

Extra-articular Debridement of Hip Joint for Management of Anterior Hip Pain



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Abstract: Groin pain is a common problem that is known to be a complex issue. The wide variety of possible pathologies in numerous anatomical structures contributes to this complexity. For patients who have anterior hip pain in Patrick's test and tenderness at Scarpa's triangle, we perform periarticular debridement based on the hypothesis that rectus femoris tendinosis, subacute/chronic fibrosis of the anterior inferior iliac spine fat pad, and gluteal muscle adhesion are responsible for such anterior hip pain. This Technical note illustrates the surgical procedure of periarticular debridement for extra-articular pathology-associated anterior hip pain. Repair of the injured labrum and correction of femoroacetabular impingement deformity have never been performed in this cohort. Arthroscopic periarticular debridement is a reliable surgical technique that can relieve anterior hip pain and provide a rapid return to normal activities.

Groin pain is a common problem and is known to be a complex issue.¹ The wide variety of possible intra-/extra-articular pathologies in numerous anatomical structures contributes to this complexity.¹ Understanding this is necessary for correct diagnosis and treatment planning.

Clinically, most patients have anterior hip pain in Patrick's test and tenderness at Scarpa's triangle. We have recently reported that periarticular pathologies, including rectus femoris tendinosis, subacute/chronic fibrosis of the anterior inferior iliac spine (AIIS) fat pad, and gluteal muscle adhesion, are responsible for the anterior hip pain of such patients and designated this pathology anterior inferior iliac spinitis (AIISpinitis).² For patients with AIISpinitis, we perform periarticular debridement based on the hypothesis that extra-articular pathologies are responsible for such anterior

hip pain. As we believe that intra-articular pathologies are not responsible for the anterior hip pain in patients with AIISpinitis, we never repair the injured labrum.

The purpose of this Technical note is to describe the hip arthroscopy technique for extra-articular debridement of the hip joint. The surgical procedure consists of debridement of the torn fibers of the direct head of the rectus femoris muscle and inflamed AIIS fat pad, decortication of the surfaces of the bony protrusion of the AIIS, and the release of the adhesions between the anterior joint capsule and gluteus muscles. This procedure provides rapid relief of anterior hip pain even without repair of intra-articular pathologies. This will be a valuable procedure for the management of anterior hip pain.

Diagnosis of Periarthritis of Hip Joint

Patrick's test is a manual examination to evaluate the pathology of the hip joint.³ This test is performed by flexing the tested leg and abducting and externally rotating the thigh. If pain is elicited in the hip joint, it is suggestive of a hip joint disorder. It is well known that Patrick's test can reveal several pain sites: anterior, lateral, and posterior. The pain site is defined based on the structures damaged. We have developed a hypothetical diagnostic algorithm for hip pain and decide the treatment option according to this algorithm (Fig 1). If patients feel hip pain anteriorly in Patrick's test and have tenderness at Scarpa's triangle, tendinosis of the direct head of the rectus femoris muscle is suspected. Ultrasound-assisted lidocaine injection into the region

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The authors report that they have no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as [supplementary material](#).

Received January 23, 2018; accepted February 17, 2018.

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2212-6287/18104

<https://doi.org/10.1016/j.eats.2018.02.012>

Diagnostic Algorithm for Hip Pain

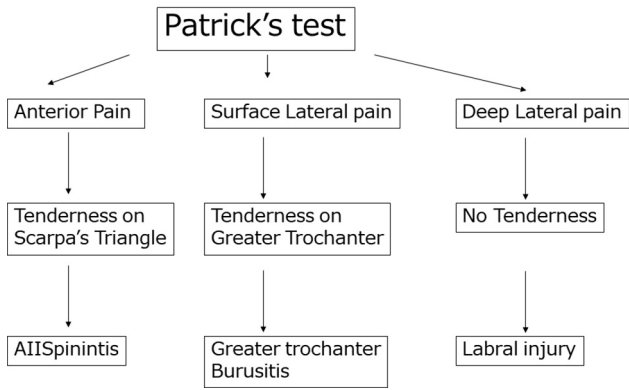


Fig 1. Flowchart of diagnosis based on the pain site of Patrick's test.

of the AII is helpful to confirm the diagnosis of anterior periarthrits. If patients feel surface lateral hip pain in Patrick's test and have tenderness over the greater trochanter, greater trochanter bursitis is suspected. Pain relief is confirmed by lidocaine injection into the greater trochanter bursa. If patients feel deep lateral discomfort, we suspect a labral tear and confirm it by lidocaine injection into the hip joint.

