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Is posterior knee arthroscopy using posterior portals necessary for orthopedic surgeons? The latest evidence on applications and techniques

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- Various uses of posterior knee arthroscopy have been shown, including all-inside repair of posterior meniscal lesions, posterior cruciate ligament (PCL) reconstruction or PCL avulsion fixation, extensile posterior knee synovectomy for pigmented villonodular synovitis or synovial chondromatosis, posterior capsular release in the setting of knee flexion contractures, and loose bodies removal.
- Posterior arthroscopy provides direct access to the posterior meniscal borders for adequate abrasion and fibrous tissue removal. This direct view of the knee posterior structures enables the surgeon to create a stronger biomechanical repair using vertical mattress sutures.
- During PCL reconstruction, posterior arthroscopy gives the surgeon proper double access to the tibial insertion site, which can result in less acute curve angles and the creation of a more anatomic tibial tunnel. Moreover, it gives the best opportunity to preserve the PCL remnant. Arthroscopic PCL avulsion fixation is more time-consuming with a larger cost burden compared to open approaches, but in the case of other concomitant intra-articular injuries, it may lead to a better chance of a return to pre-injury activities.
- The high learning curve and overcaution of neuromuscular injury have discouraged surgeons from practicing posterior knee arthroscopy using posterior portals. Evidence for using posterior portals by experienced surgeons suggests fewer complications.
- The evidence suggests toward learning posterior knee arthroscopy, and this technique must be part of the education about arthroscopy. In today's professional sports world, where the quick and complete return of athletes to their professional activities is irreplaceable, the use of posterior knee arthroscopy is necessary.

Keywords

- posterior knee arthroscopy
- PCL reconstruction
- PVNS
- synovectomy
- meniscal repair
- posteromedial portal
- posterolateral portal
- transseptal view

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Introduction

With the improvement of arthroscopic knee surgery techniques and equipment, a wider range of knee joint problems can be treated with arthroscopic techniques. However, using only anterior portals creates significant limitations in observing all areas of the knee joint, especially the posterior compartments (1). This is of more importance in the repair of posterior meniscus lesions (2). In addition, the use of anterior portals limits the surgeon in using the arthroscope to treat some problems such as posterior cruciate ligament (PCL) tears or avulsion and pigmented villonodular synovitis (PVNS) in the posterior compartment of the knee. Morgan first reported posterior knee arthroscopy to repair posterolateral and posteromedial meniscal tears in 1991 (3). Since then, various techniques have been presented to use posterior portals in the knee.

This study is a review of the available literature about posterior knee arthroscopy and the use of posterior portals for various problems of the knee joint. This study aimed to introduce knee surgeons to the benefits

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and problems of using posterior portals and the various techniques available.

Anatomy applied

Today, using posterior portals is an essential part of the arthroscopic procedure, and detailed knowledge of the relevant arthroscopic anatomy is mandatory for every knee surgeon. Narrow corridors for instrumentation and proximity to neurovascular structures raise the need for complete knowledge of posterior knee anatomy for every knee surgeon who performs arthroscopy in practice (4).

Cadaveric studies have shown that the saphenous neurovascular can be safely protected by creating two posteromedial portals in the soft spot between the posteromedial tibial plateau and the femoral condyle (5). This safe zone is bounded by the semimembranosus and gastrocnemius intraarticular folds posterior to the medial femoral condyle (5). Posterolateral portal placement is less challenging, as peroneal nerve course is less variable, and there are no branches at the level of the joint line. However, the safe zone for the posterolateral portal is the area between the biceps posteriorly and the fibular ligament anteriorly. In addition, the knee position during portal placement will affect safety since the knee must be in 90° flexion during portal placement (4). According to cadaveric and magnetic resonance imaging (MRI) investigations in extension and flexion, the average distance of the popliteal artery from the PCL midpoint increases during 90° flexion and is around 30 mm without joint distension. A posterior portal should not be placed too anteriorly to avoid the anteroposterior direction of instruments and pointing toward the popliteal artery (6).

