

Parameniscal cyst formation after arthroscopic meniscal repair with biodegradable meniscal arrow: a case report

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Abstract A 22-year-old male underwent an arthroscopic meniscal repair, using meniscal arrows, due to bucket-handle medial meniscus tear. Magnetic resonance images (MRI) at 3 years revealed a large parameniscal cyst protruding into the extra-capsular popliteal space. Arthroscopic partial cystectomy, removing only the intra-articular portion of the cyst was performed, leaving the extra-articular part of the cyst. Sixteen months postoperatively MRI revealed no cyst remnants, and the patient was free of symptoms.

Keywords Meniscus · Repair · Meniscal arrow · Complication · Cyst

Introduction

The meniscal arrow (Bionix Corp., Blue Bell, Malvern, PA) is one of the all-inside meniscal repair devices, which eliminates the need for additional incisions for tying, lessens the risk for adjacent neurovascular structures, decreases operative time, and can be placed using a less technically demanding technique than used to place inside-out sutures. However, various complications have been reported, including breakage of the arrow [3], cystic hematoma [5], and cyst formation [10]. For the treatment

of the cystic lesions, open debridement [5] or aspiration alone [10] is performed.

We report a case of a large parameniscal cyst protruding into the popliteal space in a patient who had undergone meniscal repair with the biodegradable meniscal arrow to treat bucket-handle tear of the medial meniscus. Although arthroscopic partial cystectomy was performed, the remnant cyst was completely resorbed after 16 months.

Case report

A 22-year-old male military recruit visited a clinic due to left knee pain. He had experienced several episodes of locking and a McMurray test elicited pain on the medial side of the knee. Magnetic resonance images (MRI) showed a bucket-handle type torn medial meniscus, but no evidence of a parameniscal cyst. On arthroscopy, we identified a bucket-handle tear of the medial meniscus and repaired the meniscus using two inside-out sutures at its mid-body and two biodegradable meniscal arrows at its posterior horn (Fig. 1). Three years postoperatively, the patient suffered gradual onset of pain in the operated knee aggravated by deep flexion. On MRI, a large parameniscal cyst originating from the posterior horn of medial meniscus, spanning the posterior side of the posterior cruciate ligament, and expanding into the extra-capsular popliteal space, was identified (Fig. 2a, b). Arthroscopic cystectomy was performed through a posterior trans-septal portal [1] as well as conventional arthroscopic portals, eliminating the intra-articular portion of the lesion (Fig. 2c). The extra-articular portion of the lesion behind the posterior capsule was left and open cystectomy in the popliteal fossa was not performed. Although the residual cyst was identified on the immediate postoperative MRI, the MRI 16 months

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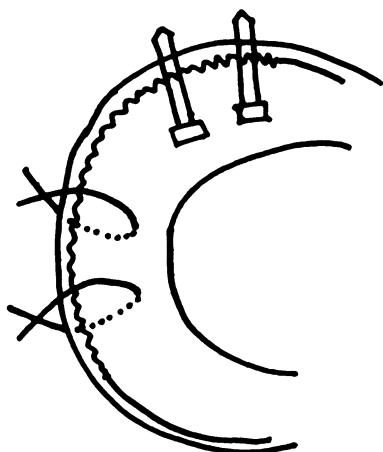


Fig. 1 Meniscal repair was performed with two inside-out sutures at the mid-body area, and two meniscal arrows at the posterior horn of the medial meniscus

postoperatively showed complete resolution of the cyst (Fig. 3). The patient was free of symptoms and had full range-of-motion.

