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Convenient three portal technique to remove locked bucket handle medial meniscus tear

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1. Introduction

Bucket handle medial meniscus tear presenting with a locked knee is a condition encountered frequently by arthroscopic surgeons. However these conditions need to be managed urgently to facilitate movement of the knee and mobility of the patient. Most of these tears can be diagnosed accurately on MRI.[1] Treatment options range from repair to menisectomy. Sometimes the tears are not salvageable and need to be removed. Arthroscopic removal is sometimes challenging and can vary from two to three portal techniques.[2,3] Most of the techniques described require adequate valgus force to open the medial compartment to facilitate easy working within the compartment. The technique of removing a bucket handle tear in a locked knee described in this article requires very little assistance and is efficient in terms of time and effort.

2. Technique (Video1)

The viewing portal (Portal 'A') is a vertical high anterolateral portal about 1 cm in length (Fig. 1) just adjacent to the lateral margin of the patellar tendon at the level of the inferior pole of the patella. The locked meniscus is visualized and a horizontal 1 cm long, low far medial portal is made just above the medial meniscus. (Portal 'C') (Fig. 2). A third vertical 1 cm portal is made just medial to the patellar tendon at the level of the inferior pole of the patella (Fig. 1) (Portal 'B'). Using Portal 'A' as a viewing portal, a grasper is introduced through Portal 'B' and the meniscus grasped at its root. A Punch is then introduced through Portal 'C' and the meniscus is cut at its root attachment (Figs. 3 and 4). Then, re positioning the grasper through Portal 'B', the transected end of the meniscus is held and traction applied laterally to bring its body attachment into view which is then cut by a punch introduced through Portal 'C' (Figs. 5 and 6). The meniscus is then delivered outside as a whole through Portal 'B', grasping it from one end (Fig. 7).

Supplementary video related to this article can be found at https://doi.org/10.1016/j.jajs.2019.02.002.

3. Discussion

Bucket handle medial meniscus tears often accompany ACL tears and in our case series all 10 cases using this technique were accompanied with ACL tear that required reconstruction.[4] Tears in the avascular area, degenerative changes in the knee, inability to reduce the tear anatomically and a deformed meniscus are reasons to remove the torn part rather than repairing it.[5]

Arthroscopy of the medial joint can be a challenge in tight knees. Working in the medial compartment not only requires accurate portal placement but also good assistance in terms of a valgus force to open up the medial compartment. Working on the posterior horn is especially difficult if adequate valgus force is not applied. The viewing portal was a vertical high anterolateral portal to avoid injury to the patellar tendon and to double as the viewing portal for the ACL reconstruction. The accessory portal too was made close to the patellar tendon and was thus vertical. In a locked knee where the meniscus is trapped between the femoral and tibial condyles using this technique the root posterior horn junction of the meniscus trapped in the notch is in direct view due to the shear force acting on it by the femoral condyle. Amputating this end

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Fig. 1. Portals used.

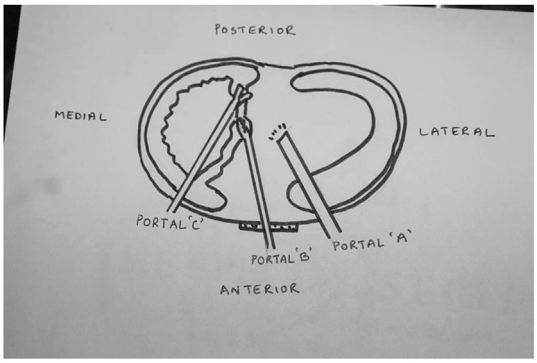

Fig. 4. Illustration of the amputation of the root end of the meniscus with portals used.

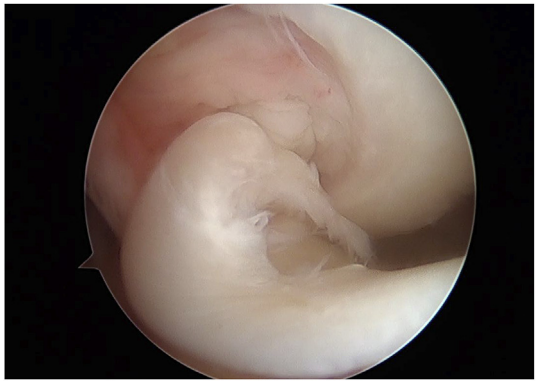

Fig. 2. Locked bucket handle medial meniscus tear.

