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Surgical technique

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Endoscopic gluteus maximus release for peritrochanteric decompression

Liberación endoscópica del glúteo mayor para la descompresión peritrocantérica

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ABSTRACT. Introduction: peritrochanteric syndrome, also known as greater trochanteric pain syndrome, affects 10-25% of the population, resulting in pain and functional impairment in the lateral hip region. This condition is often associated with significant long-term disabilities. **Objective:** this study aims to introduce a novel surgical approach for treating peritrochanteric syndrome that minimizes invasiveness and enhances patient outcomes. **Material and methods:** we describe a technique that utilizes customized portals through the iliotibial band (ITB) along with the release of the proximal insertion of the gluteus maximus (GM). Patients are positioned supine, with access to the peritrochanteric space achieved through a 70º arthroscope. Radiofrequency release of approximately 3-4 cm of the distal GM insertion is performed to alleviate pressure and reduce friction in the peritrochanteric space. **Conclusion:** the proposed surgical method offers a promising alternative to traditional approaches for treating peritrochanteric syndrome by minimizing the tissue trauma and enhancing recovery. Further research is necessary to evaluate the long-term efficacy and safety of this innovative intervention in a larger patient population.

Keywords: peritrochanteric syndrome, hip preservation, endoscopy, decompression.

RESUMEN. Introducción: el síndrome peritrocantérico, también conocido como síndrome de dolor del trocánter mayor, afecta al 10-25% de la población y provoca dolor y deterioro funcional en la región lateral de la cadera. Esta afección suele estar asociada a discapacidades significativas a largo plazo. **Objetivo:** este estudio tiene como objetivo presentar un nuevo enfoque quirúrgico para el tratamiento del síndrome peritrocantérico que minimiza la invasividad y mejora los resultados para los pacientes. **Material y métodos:** describimos una técnica que utiliza portales personalizados a través de la banda iliotibial (BIT) junto con la liberación de la inserción proximal del glúteo mayor (GM). Los pacientes se colocan en posición supina, con acceso al espacio peritrocantérico mediante un artroscopio de 70º. Se realiza una liberación por radiofrecuencia de aproximadamente 3-4 cm de la inserción distal del GM para aliviar la presión y reducir la fricción en el espacio peritrocantérico. **Conclusión:** el método quirúrgico propuesto ofrece una alternativa prometedora a los enfoques tradicionales para el tratamiento del síndrome peritrocantérico, ya que minimiza el traumatismo tisular y mejora la recuperación. Es necesario realizar más investigaciones para evaluar la eficacia y la seguridad a largo plazo de esta innovadora intervención en una población de pacientes más amplia.

Palabras clave: síndrome peritrocantérico, preservación de la cadera, endoscopia, descompresión.

Level of evidence: V

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Abbreviations:
GM = gluteus maximus
ITB = iliotibial band
PTS = peritrochanteric syndrome

Introduction

Peritrochanteric syndrome (PTS), also known as greater trochanteric pain syndrome, is characterized by pain and tenderness in the lateral hip region, specifically around the greater trochanter. This syndrome often involves pathologies of the peritrochanteric space, including structures such as the gluteus medius and minimus tendons, trochanteric bursa, and ITB, affecting 10-25% of the general population.[1] PTS can result in Harris Hip Scores comparable to those observed in osteoarthritis, highlighting the significant impact of this condition.[2] It often presents as a chronic condition, with 36% of patients remaining symptomatic at one year and 29% after five years.[3]

It is suggested that abnormal hip biomechanics may lead to the onset of gluteal tendinopathies. The ITB exerts pressure on the gluteal tendons and bursa against the greater trochanter during hip adduction, resulting in compressive force. These forces are exacerbated by weakness in the hip abductor muscles, which induces a lateral tilt of the pelvis.[4]

PTS treatment generally requires a multifaceted approach. Initially, conservative management is often employed, including rest, activity modification, and physical therapy aimed at strengthening the hip abductor muscles and enhancing biomechanical function. Nonsteroidal anti-inflammatory drugs may be prescribed to manage pain and inflammation. Corticosteroid injections[5] or platelet-rich plasma[6] into the trochanteric bursa can provide short-term relief in some patients. Surgical intervention should be considered if conservative measures fail.

The open surgical method typically requires an incision over the greater trochanter, providing direct access to the peritrochanteric structures and allowing for clear visualization of the ITB. The ITB must be incised longitudinally to reach the gluteal tendons. Compared to arthroscopic techniques, open surgery is more invasive, leading to longer recovery periods and increased postoperative pain. There is also a higher risk of complications, such as infection, bleeding, and scarring.