Using the posteromedial portal, one can reach the medial aspect of the PCL attached to the posterior septum and the posterior third of the medial meniscus (the entire ramp area from the corner point to the posterior root) (7) (Fig. 1A). Entering the posterolateral portal and rotating the arthroscope 360° results in a complete view of posterolateral structures including (i) the posterior third of the lateral meniscus from the popliteal hiatus to the meniscal root, including popliteomeniscal ligament, (ii) the posterior surface of the femoral condyle and posterior capsule of the knee, and (iii) the lateral aspect of PCL attached to the posterior septum (Fig. 1B).

The posterior septum, a triangular capsular reflection connected anteriorly to PCL and superiorly to the intercondylar notch, divides the posteromedial and posterolateral compartments of the knee. The septum comprises adipose tissue and a neurovascular structure enveloped by a synovial membrane. It is shown that the central portion is completely safe for penetration to create the transseptal portal, preferably by blunt instruments rather than a motorized shaver. Only the branches of the medial genicular vessels in the superior part of the septum may pose a concern to the surgeon (8). Using this portal, the surgeon has considerable space for working in the posterior compartment while looking through the arthroscope from the opposite side. Accessing the posterosuperior surface of posterior condyles, complete access to the PCL insertion and access to the posterior third of both meniscus are possible through the transseptal portal (8).

Transseptal views, from lateral to medial, provide a comprehensive view of the posteromedial blind zone of the knee, the so-called corner point, just above the semimembranosus attachment at the posterior border of the medial collateral ligament (MCL) (Fig. 1C). From medial to lateral, the popliteomeniscal fascicles are visible as lateral meniscus stabilizers preventing them from excessive movement and possible entrapment in cooperation with the popliteus musculotendinous unit (8) (Fig. 1D).

Meniscal injuries

Today, the preference for meniscus repair over meniscectomy is well established (9). Evidence suggests that non-degenerative meniscal tears are best repaired

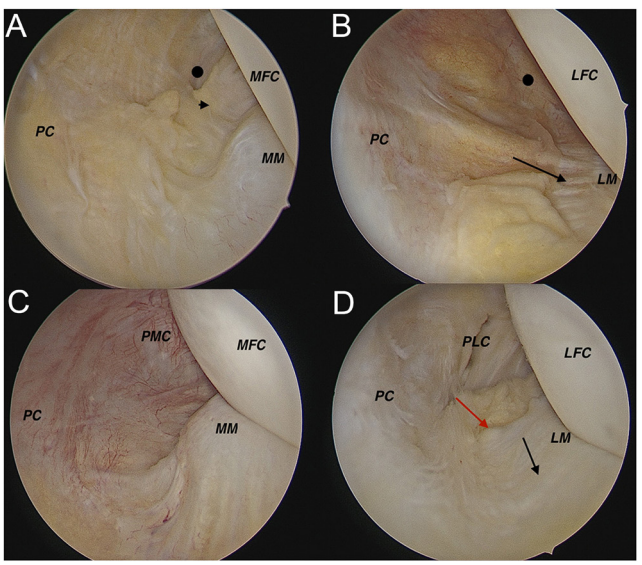

Figure 1
Normal arthroscopy of posterolateral compartment. (A) Posteromedial view of a left knee. (B) Posterolateral view of a right knee. (C) Posteromedial transseptal view of a right knee. (D) Posterolateral transseptal view of a left knee. LFC, lateral femoral condyle; LM, lateral meniscus; MFC, medial femoral condyle; MM, medial meniscus; PC, posterior capsule; PLC, posterolateral capsule; PMC, posteromedial capsule. Arrow head, PCL; red arrow, popliteus tendon; black arrow, posterosuperior popliteomeniscal fascicle; dot, septum.

using knee arthroscopy, especially in young and active people (10). A recent study has demonstrated that compared to meniscectomy, meniscus repair causes lower rates of degenerative changes and reduces demand for knee replacement in the future (10). Posterior arthroscopy of the knee provides surgeons with the facilities to repair a variety of meniscus injuries. Though posterior portals allow better views of the posterior compartments, only the posterolateral transseptal portal provides a direct view of the posterior corner point (blind zone) (Fig. 2). One of the most critical features possible only by using posterior arthroscopy techniques is direct access to the posterior meniscal borders for adequate abrasion and fibrous tissue removal (Fig. 3E). The posterior border of the meniscus, especially the medial meniscus, is a common site for incomplete healing and repair failure (11). Border debridement of the meniscal tear affects the quality of the repair (12), and the posterior portals allow the surgeon to evaluate and refresh the posterior edges of the meniscus with direct vision (2). This is a feature that is not possible if only anterior arthroscopy is used. Furthermore, abrasion of the noncartilaginous posteromedial tibial plateau border with a bur is well applicable through posterior portals (Fig. 3F).

