



# Knee Squeaking Secondary to Intra-articular Nonabsorbable Suture

## A Report of 2 Cases

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Joint squeaking has classically been described after total hip arthroplasty using a ceramic-on-ceramic bearing surface.<sup>4,5</sup> This phenomenon has also been found to occur after total knee arthroplasty and can be associated with patient concern and dissatisfaction. However, it has not been described in the postsurgical native knee. We present 2 cases of knee squeaking after medial patellofemoral ligament (MPFL) reconstruction. In both cases, the squeaking sound was a result of nonabsorbable intra-articular suture. In this report, we present the cases as well as the surgical treatments, which ultimately resulted in the successful elimination of joint squeaking.

### CASE REPORTS

#### Case 1

A 15-year-old female presented for evaluation of persistent right knee pain, swelling, and audible squeaking with active range of motion. Six months prior to presentation, she had undergone MPFL reconstruction with allograft for recurrent patellar instability at an outside institution. She denied any episodes of recurrent instability; however, she was unable to reciprocate stairs or return to previous sports activities, including running and cheerleading, due to

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persistent pain as well as an audible squeaking of the knee. She was dissatisfied with the squeaking noise and described it as occurring in social settings when she attempted to cross her legs, and it was audible to those around her. The patient failed to progress with physical therapy, and her symptoms were not relieved by anti-inflammatory drugs, icing, activity modification, taping, or the use of a knee brace.

Physical examination of her right knee demonstrated a trace effusion and persistent quadriceps atrophy, which was not present prior to the original MPFL reconstruction. Active range of motion was 0° to 140°, with an audible squeaking noise through the arc range of 70° to 90° (Supplemental Video 1). There was trace patellofemoral crepitus and tenderness to palpation over the medial patellar facet at the distal quadriceps tendon as well as over the medial femoral epicondyle (location of femoral tunnel). Patellofemoral compression test was positive. She demonstrated 2 quadrants of lateral patellar translation with a good endpoint and no apprehension. The remainder of the knee examination was within normal limits.

Plain radiographs of the knee demonstrated postsurgical changes consistent with prior MPFL reconstruction, with 2 patellar tunnels and 1 tunnel within the femur (Figure 1).

Magnetic resonance imaging (MRI) of the knee demonstrated the 4.75-mm PEEK SwiveLock anchors (Arthrex) in each patellar tunnel. The lateral facet cartilage immediately underneath the more distal anchor appeared to be irregular, suggesting possible chondral penetration; however, no structure could be visualized penetrating beyond the subchondral bone into the joint space (Figure 2). In addition, the proximal anchor appeared to breach the proximal patellar cortex and protrude into the quadriceps tendon, which corresponded with a site of tenderness on physical examination. Finally, the femoral tenodesis screw was prominent.

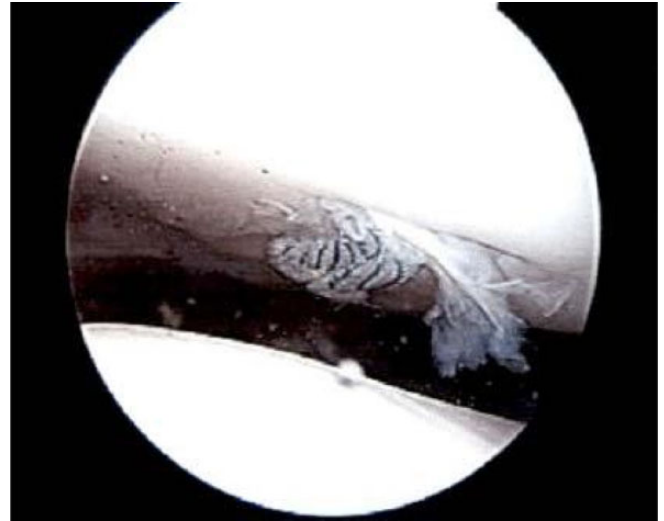


**Figure 1.** Lateral radiograph of the right knee demonstrating 2 patellar tunnels and 1 tunnel in the femur for case 1.



**Figure 2.** Axial magnetic resonance image demonstrating distal anchor within the patella with possible chondral penetration, but no suture or other structure visualized in the intra-articular space.

Given these findings and the failure of extensive physical therapy prior to presentation, the patient was indicated for diagnostic arthroscopy and removal of hardware with possible revision MPFL reconstruction. On entry into the patellofemoral joint from a standard anterolateral arthroscopic portal, it was noted that there was Fiberwire suture (Arthrex) protruding into the joint from the more distal anchor (Figure 3). While directly visualizing the patellofemoral articulation, the suture was seen to engage into the trochlea with knee flexion beyond 70°. This was consistent with the timing of the audible squeak with active range of



**Figure 3.** Intra-articular perforation of suture from distal anchor.

motion (Supplemental Video 1). The suture was debrided using an arthroscopic shaver, and the proximal anchor, which could not be seen arthroscopically, was removed by drilling from the outside in and removing it. The prominent femoral tenodesis screw was removed through a small open incision. Patellar stability was tested, and there was no increased translation after hardware removal.

Postoperatively, she was allowed to bear full weight as tolerated, with no limitations on range of motion. She entered a therapy program 5 days postoperatively that focused on quadriceps strengthening and range of motion. At the 2-week postoperative visit, she reported reduction in pain and no episodes of knee squeaking. At 6 weeks, she reported continued reduction of pain and improvement in her tenderness over the medial patellar facet and medial femoral epicondyle. She was able to reciprocate stairs comfortably and perform a straight-leg raise without pain. At 6 months postoperatively, she continued to report significant improvements in both pain and function. She was able to run and squat without pain and planned to initiate tumbling with her cheerleading squad.

