Development of an Extensive Patellar Osteophyte Following ACL Reconstruction

Case Report

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INTRODUCTION

This article presents a case of a large inferior patellar osteophyte, which developed after patellar tendon autograft anterior cruciate ligament (ACL) reconstruction. This extensive osteophyte formed a neo-articulation with the tibial plateau and contributed to arthrofibrosis, patellar baja, and patellar pain. This is an extremely unusual complication following patellar tendon harvesting for ACL reconstruction.

CASE REPORT

In September 2001, a 30 year old woman with loss of motion, stiffness, and patellar symptoms was referred to our office following postoperative ACL reconstruction radiographs that demonstrated a large distal patellar osteophyte (Figure 1).

Past medical history was significant for an anterior cruciate ligament injury sustained while jumping which was confirmed clinically with a grade 2B Lachman, a grade 2 anterior drawer and an abnormal pivot shift test. Magnetic resonance imaging (MRI) revealed a medial meniscal tear along with the anterior cruciate injury. An endoscopic ACL reconstruction using ipsilateral patellar tendon autograft was performed after motion was recovered.

It was undetermined from her records whether bone graft had been used to fill the distal patellar defect, or if the peritenon was primarily closed. Four months postoperatively, the patient was noted to have a 10° flexion contracture. Arthroscopic debridement revealed extensive scar formation within the intercondylar notch and an intact graft and scar within the medial and lateral gutters. This operative report indicated that full extension had been obtained following debridement. No preoperative radiographs were obtained.

Figure 1. Lateral radiograph demonstrates a patellar osteophyte extending from the distal patella prior to our surgical debridement. Note the appearance of a fibrous neoarticulation with the anterior tibia.

Four months following the secondary procedure, the patient tripped on a carpet, “jamming” her right knee. Radiographs taken at a local emergency room revealed the aforementioned area of ossification. She was then referred to our office.

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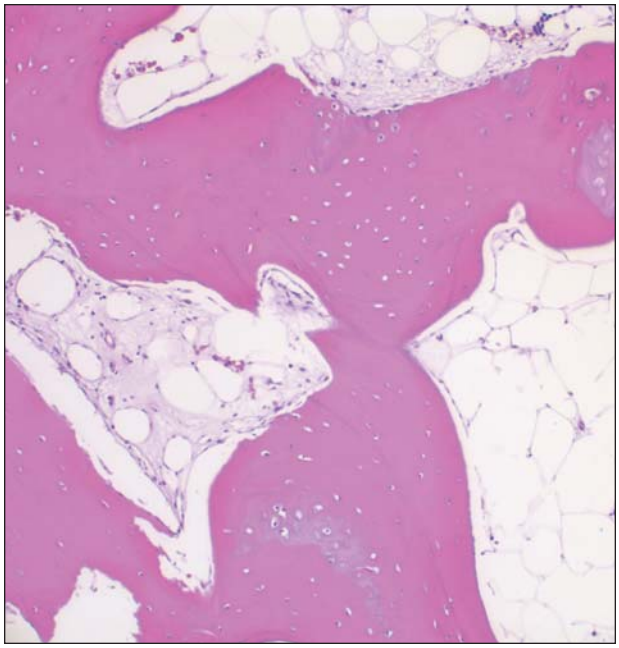

Figure 2. Specimen histology shows lamellar bone in this haematoxylin-eosin preparation (original magnification ×200).

Figure 3. Lateral radiograph 21 months post resection demonstrates no recurrence of the osteophyte. Mild degenerative changes are noted. Note the appearance of patellar baja, however this radiograph is taken in a greater degree of knee flexion compared to Figure 1.

Physical examination revealed a 10°-120° arc of motion, an 8 cm prone heel height difference in extension, significant reduction in patellar mobility and normal Lachman, anterior drawer, and pivot shift tests. Collateral laxity was not noted 0°-30°. She had no patellar instability, and a hard osseous mass was palpated within the patellar tendon area.