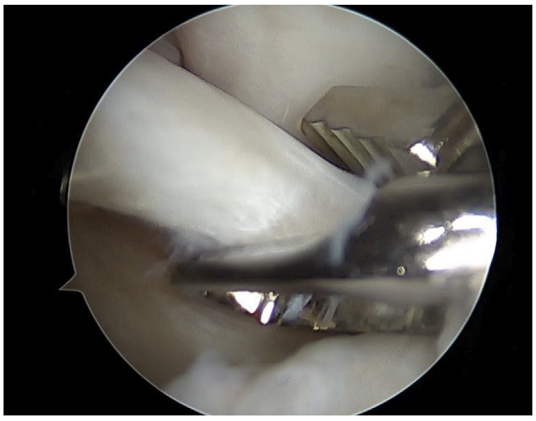

Fig. 5. Cut ends grasped with traction and punch cutting the body end of the meniscus.

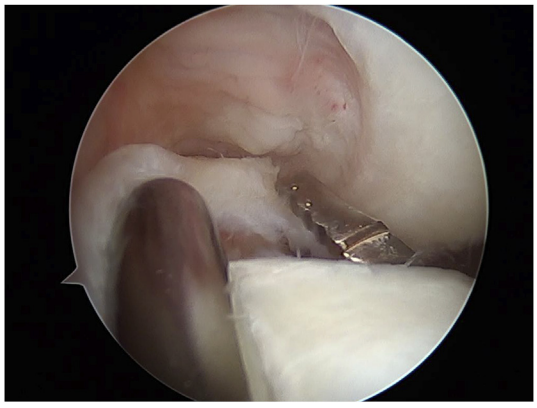

Fig. 3. Meniscus grasped at the posterior horn root junction and punch used to amputate one end.

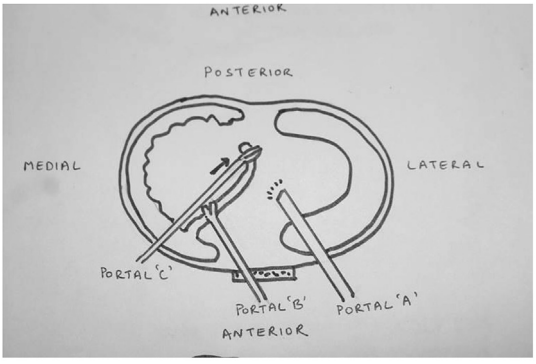

Fig. 6. Illustration of the amputation of the body end of the meniscus with portals used.

should be done carefully to avoid injury to the Posterior cruciate ligament (PCL) and the cartilage on the femoral and tibial condyles. The grasper initially grasps this end, and applying a tractional force brings the torn end into view and can be cut easily with a punch. Once this end is amputated the grasper through the accessory anteromedial portal holds the cut end so that traction can be applied to the meniscus to facilitate visualization of the torn end at body and this does not require any valgus force that is normally required to cut the meniscus from the posterior horn in the standard two portal technique. In comparison to the three portal technique involving a posteromedial portal the technique described is more convenient as it does not involve going into the posterior compartment, that can be more technically challenging. Thus this technique has the advantages of not having to apply excessive valgus to open the medial compartment and can be done

Fig. 7. Amputated medial meniscus as a whole.

with no assistant. However the same does not hold if the meniscus is not locked, in which case valgus force would be required to enter the medial compartment. The same can be applied to lateral meniscus tears as well.

4. Conclusion

The three portal technique described is a convenient alternative to the standard two portal technique and potentially reduces operative time. The frequent association with an ACL tear allows us to use the standard viewing portal in ACL reconstruction while working on the meniscus.

Disclosures

None.

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