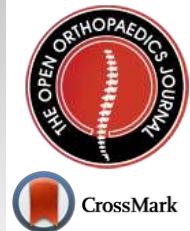




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CASE REPORT

Migration of a Meniscal Repair Implant Mimicking Meniscal Injury

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Abstract:

Complications after arthroscopic meniscal suture repair have been reported. Migration of a meniscal repair implant mimicking meniscal injury is rare. A 28-year-old female had undergone Anterior Cruciate Ligament (ACL) reconstruction at another hospital 12 years ago. The remaining instability after ACL reconstruction resulted in medial meniscal damage, wear and narrowing in the posterior third. The H-fix that was used in the meniscal repair became detached, exposing the inside of the knee joint. Meniscal repair is a successful procedure in conjunction with ACL reconstruction. However, when knee instability after ACL reconstruction remains, the choice of meniscal repair implants may lead to potential complications even after long-term clinical follow-up.

Keywords: Meniscal repair, Anterior cruciate ligament reconstruction, Arthroscopy, Knee, Joint, Injury.

Article History

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1. INTRODUCTION AND BACKGROUND

Meniscal repair is performed to prevent meniscal dysfunction and post-traumatic osteoarthritis. However, complications of meniscal suture repair, such as deep infection, repair failure, neurovascular injuries, arthrofibrosis and chondral injury, have been reported [1 - 5]. Migration of meniscal repair implants has also been reported. However, disturbance due to the migration of a meniscal repair implant mimicking meniscal injury is rare. We present a case of migration of one meniscal repair implant (H-fix, Mitek) 12 years postoperatively.

2. CASE

A 28-year-old female presented with left knee pain, crepitation, gait disturbance and a “giving way” sensation. She had undergone anterior cruciate ligament (ACL) reconstruction at another hospital 12 years back. After the surgery, she had occasional pain, but no giving way or locking sensation in her knee. Her history after the surgery was unremarkable.

Physical examination revealed swelling, effusion and medial joint line tenderness in the left knee. The range of motion was between 10° and 120°. McMurray tests for medial

meniscus were positive. The results of posterior drawer tests, and varus and valgus stress tests were normal, but the Lachman test and anterior drawer test were positive. The patient had no patellofemoral symptoms. Magnetic resonance imaging (MRI) demonstrated a reconstructed ACL, medial meniscus tear, and effusion in the suprapatellar pouch (Figs. 1A, 1B).

Arthroscopy revealed a reconstructed ACL, the medial meniscus that was worn and narrowed in the posterior third and one meniscal suture implant (H-fix), which had been used to repair the medial meniscus (Figs. 2A, 2B). The chondral lesion of the femoral medial condyle and the tibial medial plateau were found at the weight-bearing portion. The implant was resected with a punch.

The knee symptoms disappeared immediately after surgery and the patient was able to resume daily activities in a half-year. The Lysholm knee score was 85.

3. DISCUSSION

Nonabsorbable sutures, meniscus arrows or staples and bioabsorbable implants are often used to repair meniscal tears. Good-to-excellent results can be expected from meniscal repair [6, 7]. On the other hand, reported complications after meniscal repair using the inside-out technique include infection, arthrofibrosis, nerve injury, vascular injury and chondral injury [1 - 5].

In the present case, the patient remembered that she had

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undergone ACL reconstruction at another hospital 12 years back, but not that meniscal repair had been performed. There was no incision scar from meniscal repair. Before surgery, we diagnosed her with medial meniscal injury associated with the failure of anterior cruciate reconstruction. The all-inside technique for meniscal repair has the advantage of not affecting structures around the knee joint. Complications after using biodegradable meniscus arrows have been reported [8 - 10], and subcutaneous migration of meniscal arrows has been well documented. Chondral injury due to migration inside the knee joint is also a serious complication. Serious complications are mostly observed after unhealed repair of the meniscus [11, 12].



Fig. (1). Preoperative magnetic resonance imaging.
A Sagittal T1-weighted image reconstructed anterior cruciate ligament.
B Coronal T2-weighted image medial meniscal tear.