In October 2001, a right knee arthroscopic extensive debridement of the intercondylar notch, including expansion notchplasty, was performed. Scar tissue was noted extending into the medial lateral gutters and the arthroscope was initially introduced into the superomedial portal to facilitate initial debridement. The arthroscope was also moved from the standard anterolateral viewing portal as well as the inferomedial portal to assess the extent of necessary debridement. The debridement resulted in improved patellar mobility.

The patellar tendon osteophyte was approached through the previous graft harvest incision. The osteophyte was found to be directly adherent within tendinous tissue and was in the former of mid-third harvest site. An osteotome was used to resect the 2.6×1×0.9 cm stalactite from the distal patella. It extended distally to the tibial plateau region and a neo-articulation with some fibrous tissue was noted distally. The specimen was sent to pathology and was found to be consistent with normal lamellar bone (Figure 2).

Postoperatively, the patient reported a difference in patellar mobility and a reduction of stiffness at the first postoperative visit for suture removal. She underwent physical therapy directed at prone heel hangs, patellar mobilization, motion recovery, and closed chain quadriceps strengthening. The ACL reconstruction maintained normal stability and the patient was seen at interval evaluations up to 21 months postoperatively.

At last follow-up, range of motion was –5° to 125° arc of motion with a 3 cm prone heel height asymmetry in extension. Postoperatively, patellofemoral mobility was markedly improved and patellofemoral symptoms were nearly resolved. Her KT-1000 arthrometer measurements demonstrated a 1 mm side-to-side difference on maximum manual side-to-side testing. A recent radiographic series (Figure 3), demonstrated no recurrence of the distal patellar osteophyte.

DISCUSSION

Patellar tendon autograft is the most commonly used graft for ACL reconstruction. Providing 85%-90% consistent stability, along with durability, this graft has a very high patient subjective satisfaction level. However, the incidence of patellar pain has been demonstrated in numerous studies to be higher than in series using hamstring autografts.

Hamstring advocates have espoused the hamstring graft because it avoids the potential of intra or postopera-

tive patellar fractures, extensor mechanism disruption, patellar tendonitis, and patellar pain. In the senior author's published clinical follow-up studies, the incidences of patellar pain with patellar tendon autograft has been 17%, 13%, and 13% in three separate clinical follow-up studies, ranging from 2-4 years and 5-9 years for either two-incision or endoscopic reconstructions.1-3 The senior author's observation is the incidence of patellar pain has been reduced with the transition to early quad activation, attention directed toward recovering immediate extension and hyperextension, patellar mobilization activities, and avoiding open chain quad extension exercises or isokinetic quad training.

To our knowledge, this unusual complication has not been previously mentioned. We have routinely advocated autografting of the distal patellar defect following graft harvest. In our ACL follow-up studies, postoperative radiographs occasionally demonstrate a very small spur at the distal patellar region but this case is unique to our practice. We have noted a small inferior patellar spur in ,5% (eg, 5-10 mm) of our follow-ups and it is not associated with patellar pain.

In a study by Kohn et al[9] involving 19 patients who underwent patellar defect grafting from bone tunnel reamings and peritenon closure, 36% of those individuals had radiographic bone spurs at one year postoperatively. Additional studies have focused on the intrinsic healing potential of the patellar tendon donor site defect. Many of the histologic and imaging studies have confirmed that reliable filling of the defect with tendon-like tissue occurs over a two- to three-year period.[4-8,10,11]

We did not have access to the initial operative report and, therefore, are not aware of specific technique issues that may have impacted the development of this ossification process. Additionally, because postoperative radiographs were not ordered until re-injury, we cannot comment on the temporal development of the ossification. In our practice, following an initial radiograph at suture removal to assess bone tunnel location and interference screw placement, we do not routinely order radiographs unless patients report significant patellar pain, sustain a reinjury, or return to the operating room for surgical debridement for arthrofibrosis.

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