This direct view of the knee posterior structures enables the surgeon to create a stronger biomechanical repair using vertical mattress sutures. Despite the high learning curve, vertical mattress sutures to repair the posterior meniscus are only possible with posterior arthroscopy. These sutures allow contact surface repair instead of point contact repair (13) with higher torsional strength and healing rate (14). Posterior arthroscopy is the most suitable method to reduce the sagging of the peripheral piece of the posterior meniscus to provide anatomic reduction (2) (Fig. 3G and H). Anatomical reduction is essential for meniscal repair as it is for fracture healing. The same principles of fracture nonunion management are important in the success of meniscal repair, including (i) debridement and removal of fibrous tissue, (ii) anatomical reduction, (iii) stability, and (iv) healing enhancement techniques, all achievable using a posterior approach. Other benefits of posterior arthroscopy in repairing posterior meniscal lesions include less damage to cartilage and instruments (12).

Medial meniscus ramp lesions occur when the posterior horn of the meniscus detaches from the meniscotibial or meniscocapsular junction and are detected in up to 40% of anterior cruciate ligament (ACL) ruptures (15). It is crucial to scrutinize posterior compartments in ACL rupture cases to prevent missing ramp lesions. In some cases, an additional posteromedial portal may be necessary to visualize and decision-making (16). Thaunat *et al.* (17) demonstrated that a posteromedial portal is an effective way to repair ramp lesions during ACL reconstruction, which was confirmed by Ahn *et al.* (18), Morgan (3), and Keyhani *et al.* (7) (Fig. 3).

Repair of bucket-handle medial meniscus tear (BHMMT) using anterior portals is difficult due to the narrow space of the medial knee compartment so a ligament needling is usually necessary to create more space (7). The anterior arthroscopy could miss the peripheral zones of the posterior medial meniscus (12), resulting in inadequate repair of the BHMMT and incomplete remission of the symptoms (19). There have been few studies conducted on the use of posterior knee arthroscopy in BHMMT (3, 12, 18). Only one study included 48 patients who reported clinical results, according to which posterior knee arthroscopy is effective in repairing BHMMT (1).

In our experience, posterior knee arthroscopy can also facilitate the effective repair of unstable and irreducible chronic bucket-handle medial meniscal tears that are often considered irreparable. We have repaired several cases in our center using a novel provisional needle fixation technique to stabilize the meniscal fragments temporarily. After temporary fixation and switching to posterior portals, the repair process starts from the posterior region, where the rupture originates, using the all-inside technique and vertical mattress sutures. Finally, the classic outside-in technique is used for the anterior third. The mid-third is simply abraded with a shaver, keeping the MCL intact and decreasing the risk of arthrofibrosis due to MCL irritation. In our experience, a ramp lesion is seen in all patients after the reduction, supporting the theory that BHMMTs can start from a posterior ramp lesion (Fig. 4A and B). This highlights the importance of routine assessments of the posterior compartment during ACL reconstruction. Following this theory, the direct view of the posterior

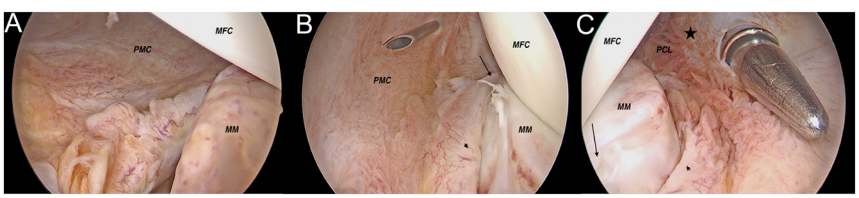

Figure 2
Right knee arthroscopy showing a ramp type IV of Thaunat classification. (A) Gillquist trans-notch view. (B) Posterolateral transseptal view. (C) Posteromedial portal view. MFC, medial femoral condyle; MM, medial meniscus; PMC, posteromedial capsule. Arrow, corner point; arrow head, peripheral fragment sagging; asterisk, septum.

