Trochanteric Micropuncture: Treatment for Gluteus Medius Tendinopathy

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Abstract: Lateral hip pain along with tenderness of the greater trochanter has been associated with greater trochanteric pain syndrome. Radiographically, this has been associated with gluteus medius pathology on magnetic resonance imaging. This has led some surgeons to conclude that abductor pathology is a primary cause of lateral hip pain. Failure of conservative treatment in the setting of gluteus medius pathology may lead to surgical intervention. In some patients a focal tear of the gluteus medius cannot be visualized and likely represents more diffuse tendinopathy. In these patients we propose micropuncture of the greater trochanter. Similar procedures have shown effectiveness in the elbow and shoulder by eliciting a healing response. Our experience suggests that trochanteric micropuncture at the insertion of the gluteus medius tendon can be effectively performed endoscopically for gluteus medius tendinopathy.

Greater trochanteric pain syndrome (GTPS) refers to a dull pain involving the lateral hip, coinciding with point tenderness along the lateral aspect of the greater trochanter that often migrates to the thigh.[1,2] Historically, these presenting symptoms were diagnosed as trochanteric bursitis; however, there is growing evidence that inflammation has a minimal role in the pathogenesis of GTPS.[2-5] Recently, abductor tendon pathologies have become recognized as a major cause of GTPS.[2,6] Bird et al.[7] conducted a prospective study in which they analyzed the prevalence of gluteus medius pathology using magnetic resonance imaging (MRI) in patients diagnosed with GTPS. They found that over half of the patients enrolled in their study (62.5%) showed gluteus medius tendinitis whereas only 8% showed trochanteric bursitis. Conclusions can be drawn that abductor pathology, as a major cause of lateral hip pain, is generally underestimated,[8] especially lateral hip pain unresponsive to conservative treatment.[9]

Zhu et al.[10] described a percutaneous needle puncture technique for the treatment of lateral epicondylitis, also referred to as "tennis elbow," which is a common tendinopathy of the elbow. Their procedure involved insertion of a 16-gauge needle into the common extensor tendon of the elbow in patients with lateral epicondylitis to elicit a healing and neovascularization response. The outcomes of their study proved that percutaneous needle puncturing can be an effective treatment modality in that setting. Snyder and Burns[11] described a similar technique, termed the "crimson duvet," in which they punctured the greater tuberosity to initiate marrow egression with the purpose of improved healing of the rotator cuff tendon.

Gluteus medius tendinopathy is pathologically similar to other tendinopathies, including those involving the rotator cuff, extensor tendons of the elbow, and patellar tendon of the knee.[10] Conservative treatment measures including physical therapy, nonsteroidal anti-inflammatory drugs, and corticosteroid injections seem to be beneficial.[3,5,12] Surgical intervention is indicated for failure of conservative treatment. Specifically, trochanteric bursectomy and repair of gluteus medius tears have been shown to be successful in both relieving symptoms of pain and improving abduction strength.[6,13,14] However, in our experience, gluteus medius pathology visualized

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endoscopically may not correlate with preoperative MRI evidence of gluteus medius tendinopathy. Specifically, many patients with MRI evidence of significant gluteus medius tendinopathy do not have focal full- or partial-thickness tears at the time of peritrochanteric endoscopy. In these patients we propose "trochanteric micropuncture" at the insertion of the gluteus medius tendon. This technical note, as well as the accompanying images and video, will describe in detail our methods for trochanteric micropuncture.

Surgical Technique

Operating Room Preparation

The technique of trochanteric micropuncture may be performed with the patient in the supine or lateral position. The patient is typically placed under general anesthesia. Hypotensive anesthesia allows lower pump pressure and improves visualization arthroscopically and endoscopically.[15] We perform hip arthroscopy and peritrochanteric endoscopy with the patient in the supine position using a traction table.[16] We frequently perform diagnostic arthroscopy and address intra-articular pathology before addressing the peritrochanteric space. The operative extremity is positioned in adduction, with the hip flexed to 10°, and the femur is internally rotated for diagnostic arthroscopy and then abducted for peritrochanteric endoscopy.

Portal Placement

We perform hip arthroscopy and peritrochanteric endoscopy using the same portals. A standard anterolateral (AL) portal, midanterior portal, and distal accessory portal are typically created during hip arthroscopy (Fig 1). These portals are also used for peritrochanteric endoscopy. An additional portal placed 2 to 5 cm proximal to the trochanter may be created for better direct access to the trochanter if necessary.

