

Five Different Complications in One Patient Following Knee Arthroplasty

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Abstract: Go arthrosis is an orthopedic disease with increasing frequency, for which total knee arthroplasty is applied frequently as surgical treatment. The most commonly observed complications of total knee arthroplasty are wound infection, wrong implant positioning, restricted range of motion in the knee joint, loosening of the components, rupture of the patellar tendon, extensor mechanism dysfunction and periprosthetic fractures. In this case report we present a 48-year-old female who achieved favorable outcome in spite of all the 5 different complications she experienced following total knee arthroplasty.

Keywords: Knee, Arthroplasty, Complications

INTRODUCTION

The first knee arthroplasty was attempted in the 1940s, and as from the 1950s, successful procedures were achieved [1]. Parallel to the advancements in the implant technology, knee arthroplasty has become one of the most satisfactory operations in orthopedic surgery. Though knee arthroplasty seems to be an easy procedure for an orthopaedic surgeon, it may lead to serious complications, such as wound healing problems, infection, loosening, and instability, restricted range of motion and periprosthetic fractures [2]. The manifestation of these complications individually may not be scientifically relevant, but almost all of these different complications witnessed one after another in the same patient and still resulting in a favorable outcome, nevertheless, is both surprising and worthy of attention.

This case report presents a 48-year-old female with rheumatoid arthritis who developed the complications of transient peroneal palsy, wound infection, periprosthetic fracture, tibial component loosening and patellar tendon rupture in different time periods following total knee arthroplasty.

CASE REPORT

A 48-year-old female with rheumatoid arthritis who was being followed-up by rheumatology presented to our outpatient clinic with increasing left knee pain which did not respond to rheumatologic treatment. The radiographic studies revealed Stage 4 gonarthrosis in the left knee. (Figure 1) Total knee arthroplasty procedure for the left knee was explained to the patient and surgery was planned. The patient underwent posterior cruciate-retaining-knee arthroplasty, with cemented, mobile polyethylene piece. (Figure 2) After the operation, the patient was unable to dorsiflex the ankle and a sensory deficit in the peroneal region was noted. The postoperative dressings were loosened immediately and the knee was flexed 90 degrees in order to relieve the peroneal nerve from pressure. After postoperative wound follow-up, the patient was discharged on day 4. Prophylactic low-molecular-weight heparin for deep vein thrombosis and non-

steroid anti-inflammatory medications were prescribed. The patient was informed in detail about the nerve impairment and follow-up was planned.

At 1-week follow-up, the wound was clean, but at 2-week follow-up there was erythema at the wound site. There was also intermittent drainage from the middle of the incision line. The results of the infection markers C-reactive protein and erythrocyte sedimentation rate were 12 mg/dl and 49 mm/hour, respectively. Knee joint aspiration was performed under sterile conditions, and the patient was admitted to the ward for intravenous antibiotic therapy. The result of the culture collected during the outpatient visit came back as negative. However, wound drainage persisted. On the fifth day of admission, debridement was planned after receiving the patient's informed consent. Intraoperative tissue culture was positive for methicillin-sensitive *Staphylococcus Aureus*. In accordance with the antibiotic susceptibility results and the suggestion of the infectious disease consultant, the patient was started on intravenous cefazolin. The patient was discharged when the wound drainage resolved and the infection parameters normalized. This second hospitalization lasted for 12 days. During this period, the peroneal nerve deficit persisted. Mobilization was

continued with an orthosis designed to keep the ankle in neutral position.

In the next follow-up visit, on postoperative day 30, it was observed that the patient had gradually started to move her ankle and regained sensation in the peroneal region. No more problems were encountered at the wound site after debridement, and the patient's nerve deficit resolved completely 2 months after surgery. An electromyographic test was performed and the results were normal. At the 3-month control after surgery, the patient had full range of movement of the knee and expressed high satisfaction with the results.

Just when everything seemed to be back on track, 6 months after surgery, the patient admitted to the emergency department with excessive pain on the same knee after a fall. The patient was diagnosed with Type 2 periprosthetic femur fracture according to the Lewis and Rorabeck [3] classification (Figure 3) and admitted to the orthopedics ward for surgery. Retrograde intramedullary femoral nailing was performed through the old incision. (Figure 4) In this third hospitalization, the patient spent 5 days in the hospital.

The fracture healed completely, and adequate callous formation was evident in the radiographs. However, the patient's knee pain did not resolve. As a result of the imaging findings and detailed examinations, the patient was diagnosed with aseptic loosening of the tibial component. Tibial component revision was planned, and the patient was informed in detail about the procedure. During surgery, excessive polyethylene insert wear and tibial component loosening were visualized. Along with the revision tibial stem, a thicker polyethylene insert was placed. An intraoperative complication occurred this time as the patellar tendon avulsed from the tibial tubercle. The patellar tendon avulsion was repaired using suture anchors, and the operation was terminated. A long leg splint was applied after surgery, and knee movement was restricted until the sutures were removed. During the first month after the removal of the sutures, 90 degree of flexion was allowed. No other complications were encountered after this operation in the monthly and yearly follow-ups.

