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Arthroscopy using General, Spinal, Regional, or Local Anaesthetics

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Abstract

The arthroscope is then moved medially into the medial gutter, and the hand is raised to follow the floor down to the tibia, checking for loose bodies. Next, the medial compartment is opened by straightening the knee and placing a valgus force on the leg.

Keywords: Medial meniscus; Medial femoral; Anterior ligament; Knee arthroscopy; Posterior femur and root; Pathology

Introduction

The arthroscope is brought into the medial compartment. At this point, the antero-medial compartment is made, which will be covered in part 4 of this series. The medial meniscus is inspected and probed for tears. The cartilage on the tibial plateau and the medial femoral condyle are evaluated. The knee lexion angle can be changed to inspect the entire weight-bearing portion of the medial femoral condyle [1]. The knee is then bent and the arthroscope is brought into the inter-condylar notch to examine the anterior cruciate ligament and posterior cruciate ligament and to check for loose bodies. The ligaments can be probed to check for integrity. To enter the lateral compartment, a triangle between the lateral meniscus, the lateral femur, and the anterior cruciate ligament is identified. The light cord is turned to look laterally, and the arthroscope is advanced into the triangle [2]. A varus force is applied to the knee either using the figure-of-4 position or directly using the circumferential leg holder. Care is taken to keep the arthroscope in the triangle as the leg is manipulated. The lateral meniscus and articular cartilage are examined similarly to the medially compartment. The popliteal hiatus and popliteal tendon are also evaluated. Next, the arthroscope is brought directly into the lateral gutter to check for loose bodies. In a tight knee it may be necessary to go back to the suprapatellar pouch to enter the lateral gutter. The techniques for addressing the 2 posterior compartments of the knee are more advanced but necessary to learn to perform a complete arthroscopy [3]. The standard technique is to turn off the water, remove the camera from the cannula, and place the blunt obturator. The cannula is inserted into the lateral portal across from the medial femoral condyle. The surgeon places a finger along the axis of the cannula to prevent plunging. The cannula is then brought into the notch while hugging the medial femoral condyle. The cannula is raised to match the slope of the tibia and inserted posteriorly while staying between the medial femur and the posterior cruciate ligament. Once in the posterior compartment, the camera is reinserted. The camera can then be pulled back a few milli-meters to visualize the posterior femur and posterior root of the medial meniscus and to check for loose bodies. Typically, posterior medial visualization must always be performed by a trans-notch technique. In many patients the postero-lateral compartment can be accessed from the lateral portal through the triangle [4]. In many patients the lateral posterior compartment is more loose, allowing easier access. On completion of knee arthroscopy, the water is turned off, and leaving the cannula in the knee, the arthroscope is removed. This allows any arthroscopic fluid to drain out of the joint so that the patient will have a faster recovery. The portals are closed with simple sutures, often using No. 3-0 nylon. Often, the knee is injected with a local anaesthetic and then a sterile compressive dressing is applied [5]. Knee arthroscopy is a valuable diagnostic and therapeutic procedure for the treatment of various knee disorders. A thorough, standardized, and systematic approach is critical for diagnostic arthroscopy to ensure that no pathology is missed. A complete diagnostic arthroscopy includes visualization of the supra-patellar pouch, medial gutter, lateral gutter, medial compartment, lateral compartment, inter-condylar notch, and posterior medial and posterior lateral compartments [6]. Diagnostic arthroscopy is a crucial skill for diagnosing intra-articular disorders of the knee including meniscal, synovial, ligamentous, and articular cartilage pathology. Mastery of basic diagnostic arthroscopy is a critical tool for orthopaedic surgeons treating disorders of the knee. Knee arthroscopy is the most commonly performed orthopaedic procedure. Indications include diagnostic arthroscopy, meniscectomy, loose body removal, chondroplasty, micro-fracture, irrigation and debridement, and ligament reconstruction. In this series of articles, we present a comprehensive review of the step-by-step surgical technique for basic knee arthroscopy [7]. Diagnostic arthroscopy involves visualization of all the intra-articular structures of the knee. A complete diagnostic arthroscopy includes visualization of the supra-patellar pouch, medial gutter, lateral gutter, medial compartment, lateral compartment, inter-condylar notch, and posterior medial and posterior lateral compartments. Diagnostic arthroscopy is a crucial skill for diagnosing intra-articular disorders of the knee including meniscal, synovial, ligamentous, and articular cartilage pathology [8]. Mastery of basic diagnostic arthroscopy is a critical tool for orthopaedic surgeons treating disorders of the knee. In this article basic diagnostic knee arthroscopy is reviewed in a step-by-step manner. The arthroscope is placed into the supra-patellar pouch through the anterolateral portal. The light cord is rotated downward to look up at the patella, and then the light cord is raised to look down at the trochlear groove to evaluate for cartilage injury. The arthroscope is then moved medially into the medial gutter, and the hand is raised to follow the floor down to the tibia, checking for loose bodies. Next, the medial compartment is opened by straightening the knee and placing a valgus force on the leg.

