The Meniscal Cyst : Arthroscopic Decompression And Modified Outside-In Suture Repair of The Anterior Horn of Lateral Meniscus

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Abstract: This article describes a modified suture technique designed for the vertical repair of the ante-rior horn of the meniscus after arthroscopic decompression of a large meniscal cyst. This procedure comprises of three steps: first, the meniscus was pierced vertically using a suture hook and a No. II PDS suture. Second, both ends of the No. II PDS on the femoral and tibial surfaces of the meniscus were pulled to the out-side of the joint capsule using a spinal needle pre-loaded with suture material. Finally, a skin incision was made adjacent to the suture materials, and both ends were tied. We recommend this technique not only for the vertical repair of the anterior horn of the meniscus after decompression of large meniscal cyst, but also to repair a longitudinal tear of the meniscus.

Key words: Menisci Cyst, Arthroscopic Treatment, Repair, Knee

INTRODUCTION: Intra-articular cysts or ganglions are rare, but it is possible to remove them successfully either by open excision[1] or by arthroscopic decompression. If in traarticular cysts or ganglions are associated with other pathology, surgical outcomes appear to be less favorable[2]. Generally, meniscal cysts associated with a horizontal meniscal tear were treated by arthroscopic meniscectomy and cyst decompression[3,4,5]. In some cases, ganglion cysts may be located on the periphery of the meniscus but may not be associated with a meniscal tear. In the absence of a tear, a meniscal cyst can be removed without a meniscec-tomy[4]. In the case of a large meniscal cyst, however, arthroscopic cyst decompression may leave the meniscus unstable. Therefore, meniscus repair should be considered.

The purpose of this article is to explain the modified outside-in suture technique developed for the vertical repair of the anterior horn following arthroscopic decompression of a meniscal cyst.

SURGICAL TECHNIQUE : Clinical examination of this 46 year old Female with nontraumatic left knee swelling since 6 months following twsting injury shows just before surgery shows dynamic swelling at lateral joint line suggestive of lateral meniscus cyst (Fig. 1).

Fig. 1. Left Knee showing lateral joint line cyst , most probably Lateral Meniscal cyst

Diagnostic arthroscopic examination of the knee was per-formed using standard anterolateral and anteromedial portals. The anteromedial portal allowed for better inspection of the lateral meniscus anterior horn tear. The cystic mass might be detected on the periphery of the anterior margin of lateral meniscus and might occupy nearly whole length of the anterior horn of meniscus (Fig. 2a). Using a spinal needle, the cysts were punctured and then decompressed with a motorized shaver, subsequently producing a yellow gelatinous fluid. In some cases, the

lateral meniscus may become unstable after cyst removal. To prevent this from occurring, we performed the modified out-side-in suture technique.

The modified outside-in suture technique was per-formed using a spinal needle which was used for the outside-in suture technique[5] and a suture hook (LinvatecTM; Largo, FL, USA) which was generally used for the all-inside suture technique. First, an arthroscope was introduced through the contralateral portal, and an semi-lunar shaped straight suture hook (LinvatecTM) was inserted through the ipsilateral portal (Fig. 2b).

Fig. 2a. A large meniscal cyst of the lateral meniscus (arrow-heads) extends from the anterior cruciate ligament to the anterolateral horn of the meniscus in front of the lateral femoral condyle (LFC)

Fig. 2b. An arthroscopic photograph shows the suture hook (LinvatecTM), which pierced through the inner portion of the torn meniscus vertically

The meniscus was pierced at the lower surface to the upper surface by orienting the suture hook in a vertical direction (Figs. 3a and 4). Next, the No. 0 PDS (Ethicon, Sommerville, NJ, USA) suture material was advanced through the canal of the suture hook. After withdrawing the suture hook from the joint, end of the suture were retrieved through the ipsilateral portal using a suture retriever (Fig. 3b).

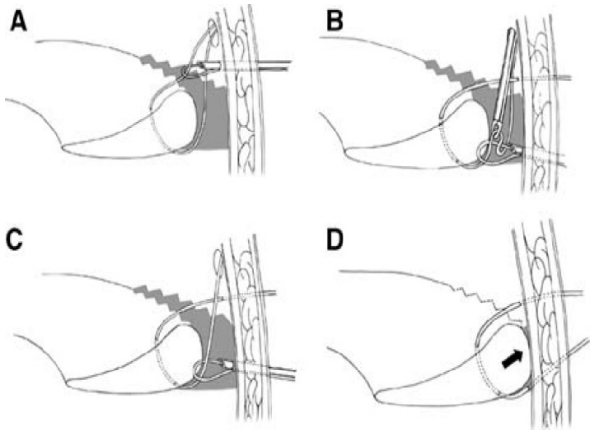

Fig.3. a The end of the PDS above the meniscus is pulled outside of the capsule by pulling the loop of the nylon. b A spinal needle with the loop of the No. 0 nylon is re-inserted below the meniscus to pull out the PDS, which passed through the torn meniscus. The loop is manipulated to the front end of the PDS below the meniscus. The end of the PDS below the meniscus was then retrieved through the loop of the nylon. c The end of the PDS below the meniscus is pulled outside of the capsule by pulling the loop of the nylon. d The torn meniscus is reduced (arrow) by pulling both ends of the No. 0 PDS, which holds the circumferential fibers of the meniscus