Indications

After the diagnosis of AIIspinintitis, all patients underwent physical therapy for at least 6 weeks.

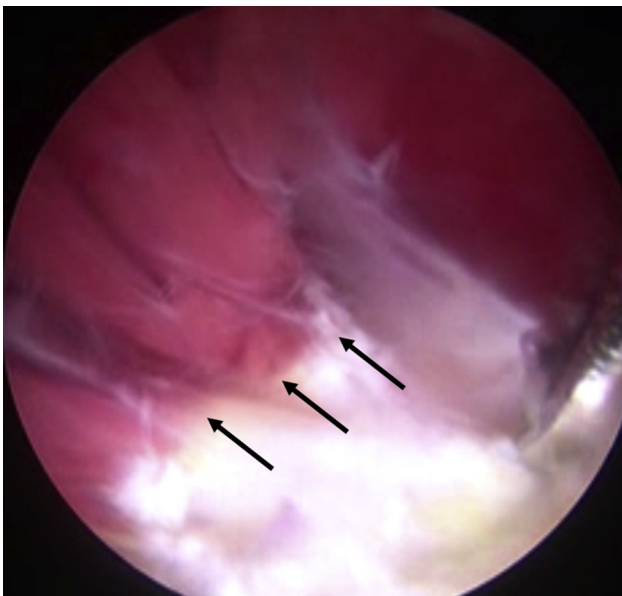


Fig 2. Screenshot from the video of an adhesion between anterior joint capsule and gluteus muscles (arrow). View of right hip, with camera positioned in the anterolateral portal.

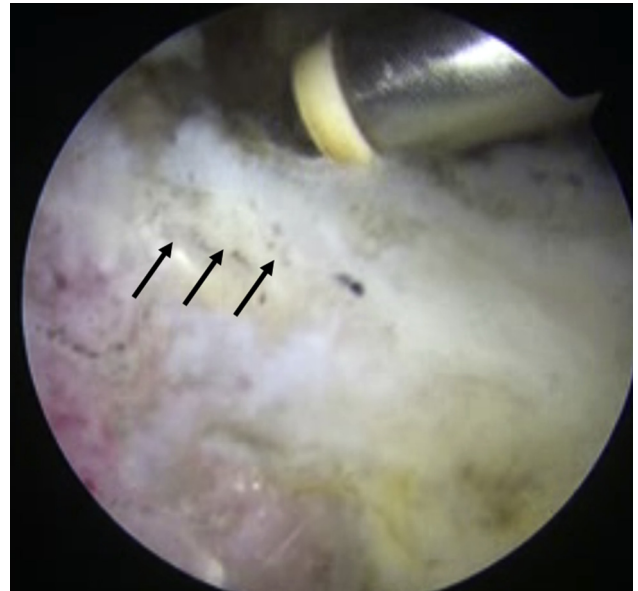


Fig 3. Screenshot from the video of a tendinosis of direct head of rectus femoris muscle (arrow). View of right hip, with camera positioned in the anterolateral portal.

Extra-articular debridement was indicated for the patients who were resistant to the conservative therapy.

Surgical Technique

Setup and Arthroscopic Access

Under general anesthesia, the patient is placed in the supine position on a traction table, both feet are well secured and padded, and a peroneal post is used to

