Technical Note

Endoscopic Repair of Partial Gluteus Medius Tear: Staple Configuration With Suture Anchors

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Abstract: Tears of the gluteus medius and minimus have emerged as significant contributors to lateral hip pain and functional impairment. Surgical intervention reliably delivers pain alleviation and ability to return to activities. Nevertheless, conventional open procedures entail substantial incisions, extensive tissue damage, and protracted recovery. Endoscopic approaches have provided minimally invasive alternative strategies. This Technical Note details a method for addressing partial gluteus medius tears by recreating the hip abductor tendon insertion footprint and employing a bioinductive patch to promote wound healing.

Gluteus medius and minimus tears can cause considerable lateral hip pain with walking, functional impairment, and reduced quality of life. Although previously misdiagnosed as bursitis, there has been increasing recognition of these tears as a cause of greater trochanteric pain syndrome, especially without response to nonoperative measures.[1-5] Diagnosis has been facilitated by advancements in and increased access to magnetic resonance imaging (MRI), especially when investigating concomitant hip pathology.[6] In one study, almost one half of the patients diagnosed with greater trochanteric pain syndrome had a gluteus medius tear.[4] Among patients undergoing total hip arthroplasty, studies have demonstrated a prevalence of abductor mechanism tears ranging from 20% to 25%.[7,8] Surgical repair has consistently been shown to relieve pain and enhance functionality.[9-12] Traditional open surgical approaches for repair often result in large incisions, increased tissue trauma, and prolonged recovery times.[12] However, advances in endoscopic techniques offer a minimally invasive alternative for the repair of gluteus medius tears.[10] This article presents the recreation of the hip abductor tendon insertion footprint to repair a partial gluteus medius tear and the use of a bioinductive patch to improve wound healing. This study was performed in accordance with the ethical standards in the 1964 Declaration of Helsinki and at the Department of Orthopaedics and Rehabilitation at the Yale School of Medicine.

Surgical Technique (With Video Illustration)

We describe in detail the procedure seen in Video 1. The patient is positioned supine on a post-less distraction table for endoscopy. The surgical site is prepped and draped in a sterile fashion (Fig 1). Under fluoroscopy, a spinal needle is introduced into the peritrochanteric space. The proximal and posterior portals are identified using spinal needle localization. Once both portals have been established, the approach to peritrochanteric space can begin.

A blunt obturator is used to reinsert the 70° arthroscope into the peritrochanteric space through the midanterior portal. To facilitate access and increase the volume of the peritrochanteric space, the operative limb is abducted from 20° to 30°. When the trochanteric bursa is encountered, the DYONICS ELECTROBLADE (Smith & Nephew, Watford, England) is used to remove it entirely. The ELECTROBLADE is introduced through the anterolateral portal, and a trochanteric bursectomy and debridement are performed (Fig 2).

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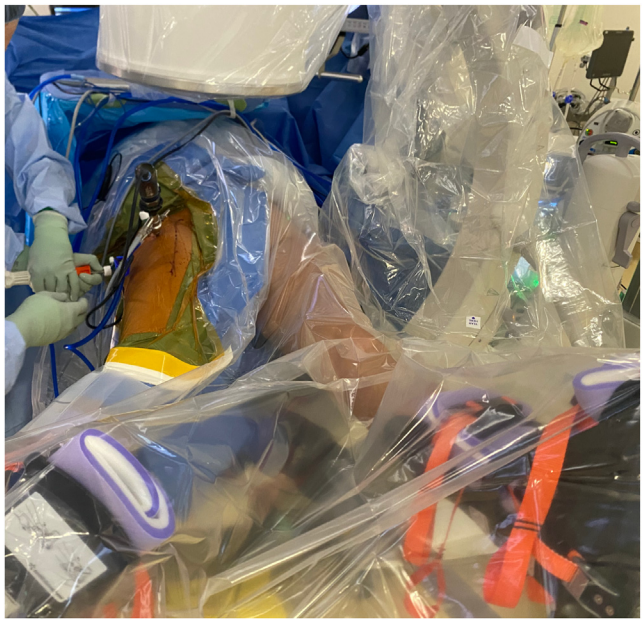

Fig 1. Image of patient positioning. The patient is positioned supine, with legs abducted on a post-less distraction table.

