Technical Note

Arthroscopic Resection of Bucket-Handle Tears With the Help of a Suture Punch: A Simple Technique to Shorten Operating Time

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Summary: We describe a surgical technique that has been used successfully for excising bucket-handle tears. The technique is routinely used in our department and has been found to shorten operating time. A suture punch is used to pass the suture through the bucket-handle tear. Manually maneuvering the free suture ends, it is always possible to cut the posterior or anterior attachment of the tear under direct visualization without the need for an additional portal and without the risk of losing the excised fragment in the joint. In our experience, the technique is simple, inexpensive, and reliable, but more importantly, it has shortened operating time significantly. **Key Words:** Arthroscopy—Meniscus—Excision—Bucket-handle tear.

Resection of bucket-handle tears is one of the most challenging technical problems in arthroscopic surgery. Particularly for the inexperienced arthroscopic surgeon and for beginners, this can be a difficult skill to master. A displaced bucket-handle tear makes it difficult to visualize all the compartments during the arthroscopy. There are normally 2 alternatives for an arthroscopist when excising a bucket-handle tear: either removing the meniscus piecemeal or trying to excise the fragment all in 1 piece.[1] Arthroscopic advances between 1980 and 1990 and the popularization of arthroscopic surgical procedures resulted in placing less emphasis on this subject, because such tears could be resected in the classic triangular approach. Still, there are several reports describing different surgical techniques to overcome the difficulties encountered during the removal of a bucket-handle tear.[2-8]

Our observations have shown that, in the learning curve of arthroscopy, residents always experience some difficulties during the excision of the mobile portion of a bucket-handle tear. Paksima et al.[7] reported a simple technique for excising bucket-handle tears with the help of a 4-mm Caspari suture punch. We decided to use this simple technique in our institution and found the results encouraging. The new technique, which has become our routine clinical application, seems to overcome the problems encountered with another accurate and reliable procedure consisting of 7 steps as described by Sprague.[8] He reported that the progress of new methods depends on the new instruments to be introduced.

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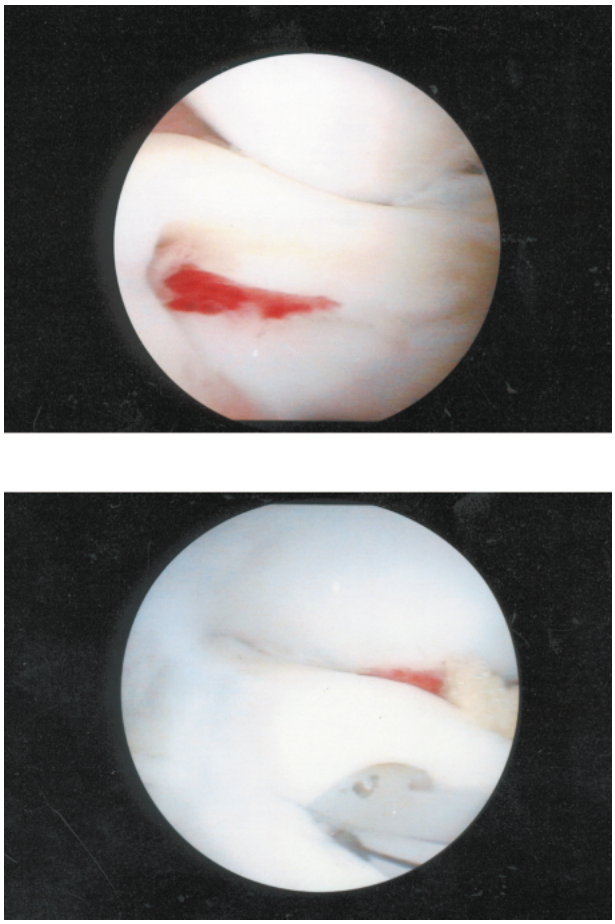
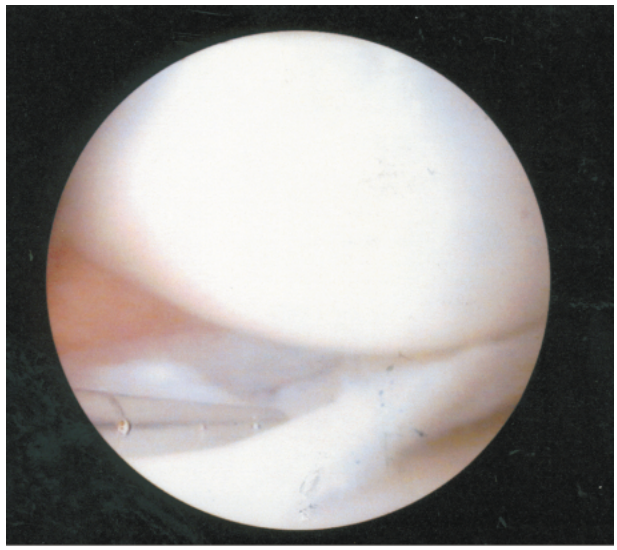


