

Case report

Delayed peroneal nerve palsy after total knee arthroplasty—A rare complication of tibial osteolysis



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Ajit J. Deshmukh*, Bozena Kuczynski, Giles R. Scuderi

Insall Scott Kelly Institute, 210 E 64th St, 4th floor, New York, NY 10065, United States

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ABSTRACT

We present a case of peroneal nerve palsy which occurred 12 years after primary total knee arthroplasty as a result of extensive tibial osteolysis. The tibial osteolytic cyst extended through a cortical defect in the proximal tibia into the anterolateral compartment of the leg causing compressive neuropathy of the peroneal nerve. Imaging included radiographs, CT scan and MRI. At revision surgery, the tibial component was found loose with significant proximal tibial osteolysis. The cyst in the leg was decompressed through the cortical defect in the proximal tibia and analysis of cystic fluid revealed polyethylene debris. At 7-year follow-up after revision, the osteolytic cyst had resolved but the peroneal palsy did not recover.

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1. Introduction

Peroneal nerve palsy is a rare, but potentially devastating complication of primary total knee arthroplasty (TKA) and usually occurs in the immediate post-operative period following correction of fixed deformities [1]. We report a case of late irreversible common peroneal nerve palsy 12 years following TKA associated with tibial polyethylene wear-related tibial osteolytic cyst extending into the anterolateral compartment of the lower leg causing a compressive neuropathy of the peroneal nerve.

2. Case report

A 73-year-old male underwent bilateral TKA for primary osteoarthritis at another institution. He was referred to the senior author 12 years later with a failed TKA due to tibial polyethylene wear associated with a cyst-like mass along the antero-lateral aspect of his leg, and right common peroneal nerve palsy, which had been present for about 2 months. The cyst had been previously aspirated on numerous occasions by the original surgeon, but the cystic swelling recurred each time. Upon presenting to the senior author, examination showed a cystic swelling anterolaterally over the upper two-thirds of the right leg measuring approximately 3 cm wide and 10 cm long. The patient had significant motor weakness of the right extensor hallucis longus (EHL), toe extensors and tibialis anterior (TA). There was hypoesthesia over the superolateral aspect of the dorsum of the right foot and first web-space, suggestive of superficial and deep peroneal nerve

involvement. To assist with ambulation the patient wore an ankle-foot orthosis (AFO). The knee examination revealed a healed midline incision, moderate joint effusion, neutral alignment and active range of motion 0–110° with good quadriceps and hamstring strength. The knee was stable in the sagittal plane, but had about 5.0 mm of lateral laxity in extension in coronal plane.

Radiographic evaluation demonstrated a posterior stabilized TKA with lateral joint space widening and narrowing of the medial joint space, suggestive of medial tibial polyethylene wear. Medial and lateral tibial osteolytic cysts were apparent beneath the tibial tray (Fig. 1A and B). An MRI was obtained by the referring physician, which showed a long tubular fluid filled structure measuring 12.5 cm by 3 cm along the lateral side of the knee (Fig. 2A and B). A CT scan (Fig. 3A and B) showed osteolysis in the proximal tibia with a focal area of cortical disruption in the lateral tibial metaphysis, just anterior and distal to the proximal tibio-fibular joint. A three-phase bone scan showed evidence of tibial loosening. Fluid was aspirated and sent for analysis which demonstrated no evidence of acute infection. Pre-operative nerve conduction and needle EMG studies confirmed the diagnosis of a peroneal nerve palsy.

In view of the findings, a revision TKA was performed. Operative findings revealed a loose tibial component with a well-fixed femoral component. The tibial polyethylene insert showed significant medial wear (Fig. 4). The osteolytic lesion in the proximal tibia communicated directly with a large synovial cyst in the anterolateral compartment of the lower leg. The synovial cyst was decompressed and the fluid analysis showed polyethylene debris. The revision TKA consisted of a stemmed constrained condylar prosthesis with a tibial trabecular metal cone to manage the tibial osteolytic lesion (Fig. 5A and B). At 7-year follow-up, his knee was functioning well and completely cyst resolved, but the peroneal nerve palsy was still present.

* Corresponding author at: 475 Main Street #3D, New York, NY 10044, United States.
Tel.: +1 347 399 9349 (mobile).

E-mail address: drajitdeshmukh@gmail.com (A.J. Deshmukh).



Fig. 1. A: AP radiograph of the right knee demonstrating a cemented total knee prosthesis along with reduced medial joint-space suggestive of medial poly-wear. Osteolysis is most prominent in the lateral tibial plateau. B: Lateral radiograph demonstrating osteolysis in the anterior proximal tibia.