The entire peritrochanteric space, including the gluteus medius, gluteus minimus, vastus lateralis, and gluteus maximus insertions, is evaluated.

The gluteus medius insertion is probed to confirm partial destabilization on its undersurface at the attachment to the lateral facet. A microfracture awl is used to create multiple holes in the lateral facet of the greater trochanter, passing through the partially torn gluteus medius. This technique aims to stimulate healing by inducing a controlled injury response.

Under fluoroscopy, a pair of Q-FIX anchors (Smith & Nephew) is placed in a transtendinous fashion in the lateral facet (Fig 3A). The sutures from each anchor are tied to each other, creating a horizontal mattress suture staple configuration (Fig 3B). These sutures are shuttled into the space (from point A to point B and vice versa) to maximize tendon compression and stability. These sutures incorporated within the gluteus medius tendon are further anchored into the distal insertion using a MicroRaptor Anchor (Smith & Nephew) (Fig 3C). This achieves excellent compression of the tendon over the lateral facet (Fig 3D). The suture repair construct outlines the insertion pattern of the gluteus medius and minimus (Fig 4). The repair was augmented with a REGENETEN patch (Smith & Nephew) (Fig 5). In addition, iliotibial band lengthening is performed on patients who described catching or snapping during the history and physical examination.

Fig 2. Right hip, supine position. Endoscopic view of peritrochanteric space from the distal anterolateral accessory (DALA) portal. The DYONICS ELECTROBLADE (Smith & Nephew) is used to perform a trochanteric bursectomy and debridement.

Discussion

As it relates to promoting the understanding of greater trochanteric pain syndrome, gluteus medius tears have become increasingly recognized as a possible etiology of pain given the advancements in MRI.[1-6] Further, a growing amount of literature has reported the benefits of endoscopic repair of gluteus medius tears compared with traditional open surgical approaches, as it results in smaller incisions, decreases tissue trauma, and shortens recovery time.[12] Similarly, recent systematic reviews by Alpaugh et al.,[13] Chandrasekaran et al.,[14] and Longstaffe et al.[15] demonstrated that although both open and endoscopic gluteal tendon repairs improve functional outcomes and reduce pain, endoscopic repair results in fewer postoperative complications including lower tendon retear rates. As a result, endoscopic gluteal tendon repair should be strongly considered to improve overall outcomes in patients with gluteus medius tears.

Previous Technical Notes have introduced various endoscopic gluteal tendon repair techniques. An open repair technique by Maldonado et al.[16] discussed simultaneous gluteus medius repair during total hip arthroplasty using the direct anterior approach. An endoscopic technique discussed by Merrill et al.[17] highlighted the use of a single-row repair technique for partial-thickness tears and a double-row repair for full-thickness tears. Laskovski and Urchek[18] highlighted the use of an acellular human dermal allograft to augment tear repair, whereas another technique discussed by Domb et al.[19] involved transtendinous endoscopic gluteus medius debridement and repair. In the setting of failed repairs or irreparable tears, Inclan et al.[20] discuss a technique to transfer the gluteus maximus tendon to treat hip abductor deficiency.

In this Technical Note, we present the reestablishment of the hip abductor tendon insertion footprint to repair a partial gluteus medius tear and the use of a bioinductive patch to improve wound healing. Our repair technique differs from others by laying