The two known endoscopic approaches for managing peritrochanteric space pathologies, outside-in and all-inside, occasionally require ITB fasciectomy to decompress the roof of the peritrochanteric space, protect the repair of the abductor tendons, and reduce friction on the greater trochanter.[7] This procedure carries the risk of causing deformity to the lateral thigh and may overload the contralateral abduction mechanism.[8]

We propose a novel surgical approach to the peritrochanteric space that involves the use of portals through the ITB and release of the proximal portion of the GM insertion. This method aims to reduce pressure in the peritrochanteric space, protect the repair of the abductor tendons, and minimize friction of the ITB over the greater trochanter while simultaneously being less invasive, painful, and restrictive for the patient.

Anatomy

The peritrochanteric space, the region of interest in this surgical technique, is a complex anatomical area. It contains the greater trochanter, tendons of the gluteus medius and minimus, trochanteric bursa, and ITB. The trochanteric bursa, located between the greater trochanter and GM and ITB, facilitates smooth gliding of these structures during hip movements. Inflammation of this bursa is commonly observed in peritrochanteric pain syndrome.[9]

Of particular relevance to the described surgical technique is the proximal insertion of the GM onto the ITB. A cadaveric study by Antonio et al., revealed that the GM muscle transmits only a minor portion of its force to the femoral linea aspera via the lateral intermuscular septum. Additionally, it transmits force to a broad surface comprising the fascia lata and the iliotibial tract.[10] The endoscopic release targets this proximal insertion, aiming to decompress the peritrochanteric space.

Understanding the relationship between the GM insertion, ITB, and underlying gluteus medius and gluteus minimus tendons is crucial for safe and effective endoscopic release. The location of the sciatic nerve in relation to the posterior aspect of the greater trochanter must also be considered to avoid iatrogenic injury during portal placement and surgical dissection.

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Technique

For this procedure, the patient is positioned supine without longitudinal traction if no additional intra-articular pathology is to be addressed. If there is concomitant intra-articular pathology, the patient is positioned on a traction table (with or without a post), and the intra-articular pathology is first addressed using the required portals. After completing the intra-articular procedure, the leg is freed from the table and the boot is removed without breaking the sterile feed. The leg is now held by an assistant who performs internal and external rotations, as well as abduction, when needed. Another important role of the assistant is to alert the surgeon of any sciatic nerve activity, which will be noticed as muscular activity in the leg. If there is no intra-articular procedure, a standard operating table is used, with the leg draped over the table for manipulation. Our group has published a customized portal for the management of deep gluteal syndrome.[11]

Portals: for portal disposition, the width of the greater trochanter is measured at the level of the most lateral aspect of the greater trochanter and divided into three segments from anterior to posterior. The tip of the greater trochanter can be identified by the abduction and adduction of the leg. The posterolateral proximal and posterolateral distal portals are positioned at an equal distance to that measured previously as the width of the greater trochanter, proximal and distal, respectively, from the most lateral aspect of the greater trochanter in line with the previously marked third segment *(Figure 1)*. This allows for customized portal placement in line with the patient's anatomy.

Access: the peritrochanteric space was accessed through the distal posterolateral accessory portal utilizing a 70º, 4 mm arthroscope connected to an inflow water pump set at a flow rate of 0.7-l per minute and a pressure of 40 mmHg to create a surgical space between the trochanteric bursa, vastus lateralis, and ITB. The proximal posterolateral accessory portal is then established under direct visualization.

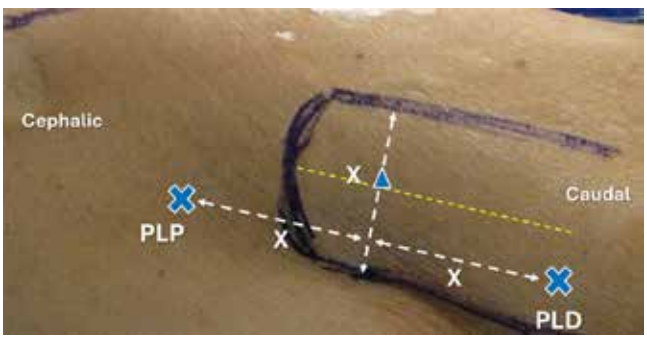

Figure 1: Placement of the personalized peritrochanteric portals. The outline of the femur is identified, and the most lateral aspect palpated (blue triangle) is noted. The anteroposterior distance of the femur at this point is then measured proximally and distally to mark the proximolateral postal (PLP) and posterolateral distal postal (PLD), at the distal third of the femur (from anterior to posterior).