In the final follow-up visit, which was 62 months after her first surgery and 50 months after her last surgery, the knee flexion was 100 degrees and the extension was full. (Figure 5)

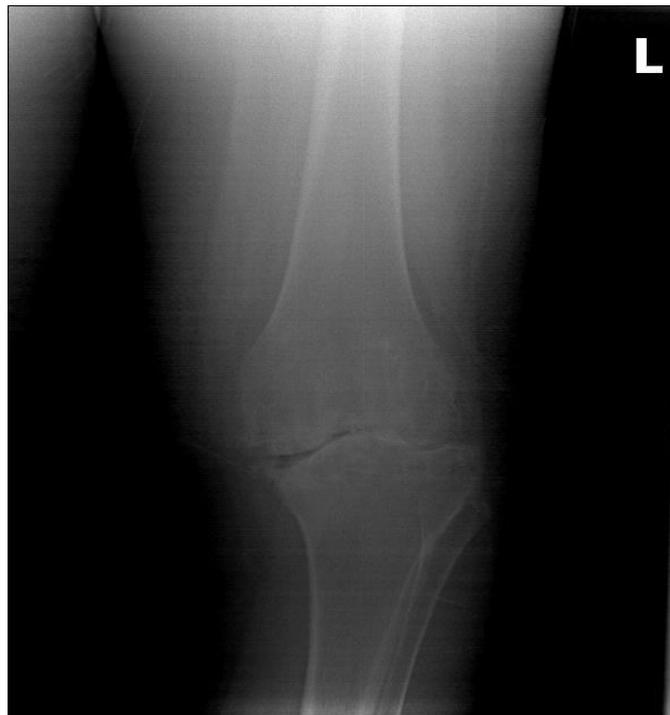


Fig-1 : Preoperative anteroposterior radiograph of the knee

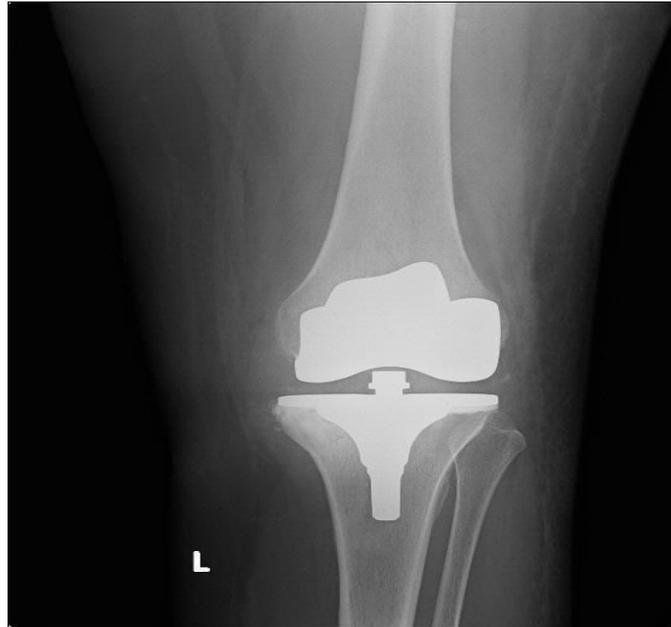


Fig-2: Postoperative anteroposterior radiograph of the knee



Fig-3: Anteroposterior radiograph of the per prosthetic femur fracture

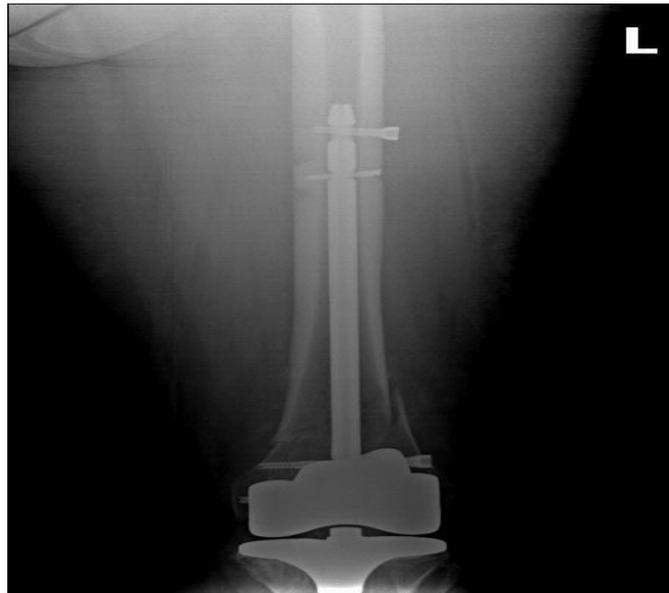


Fig-4: Anteroposterior radiographic image after retrograde intramedullary nailing



