

Extracorporeal Shockwave Therapy in Greater Trochanteric Pain Syndrome

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Abstract

Peritrochanteric hip pain or great trochanter pain syndrome (GTPS) is a frequent complaint in offices and is the most common cause of pain and tenderness affecting the lateral part of the hip. Traditional conservative treatment of GTPS includes the use of anti-inflammatory drugs, physical therapy, and changing activities of daily living. In resistant cases, shockwave treatment presents satisfactory results considered good and excellent in 70 to 80% of GTPS cases treated by this technique, reducing the need for other treatments and the use of medications for long periods. The treatment of GTPS with shock waves can be performed with focal waves or radial pressure waves, with the application of 3 initial sessions with an interval of one week, frequencies between 4 and 6 Hz, with 500 initial pulses in the region and at least 2000 pulses using energy between medium and high intensity at the point of greatest sensitivity on palpation, It is also important to treat the trigger points of the hip region. Due to the anatomical characteristics of a deep joint and the frequent presence of an associated myofascial pain, hip pathologies are a good option for the concomitant use of focal and radial pressure waves.

Keywords: Greater trochanteric pain syndrome; Trochanteric bursitis; hip pain; lateral hip pain; Shock waves; Radial pressure waves.

INTRODUCTION

Peritrochanteric Hip Pain or Greater Trochanteric Pain Syndrome (GTPS) is a frequent complaint in orthopedic offices and is the most common cause of pain and tenderness affecting the lateral part of the hip. The term trochanteric bursitis should be avoided because inflammation of the bursa is present in only 20% of cases, being more common an involvement of the gluteal tendons in the insertion of the greater trochanter. 1

This complaint affects 1.8 out of every 1000 adults, with women aged 40 to 60 years being the most affected. Factors such as age, obesity, knee osteoarthritis and low back pain may be predisposing to GTPS, especially in women due to the shape of the pelvis, which generates greater tension on the iliotibial tract, as well as factors related to pelvic and hip instability. 2

GTPS manifests as a deep pain in the lateral part of the hip with irradiation to the buttock

and lateral part of the thigh. (Figure 1) It gets worse when lying on the affected side, squatting, sitting with the leg crossed or even climbing stairs. Psychosocial factors can also influence complaints related to GTPS.

DIFFERENTIAL DIAGNOSIS

Lateral hip pain may be related to several pathologies (Table 1). Careful physical examination and complementary imaging are important for a correct diagnosis and indication of effective treatment. 2 Chronic low back pain with compression of nerve roots of L4 and L5 can affect the function of the gluteus and cause pain in this region.

Denervation of the gluteus medius and minimus muscles by compressive injuries of the lumbar spine can also simulate symptoms of GTPS and lead to inadequate treatments. 4

PHYSICAL EXAMINATION

The evaluation of hip pain is always challenging due to the anatomical

characteristics of the joint, which hinders the palpation of deep structures. The innervation of the region does not allow to easily differentiate a local pain from an irradiated or radicular pain, because of the common area of pain with the pathologies of the lumbar spine. Pain on palpation of the lateral aspect of the hip is the most important sign of GTPS on physical examination, where the insertion of the gluteus medius muscles in the posterior part of the trochanter and the gluteus minimus in the anterior part can be identified. (Figure 2).

Tests that evaluates the sacroiliac joint such as Patrick's (FABER) test, as the gluteus medius in the hip, such as the Trendelenburg's sign, should also be considered in the examination of patients with suspected GTPS. 3

MYOFASCIAL EVALUATION

The presence of trigger points in the hip region are frequent and are always associated with other diagnoses related to GTPS.