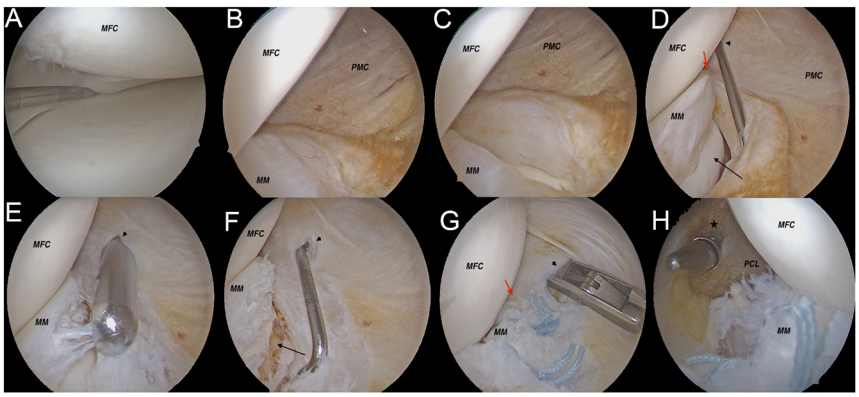

Figure 3
Left knee arthroscopy showing a ramp type IV. (A) Checking the instability using anterior view. (B, C) Gillquist trans-notch view before and after instability check that shows meniscal movement and instability. (D) Peripheral meniscal fragment sagging shown through the posterolateral transseptal view. (E) Meniscal borders abrasion with a shaver via a posterolateral transseptal view. (F) Posteromedial tibial plateau was abraded with a burr. (G) Posterolateral transseptal and (H) posteromedial views after repair. MFC, medial femoral condyle; MM, medial meniscus;; PMC, posteromedial capsule. Arrow head, posteromedial portal; asterisk, septum; black arrow, medial plateau; red arrow, corner point..

compartment using posterior portals helps the surgeon to abrade completely the meniscal borders (Fig. 4C) and start the repair process from the ramp area near the meniscus root, where the tears originated. Posterior arthroscopy also facilitates elevating the peripheral depressed fragments, which results in a greater anatomic reduction and larger contact surface area (2) (Fig. 4D and E).

Hypermobile lateral meniscus

Hypermobile lateral meniscus occurs when popliteomeniscal fascicles rupture (20). Three popliteomeniscal fascicles including anteroinferior, posterosuperior, and posteroinferior attach to the lateral meniscus, at the popliteal hiatus (21) (Fig. 1B and D). Disruption of the posterosuperior PMF is required to induce hypermobility in the lateral meniscus (22) (Fig. 5C). During knee flexion, the posterior portion of the lateral meniscus is pulled back and as the knee is extended it moves forward. When posterosuperior PMF ruptures, these movements are reversed, resulting in the hypermobile lateral meniscus (23). There is usually no definite history of trauma (24), and if the displaced lateral meniscus is reduced spontaneously, there may not even be evidence of rupture in the popliteomeniscal fascicles on MRI (25). Although clinical evaluations have been introduced for diagnosis (21), arthroscopy is the best modality for evaluating lateral meniscus movement (Fig. 5A and B) and observing popliteomeniscal fascicle rupture at the popliteal hiatus, both of which can be easily performed through posterior arthroscopy (26) (Fig. 5C).

Surgical intervention is indicated in cases of failed conservative treatment. Pain or a locked knee with no specific meniscus injury is the most common symptom (27). Treatments such as subtotal meniscectomy and posterolateral capsule shrinkage have been introduced (21, 28). Knee locking and osteoarthritic changes were reported as complications after these treatments (29).

