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Total knee arthroplasty in a patient with a history of Tibial osteomyelitis case report

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Abstract

The authors report the rare occurrence of a case of tibial osteomyelitis in a patient with severe genu valgum associated with recurvatum who underwent total knee arthroplasty. A literature review is provided, and the correlation between total knee arthroplasty and previous osteomyelitis is discussed. Single-stage total knee arthroplasty is a viable option for a patient with a history of osteomyelitis associated with genu valgum and recurvatum.

Keywords: Total knee arthroplasty, osteomyelitis, infection

Introduction

Total Knee Arthroplasty (TKA) is a major surgical procedure subject to postoperative complications, with infection being one of the most severe and feared, representing a true challenge for the orthopedic surgeon due to its difficult and prolonged treatment ^[1].

In the international literature, the incidence of infection ranges from 1% to 5%. In high-volume centers with specialized teams and extensive experience in TKA, this rate can be reduced to less than 1% ^[2].

Post-TKA infections can occur via three mechanisms: direct bacterial implantation, hematogenous spread or reactivation of a dormant focus.² Conditions such as septic arthritis, osteomyelitis or previous surgical manipulations may lead to infection due to reactivation of a dormant osteoarticular focus ^[2].

TKA is generally a successful procedure with good outcomes; however, patients with a history of osteomyelitis are at higher risk of developing an infection following joint replacement ^[3].

Osteomyelitis can cause significant bone destruction and soft tissue damage, leading to pain, systemic malaise and functional deficits ^[3].

The aim of this study was to present a case of total knee arthroplasty in a patient with osteoarthritis associated with genu valgum, recurvatum and a history of osteomyelitis.

Case Report

A 61-year-old female patient, a hairdresser, hypertensive, with a body mass index (BMI) of 31 kg/m², presented with severe pain in the left knee. Her medical history revealed a total hip arthroplasty for coxarthrosis, as well as a history of osteomyelitis in the left leg with 42 years of evolution. On physical examination, a severe reducible genu valgum deformity of the knee associated with recurvatum was observed (Figure 1). The range of motion was from -10° to 80°. Additionally, a scar was noted on the anterior aspect of the left leg, resulting from previous osteomyelitis surgery. This surgical scar showed no signs of inflammatory changes. Preoperative blood tests were requested, with the erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels within normal limits. Radiographic examination revealed a lytic lesion in the medial diaphysis of the tibia (Figure 2).

The patient underwent spinal anesthesia combined with femoral nerve and sciatic nerve peripheral block. The surgery was performed under ischemia with a pneumatic tourniquet inflated to 125 mmHg, which was 50 mmHg above the patient's systolic blood pressure, after exsanguination of the limb. The surgical procedure was carried out with the patient in the supine position, using the classic medial parapatellar approach. An extramedullary tibial guide was utilized. The implant used was the Legion model (Smith & Nephew®), a posterior-stabilized prosthesis with patellar substitution.

In the immediate postoperative period, the patient showed improvement in pain and knee function. The patient returned to her usual activities, satisfied with the surgical outcome. The range of motion was from 0° to 95°. The

Knee Society Score (KSS) functional score⁴ improved from 48 preoperatively to 90 postoperatively, with three and a half years of clinical follow-up (Figure 3).



Fig 1: Pre operative clinical evaluation



Fig 2: Pre-operative radiographic evaluation



Fig 3: Post-operative radiographic evaluation

Discussion

Nishitani *et al.* report a case of a patient with a history of osteomyelitis that had persisted for 64 years. The patient underwent a hinge-type total knee arthroplasty (TKA) due to knee recurvatum and limited range of motion [5]. According to these authors, TKA or arthrodesis are the only surgical alternatives for this type of patient [5]. We believe that knee arthrodesis is a procedure of last resort. Our patient presented with genu valgum and recurvatum, and the implant used was a primary posterior-stabilized TKA.

In patients with a history of osteomyelitis, there is concern that TKA may activate dormant microorganisms [3]. As such, the literature on this topic is limited, highlighting the relevance of our case.

Jerry *et al.* contraindicate TKA in patients with a history of knee osteomyelitis [6]. Our patient had a history of

osteomyelitis in the tibial diaphysis with a long period of evolution without recurrence. Given this, we chose knee joint replacement as the treatment option.

Total knee replacement (TKA) following adjacent bone osteomyelitis is a challenge, not only due to the risk of infection recurrence but also because of the increased risk of complications arising from associated changes in the skin, soft tissues, and bones [3]. Some authors recommend performing TKA in two stages in patients with a history of osteomyelitis [7-8]. Willians *et al.* presented a series of four patients who underwent single-stage TKA [3]. In this study, three patients developed immediate postoperative complications, and the fourth patient eventually required knee arthrodesis [3]. On the other hand, Lee *et al.* reported satisfactory outcomes in patients with a history of osteomyelitis who underwent single-stage TKA [9]. Our

approach was to perform the joint replacement in a single stage, reducing the number of surgeries.

Nazarian *et al.* described three patients with osteomyelitis who underwent two-stage TKA, with none of the patients experiencing infection recurrence after an average follow-up of 4.5 years^[8]. Our study had a follow-up of 3.5 years with no signs of infection.

The decision to proceed with TKA is based on the patient's history, clinical examination, and radiological findings of advanced osteoarthritic changes^[3]. We agree with this statement and emphasize the importance of a thorough clinical history.

The literature recommends the use of an extramedullary tibial guide in these cases^[3]. In our opinion, avoiding the tibial intramedullary canal reduces the risk of bleeding and infection. Therefore, an extramedullary tibial guide was used.

Lee *et al.* advocate for the use of antibiotic-loaded orthopedic cement^[9]. We share this perspective and used cement impregnated with vancomycin.

Conclusion

Single-stage total knee arthroplasty (TKA) is a viable option for a patient with a history of osteomyelitis associated with genu valgum and recurvatum.

Conflict of Interest

Not available

Financial Support

Not available

Reference

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