FIGURE 1. Subluxated bucket-handle tear in the intercondylar notch and puncturing it with the suture punch.

SURGICAL TECHNIQUE

The technique we use starts with the standard diagnostic arthroscopy. Once the presence of a bucket-handle tear is confirmed, a plan is made to excise the fragment as a whole (Fig 1). In case of subluxation of the bucket-handle fragment into the intercondylar notch, we try to reduce the fragment back to its rim at the original position to better delineate the extent of the tear (Fig 2). If this is not the case, then we leave the fragment where it is and proceed to the next step. The next step is to look across the intercondylar notch at the posterior horn of the meniscus while the viewing arthroscope is still contralateral to the pathology. Both lateral and medial bucket-handle tears are removed with the help of a suture punch (Smith & Nephew Endoscopy, Andover, MA) through the anteromedial portal (Figs 1 and 2). The suture punch is also introduced through the anteromedial portal into the knee joint. The meniscus is then grasped and punctured with a No. 1 nonabsorbable surgical suture (Acufex Suture Needle; Acufex, Mansfield, MA) leaving a loop of suture in the torn part of the meniscus. After removing the suture punch, the free ends of the suture can be grasped manually and gently pulled (Fig 3). Then a basket forceps is introduced through the



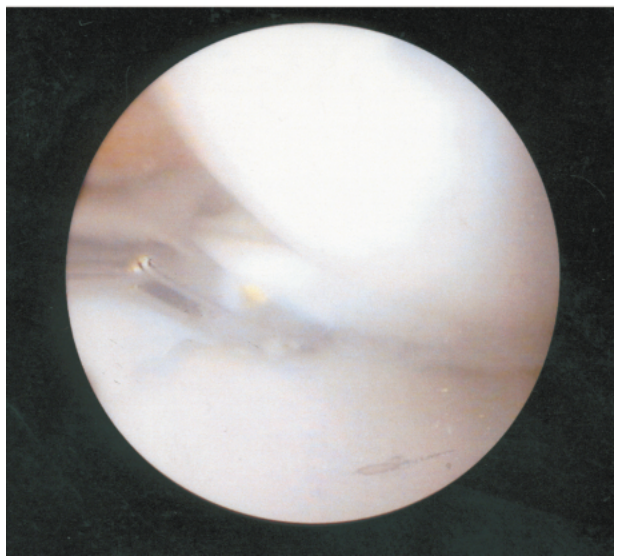
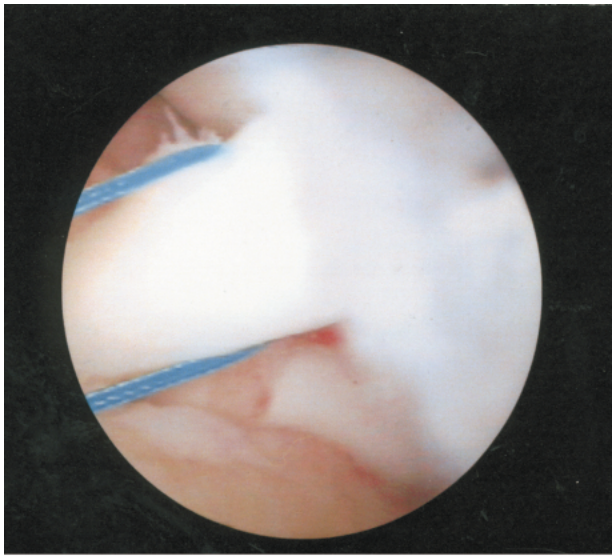


FIGURE 2. Reduced bucket-handle tear is held in its original position with the suture punch.