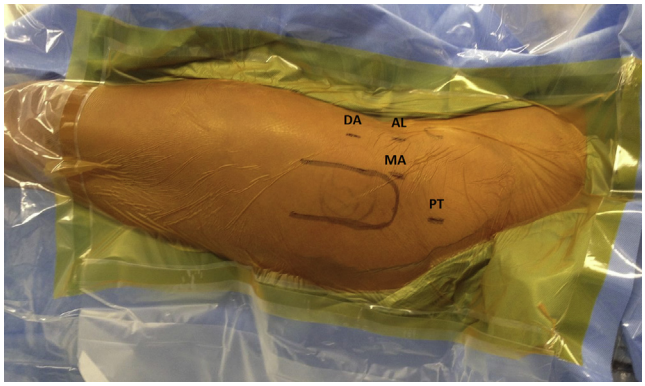

Fig 1. A standard anterolateral portal (AL), midanterior portal (MA), and distal accessory portal (DA) are typically created during hip arthroscopy, and an additional portal placed 2 to 5 cm proximal to the trochanter (PT) may be created for better direct access to the trochanter if necessary.

Peritrochanteric Endoscopy

Visualization and access to the peritrochanteric space have been described previously by Voos et al.[17] Our technique is similar. After hip arthroscopy, a blunt trocar and cannula are inserted from the distal accessory portal into the peritrochanteric space. We typically use a 5-mm cannula (Smith & Nephew, London, England). The insertion is performed under fluoroscopic guidance, and the trocar is typically placed at the level of the vastus ridge (Fig 2). This prevents the arthroscope from being inserted in the vastus lateralis or gluteus medius. The 70° arthroscope is then inserted into the peritrochanteric space. A probe or shaver can be inserted from the AL portal. Abducting the leg decreases tension on the iliotibial band and allows better access to the peritrochanteric space. A suction shaver is then used to clear bursal tissue, which frequently overlies the vastus lateralis and gluteus medius. Once bursal tissue and fibrinous bands are removed, the gluteus medius is amenable to inspection. A probe is placed through the AL portal, and the tendon is palpated. Symptomatic full-thickness and high-grade partial-thickness tears are typically repaired using suture anchors.[2,9,17,18]

Trochanteric Micropuncture

Our indication for trochanteric micropuncture has been patients in whom nonoperative treatment fails with gluteus medius tendinopathy, visible on MRI, who do not have a full- or partial-thickness tear identified at the time of endoscopy (Fig 3). Patients with a localized area of high-grade tearing undergo suture anchor

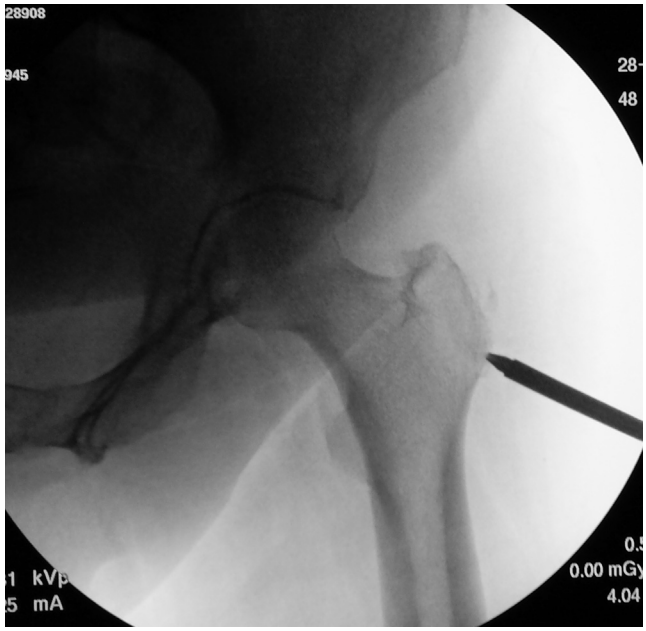

Fig 2. Fluoroscopic guidance of the trocar and cannula through the distal accessory portal into the peritrochanteric space, typically placed at the level of the vastus ridge.

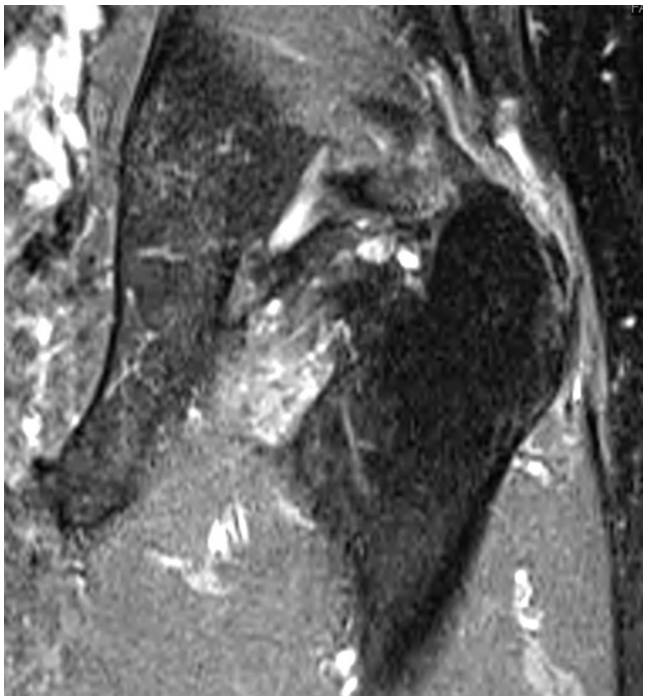

Fig 3. Magnetic resonance imaging of gluteus medius tendinopathy of the hip without full- or partial-thickness tear seen at the time of endoscopy.