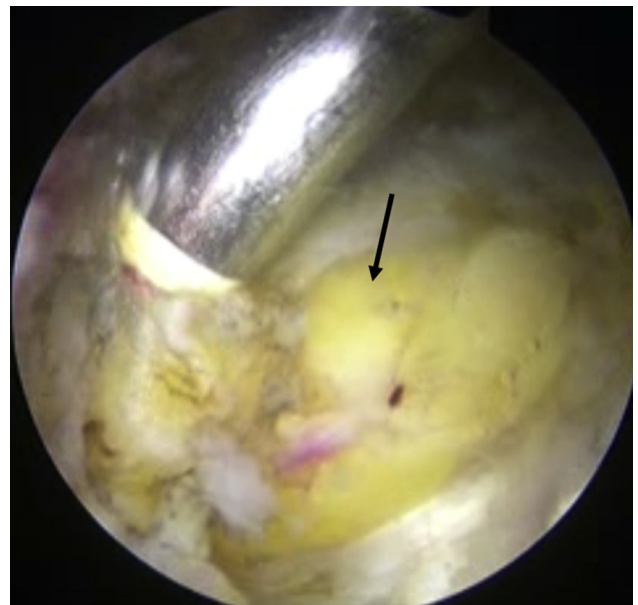


Fig 4. Screenshot from the video of an anterior inferior iliac spine fat pad (arrow). View of right hip, with camera positioned in the anterolateral portal.

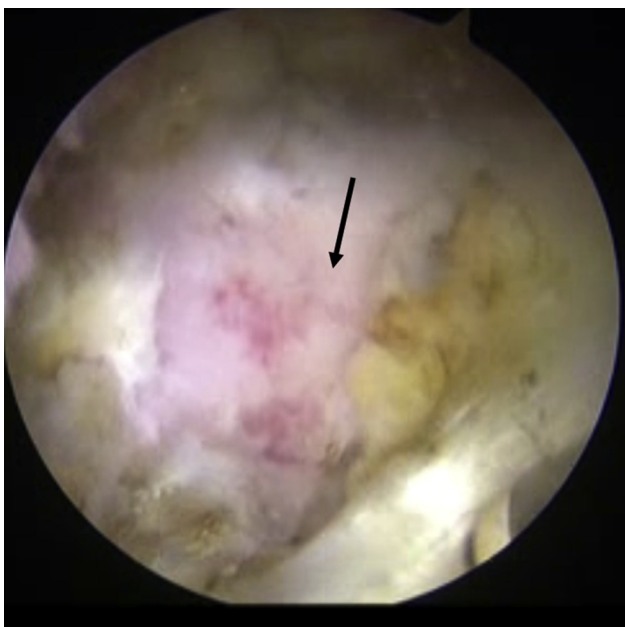


Fig 5. Screenshot from the video after the completion of debridement of anterior inferior iliac spine fat pad (arrow). View of right hip, with camera positioned in the anterolateral portal.

protect the genitalia. The hip is prepared and draped in the usual fashion. Traction is applied to the operative hip until the vacuum sign is present on the fluoroscopic image. An anterolateral portal is first established by use of a no. 11 blade to make an incision in the skin. A spinal needle is inserted through the incision and into

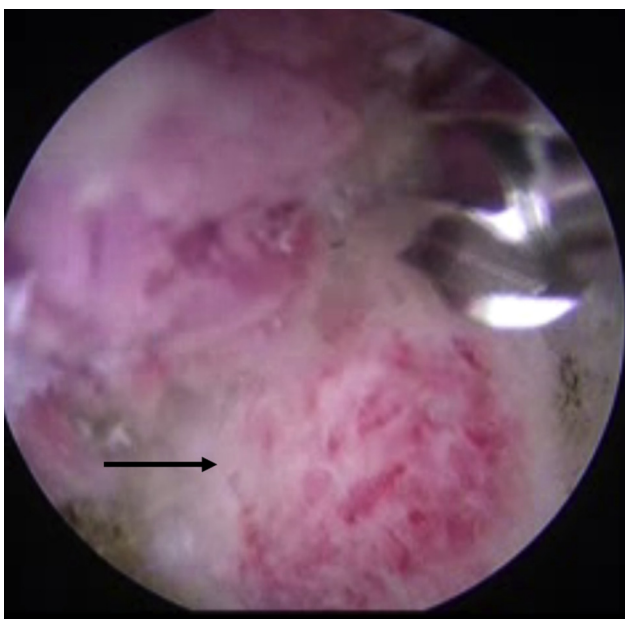


Fig 6. Screenshot from the video after the completion of decortication of the bony surface of the anterior inferior iliac spine (arrow). View of right hip, with camera positioned in the anterolateral portal.

the joint, with care taken to avoid the labrum and the femoral head. An over-the-guidewire technique is used to insert a 70° arthroscope through a 5.5-mm cannula. A midanterior portal is established by use of the same over-the-guidewire technique.