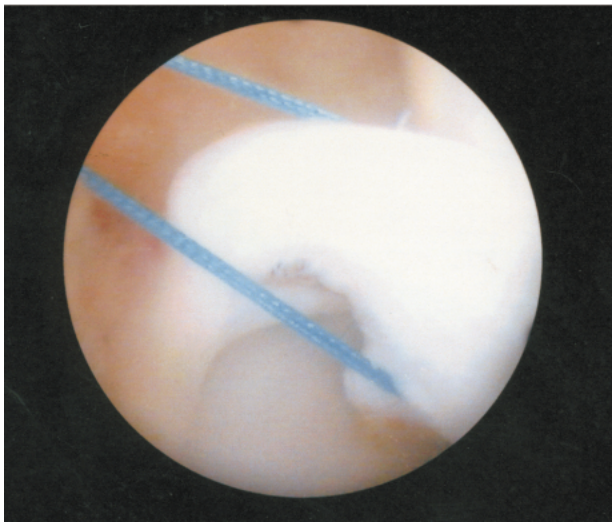


FIGURE 3. The bucket-handle tear fragment is grasped and punctured with a No. 1 Acufex Suture Needle, which can be easily manipulated.

same portal and the tear is cut almost through the posterior attachment of the mobile fragment. The cut could completely divide the fragment. Gentle traction with the hand-held suture allows us to incise the posterior horn attachment of the tear under tension and direct visualization. While keeping the posterior part of the meniscus in view, traction becomes stronger and, after complete incision through the posterior portion, it is possible to get the whole fragment after excising the anterior attachment of the tear.

In the case of reduction of the bucket-handle tear to its original position, the anterior portion of the bucket-handle fragment is probed first to test the direction and location of the intended cut. The cut must be carefully placed to avoid leaving a large anterior stump that could cause difficulties when contouring the remaining portion. We then cut the anterior attachment of the tear. The posterior portion is cut without applying any traction to the hand-held sutures. Complete removal of the fragment can be accomplished without the risk of losing it within the joint (Figs 4-6). The remaining portion of the meniscus is then contoured in the standard fashion.

DISCUSSION

The bucket-handle tear is a common tear in both the medial and lateral menisci, occurring in a relatively young age group. Treatment of the tear requires removing the mobile fragment and leaving a stable and smoothly contoured meniscal rim. Numerous methods of arthroscopic removal of the bucket-handle fragment have been described and, often depending on the pathology itself, one surgical technique is found to be superior to another.[2,3,5-8] The most difficult step in the arthroscopic treatment of bucket-handle tears is removal of the mobile portion. During the arthroscopic procedure, it is always a technical problem if the fragment gets lost in the joint. In this technique, manually applied tension during the entire procedure assists the surgeon. After incising the anterior or, alternatively, the posterior part of the tear, there is no risk

FIGURE 4. Easy removal of the bucket-handle fragment through the same portal in a patient who underwent an arthroscopically assisted anterior cruciate ligament repair.

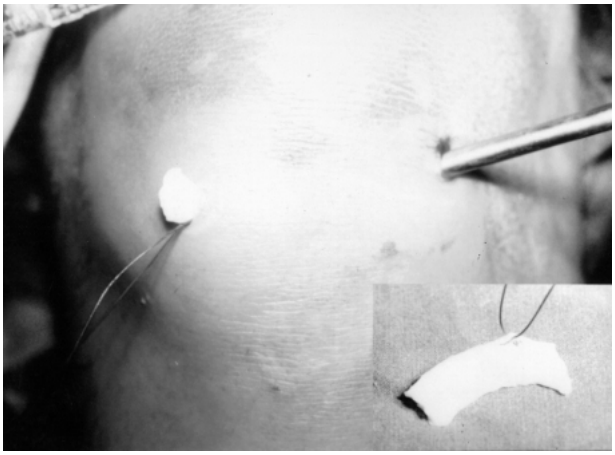


FIGURE 5. The bucket-handle fragment is removed from the joint through the same portal with the hand-held sutures in a standard fashion.

