



Arthroscopic Technique of Femoroacetabular Impingement

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Arthroscopic treatment of labral and chondral lesions traditionally have ignored the coexisting impinging lesions that often are the primary anatomic pathology. We have developed a fully arthroscopic approach to femoroacetabular impingement that is able to address not only pertinent labral and chondral pathology but the Cam and pincer lesion as well. Some authors have suggested that it is exceedingly difficult, if not impossible, to address these lesions arthroscopically. Our technique requires precise patient positioning and fluoroscopic imaging in combination with accessory arthroscopic portals to manage these lesions. Arthroscopic management of femoroacetabular impingement provides excellent visualization and results in a shorter period of rehabilitation, fewer potential complications and produces equivalent clinical outcomes when compared with formal, open surgical dislocation.

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Arthroscopic treatment of labral and chondral lesions traditionally have ignored the coexisting impinging lesions that often are the primary anatomic pathology. We have developed a fully arthroscopic approach to femoroacetabular impingement (FAI) that is able to address not only pertinent labral and chondral pathology but the Cam and pincer lesion as well. Some authors have suggested that it is exceedingly difficult, if not impossible, to address these lesions arthroscopically.¹ Our technique requires precise patient positioning and fluoroscopic imaging in combination with accessory arthroscopic portals to manage these lesions. Arthroscopic management of femoroacetabular impingement provides excellent visualization and results in a shorter period of rehabilitation, fewer potential complications and produces equivalent clinical outcomes when compared with formal, open surgical dislocation.

Surgical Technique

Patient Positioning

We perform hip arthroscopy using a standard fracture table with the patient in a modified supine position. The hip is

placed in a position of 10° flexion, 15° internal rotation, 10° lateral tilt, and neutral abduction. Using an extra-wide peroneal post (Bledsoe Philippon, Perineal Post Pad Kit, Medical Technology Inc, Grand Prairie, TX), the operative leg is first placed in forced adduction, which forces the femoral head laterally. This maneuver helps vent the capsule before excessive in-line traction is applied. The extra wide peroneal post also helps minimize our incidence of pudendal nerve palsy. A minimum of 8 to 10 mm of distraction is recommended to avoid any iatrogenic injury to the chondral surfaces or labrum caused by the arthroscopic instrumentation. Adequate traction typically requires between 25 and 50 pounds of force.² Either general or spinal anesthesia may be used; however, it is necessary to maintain paralysis or complete skeletal muscle relaxation at all times to minimize the amount of traction force required for distraction. Gentle countertraction is also applied to the contralateral limb to avoid significant angulation of the pelvis around the perineal post. All of the intra-articular structures in the hip joint can be seen through the combined use of 70° and 30° arthroscopes as well as the interchange of portals.³

Portal Placement

Two (anterolateral and anterior) or three portals are necessary to adequately decompress femoroacetabular impingement (FAI): the anterolateral portal, anterior portal, and distal lateral accessory portal. Accurate portal placement is

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essential for optimal visualization of intra-articular structures and will minimize iatrogenic chondral injury.

The anterolateral portal has also been described as the anterior paratrochanteric portal as it is referenced off of the greater trochanter. This portal allows for optimal visualization of the iliofemoral ligament, femoral head, anterior superior labrum, ligamentum teres, transverse ligament, and most of the acetabulum. The anterolateral portal is traditionally established approximately 1 to 2 cm superior and 1 to 2 cm anterior to the anterosuperior “corner” of the greater trochanter. In our experience we have found the portal to be more useful if placed directly off of the anterosuperior portion of the greater trochanter. Typically a 70° arthroscope is used through this portal for greatest visualization. Once the traction is applied, the anterolateral portal is established under fluoroscopic guidance using the landmarks described above. Immediate visualization of the anterior triangle is established through this portal. The anterior triangle represents the intra-articular portion of the lateral limb of the iliofemoral ligament.

The anterior portal is established by identifying the intersection of the vertical line drawn from the anterior superior iliac spine distally and the horizontal line drawn from the superior surface of the femoral greater trochanter medially. The anterior portal allows for visualization of the posterior–superior capsule, posterior–superior labrum, the posterior recess, the femoral head, and the ligamentum teres. This portal also is useful for viewing the head–neck junction, the anterior femoral neck, the zona orbicularis, and the distal insertion of the capsular ligaments on the intertrochanteric line. Again, use of the 70° arthroscope will allow for optimal visualization. A spinal needle is inserted under direct visualization between the lateral and medial limbs of the Y-Ligament. After the skin is incised, this portal should be established using blunt dissection as its location presents a significant risk to the lateral femoral cutaneous nerve, which lies within several millimeters of the cannula. In addition, the lateral femoral circumflex artery and femoral neurovascular bundles must be protected.⁴ The femoral neurovascular bundle is at risk if the trochar is placed too anterior or deep.⁵ As soon as the anterior portal is established, the camera should be inserted into the cannula to verify that the anterolateral portal has been placed adjacent to and not through the acetabular labrum.

We find that the anterolateral and the anterior portals are all that is necessary to perform a majority of procedures about the hip joint. The head–neck junction, however, may be difficult to access with previously described portals. We have developed a distal lateral accessory portal that has markedly increased our ability to treat impingement disorders of the hip. This distal lateral accessory portal is placed after the traction has been released, and the operative leg is flexed 45°. An important technical note during the creation of this portal is to release the traction slowly. The 70° arthroscope should be positioned in the anterior portal, and the femoral head should be visualized. Upward pressure on the arthroscope will reduce chondral injury to the femoral head. The arthroscope can then easily slide anteriorly and distal over the fem-



Figure 1 Arthroscopic picture of bruised labrum.

oral head as it is visualized throughout hip flexion. The arthroscope will then transition into a position peripheral to the labral rim with a view of the femoral head/neck junction. With the hip flexed 45° and externally rotated 10 to 20°, the anterior capsule will distend providing excellent visualization over the femoral head/neck junction. Once the scope is in position, a skin incision is made approximately 4 cm distal to the midpoint between the anterior and anterolateral portals. Under direct visualization a spinal needle is introduced into the capsule using the zona orbicularis as an anatomic landmark. A guidewire is then inserted through the spinal needle, and a cannulated blunt trochar is used to safely establish the access.

Cam Procedure

Visualization of the femoral head neck junction must be established before addressing the impinging lesion. From the anterior portal, the intra-articular portion of the labrum can be evaluated for tears or degeneration (Fig. 1). In cases of Cam impingement, labral pathology can vary from bruising to frank tears. After the labral pathology is properly addressed, attention can be focused to improving the contour of the femoral head neck junction. When the distal lateral accessory portal is established and the hip is flexed to 45°, the arthroscope is transitioned to the periphery of the labral rim. From this position, the impinging lesion can be directly visualized (Fig. 2).

The arthroscopic technique for the treatment of Cam impingement has been previously described.⁶ A motorized shaver is used initially to gain visualization of the entire femoral head–neck junction. The osteoplasty is then performed with a motorized burr (Fig. 3). The hip can range from internal to external rotation to improve access that may be needed depending on the location of the impinging lesion. Extreme caution must be exercised to avoid injury to the lateral retinacular vessels that perforate through the lateral femoral neck at its capsular insertion. These vessels can be avoided by avoiding capsular penetration with the burr. The Cam lesion should be debrided down to recreate the anatomic sphericity of the femoral head and eliminate the prom-

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