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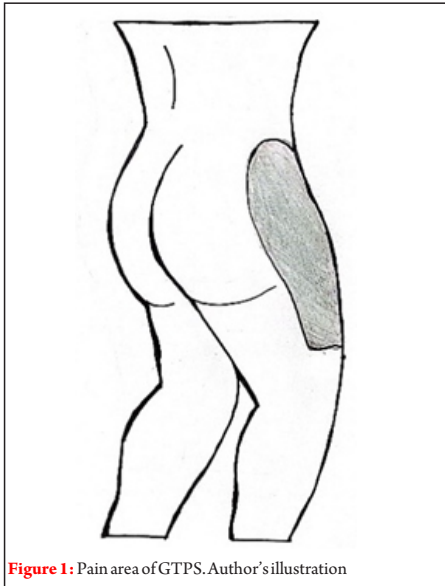


Figure 1: Pain area of GTPS. Author's illustration

Trigger points in the gluteus maximus, medius and minimus muscles as well as in the tensor fasciae latae, piriformis and quadratus lumborum are common in the pelvic region and can present an area of referred pain that can simulate symptoms of the GTPS. The referred pain pattern from the trigger point of the gluteus minimus can be felt in the gluteal, lateral or posterior region of the thigh, up to the lateral calf region of the lateral malleolus, simulating a sciatic pain. 5 If pain is perceived at the greater trochanter, the trigger points may be located in the dorsal region of the gluteus medius and maximus muscles and in the external rotators.6

IMAGING

Imaging exams are important in hip pathologies to aid in the differential diagnosis among the diseases that affect this region. The use of ultrasound scan, increasingly common in offices, works as an aid to the physical examination during the medical evaluation, helps to detect bursal collections, tendon changes, with partial or total injuries,



Figure 4: Application of focal shockwaves in the peritrochanteric region. Personal collection Dr. André Krueel.

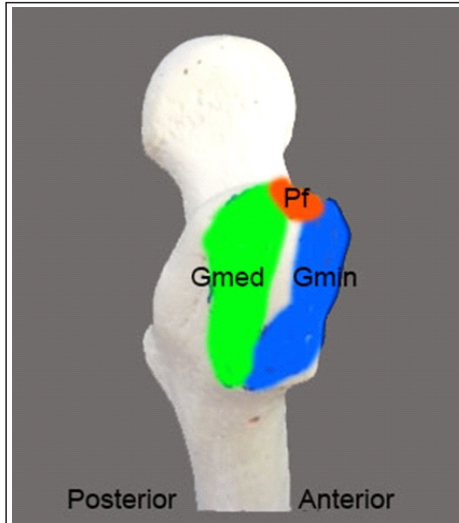


Figure 2: Lateral view of the proximal femur with insertion of the gluteus medius, minimus and piriformis tendons in the greater trochanter. Label: Gmed: gluteus medius; Gmin: gluteus minimus and Pf: piriformis. Adapted from: Gollwitzer H, Opitz G, Gerdesmeyer L, Hauschild M. Peritrochantäre Schmerzsyndrome [Greater trochanteric pain syndrome]. Orthopade. 2014 Jan;43(1):105-16; quiz 117-8. German. doi: 10.1007/s00132-013-2208-8.

and can guide the applications of shockwaves in presence of calcifications, that are frequent sites of patients' complaints. Magnetic resonance imaging (Figure 3) is another method of imaging in cases of hip pathologies. The use of gadolinium contrast may improve the accuracy of the exam and contralateral evaluation may be important to evaluate early-stage pathologies that are still asymptomatic. Patients with persistent pain, above a month, should undergo this exam to rule out diagnoses such as osteonecrosis of the femoral head and tumors in the pelvic region, which even contraindicate the use of shockwaves. 7

CONSERVATIVE TREATMENT

The traditional conservative treatment of GTPS includes using anti-inflammatory drugs, physical therapy, and changing activities of daily living.3 Corticosteroid infiltrations into the trochanteric bursa were once a widely used practice in this treatment. But can cause degenerative effects on tendon structure. So, they are currently less recommended.