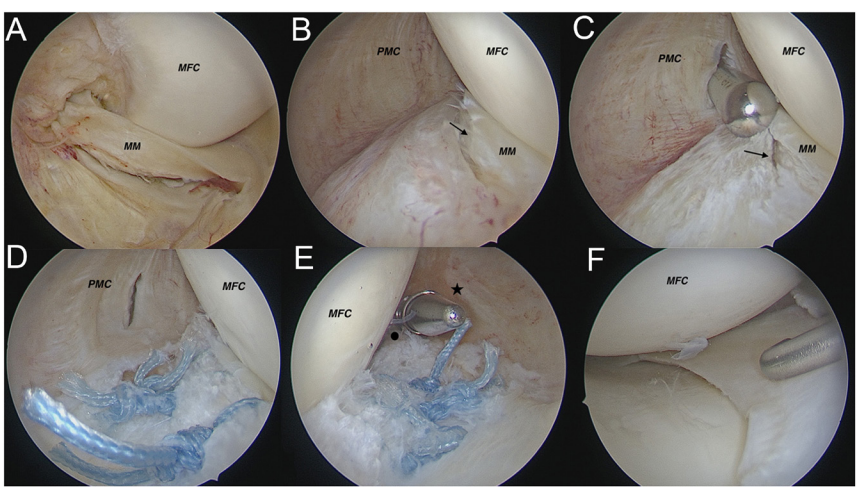

Figure 4
Right knee arthroscopy showing a locked bucket-handle medial meniscal tear. (A) Anterolateral portal view. (B) Posterolateral transseptal portal view shows a ramp type IV after reduction (C) that was abraded using the posteromedial portal. (D) Posterolateral transseptal and (E) posteromedial portal views show the final repair. (F) Final stability check after repair through anterolateral portal view. MFC, medial femoral condyle; MM, medial meniscus; PMC, posteromedial capsule. Arrow, ramp; asterisk, septum; dot, posterior cruciate ligament.

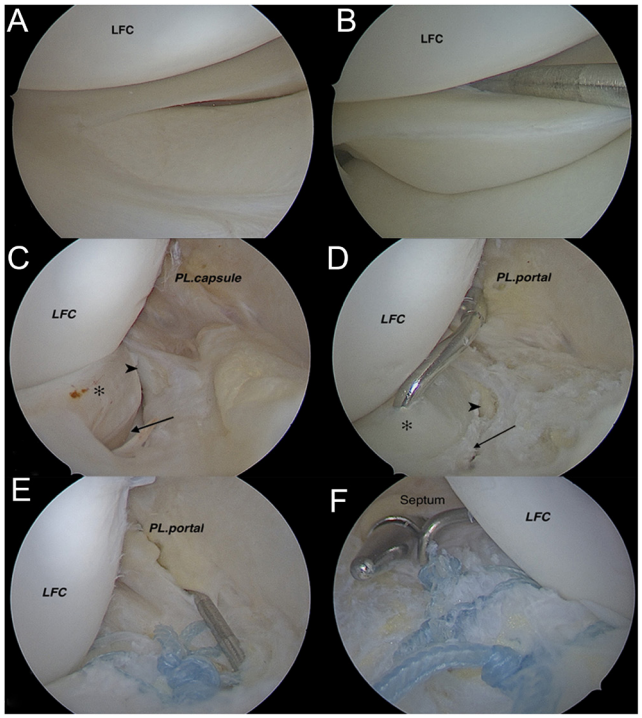

Figure 5
Right knee arthroscopy. (A) Anterolateral portal view shows normal lateral meniscus. (B) Abnormal lateral meniscal movement by probing. (C) Posteromedial transseptal view with a 30° lens that shows popliteomeniscal fascicle tear. (D) Repair by using suture hook technique from posterolateral portal. (E) Posteromedial transseptal and (F) posterolateral views of a repaired lateral meniscus. LFC, lateral femoral condyle; PL, posterolateral. Arrow, posterosuperior popliteomeniscal tear; arrow head, popliteus tendon; asterisk, lateral meniscus.

Following advances in knee arthroscopy equipment and techniques, the popliteomeniscal junction can now be treated arthroscopically by direct repair (26) (Fig. 5D). Similar to the medial compartment of the knee, assessing the posterior horn of the lateral meniscus utilizing anterior portals to reach the popliteomeniscal ligaments at the popliteal hiatus is limited by the narrow anatomy of the posterolateral compartment (30). Therefore, posterior arthroscopic techniques can be helpful in these cases to achieve functional and anatomical fixation of the lateral meniscus (26). As opposed to anterior arthroscopy, posterior arthroscopy provides surgeons with complete access to the popliteomeniscal junction and elevates the sagging fragment without requiring the figure-of-four position (31) (Fig. 5E and F).