Under arthroscopic view, a spinal needle, in which No. 0 nylon had been preloaded, was inserted above the meniscus in order to pull out the PDS that had passed through the torn meniscus. The loop of No. 0 nylon was then

manipulated so that it was oriented in the front of the No. 0 PDS. The No. 0 PDS was retrieved through the loop of the nylon with a suture retriever and the end of the suture was pulled outside of the capsule by pulling the loop of the nylon A spinal needle, in which No. 0 nylon had been preloaded, was re-inserted below the meniscus in order to pull out the PDS that had passed through the torn meniscus. The loop was adjusted to be in front of the end of the PDS below the meniscus. The end of the PDS below the meniscus was retrieved through the loop of the nylon (Fig. 3b) and was then pulled outside of the capsule by pulling the loop of the nylon. The torn meniscus was reduced by pulling both ends of the No. 0 PDS, which held the circumferential fibers of the meniscus.

A 1-cm skin incision was made close to the two ends of the PDS suture. Using a curved hemostat, the area was dissected down to the level of the retinaculum. The two PDS suture ends were then retrieved through the incision. It was confirmed that there was no soft tissue interposed between the two throngs of PDS, with the exception of the retinaculum. After the reduction of the meniscus, both suture ends were tied with the optimal tension after the reduction of the the meniscus, which was achieved by manipulating a probe inserted through the ipsilateral portal. After placement of the sutures, a gap between the meniscus and the joint capsule was closed (Fig. 4).

From March 2004 to August 2004, four out of nine total patients who underwent meniscal cyst arthroscopic decompression needed repair, presumably be-cause the menisci were unstable after decompression. Each of the four patients was followed for more than 12 months post-operatively. In all four patients, no mass was palpable on follow-up. The McMurray test in each was negative and the patients reported no joint line tenderness, general pain or loss of sensation.

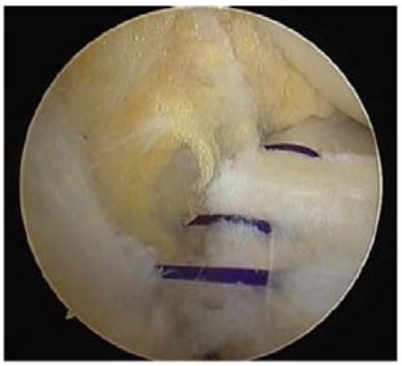

Fig.4. The large gap between the meniscus and the joint capsule after decompression of the meniscal cyst was closed after tying three modified outside-in sutures

DISCUSSION : Intra-articular cysts and ganglions are relatively uncommon; the reported incidence ranges from 0.4 [6] to 2.0%[7] . Cysts or ganglions have been found in various anatomical locations, including the anterior cruciate ligament, posterior cruciate ligament [8] and the infrapatellar fat pad[7,8,9] . Cysts may also be associated with the meniscus itself[1] . In this case, the cyst can be decompressed arthroscopically, and with a fair amount of success[3]. Occasionally, though, the meniscus might be detached from the peripheral capsule after decompression, especially if it involves a particularly large meniscal cyst. If the size of the meniscal detachment is more then 2 cm, the meniscus should be repaired to prevent instability.

When the anterior horn of the meniscus needs to be repaired after decompression or a longitudinal tear, the outside-in suture technique can be used for repair[10] .However, it is difficult to make a vertical suture with the outside-in technique due to the spinal needle,

which is horizontally situated through the torn meniscus. For vertical repair of the anterior portion of the meniscus, we modified the outside-in technique. Vertical repair, which can hold more circumferential collagenous fibers of the meniscus, has more strength than the horizontal repair[11,12.] Therefore, vertical repair via a modified outside-in suture technique is preferable in order to stabilize a torn meniscus.

There are advantages of the modified outside-in suture technique. First, penetration of the capsule with a spinal needle is easier with the modified technique than with the ordinary outside-in suture technique; the latter requires blind penetration through the capsule and meniscus at the same time. Second, a more vertically oriented suture, which can hold the meniscus symmetrically, yields anatomical reduction and provides good coaptation. Therefore, we can expect good results from this type of meniscal repair.

CONCLUSION: we introduced a new technique for the vertical repair of an unstable anterior horn of meniscus after decompression of a large meniscal cyst. This technique may also be applied to the repair of a longitudinal tear in an anterior horn longitudinal tear of meniscus.

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