Diagnostic Findings of Intra-articular Lesions

Routine diagnostic arthroscopy was performed to assess the ligamentum teres, cartilage surfaces, and acetabular labrum. As we hypothesized that intra-articular pathologies were not responsible for the hip pain in this cohort, we never repaired the injured labrum (Video 1).

Diagnostic Findings and Intraoperative Procedures for Extra-articular Lesions

Tendinosis of the Direct Head of the Rectus Femoris Muscle

We next assess the extra-articular area using a 30° arthroscope (Video 1). The anterolateral portal is used as the viewing portal (arthroscope insertion), whereas the midanterior portal is the working portal (instrument insertion). Adhesions between the anterior joint capsule and gluteus muscles are released using a shaver (Dyonics Electroblade, Smith and Nephew, Memphis, TN; Fig 2). The conditions of the direct head and reflective head of the rectus femoris muscle are evaluated. Tendinosis of the direct head of the rectus femoris muscle is a common pathology (Fig 3). In contrast,

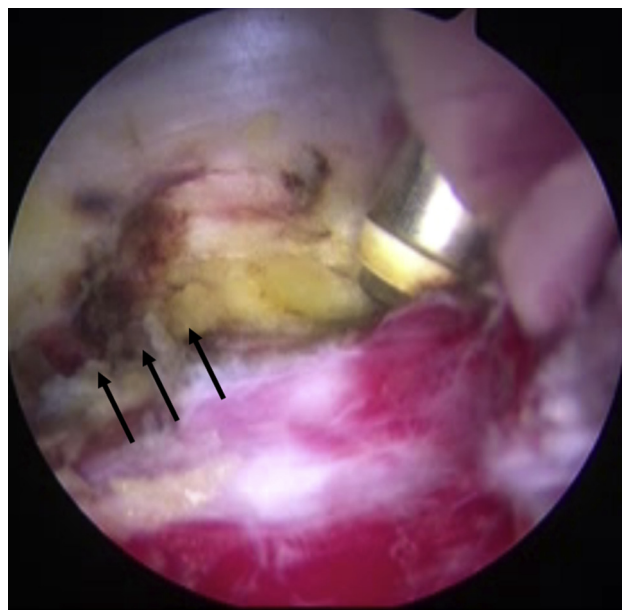


Fig 7. Screenshot from the video of inflamed intermuscular fat tissue between the rectus femoris muscle and iliocapsularis muscle (arrow). View of right hip, with camera positioned in the anterolateral portal.

Table 1. Pearls and Pitfalls

Pearls	Pitfalls
<p>A 30° arthroscope is helpful for the assessment and management of extra-articular lesions.</p> <p>It is important to identify and address the structural causes. In addition to the location of hip pain in Patrick's test, ultrasound-assisted lidocaine injection will help to confirm the structural cause of hip pain.</p> <p>Thorough debridement of iliopectineal bursitis is necessary for pain relief.</p>	<p>Careful attention should be paid not to leave the fat tissues beneath the direct head or the reflective head tendon.</p> <p>Inflammatory reactions marked in the intermuscular fat pads between the rectus femoris and iliocapsularis. Debridement of this intermuscular fat pad is also critical for pain relief.</p>

rupture of the reflective head is extremely rare. Any torn fibers of the direct head's tendon are debrided with a shaver and electrocautery (Dyonics Electroblade), leaving healthy intact fibers.

Fat Pad on Anterior Inferior Iliac Spine

A thin mature fat pad normally exists on the AIIS. The AIIS fat pad has several pathologic patterns, including blood vessel-rich edematous fat, partial fibrosis of fat, and replacement by scar tissue (Fig 4). The AIIS fat pad is debrided with a shaver and electrocautery (Fig 5). Careful attention should be paid not to leave fat tissues beneath the direct head or the reflective head tendon. Then the surfaces of bony protrusions of the AIIS are decorticated with a 5.5-mm round burr (Smith and Nephew; Fig 6).

Intermuscular Fat Pad Between the Rectus Femoris Muscle and Iliocapsularis Muscles

Inflammatory reactions including hemorrhage and neovascularization are often present in the intermuscular fat pads between the rectus femoris muscle and iliocapsularis muscles (Fig 7). The intermuscular fat pads are also debrided with a shaver and electrocautery.