Posterior cruciate ligament reconstruction

Arthroscopic PCL reconstruction can be performed with or without posterior portals, both of which are common techniques utilized by knee surgeons worldwide (32, 33). The killer curve site is one of the common failure sites for the PCL graft. In addition to the more popular graft turning angle in the sagittal plane (GASP), the graft turning angle in the coronal plane (GACP) is also of great importance. High GASP and/or GACP both constitute the overall killer turn which is considered to be a cause of higher failure rates after PCL reconstruction (34). Attempts to evaluate these angles and attenuate the stress-rising effects of killer turn have been a focus of recent PCL papers (34, 35).

As the tibial inlay technique fell out of favor, remnant-preserving PCL reconstruction has become popular (36) (Fig. 6A). Posterior portal gives the surgeon proper double access to the tibial insertion site, which can result in less acute curve angles and the creation of a more anatomic tibial tunnel (Fig. 6A). Moreover, it gives the best opportunity to preserve the PCL remnant (37) (Fig. 6A and C).

Due to poor visualization of the posterior tibia insertion site, the guide pin may damage the popliteal neurovascular during tibial tunnel preparation (38). Posterior arthroscopy gives an excellent direct view over the tibial pin exit site from the posteromedial portal. Due to increased visualization, fluoroscopy is not required for PCL reconstruction (Fig. 6A). As previously shown by Ahn *et al.*, limited posterior capsular release, which is only possible via posterior knee arthroscopy, reduces vascular injury by moving the popliteal vessels away from the tibia (38).

In the anterior-only technique, Wrisberg and Humphry ligaments would have to be sacrificed for good exposure to the PCL insertion. Posterior arthroscopy allows for preserving the meniscofemoral ligaments and the PCL remnant (Fig. 6C). Preserving PCL remnants could help patients' proprioception as well as reduce graft stress on the killer curve site. In addition to stabilizing the posterior horn of the lateral meniscus, the meniscofemoral ligaments

Figure 6
Left knee arthroscopy showing (A) PCL tear. (B) Posteromedial view and (C) anterior view after reconstruction. MFC, medial femoral condyle. Arrow, Weisberg ligament; arrow head, Humphrey ligament; asterisk, PCL remnant.

also synergize with the PCL (39). By preserving them, the risk of graft failure can be reduced (36).

The posteromedial portal could be used for direct visualization through posterior arthroscopy to confirm the tibial tunnel location without intraoperative fluoroscopy. However, some surgeons still believe fluoroscopy is necessary during PCL reconstruction surgery (40). It also eliminates the need for intraoperative switching to a 70° lens which is both time-consuming and expensive.

PCL avulsion fracture

PCL avulsion fracture injuries are among the rare knee pathologies and usually require fixation. Most orthopedic surgeons are familiar with open reduction and internal fixation of bony PCL avulsion with good results reported in the literature (41). However, concomitant lesions including meniscus or ligamentous injuries occur in about 20% of cases (42) that cannot be treated by open approaches. The invasive nature of open approaches and the need to address other intra-articular injuries make arthroscopic fixation a good substitution method.

The use of arthroscopy in the reduction and fixation of bony PCL avulsion was first introduced about 35 years ago with arthroscopic-assisted percutaneous screw fixation in a cadaveric model (43). Improvement of arthroscopic suture materials leads to mechanically similar constructs comparing arthroscopic fixation with open screw fixation (44). Different arthroscopic fixation constructs are available using single or dual posteromedial portals with or without a posterolateral portal to address bony PCL avulsion (45, 46, 47, 48) (Fig. 7). Arthroscopic PCL avulsion fixation is more time-consuming with a larger cost burden compared to open approaches (49), but in the case of other concomitant intra-articular injuries, it may lead to a better chance of a return to pre-injury activities (42).

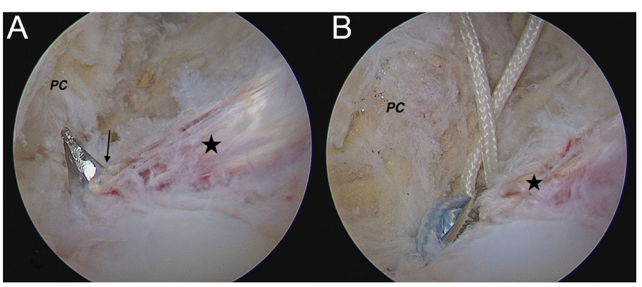

Figure 7
PCL avulsion of a right knee. (A) Posterolateral view showing the bony avulsion fixed with a K wire provisionally. (B) Posterolateral view showing final fixation using an endobutton. PC, posterior capsule. Asterisk, PCL.