of losing the fragment within the joint. Often, removing the fragment is time consuming and difficult if one does not use an additional portal to introduce another instrument for grasping and cutting the posterior horn under tension. This technique eliminates the need for an additional portal. Reliable grasping of the fragment when it has been detached at both ends is essential. Otherwise it is a time-consuming effort to find the free fragment within the joint. It is important for the surgeon who routinely performs arthroscopic meniscal surgery to be comfortable with a reliable and simple technique. The method we use has the advantages stated above and has proven to be quick, with an average removal time of 8 minutes. The time reported by Dandy was 20 minutes.[3]

In the first 2 surgical excisions that we performed with the help of the suture punch, we used a secondary suture in case the primary suture was insufficient, but we found that 1 loop of suture was adequate and reliable for the whole procedure. We also found that intra-articular positive pressure helped to force the free fragment out of the joint without the need for any additional traction to the hand-held sutures. The significant shortening of the operating time and the ease of the procedure have made this technique a routine clinical application in our department. It is easy because the whole procedure can be performed without changing the portals and allows one to use the same portal for the suture ends and the basket forceps.

Although this technique has many advantages, it may not be universally effective in every case. There may be times when it must be modified or another approach used instead, and other surgeons may find other techniques more suitable. In our experience, however, the technique is simple, inexpensive, and reliable, and most importantly, it has proved to significantly shorten operating time.

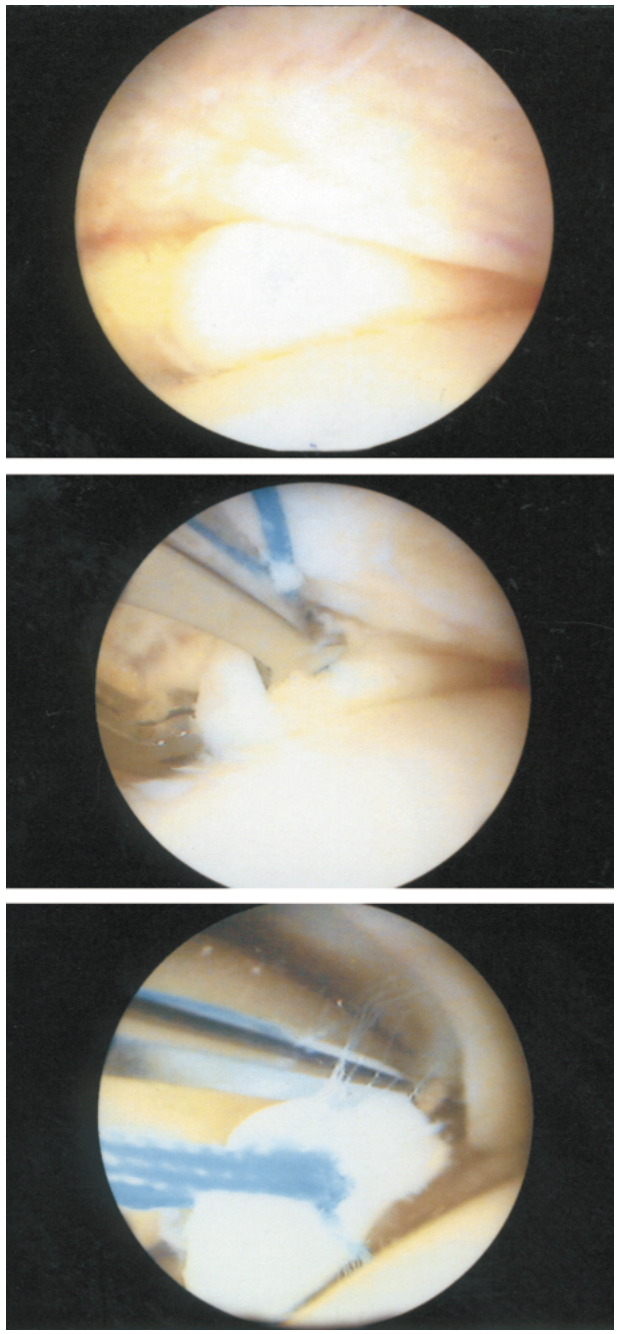


FIGURE 6. A ruptured bucket-handle tear of the lateral meniscus has been grasped with the suture punch to finish the intended cut. The fragment is excised as a whole and removed from the joint.

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