Discussion

While the reported complication rate after meniscal repair ranges from 0 to 45% [2, 6] the formation of a parameniscal cyst after meniscal repair is rare [4, 6, 7, 9, 10]. With regards to suture materials and methods, postrepair meniscal cysts have developed after use of nonabsorbable sutures with inside-out methods [4, 6, 9] and with biodegradable devices for all-inside methods [7, 10]. Among the biodegradable devices, Lombardo and Eberly [7] used T-Fix devices (Acufex, Andover, MA), which made an additional operation for a meniscal cyst necessary. After using meniscal arrows (Bionix Corp., Blue Bell, Malvern,

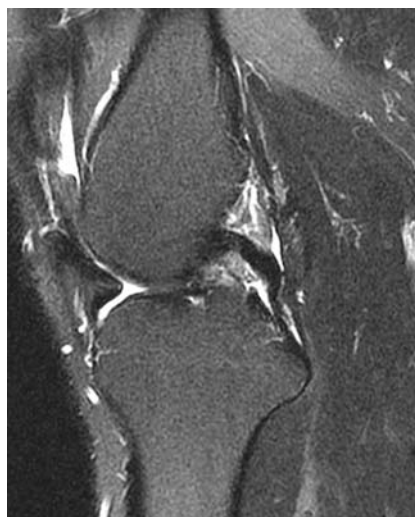


Fig. 3 MRI at 16 months after arthroscopic cystectomy shows no evidence of a residual cyst

PA), postrepair meniscal cysts were completely resolved 18 weeks after meniscal repairs [10]. We used two meniscal arrows (Bionix Corp., Blue Bell, Malvern, PA) for the posterior horn of the meniscus, and 3 years later, the patient required surgery for an unresolved cyst. The exact cause of meniscal cyst formation after meniscal repair is unclear. Some proposed etiologies include the migration of synovial cells and cyst formation [6], a combined instability of the knee [9] degeneration of the meniscus [5], the number of sutures and the interval between the sutures [7], and a self-limited inflammatory reaction to the meniscal arrows used [10]. In the present patient, MRI before cyst excision showed grade 2 degeneration of the meniscus according to the grading system of Mustonen et al. [8]. We could not find the connection with the arrow, between the meniscus and the posterior capsule, in either MRI or arthroscopic findings. Additionally we did not perform a biopsy or

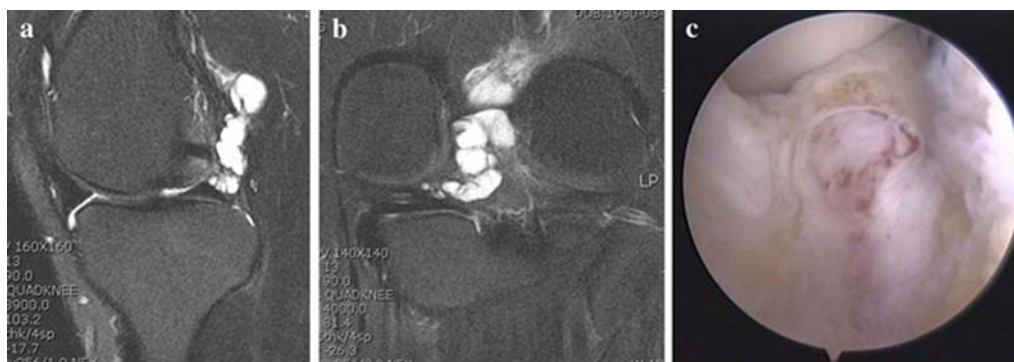


Fig. 2 Images from the second surgery. The sagittal (a) and coronal (b) MRI show a large parameniscal cyst originating from the posterior horn of the medial meniscus and expanding into the extra-capsular space. Arthroscopic view (c) from the posterolateral portal through

the trans-septal portal demonstrates the cyst (in the center) behind the tibial insertion of the posterior cruciate ligament (on the left) and the posterior horn of the medial meniscus underneath the medial femoral condyle (on the upper side)

evaluate the cystic contents. The mechanism of cyst formation and extra-articular extension of the cyst remain elusive.

In previous reports, postrepair meniscal cysts were self-limited [10] or were treated by open excision [4, 6, 9]. The cyst in our case had an intra-articular mass and a simultaneous extra-articular lesion mimicking a Baker cyst. Because these were interconnected as seen in MRI (Fig. 2a), we performed an arthroscopic intra-articular cystectomy alone with informed-consent, in expectation of residual resolution. The result at 16 months post-operation was good and no residual cysts were detected on MRI.

This case shows that partial arthroscopic resection of a meniscal cyst, which might induce spontaneous resorption of the extra-articular rest.

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