Long-term outcomes after meniscal repair in patients undergoing concurrent ACL reconstruction are limited to small single-center series, with failure rates ranging from 0-29% at a minimum 5-year follow-up [13 - 15]. A systematic review calculated the failure rate of meniscal repair in ACL-reconstructed knees to be 26.9% at 5 years [16]. A few studies suggested that ACL reconstruction produces protective effects for meniscal repair [17 - 19]. On the other hand, Nepple reported that the failure rate increased in combined ACL reconstruction and meniscal repair groups compared with meniscal repair in stable knees [16]. In the present case, the remaining instability after ACL reconstruction might result in medial meniscal damage and wear from the arthroscopic findings.

Thus, the following scenario should be considered: ACL reconstruction and medial meniscal repair were performed 12 years back. The remaining instability after ACL reconstruction

resulted in medial meniscal damage, wear and narrowing in the posterior third. Then, the H-fix that was used in the meniscal repair became detached, leading to left knee pain and crepitation.

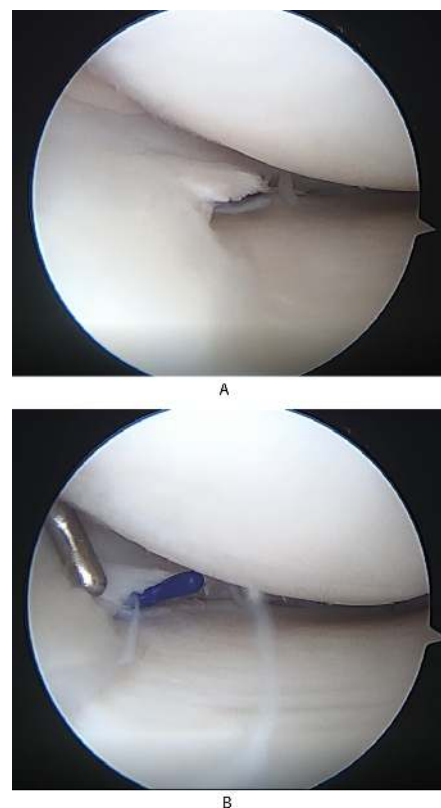


Fig. (2). Arthroscopic view from an anterolateral portal.
A Medial meniscus before probing.
B H-fix under the medial meniscus.

CONCLUSION

The all-inside meniscal repair technique is a reliable treatment option. The choice of meniscal repair implants may lead to potential complications even in long-term clinical follow-up after ACL reconstruction and combined meniscal repair.

LIST OF ABBREVIATIONS

ACL = Anterior Cruciate Ligament
 MRI = Magnetic Resonance Imaging

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

Not applicable.

STANDARD OF REPORTING

PRISMA Guideline and methodology were followed.

CONSENT FOR PUBLICATION

We have obtained consent to publish from the patient.

CONFLICT OF INTEREST

The author declares no conflict of interest, financial or otherwise.

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Declared none.