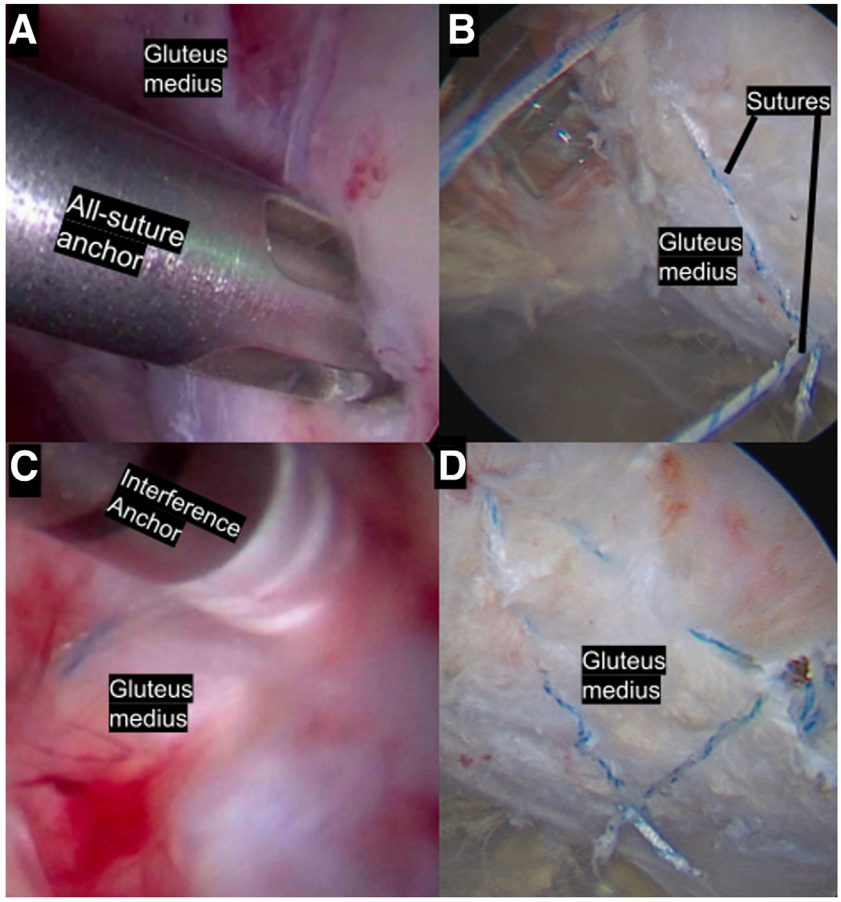

Fig 3. Right hip, supine position. Endoscopic view of peritrochanteric space from distal anterolateral accessory (DALA) portal. (A) Q-FIX anchors (Smith & Nephew) are placed in a transtendinous fashion. (B) Sutures from each anchor are tied to each other, creating a horizontal mattress suture staple configuration. (D) Anchoring sutures into the distal insertion using a MicroRaptor Anchor (Smith & Nephew). (D) Final configuration of suture repair construct.

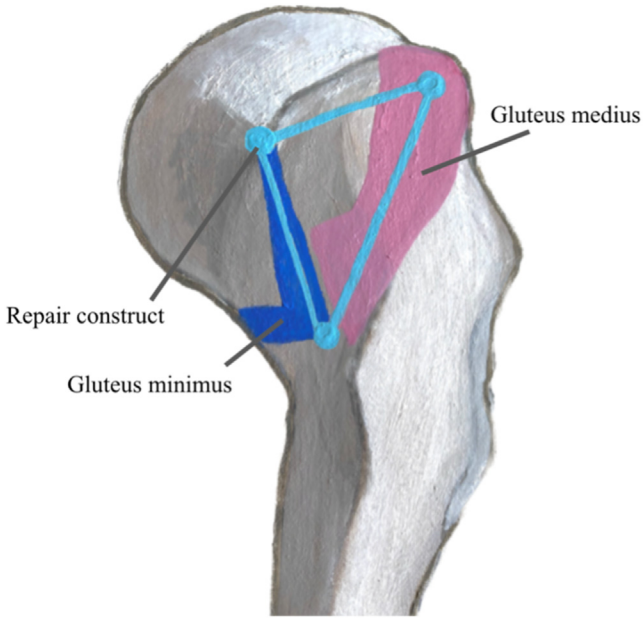

Fig 4. Sagittal illustration of the greater trochanter. Insertion footprints of the gluteus medius and gluteus minimus tendons with repair construct overlaid.

sutures over the insertion sites of the gluteus medius and gluteus minimus tendons, maximizing compression against the majority of the footprint. Transtendinous Q-FIX Anchors are used to create a horizontal mattress suture staple configuration and a MicroRaptor Anchor is used to anchor sutures within the gluteus medius tendon into the distal insertion. Some of the advantages of these anchors include smaller incisions, decreased tissue trauma, less intraoperative time required for tear repair, shortened recovery time, maximization of tendon compression over the lateral facet, and lower tendon retear rates (Table 1). The REGENETEN patch presented in this article could also help eliminate concerns of slow wound healing associated with endoscopic repair.