Postoperative Instructions

Formal physical therapy is begun on postoperative day 1 without any restriction of weight bearing and range of motion. Patients return to the normal activities of daily life and sports 2 weeks after the operation.

Discussion

This Technical Note illustrates the arthroscopic approach to extra-articular pathologies as an alternative

procedure for the management of anterior hip pain. The principle of this procedure is the minimum management of the lesions required.

Groin pain is a common problem and is known to be a complex issue.¹ The wide variety of possible pathologies in numerous anatomical structures contributes to this complexity.¹ Intra-articular pathologies like acetabular labrum tears, cartilage damage, and ligamentum teres tears are believed to be major problems causing hip pain. Currently, femoroacetabular impingement (FAI) correction and labral repair are common therapeutic modalities for the management of groin pain.^{4,5} In contrast, extra-articular pathologies like tendinosis of the direct head of the rectus femoris and bursitis around the hip joint receive relatively little attention as targets of surgical intervention in patients with anterior hip pain confirmed by Patrick's test. In addition to intra-articular pathologies, periarticular pathologies are common and severe. Tendinosis of the direct head of the rectus femoris muscle is common, and fibrosis of the fat pads on the AIIS and anterior joint capsule is more severe than we originally thought.² Based on the hypothesis that not intra-articular pathologies but rather periarticular lesions around the AIIS are responsible for the groin pain in patients with AIISpinitis, only periarticular debridement was performed in this cohort. We never repaired the labrum. Neither cam decompression for FAI nor acetabuloplasty for acetabular dysplasia was performed.

There are advantages and disadvantages to this technique (Table 1). For patients who have anterior hip pain in Patrick's test and tenderness at Scarpa's triangle, we perform only periarticular debridement even if the patients have labral tears and FAI deformity. The

Table 2. Advantages and Disadvantages

Advantages	Limitations
<p>Less invasive surgery. The ruptured labra have never been repaired, nor have femoroacetabular impingement-specific deformities been corrected. As capsulotomy is not necessary, capsulotomy-associated risk of iatrogenic joint instability or postoperative hip pain can be avoided.</p> <p>Rapid return to sport. Patients can return to normal activities of daily life and sports activities 2 weeks after operation</p>	<p>This procedure may not have power to prevent the progression of osteoarthritis.</p> <p>The evaluation of the necessity of the repair of the direct head's tendon is an issue for future research.</p>

ruptured labra are not repaired nor are FAI-specific deformities corrected. As capsulotomy is not necessary, the capsulotomy-associated risk of iatrogenic joint instability or postoperative hip pain can be avoided. This can also lead to the rapid return to normal activities of daily life and sports. This is an attractive feature of this technique. FAI surgery has 2 purposes, management of hip pain and the prevention of osteoarthritis. Although extra-articular debridement can provide pain relief, this procedure has no power to prevent the progression of osteoarthritis. This may be the major disadvantage of this procedure. Regarding the management of the ruptured direct head's tendon, we performed only debridement of the torn fibers. The evaluation of the necessity of the repair of the direct head's tendon is an issue for future research. This is also another limitation.

There are several pearls and pitfalls related to an all-arthroscopic surgical technique (Table 2). When one is planning an arthroscopic surgical intervention for the treatment of hip pain, it is important to identify and address the structural causes. Intra-articular causes of hip pain include acetabular labral tears, cartilage injury, ligamentum teres tears, and synovitis. Extra-articular causes include tendinosis of the direct head of the rectus femoris and fibrosis of AIIIS fat pads. In addition to the location of the hip pain in Patrick's test, ultrasound-assisted lidocaine injection will help to confirm the structural cause of the hip pain.

In conclusion, rectus femoris tendinosis, subacute/chronic fibrosis of the fat pad, and muscle adhesion are

common extra-articular pathologies in patients with anterior hip pain. For patients with AIIISpinitis, arthroscopic extra-articular debridement is a reliable surgical technique that can provide remarkable pain relief and a rapid return to sports.

Acknowledgment

The authors thank Professor Y. Shimada for critical support and Mr. M. K. Barrymore for comments on the manuscript.

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