Fig-5 : In the last follow-up visit; the patient's knee flexion is 100 degrees and the extension is full

DISCUSSION

The incidence of temporary peroneal nerve injury after total knee arthroplasty is between 0.3% and 4% [4]. Patients with valgus deformity are particularly prone to peroneal nerve injury caused by mechanical stretching of the nerve during knee arthroplasty. It has also been reported to occur due to hematoma compression, tourniquet-related tissue damage, epidural anesthesia or due to the compression caused by the CPM (continuous passive motion) device postoperatively [5]. Because rheumatoid arthritis causes severe deformity, it is considered to be a risk factor for peripheral nerve injury following knee arthroplasty [6]. The patient presented in this case report had rheumatoid arthritis and the operation was performed under spinal anesthesia. Therefore, there were risk factors for peroneal nerve injury. When peroneal nerve injury occurs, the first thing to do is to check whether if there is a mechanical compression to the nerve. In our patient, an emergency ultrasonography was performed right after the development of the injury, but no mechanical compression such as a hematoma was observed. The constrictive dressings were loosened and the knee was flexed to relieve a possible peroneal nerve compression. In such cases, the literature suggests EMG (electromyography) testing every 3-month and most patients have been reported to recover spontaneously. Mont et al have performed urgent surgical decompression on 31 patients with peroneal nerve injury, and reported improvement in 16 patients [7]. We believe that it is reasonable to wait for spontaneous regression, unless there is a mechanical block. Likewise, the peroneal nerve injury observed in our patient regressed spontaneously within a month, without having to perform EMG control.

The infection rate after knee arthroplasty is about 1-3% [8]. The second complication discussed in this case report is the wound discharge, which began in the second week after surgery. Not at all the wound discharges occurring after knee arthroplasty stem from prosthetic infections. The term "prolonged discharge" refers to wound discharge lasting longer than five days. This may lead to prosthetic infections [9]. Prosthesis infection is a very destructive complication that may result in amputation. The literature suggests using a treatment protocol named DAIR (debridement, antibiotics, and implant removal) for prosthetic infections. According to this treatment protocol, early infection is treated with debridement and parenteral antibiotherapy; whereas persistent infection is treated with the removal and replacement of the implants by one or two-stage revisions [10]. This case was treated with early debridement and appropriate antibiotherapy.

In the sixth month after the surgery, the patient sustained a supracondylar femur fracture due to a fall. Periprosthetic femur fracture is a complication that may follow knee arthroplasty operations, with an incidence of % 0.3-2,5%. Its treatment is often challenging [11]. The stability of the prosthesis and the localization of the

fracture are important factors in the treatment. In this patient, the fracture did not extend to the prosthesis to compromise its integrity. The treatment was carried out by performing retrograde intramedullary femoral nailing through the old incision. In the follow-ups, there was no change in the fracture position and the fracture fully healed.

Persistent pain following knee arthroplasty is a deeply disturbing situation, both for the surgeon and for the patient. This patient complained of persistent knee pain after the resolution of the above-mentioned complications, namely the peroneal nerve palsy, wound infection and periprosthetic fracture. Further examinations were suggestive of tibial component loosening and polyethylene insert wear. Thus, revision surgery was scheduled. Tibial component loosening and polyethylene wear are the most prominent causes of knee revision arthroplasty [12]. For the treatment of aseptic loosening, one-stage revision is recommended. In the revision surgery of this patient, tibial component loosening and polyethylene wear were observed intraoperatively.

Revision surgery bears more risks and higher complication rates than primary surgery. Especially during the eversion of the patella, the patellar tendon may avulse from the tibial tubercle. In such cases, fixation of the patellar tendon to the bone with non-absorbable suture materials, suture anchor or U nails is recommended. If the stability remains insufficient despite these measures, the tendon should be repaired with autologous or allogeneic grafts [13]. In this patient, the patellar tendon was avulsed from its insertion during the revision surgery, and it was repaired intraoperatively with suture anchors. Grafting was not deemed necessary because stability was achieved.

The patient experienced almost all of the possible complications that might follow a knee arthroplasty. More than 5 years have passed from the patient's first surgery, and the patient's gait is normal. The patient's knee flexion is 100 degrees and the extension is full. In the last follow-up visit, the patient had a good score on the WOMAC (Western Ontario and McMaster Universities Osteoarthritis index) scale.

CONCLUSION

Despite the possibility of serious complications, knee arthroplasty is an essential surgical procedure in orthopedic surgery. Early detection and appropriate treatment of the complications may facilitate satisfactory results.

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