3. Discussion

Osteolysis following TKA is commonly associated with polyethylene wear and is often associated with component loosening [2–7]. It is not unusual with osteolysis to develop a popliteal cyst, but we are aware of only one previous report of a synovial cyst extending from a zone of osteolysis into soft tissue of the calf after TKA [8]. Another previous report described the presence of severe metallosis, and resulting pseudotumor, compressing the common peroneal nerve [9]. To the best of our knowledge, a late peroneal nerve palsy associated with tibial osteolysis and a synovial cyst has not been previously described.

Cysts about the native knee joint are most commonly encountered in the popliteal region. These include not only Baker's cysts, but also cysts arising secondary to pathological processes such as meniscal tears and osteoarthritis. Incidence of Baker's cysts as identified by MRI ranges from 4.7% to 19% in patients with symptoms of internal derangement

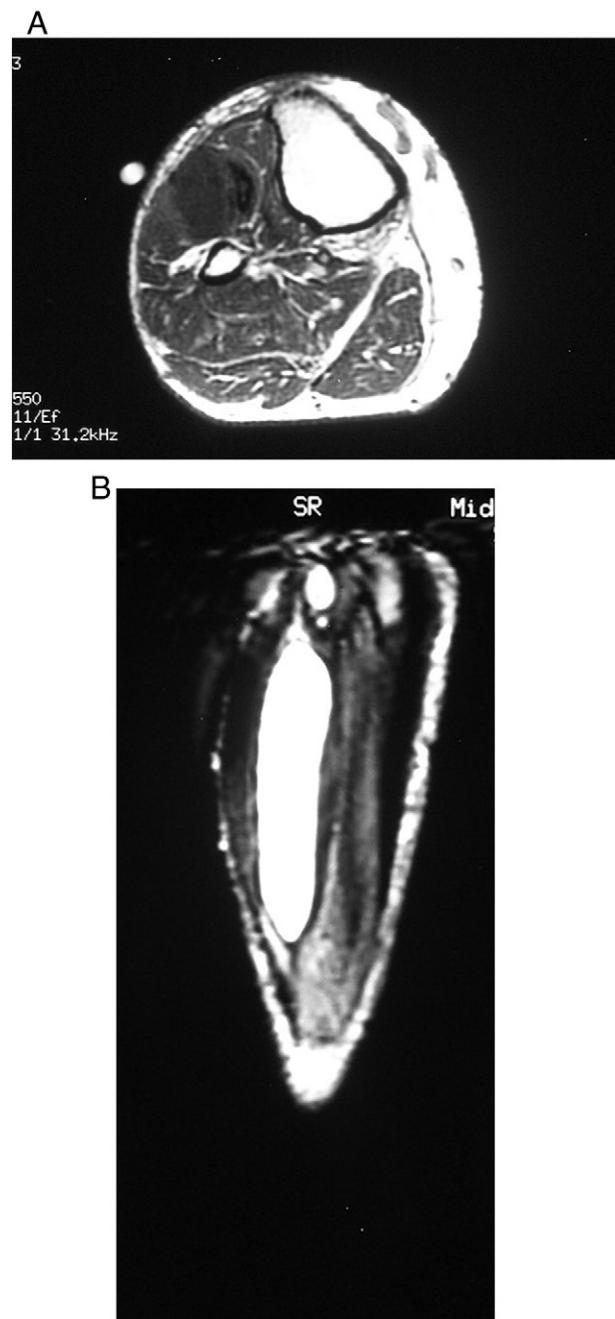


Fig. 2. A: T1 weighted MRI (axial image) showing a cystic lesion on the antero-lateral aspect of the proximal tibia B: T2 weighted MRI (coronal image) showing the cystic lesion in the lower leg.

of the knee [10,11]. The proximal tibiofibular joint (PTFJ) is an unusual localization for synovial cysts with a prevalence ranging from 0.09% to 0.76% on MRI of symptomatic knees [12,13]. In a review of literature performed in 2004, a total of 53 cases of synovial cysts from PTFJ were reported. Twenty-eight of these 53 cases were associated with a peroneal nerve palsy [12]. Gibbon et al. reported on a case of peroneal nerve palsy secondary to compression by a synovial cyst arising from the PTFJ in the presence of an ipsilateral TKA [14]. No communication of the PTFJ with the knee joint was found. Few reports exist about the occurrence of cysts arising as a result of polyethylene or metal wear particles from TKA [8,15,16]. More recently, Harvie et al. reported on a “pseudotumor” caused by severe metallosis from a TKA, communicating with the knee joint and causing reversible common peroneal palsy [9]. Peroneal nerve palsy secondary to compressive neuropathy from a

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