Diffuse pigmented villonodular synovitis and other soft tissue mass

Pigmented villonodular synovitis (PVNS) most commonly occurs in the knee and affects the joint, and tendon sheet, as a neoplastic proliferation of synovial tissue occurs (50). Patients with PVNS usually suffer from pain, reduced joint motion and even joint locking, frequent joint effusions, stiffness, and instability (51). In most cases, it is impossible to diagnose PVNS based on its clinical presentation, so imaging studies (MRIs) are usually recommended. Standard treatment for PVNS includes early open or arthroscopic surgery with synovectomy. The operation aims to restore joint function and prevent the destroying joint cartilage by the diseased synovium.

Depending on the extent of involvement, there are two variants including localized and diffuse PVNS (DPVNS). DPVNS can adhere to any bony part of the knee, including the submeniscus and intercruciate deposits; its elimination is difficult without causing significant harm to adjacent structures. A case-by-case decision is made about performing arthroscopic synovectomy for DPVNS based on the location, type, involvement of surrounding structure, and invasiveness (52). The main factor leading to a successful outcome is disease recurrence which depends on the success of the initial lesion resection (53).

Open synovectomy involves several drawbacks including the need to expose neurovascular structures during surgery, long hospital stay, surgical site complications, postoperative stiffness, and long-term rehabilitation. However, arthroscopic synovectomy poses technical challenges. Arthroscopic removal of pathological synovium is associated with faster recovery and minimal loss of function. However, complete arthroscopic removal can be difficult, especially in posterior compartments. Incomplete resection of the pathological tissue has been suggested as the cause of recurrence.

Compared with open surgery, arthroscopic synovectomy decreases postoperative stiffness, facilitates rehabilitation, and reduces wound complications. Surgeons usually use open posterior approaches in cases where the disease extends posteriorly through the capsule to ensure a complete synovectomy (54). However, results of extended arthroscopic synovectomy through the posterior portals of PVNS-affected knees confirm the effectiveness of posterior knee arthroscopy for complete synovectomy. Shekhar *et al.* reported arthroscopic synovectomy through 2 posterior portals without adjuvant therapy in 10 cases of posterior localized PVNS. No patient experienced a recurrence of symptoms or any other complications during the next 2 years (50). Keyhani *et al.* evaluated 21 cases of DPVNS of the knee. He performed total synovectomy through four posteromedial, posterolateral, anteromedial, and anterolateral portals providing full access to the knee

joint. Simonetta *et al.* performed the same technique and successfully removed localized PVNS of the knee with an additional extension through the posterior capsule using four arthroscopic portals. Each portal was switched from viewing to work when needed (55).

In conclusion, PVNS can be treated safely and effectively by complete arthroscopic synovectomy, with a low recurrence and complication rate. It seems that once accessed, the PVNS can be easily removed with the shaver as it peels away from the synovium (Fig. 8).

Techniques

Morgan (3) employed the anterolateral portal to observe the peripheral posterior borders of the meniscus through the intercondylar notch using a 70° arthroscopic lens. Then, he used a cannula to place vertically oriented sutures through the posteromedial or posterolateral portals using the all-inside technique. Morgan debrided tear borders, excoriated the synovium, placed the autogenous clot for chronic cases, and tied knots with a knot pusher, all done through the cannula. As mentioned in his report, the use of an expensive 70° lens and a cannula with its possible complications, such as cartilage injury, are among the limitations of this technique.

Ahn is one of the pioneers in the field of posterior knee arthroscopy with many technical notes and studies, the first of which was published in 2000, introducing the posterior transseptal portal (56). Ahn's technique can be summarized in three steps: (i) posteromedial portal establish under direct vision of a 30° lens that passes through an anterolateral portal, (ii) posterolateral portal establish by moving the arthroscope to the anteromedial portal to facilitate trans notch visualization of the posterolateral compartment, and (iii) posterior transseptal portal establish by viewing and shaving the posterior septum using the posteromedial and posterolateral portals or vice versa. Using this technique, Ahn has treated a variety of knee injuries, including total synovectomy for different types of arthritis (56); PCL reconstructions (57); removal of tumors, popliteal cysts, or loose bodies of the posterior compartment (58); repairs of medial and lateral meniscus tears (59); and hypermobile lateral meniscus (20).