There are some technical pearls and pitfalls that could be considered for optimal endoscopic repair of partial gluteus medius tears (Table 2). Abducting the operative limb from 20° to 30° improves access to the peritrochanteric space and, when coupled with fluoroscopic guidance, increases ease of placement of Q-FIX anchors in a transtendinous manner in the lateral facet. Healing also can be improved using a microfracture awl and

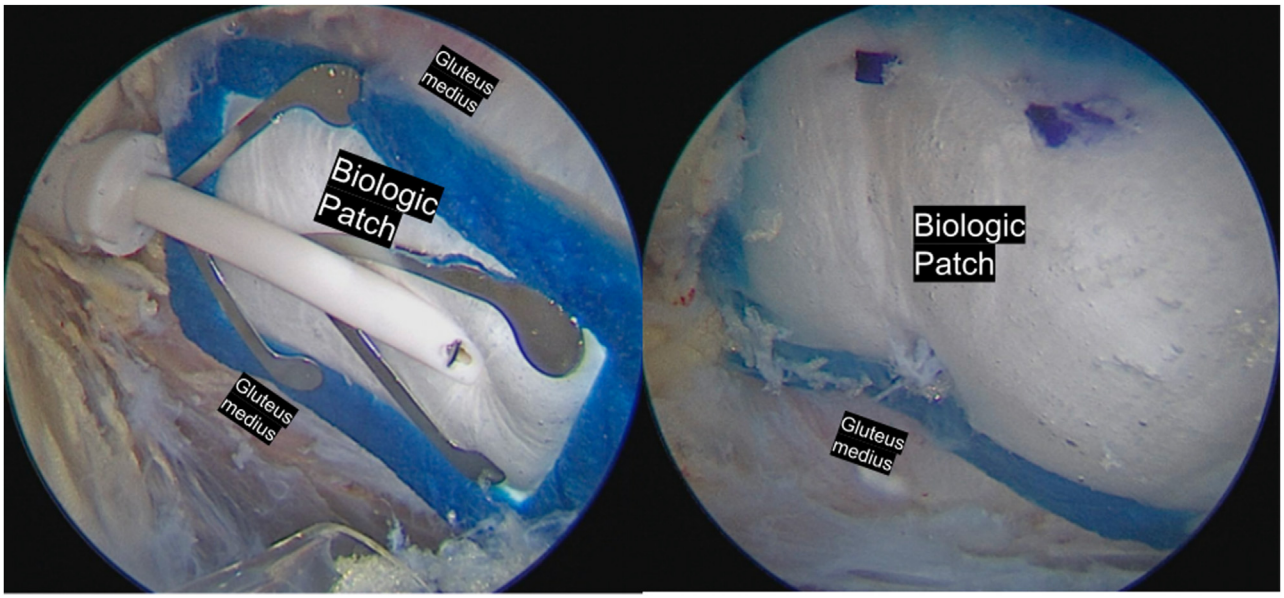

Fig 5. Right hip, supine position. Endoscopic view of peritrochanteric space from distal anterolateral accessory portal (DALA). Augmenting the repair with a REGENETEN patch (Smith & Nephew).

Table 1. Advantages and Disadvantages of Endoscopic Gluteus Medius Repair

Advantages	Disadvantages
Smaller incisions	Implant cost
Decreased tissue trauma	Learning curve
Less intraoperative time required for repair	
Shortened recovery time	
Maximization of tendon compression over the lateral facet	

Table 2. Pearls and Pitfalls of Endoscopic Gluteus Medius Repair

Pearls
Abduct operative limb from 20° to 30° to improve access to peritrochanteric space
Use of microfracture awl to stimulate healing
Use fluoroscopic guidance to place suture anchors in the anatomic footprint of abductors
Pitfalls
Failing to establish portals in appropriate orientation
Failing to perform trochanteric bursectomy and debridement to visualize peritrochanteric space
Use a cannula to avoid soft-tissue bridges when shuttling transverse suture

REGENETEN patch. In contrast, pitfalls include failing to establish portals in the appropriate orientation and failing to perform trochanteric bursectomy to visualize the peritrochanteric space, as well as difficulty shuttling sutures for the tear repair.

In conclusion, endoscopic repair of gluteus medius tears is critical for not only restoring functional outcomes of the hip but also maximizing tendon compression over the lateral facet and lowering tendon retear rates in comparison with open surgical approaches.

Disclosures

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: A.J. reports a relationship with Arthrex that includes funding grants. All other authors (N.P., S.S., R.M., K.K., S.P.) declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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