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Knee arthroscopic surgery continues to advance in leaps and bounds [9]. The anterior cruciate ligament (ACL) remains the most controversial structure to be operated on in the knee, and although the enthusiasm for double-bundle reconstruction has waned, there is a definite preference for anatomic reconstruction using an individualized approach. Despite early failed attempts at ACL primary repair, there is a renewed interest in this preservative approach with the application of technologically advanced instruments and implants. The thrust toward meniscal preservation too continues as better understanding of meniscal healing, improved repair techniques, and novel methods to enhance healing have encouraged surgeons to repair tears previously deemed irreparable. Similarly, articular cartilage surgery has advanced with better understanding of cellular mechanisms and the development of newer techniques of cartilage regeneration. Although the focus in the present era has been to restore anatomy with optimal biomechanical constructs, upcoming technology will address biological concerns in healing, especially with degenerate tissues. Future trends in knee arthroscopy include application of scaffolds, ortho-biologics, stem cells, and bioreactors to generate personalized, and patient specific auto-genous tissue engineered implants. The indications for ACL repair are acute femoral avulsions of <3 weeks duration, with good quality tissue to be approximated, in young patients with lower activity levels and pre-injury Tegner activity scores <5. Isolated studies have documented good results in athletes and high activity groups too. However, the biggest hurdle to wide acceptability of ACL repair is the lack of convincing clinical data to support its regular use in clinical practice. This may change with time. At present, there are four different techniques of ACL repair described. These include refixation with suture anchors, internal brace ligament stabilization, dynamic intra-ligamentary stabilization (DIS), and bridge enhanced ACL repair. Refixation with suture anchors Refixation with two suture anchors in the femoral footprint with alternate interlocking Bunnell type stitches in the two bundles of ACL has been described with varying success. The study noted that the long-term failure rates are comparable to ACL reconstruction in properly selected patients. The BEAR technique utilizes a bovine origin extracellular matrix scaffold augmentation in addition to the ACL repair to enhance healing of the torn ACL. The drawback is this technique requires a 5 cm arthrotomy. Only one human study has been done and reported good to excellent results at 2 years. Individualized ACL reconstruction Although ACL repair shows some promise, the gold standard for ACL tears remains reconstructive surgery. What is increasingly recognized is that one size does not fit all. Anatomical variations in size and shape of the bones and ligaments, along with varied patient factors and functional demands may not allow the same standardized reconstruction in every knee. Hence, the concept of individualized ACL reconstruction has been proposed. The principles of this include: Appreciate the native anatomy, individualize surgery according to patient needs, place the graft in the centre of footprint, attempt to fill in about 80% of the footprint surface, and tension the grafts individually if performing a double-bundle construct. Routine notch plasty is discouraged as it may lead to bone overgrowth and impingement at a later date. Although the ideal graft, technique, fixation, and need for augmentation will continue to be debated, the following information, determined based on recent meta-analyses, may be applied to individualize ACL reconstruction.

Conclusion

The authors also hypothesize that pain interference and psychological functioning are associated with pain intensity at different sites, although this hypothesis needs empiric confirmation with data. Intuitively, the sites most likely to exert the strongest associations are the ones related to ambulation, which makes biomechanical sense, given that these muscles are particularly taxed physically and consequently susceptible to contraction-induced injury, as discussed earlier

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Conflict of Interest

None.

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