

Kissing Cartilage Lesions of the Knee Caused by a Bioabsorbable Meniscal Repair Device

A Case Report

Robert F. LaPrade,* MD, PhD, and Nicholas J. Wills, MD

From the Department of Orthopaedic Surgery, University of Minnesota, Minneapolis, Minnesota

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All-inside meniscal repairs using bioabsorbable repair devices have been a new tool for orthopaedic surgeons in the treatment of meniscal tears. Multiple studies have shown the efficacy of this technique.^{1,4,6} Unfortunately, complications such as arrow breakage,³ inflammatory foreign body reactions,^{8,9} chondral injuries,^{2,7,10} and loss of fixation⁵ have been observed with this technique. We would like to present a new variation of the problem seen by others, a case of kissing lesions of grade IV chondromalacia of the medial compartment of the knee caused by a chondral injury from a meniscal arrow in a young patient.

CASE REPORT

In February 1998, a 31-year-old man injured his right knee while running a physical fitness test. The injury was evaluated at an outside hospital and was determined to be a 2-cm vertical tear in the posteromedial aspect of the medial meniscus. The patient underwent an arthroscopic all-inside meniscal repair in May 1998. The tear was repaired with five 13-mm-long meniscal arrows (Bionx Implants, Blue Bell, Pa). During the procedure, it was noted that the articular cartilage of his medial femoral condyle and medial tibial plateau was normal. The surgery was completed without complications, and the patient was discharged the same day with a universal brace locked in extension. He was nonweightbearing for 6 weeks after surgery and

underwent 3 months of physical therapy after being allowed to bear weight.

The patient came to our institution complaining of continued right knee medial joint-line pain and swelling. Radiographs of the knee at that time were normal (Figure 1) with no joint space narrowing, osteophyte formation, or subchondral sclerosis. The patient was given nonsteroidal anti-inflammatory medications and enrolled in physical therapy. He returned 1 month later with complaints of continued medial knee pain and swelling. At that time, our differential diagnosis included synovitis from a reaction to the bioabsorbable implants or a possible re-tear of the previously repaired meniscus. An MRI with intra-articular gadolinium was obtained that revealed a full-thickness groove in the sagittal plane in the articular cartilage of the medial femoral condyle (Figure 2).

The patient was brought to the operating room for an arthroscopic examination of his painful right knee. At that time, a significant groove of the articular cartilage on the medial aspect of the medial femoral condyle was noted that was caused by a meniscal arrow. On flexion and extension of the knee, the groove extended from almost near extension to full flexion. The articular cartilage defect was noted to be several millimeters wide and extended down to subchondral bone (Figure 3). The majority of the meniscal tear appeared to have healed except for a small portion of the medial aspect of the patient's medial meniscus, so an arthroscopic partial medial meniscectomy was performed. The meniscal device fragmented into shards when palpated with a probe and was removed by suction concurrent with the meniscectomy. There was no synovitis or damage to the ligamentous structures or other articular cartilage found during the procedure, and the articular cartilage of the medial tibial plateau appeared normal.

Two years later, in 2002, the patient returned with a complaint of medial compartment activity-related knee pain that was refractory to treatment with nonsteroidal anti-inflammatory medications. Repeat radiographs of his

*Address correspondence to Robert F. LaPrade, MD, PhD, Department of Orthopaedic Surgery, University of Minnesota, 2450 Riverside Avenue, R200, Minneapolis, MN 55454 (e-mail: lapra001@umn.edu).

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Figure 1. Original normal AP radiograph (right knee).

right knee revealed evidence of early onset osteoarthritis (Figure 4) with osteophyte formation in the medial joint line, subchondral sclerosis of the medial tibial plateau, and medial compartment joint space narrowing. Standing long-leg radiographs revealed a weightbearing axis that passed through the medial aspect of the medial tibial spine (Figure 5). A repeat MRI scan revealed further progression of his medial compartment articular cartilage changes. The corresponding medial tibial plateau articular cartilage was worn down to subchondral bone (Figure 6). The patient was placed into a custom-made right knee medial compartment unloader brace and has noted a moderate amount of improvement in his functional limitations with the use of the unloader brace.

DISCUSSION

Every surgery poses potential complications. Both outside-in and inside-out meniscal repair techniques can cause injury to the neurovascular structures of the knee.^{12,13} The all-inside repair, because of its relative ease of technique and decreased incidence of neurovascular complications, has become very popular. Its complications, however, are becoming more apparent with longer follow-up and an increase in the number of bioabsorbable meniscal repair devices used.



A



B

Figure 2. A narrow area of full-thickness grade IV chondromalacia over the medial aspect of the medial femoral condyle (arrows) was demonstrated on the MRI scan (2 coronal views, right knee).