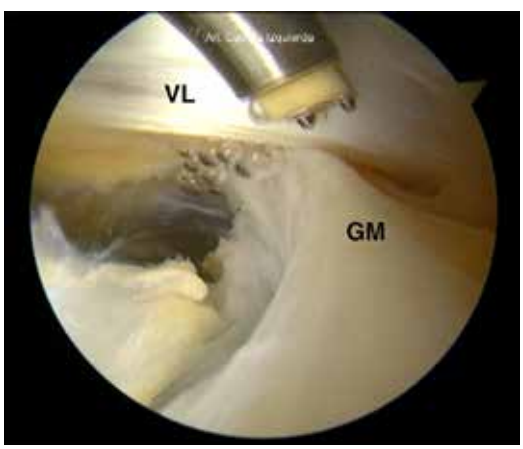

Figure 2: Endoscopic view of the Vastus Lateralis (VL) Gluteus Maximus (GM) through the PLD portal.

Figure 3: Endoscopic tenotomy of distal GM tenotomy close to the linea aspera with a radiofrequency device.

Visualization and tenotomy: once access is achieved, a bursectomy is performed to remove the trochanteric bursa, and the insertion of the GM is identified, located immediately inferior to the vastus lateralis, serving as an important endoscopic landmark *(Figure 2)*. Following identification, a radiofrequency release of approximately 3-4 cm is performed from this insertion using a radiofrequency device, ensuring that the procedure is conducted close to the linea aspera *(Figure 3)*.

Addressing peritrochanteric pathology: the establishment of a surgical space around the peritrochanteric area has greatly enhanced the ability to visualize and perform procedures such as gluteus medius repair with anchors and sutures, microperforation of the trochanter, and sciatic nerve release.

Postoperative care: postoperative care is critical for optimizing the recovery process. Patients are advised to follow a rehabilitation protocol that includes a gentle range of motion exercises, followed by a gradual increase in activity as tolerated. Pain management is addressed through the use of prescribed analgesics, and physical therapy is initiated to improve muscle strength and functional outcomes, avoiding contraction and extension of the GM to protect the tenotomy site.

Discussion

The underlying cause of the increased tension in the peritrochanteric structures remains unclear. Nonetheless, given the anatomical and functional relationship between the GMT and peritrochanteric area, we propose that GMT tenotomy could potentially reduce tension in this region.[12]

By releasing the proximal 3-4 cm of the distal insertion of the GM, we achieve decompression of the peritrochanteric space, reduce friction on the greater trochanter, and protect our repair of the abductor tendons without affecting the muscle's function. A similar technique has been described

by Polesello et al., as a treatment for snapping hip with good results at 22 months and no reported complications,[13] differing from our technique in which the portals are not customized.

Although the proposed surgical technique offers a promising approach to peritrochanteric decompression, several limitations must be acknowledged. First, this study primarily describes a novel surgical technique. As such, it lacks clinical outcome data to definitively demonstrate its effectiveness. Future studies with a prospective, controlled design are needed to evaluate the clinical efficacy of this technique in terms of pain reduction, functional improvement, and patient satisfaction.

The potential benefits of this technique extend beyond simple decompression alone. By releasing the proximal GM insertion, we may be able to address the underlying biomechanical factors contributing to the peritrochanteric syndrome. This release may reduce tension on the gluteus medius and minimus tendons, potentially promoting healing and preventing further injuries. Furthermore, the improved visualization afforded by the endoscopic approach allows for a more thorough assessment of the peritrochanteric space, enabling the identification and treatment of other associated pathologies, such as partial tears of the gluteus medius or minimus tendons and sciatic nerve impingement.

Finally, it is important to consider the potential risks associated with this technique. These include, but are not limited to, bleeding, infection, nerve injury (particularly to the sciatic nerve), and incomplete release of the GM insertion. Careful attention to anatomical landmarks, meticulous surgical techniques, and appropriate patient selection are essential to minimize these risks.

Conclusions

Overall, this approach allows excellent visualization of the peritrochanteric space and minimizes trauma to the surrounding soft tissues, leading to reduced postoperative pain and enhanced patient satisfaction. The indications for this procedure, in addition to the peritrochanteric procedure, include adhesion removal, sciatic nerve release,[11] and gluteus medius and coxa saltans procedures.[13,14] This procedure should not be performed in patients with a history of gluteus maximus surgery or injury. We recommend deep anatomical knowledge of the region and sciatic nerve course to avoid injury, avoid tenotomy of more than 5 cm (to prevent bleeding), use a pressure of 35 mmHg,[11] and use warm irrigation solution.[15] Further research and follow-up studies are necessary to assess the long-term outcomes and efficacy of this surgical method.

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