Although not mentioned in the original technical note, Ahn routinely used an arthroscope with a 70° lens, with or without a 30° lens, in his later studies (20, 59). Moreover, Ahn modified the posterior arthroscopy technique using two close posteromedial portals, which can restrict the suture hook application, especially when a cannula is used (18). Another limitation of this technique is the need for someone to hold the arthroscope.

Recently, a new modification in the posterior knee arthroscopy technique has been reported, without a cannula and using only a 30° lens (7). They use suture hooks to create vertical mattress sutures and assess the extent of the meniscal lesion to lift the sagging. This technique eliminates the need for septal shaving, which can be a significant point in this technique. Apart from reducing the risk of hemarthrosis due to injury of the middle genicular artery, the septum is also rich in mechanoreceptors. Although, during PCL reconstruction, they shave the lower part of the septum, below the area of the middle genicular artery, to have a direct vision of the tibial insertion site.

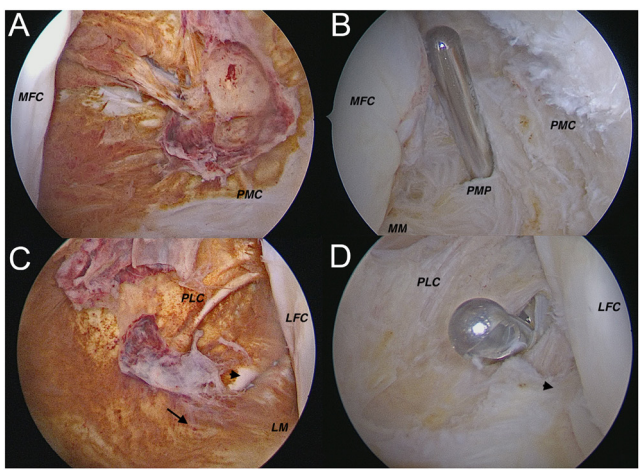

Figure 8
PVNS of a left knee. (A, B) Posterolateral transseptal view before and after synovectomy. (C, D) Posteromedial transseptal view before and after synovectomy. LFC, lateral femoral condyle; LM, lateral meniscus; MFC, medial femoral condyle; MM, medial meniscus; PLC, posterolateral capsule; PMC, posteromedial capsule; PMP, posteromedial portal. Arrow, popliteomeniscal fascicle; arrow head, popliteus tendon.

Discussion

The high learning curve and overcaution of neuromuscular injury have discouraged surgeons from practicing posterior knee arthroscopy. Evidence for posterior knee arthroscopy performed by experienced surgeons suggests fewer complications than expected. The evidence suggests toward learning posterior knee arthroscopy, and this technique must be part of the education about arthroscopy. In today's professional sports world, where the complete return of athletes to their professional activities is irreplaceable, attention to posterior arthroscopy seems more important than ever.

Where bucket-handle tears and ramp lesions start from the posterior part of the meniscus, anatomical reduction and secure fixation without posterior portals seem impossible. Using a posterior arthroscopic approach in the

knee, refreshing and removing the fibrous tissue, maximal contact of fragments, and anatomical reduction are all possible. While procedures like posterior meniscal repair and PCL reconstruction are difficult from the anterior approach, other procedures like abrasion and removal of fibrous tissue from posterior meniscal borders, anatomical reduction, posterior compartment synovectomy, and loose body removal, and PCL avulsion fixation are impossible by anterior arthroscopy.

Conclusion

Studies about the clinical results of posterior knee arthroscopy are not enough. Future studies should focus on the comparison between posterior knee arthroscopy and other techniques since the lack of clinical trial studies is quite noticeable. By increasing studies in this field and conducting systematic reviews in the future, better conclusions can be drawn about the effectiveness of posterior knee arthroscopy.

ICMJE conflict of interest statement
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Author contribution statement
S Keyhani and R F LaPrade designed the study and reported on their experience in the manuscript. M Movahedinia, A S Vazir, M Soleymanha, F Vosoughi, and M Tahami participated in the drafting and design and have given final approval of the version to be published. They revised the manuscript critically for important intellectual content.

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