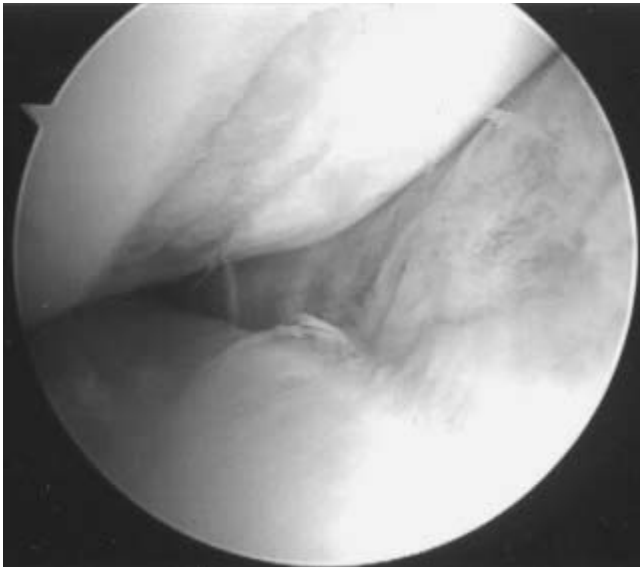


Figure 3. Arthroscopic appearance of the articular cartilage of the medial compartment of the patient's right knee. A full-thickness sagittal plane groove of grade IV chondromalacia caused by a bioabsorbable meniscal repair device is demonstrated.



Figure 4. AP standing radiograph of the right knee 2 years after arthroscopic assessment. Osteophyte formation and joint space narrowing are seen in the medial compartment.



Figure 5. Long-leg AP alignment radiograph showing the mechanical axis passing through the medial aspect of the medial tibial spine.



Figure 6. A repeat MRI scan demonstrates full-thickness chondral kissing lesions of the far medial aspect of the medial compartment (coronal view, right knee, 2 years after arthroscopic assessment).

There are many possible causes for meniscal repair devices damaging the articular cartilage of the knee. A few examples would be surgeon error in leaving a repair device too proud or using one that is too long.⁹ These potential problems should decrease with continued use and familiarity of the products. Unfortunately, complications such as breakage or migration of a repair device out of the meniscus are difficult for a surgeon to avoid.

Although other authors have reported chondral injuries caused by bioabsorbable meniscal repair devices, most reports involved patients who resumed normal activity after removal of the implant,^{7,10} authors that did not report follow-up with the patient,¹¹ or patients who had less extensive lesions.² Our patient displayed rapid progression to a severe chondral lesion even after the bioabsorbable repair device was removed. Therefore, we present this case of rapidly progressive symptomatic kissing lesions of grade IV chondromalacia of the medial femoral condyle and tibial plateau so that other surgeons will see

the gravity of the situation and include this in their differential diagnosis of a patient with continued knee pain and swelling after a meniscal repair with bioabsorbable devices. By understanding the rapid course of the problem, we may be more willing to use resources such as MRI or repeat arthroscopy to discern the reason for continued patient difficulty, thereby arresting or preventing chondral injury and disability before progression to the point observed in our young patient.

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REFERENCES

1. Albrecht-Olsen P, Kristensen G, Burgaard P, Joergensen U, Toerholm C. The arrow versus horizontal suture in arthroscopic meniscus repair. *Knee Surg Sports Traumatol Arthrosc.* 1999;7:268-273.
2. Anderson K, Marx R, Hannafin J, Warren R. Chondral injury following meniscal repair with a biodegradable implant. *Arthroscopy.* 2000;16:749-753.
3. Calder S, Myers P. Broken arrow: a complication of meniscal repair. *Arthroscopy.* 1999;18:651-652.
4. Hurel C, Mertens F, Verdonk R. Biofix resorbable meniscus arrow for meniscal ruptures: results of a 1-year follow-up. *Knee Surg Sports Traumatol Arthrosc.* 2000;8:46-52.
5. Hutchinson M, Ash S. Failure of a biodegradable meniscal arrow. *Am J Sports Med.* 1999;27:101-103.
6. Jones HP, Lemos MJ, Wilk RM, Smiley PM, Gutierrez R, Schepsis AA. Two year follow-up of meniscal repair using a bioabsorbable arrow. *Arthroscopy.* 2002;18:64-69.
7. Kumar A, Malhan K, Roberts S. Chondral injury from bioabsorbable screws after meniscal repair. *Arthroscopy.* 2001;17:34.
8. Menche D, Phillips G, Pitman M, Steiner G. Inflammatory foreign-body reaction to an arthroscopic bioabsorbable meniscal repair. *Arthroscopy.* 1999;15:770-772.
9. Oliverson T, Lintner D. Biofix arrow appearing as a subcutaneous foreign body. *Arthroscopy.* 2000;16:652-655.
10. Ross G, Grabill J, McDevitt E. Chondral injury after meniscal repair with bioabsorbable arrows. *Arthroscopy.* 2000;16:754-756.
11. Seil R, Rupp S, Dienst M, Mueller B, Bonkhoff H, Kohn D. Chondral lesions after arthroscopic meniscus repair using meniscal arrows. *Arthroscopy.* 2000;16:E17.
12. Small N. Complications in arthroscopic surgery performed by experienced arthroscopists. *Arthroscopy.* 1998;4:215-221.
13. Stone R, Sprague N. Complications of arthroscopic meniscal repair. In: Sprague N, ed. *Complications in Arthroscopy.* New York, NY: Raven Press; 1989:157-168.