and it is rather vital to prevent fracture healing complications in the future.⁸

In this patient, it was known that there was a history of trauma in the form of a traffic accident in 2013, which was followed by the installation of an implant in the distal femur. Over time, the patient complained of pain and was found to have a protrusion under the skin at the implant site, so surgery was performed in 2014 to remove the previously installed implant. Since the surgical removal of the implant, the patient complained of pain and did not move his knee joint much, which then worsened the stiffness in the patient's knee joint. In pre-op radiology, it was found that the malunion of the femur caused a narrowing of the joint space and closed the possibility of flexion of the genu. Range of motion pre-op obtained 0-5°. Anatomical limitations on the patient's knee indicate the cause of pain and reluctance to move, which leads to stiffness of the joint. In these patients, treatments that can be considered include arthroscopic debridement, joint debridement, bone decompression, osteotomy, and arthroplasty. Osteotomy was chosen because of a malunion in the patient's supracondylar femur, causing a femorotibial varus malalignment. During the operation, corrective osteotomy was performed from varus to slight valgus at the fracture site. Then an angled broad plate was placed to stabilize and produce compression at the fracture site.

Degenerative knee arthritis is a complication of femoral or tibial fractures potentially avoidable by the correction of various degrees of malalignment. Lower limb fracture alignment should be restored to as near normal as possible to reduce the likelihood of osteoarthritis.⁹

Knee stiffness, or more accurately, a limitation in range of motion, is a potential complication after any intra-articular or extra-articular injury. It can be caused by a flexion contracture, an extension contracture, or a combined contracture. In this case, the patient's inability to flex the knee could be caused by flexion contracture. In concordance with previous studies, it is possible with malunion or could also be a direct consequence of the initial injury.¹⁰

The most challenging aspect of posttraumatic reconstruction around the knee is choosing the

individualized surgery for the patient. The common knowledge is that more active patients are offered the option of osteotomy or arthrodesis, and the older ones are managed with arthroplasty.¹¹

Jude's quadricepsplasty has shown can improve flexion ability in patients with ankylosis and has the advantage of being less damaging to the quadriceps mechanism and addressing the problem of the external fixator pin site being attached to the lateral side of the thigh.

Judet's quadricepsplasty is a procedure that is performed in several stages with the range of flexion determined after each stage of surgery, providing an opportunity to stop as soon as adequate flexion is obtained.¹²

This procedure is performed through two incisions; one is a medial parapatellar incision extending to the tibial tuberosity's medial side. This allows access to the patellar tendon, releasing the medial retinaculum, suprapatellar pouch, and intraarticular adhesions. The second is a long lateral incision made lateral to the lower pole of the patella to 5 cm distal to the greater trochanter. The patella and lateral retinacular tissue are freed through the distal portion of this incision, ensuring that the patella can be easily removed from the femoral condyle. In addition, this incision allows the release of adhesions and frees the vastus lateral from the linea aspera. The vastus intermedius is then removed extraperiosteally from the lateral and anterior surfaces of the femur.

In most cases, this muscle is fibrotic and requires resection. Debulking of the excess bone against the callus is performed at this stage. The third stage is the proximal detachment of the vastus lateralis at its origin from the greater trochanter. If necessary, the rectus femoris from the iliac, performed with care while protecting the femoral nerve.

The tissue is usually extensively fibrotic, and surgical knife surgery can cause large bleeding surfaces where hemostasis is difficult; for this reason, the use of diathermy is recommended. The range of flexion after skin release and closure was recorded.

Postoperatively, immediate mobilization was performed using a continuous passive motion device up to 90° flexion. Postoperative care includes continuous passive movement from 0° to 60° flexion as soon as possible postoperatively under control of epidural pain with ice packs to reduce swelling. The range and speed are gradually increased until the maximum possible flexion is achieved. Gentle manipulation under general anesthesia is performed when necessary if the patient does not maintain at least 90° of flexion during the first six weeks. After the patient went home, physiotherapy was carried out three times a week as an outpatient. Three months post-op, on clinical examination, the patient could walk with a maximum flexion of 90° on the left genu.

CONCLUSION

Osteoarthritis genu is a form of pathology that reduces the patient's quality of life because it interferes with the patient's mobility and movement, thereby reducing the function of daily life. One form of therapy is operative therapy with Judet's quadricepsplasty which is carried out in several stages in the operation to restore joint function as optimally as possible.

In this patient, post-traumatic osteoarthritis was found and Judet's quadricepsplasty was performed with optimal results. Mastery of this technique can provide maximum postoperative results even though patients in pre-op conditions cannot flex at all, thus, this technique must be mastered by every orthopedic doctor well.

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