repair. In our experience the gluteus medius tendon often appears degenerative without a focal lesion. In these patients, stimulating a healing response at the bone-tendon interface may be beneficial through a similar mechanism used for lateral epicondylitis or rotator cuff tendinopathy.[10,11]

Once the determination has been made to proceed with trochanteric micropuncture, we make a portal just proximal to the tip of the trochanter. A microfracture awl (Arthrex, Naples, FL) is then inserted through this portal, and the area of gluteus medius tendinopathy is visualized. This can be aided by careful examination of the preoperative MRI scan. The foot can be internally and externally rotated to improve access to the entire greater trochanter. The area of gluteus medius insertion and the surrounding area are then punctured with a microfracture awl (Fig 4). The technique is similar to that described by Steadmann et al.[19,20] in the knee for cartilaginous defects or to the crimson duvet described by Snyder and Burns.[11] The awl is typically driven into the greater trochanter to a depth of 3 to 5 mm with a light mallet. The awl pierces the tendon before making bony contact, and no attempt is made to visualize the bony surface (Video 1).

Postoperative Rehabilitation

The postoperative rehabilitation protocol is patient specific and depends on any concomitant procedures that are performed in addition to trochanteric micropuncture. We typically restrict weight bearing for 2 weeks after hip arthroscopy/peritrochanteric endoscopy and ask patients to maintain 20 lb of heel-touch weight bearing. A hip brace (DJO Global, Vista, CA) is used to limit range of motion to 90° of flexion for the first 2 weeks. Range of motion is then allowed to progress within a pain-free zone. When the patient is fully weight bearing and achieves full range of motion, therapy is advanced. Gentle strengthening exercises begin with a stationary bicycle and isometrics. As strengthening progresses, patients start using an elliptical machine and a slide board and perform hip girdle (gluteus medius) strengthening.

Discussion

The treatment of lateral-sided hip pain is evolving as our understanding of gluteus medius pathology increases. Historically, patients with lateral-sided hip pain were diagnosed with trochanteric bursitis and treated nonoperatively. Although this is successful for most patients with lateral-sided hip pain, there are patients with pain unresponsive to conservative treatment. Recent recognition of gluteus medius pathology has led to repair of full- and partial-thickness tears,[2,9,17,18] and early success has been documented. However, there are a significant number of patients with preoperative imaging showing gluteus medius tendinopathy who have no focal defects identified endoscopically. We believe that these patients have painful degenerative gluteus medius pathology similar to lateral epicondylitis or rotator cuff tendonitis. This patient group may benefit from trochanteric micropuncture.

The advantages and disadvantages of trochanteric micropuncture are presented in Table 1. The technique is simple and uses microfracture instruments known to

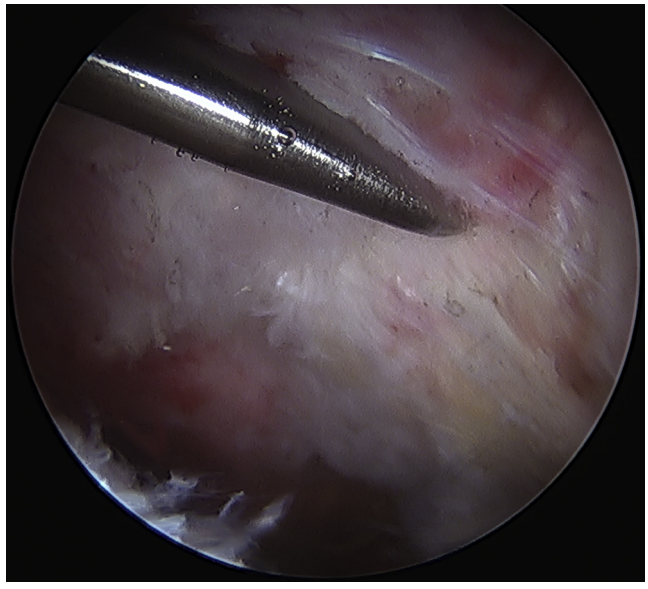

Fig 4. Endoscopic treatment for micropuncture using microfracture awl.

Table 1. Advantages and Disadvantages of Trochanteric Micropuncture Used for Treatment of Gluteus Medius Tendinopathy

Advantages
No disruption of attached tendon
No alteration of postoperative weight bearing
Stimulation of host repair
Disadvantages
Undersurface of gluteus medius tendon is not exposed for inspection

all arthroscopists. Similar techniques in the elbow and shoulder have shown satisfactory outcomes. Further evaluation of the clinical results of this technique are necessary and currently under way.

Trochanteric micropuncture is a new technique, and to date, clinical follow-up is lacking. However, this technique may be appropriate for patients with refractory lateral hip pain in the setting of gluteus medius tendinopathy.

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