Figure 3: Magnetic resonance imaging of the pelvis with emphasis on calcification site in the greater trochanter. Personal collection Dr. Francisco Robson Alves

Corticosteroids may have a superior effect in the short and medium term when compared to shockwaves and other treatment modalities, but they lose out in the long term and increase the risks previously described. 8 The cases that present the worst result with the shockwave treatment are those that have performed several infiltrations prior to the applications. It is recommended that patients who have undergone hip infiltration with corticosteroids wait at least 30 to 45 days to perform the application of shockwaves.6

SHOCKWAVE PROTOCOL

The use of shockwaves in GTPS has a grade of recommendation B according to the level of evidence verified in several publications on the subject in the specialized literature with the use of pressure wave.9 The application should be performed with the patient in lateral decubitus position after the identification of the anatomical landmarks and pain sites. (Figure 4) Treatments of GTPS with shockwaves can be

TABLE 1. MAIN DIFFERENTIAL DIAGNOSES OF GREATER TROCHANTERIC PAIN SYNDROME.	
Anterior	<ul style="list-style-type: none"> • Osteoarthritis • Osteonecrosis of the Femoral Head • Iliopsoas Bursitis • Adductor Tendinopathy
Lateral	<ul style="list-style-type: none"> • Gluteus Medius Dysfunction • Iliotibial Band Syndrome • External Snapping Hip Syndrome • Meralgia Paresthetica • Femoroacetabular Impingement
Posterior	<ul style="list-style-type: none"> • Sacroiliitis • Deep Gluteal Syndrome • Ischial Tendinopathy / Bursitis

Brazilian Medical Society of Shockwave Treatment (SMBTOC) in 2018 (Table 2) 15

REHABILITATION AFTER APPLICATION OF SHOCKWAVES

Follow-up after the application of shockwaves with proper rehabilitation and strengthening exercises are necessary for the outcome of treatment.

Gluteal muscle atrophy with local fatty infiltration in women with GTPS should be considered in a rehabilitation plan. As well as correction of postural errors and eventual dysmetria that should be investigated in a consultation prior to treatment with shockwaves.¹⁶

CONCLUSION

Shockwave treatment in GTPS presents satisfactory results, considered good and excellent in 70 to 80% of the treated cases, reducing the need for other treatments and the use of medications for long periods.

The approach of myofascial pain adjacent to the peritrochanteric region is essential, contributing to a good result, as well as a rehabilitation program should be included in the therapeutic plan established for each patient.

TABLE 2. PROTOCOL OF THE BRAZILIAN MEDICAL SOCIETY OF SHOCKWAVE TREATMENT (SMBTOC) FOR GREATER TROCHANTERIC SYNDROME	
Number of Sessions	3 to 6 sessions
Interval	Weekly
Focal or Radial	No difference
Frequency	4 a 6 Hz
Intensity	Start medium and get to high
Number of pulses per session	500 initial and 2000 with medium/high energy
Where to apply	Peritrochanteric region
Anaesthesia	No anaesthesia
Treat nearby muscles	Yes

performed with focal waves or radial pressure waves, starting with 3 sessions with an interval of a week, frequencies from 4 to 6 Hz, with 500 initial pulses in the region and at least 2000 pulses using energy medium and high intensity at the point of greatest sensitivity on palpation. Local anesthesia should not be performed. Each trigger point should receive at least 400 to 500 pulses.⁷

Furia et al. evaluated 33 patients with GTPS treated with pressure wave (2000 pulses, 10 Hz, 4 bar) and obtained positive results in a 12-month follow-up compared to a control group.¹⁰

Ramon et. al. evaluated 103 patients with GTPS treated with focal waves associated with an exercise program compared to isolated exercises. The group treated with shockwaves was safe and effective in 86.8% of the cases after 2 months of treatment, maintaining the result until the end of the

follow-up.¹¹

Another study evaluated 50 patients with GTPS due to gluteus medius and minimus tendinopathy. The group treated with focal shock waves achieved a significant improvement in pain in short and medium term when compared to the group treated with therapeutic ultrasound alone.¹²

Both radial and focal technologies are efficient in treating GTPS. However, due to the depth of the gluteus medius and minimus in some patients, the use of focal waves with higher energy should be preferred, as it delivers a more adequate energy density flow level (EFD) at the deep penetration site.^{13,14}

Due to anatomical characteristics of a deep joint and associated myofascial syndrome, hip pathologies are a good option for the concomitant use of focal and pressure waves.

According to the protocol presented by

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has/her given his/her consent for his/her images and other clinical information to be reported in the Journal. The patient understands that his/her name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflicts of Interest: Nil. **Source of Support:** None.

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