REFERENCES

- [1] Small NC. Complications in arthroscopic meniscal surgery. *Clin Sports Med* 1990; 9(3): 609-17. [http://dx.doi.org/10.1016/S0278-5919(20)30711-0] [PMID: 2199072]
- [2] Albrecht-Olsen P, Kristensen G, Burgaard P, Joergensen U, Toerholm C. The arrow versus horizontal suture in arthroscopic meniscus repair. A prospective randomized study with arthroscopic evaluation. *Knee Surg Sports Traumatol Arthrosc* 1999; 7(5): 268-73. [http://dx.doi.org/10.1007/s001670050162] [PMID: 10525694]
- [3] DeHaven KE. Meniscus repair. *Am J Sports Med* 1999; 27(2): 242-50. [http://dx.doi.org/10.1177/03635465990270022301] [PMID: 10102109]
- [4] Koski JA, Ibarra C, Rodeo SA, Warren RF. Meniscal injury and repair: clinical status. *Orthop Clin North Am* 2000; 31(3): 419-36. [http://dx.doi.org/10.1016/S0030-5898(05)70161-9] [PMID: 10882468]
- [5] Grant JA, Wilde J, Miller BS. Comparison of inside-out and all-inside techniques for the repair of isolated meniscal tears: a systematic review. *Am J Sports Med* 2011. [PMID: 21737837]
- [6] Johnson MJ, Lucas GL, Dusek JK, Henning CE. Isolated arthroscopic meniscal repair: a long-term outcome study (more than 10 years). *Am J Sports Med* 1999; 27(1): 44-9. [http://dx.doi.org/10.1177/03635465990270011501] [PMID: 9934417]
- [7] Rubman MH, Noyes FR, Barber-Westin SD. Arthroscopic repair of meniscal tears that extend into the avascular zone. A review of 198 single and complex tears. *Am J Sports Med* 1998; 26(1): 87-95. [http://dx.doi.org/10.1177/03635465980260013301] [PMID: 9474408]
- [8] Song EK, Lee KB, Yoon TR. Aseptic synovitis after meniscal repair using the biodegradable meniscus arrow. *Arthroscopy* 2001; 17(1): 77-80. [http://dx.doi.org/10.1053/jars.2001.7800] [PMID: 11154373]
- [9] Menche DS, Phillips GI, Pitman MI, Steiner GC. Inflammatory foreign-body reaction to an arthroscopic bioabsorbable meniscal arrow repair. *Arthroscopy* 1999; 15(7): 770-2. [http://dx.doi.org/10.1016/S0749-8063(99)70011-3] [PMID: 10524827]
- [10] Seil R, Rupp S, Dienst M, Mueller B, Bonkhoff H, Kohn DM. Chondral lesions after arthroscopic meniscus repair using meniscus arrows. *Arthroscopy* 2000; 16(7): E17. [http://dx.doi.org/10.1053/jars.2000.9244] [PMID: 11027775]
- [11] Kelly JD IV, Ebrahimpour P. Chondral injury and synovitis after arthroscopic meniscal repair using an outside-in mulberry knot suture technique. *Arthroscopy* 2004; 20(5): e49-52. [http://dx.doi.org/10.1016/j.arthro.2004.03.022] [PMID: 15122157]
- [12] Mine T, Hayashi R, Ihara K, Kawamura H, Kuriyama R, Tominaga Y. Chondral injury after inside-out meniscal suture repair using meniscal sutures. *Open Orthop J* 2019; 13: 72-5. [http://dx.doi.org/10.2174/1874325001913010072]
- [13] Lee GP, Diduch DR. Deteriorating outcomes after meniscal repair using the Meniscus Arrow in knees undergoing concurrent anterior cruciate ligament reconstruction: increased failure rate with long-term follow-up. *Am J Sports Med* 2005; 33(8): 1138-41. [http://dx.doi.org/10.1177/0363546505275348] [PMID: 16000655]
- [14] Logan M, Watts M, Owen J, Myers P. Meniscal repair in the elite athlete: results of 45 repairs with a minimum 5-year follow-up. *Am J Sports Med* 2009; 37(6): 1131-4. [http://dx.doi.org/10.1177/0363546508330138] [PMID: 19279222]
- [15] Steenbrugge F, Verdonk R, Hürel C, Verstraete K. Arthroscopic meniscus repair: Inside-out technique vs. Biofix meniscus arrow. *Knee Surg Sports Traumatol Arthrosc* 2004; 12(1): 43-9. [http://dx.doi.org/10.1007/s00167-003-0446-8] [PMID: 14513212]
- [16] Nepple JJ, Dunn WR, Wright RW, Pandit H, Wandless F, Thomas NP. Meniscal repair outcomes at greater than five years: a systematic literature review and meta-analysis. *J Bone Joint Surg Am* 2012; 94(24): 2222-7. [http://dx.doi.org/10.2106/JBJS.K.01584] [PMID: 23318612]
- [17] Scott GA, Jolly BL, Henning CE. Combined posterior incision and arthroscopic intra-articular repair of the meniscus. An examination of factors affecting healing. *J Bone Joint Surg Am* 1986; 68(6): 847-61. [http://dx.doi.org/10.2106/00004623-198668060-00006] [PMID: 3755440]
- [18] Tenuta JJ, Arciero RA. Arthroscopic evaluation of meniscal repairs. Factors that effect healing. *Am J Sports Med* 1994; 22(6): 797-802. [http://dx.doi.org/10.1177/036354659402200611] [PMID: 7856804]
- [19] Wasserstein D, Dwyer T, Gandhi R, Austin PC, Mahomed N, Ogilvie-Harris D. A matched-cohort population study of reoperation after meniscal repair with and without concomitant anterior cruciate ligament reconstruction. *Am J Sports Med* 2013; 41(2): 349-55. [http://dx.doi.org/10.1177/0363546512471134] [PMID: 23263297]