## Case 2

An 18-year-old female presented for evaluation of right knee squeaking with active range of motion. At the time of presentation, she was 2 months status post-right MPFL reconstruction with semitendinosus allograft for recurrent patellar instability at the same institution. The graft was fixed with 2 tunnels on the patellar side with 5 × 15 mm Milagro screws (Depuy Mitek) and a single femoral tunnel fixed with an 8 × 23 mm Milagro screw. She had a pull-through Orthocord (Depuy Mitek) suture placed through the patella for docking of her graft in the patella. The suture was cut at the level of the skin laterally.

For the 2 weeks prior to presentation, she noted squeaking with active range of motion. She had no complaints of pain or instability, but the audible squeaking was a source



**Figure 4.** Lateral radiograph of the right knee demonstrating 2 patellar tunnels and 1 tunnel in the femur for case 2.

of dissatisfaction and concern. Physical examination of her knee on presentation demonstrated no effusion. She had full range of motion from 0° to 140° with audible squeaking in flexion (Supplemental Video 2). There was no crepitation or tenderness over her medial or lateral patellar facet and no increased lateral translation. Plain radiographs demonstrated adequate tunnel placement from her MPFL reconstruction (Figure 4).

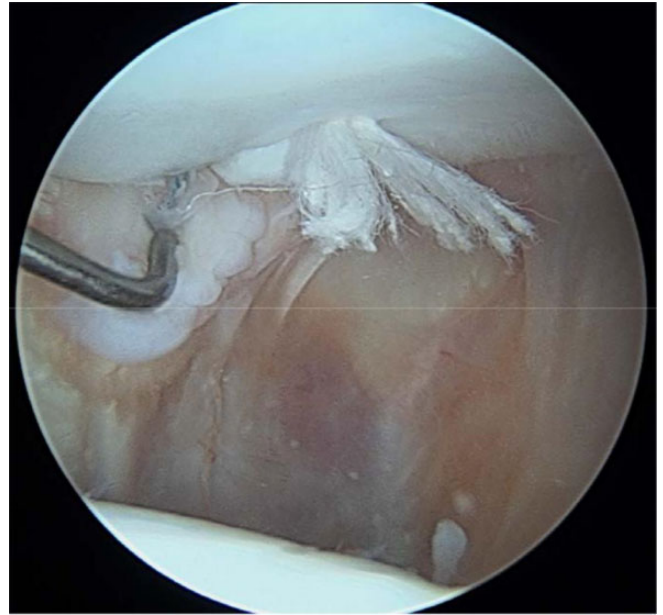
Given these findings, the patient was indicated for diagnostic arthroscopy of the knee. At the time of surgery, Orthocord suture was noted to be protruding into the joint at the lateral patellar facet and synovial junction (Figure 5). The remainder of the patellofemoral articulation showed no significant chondral damage. The suture was removed with a basket forceps and shaver. No anchors were prominent or required removal. The patient's MPFL graft was intact, and she had normal patellar stability.

Postoperatively, the patient continued to rehabilitate from her MPFL reconstruction. At her first postoperative visit, she reported no episodes of knee squeaking and no pain (Supplemental Video 3). The remainder of her postoperative course was uneventful.

## DISCUSSION

The phenomenon of joint squeaking can be a source of significant patient distress. It has been classically described as a potential complication after total hip arthroplasty using ceramic-on-ceramic bearings, with an incidence of 0.7% to 20%.<sup>5</sup> While this entity has been described in the hip and knee arthroplasty literature,<sup>4,5,7</sup> to our knowledge, there is currently no description regarding sounds emanating from the native postsurgical knee.

In both of our cases, suture had penetrated the chondral surface of the patella after MPFL reconstruction. Despite



**Figure 5.** Suture penetration into lateral patellar facet and synovial junction.

the evolution of new techniques, complications after MPFL reconstruction occur in approximately 16% of patients, with half of those occurring as a result of technical errors.<sup>6</sup> The majority of complications are related to patellar fixation of the MPFL graft. Fracture, joint penetration, and hardware complications are the most commonly reported.<sup>1-3,8,9</sup> While the complication presented in this case report may be prevented by ensuring that suture does not penetrate the joint space, it is possible that anatomic variations (eg, long lateral patellar facet) may predispose certain patients to this complication even in experienced hands. These cases bring to light a previously undescribed complication after MPFL reconstruction.

In the first case, MRI was nondiagnostic and the suture could not be visualized. The audible squeak was of identical quality in both cases and was the key to diagnosis. In both cases, the sound could be heard only with active motion and was not apparent at the time of examination under anesthesia. The sound was not reproducible with passive range of motion because biomechanical compression across the patellofemoral articulation is required for the squeak to be reproduced. Moreover, given that the same audible squeak was produced from 2 different types of suture, it is possible that penetration of any braided, nonabsorbable suture into the joint space can result in an audible squeak.

While surgical intervention after a relatively short period of joint noise may seem somewhat aggressive, this complication had been encountered in the practice previously and the noise did not resolve on its own with time. Therefore, given the level of concern expressed by the patients and prior experience with this complication, early intervention was warranted, as there was no indication that the knee squeaking would eventually resolve on its own.

In summary, the friction of nonabsorbable suture on articular cartilage with active compression across the

patellofemoral joint produces a characteristic and identifiable squeak, which the surgeon should be aware of. It is worth reiterating that MRI was not of value in the diagnosis. As noted previously, arthroscopic debridement of the suture resulted in definitive resolution of the squeaking in both cases.

A Video Supplement for this article is available at <http://journals.sagepub.com/doi/suppl/10.1177/2325967117716386>.

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