REVIEW ARTICLE

An Osteopathic Approach to Greater Trochanteric Pain Syndrome

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ABSTRACT: Greater trochanteric pain syndrome is a common office complaint in primary care. It encompasses a constellation of clinical conditions, including greater trochanteric bursitis, teninopathies affecting the gluteus medius and gluteus minimus, inflammation of the iliotibial band and abductor-adductor imbalance. Common treatments include supportive care such as rest, ice, and compression as well as corticosteroid injections, Extracoproreal shockwave therapy and home exercise programs. Surgical interventions are reserved for refractory cases. Emerging therapies include OMM utilizing muscle energy, as well as regenerative medicine such as PRP or prolotherapy.

INTRODUCTION

Greater trochanteric pain syndrome (GTPS) is a common complaint for which patients present to primary care physician's offices. Formerly referred to as Trochanteric Bursitis, this pain syndrome is multi-factorial. Historically GTPS was thought to be related to bursitis affecting one of several peri-trochanteric bursae. However, many studies using MRI and gross dissection have failed to demonstrate a significant presence of inflammation or distended bursae in patients suffering from GTPS. There has also been a paucity of bursitis found in GTPS patients, present on ultrasound and MRI in only 20.2% of patients.[1] Additional etiologies proposed for GTPS include gluteus medius and gluteus minimus tendinopathy as well as iliotibial band tendinopathy. GTPS affects 10-25% of the general population, with an annual incidence of 1.8 per 1000 patients per year, and is more common in women by a factor of 4 to 1.[2,3,4] There is also a comorbidity of 18-45% with low back pain patients.[4] GTPS may cause considerable pain, and has been clinically shown to be responsible for significantly high levels of pain and physical impairments, as well as reduced capacity for full time work and poor to fair quality of life comparable to persons with severe hip osteoarthritis.[5]

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GTPS may present with lateral hip pain which may be insidious or begin abruptly. Excessive adduction puts additional strain upon the iliotibial band (ITB) and predisposes it to injury. Excessive adduction also puts an additional strain through the gluteus medius and minimus muscles.[6] GTPS is a common occurrence among sedentary persons, as well as running athletes, particularly if their gait crosses the midline. In addition to these traditional GTPS populations, during the first year post stroke, 29 of 86 patients without pre-existing history of GTPS reported lateral hip pain. Of these 86 patients, 28 patients met the criterion for GTPS, suggesting a relationship between antagonistic muscles and spasticity post CVA.[8]

HISTORY

Patients frequently complain of lateral hip pain, which is exacerbated by lying on the ipsilateral side or with weight bearing activities. A study seeking to identify history and physical exam factors to help discriminate OA from GTPS found that patients with GTPS could ambulate more than 30 minutes before pain onset, whereas OA patients felt pain in less than 30 minutes. Patients with GTPS also had less difficulty manipulating and putting on their shoes.[9] Factors highly correlated with GTPS include ipsilateral iliotibial band tenderness, ipsilateral and/or contralateral knee osteoarthritis, low back pain and leg length discrepancies.[4] BMI was not shown to be significantly related to GTPS.[4]

Likely etiologies for GTPS may include myofascial pain, trochanteric bursitis, tendinosis and rupture of the gluteus medius and minimus tendon, and external snapping hip, all of which may be contributory to the clinical syndrome. In addition, alternative etiologies such as hip osteoarthritis, lumbar radiculopathy or other spine pathology, avascular necrosis of the hip, fracture or stress fracture of the femur, slipped capital femoral epiphysis as well as referred visceral pain should be considered.[10]

PHYSICAL EXAM

A thorough neurological and musculoskeletal exam including incitatory testing such as straight leg raise should be undertaken. Particular care should be given to ascertaining location, quality, severity, as well as exacerbating and alleviating factors to help eliminate alternative etiologies for their pain. Differentiation from hip osteoarthritis is an important but challenging undertaking.

There has been debate as to the reliability of physical examination in delineating GTPS from OA. The Altman Criteria (1991) clearly define OA, but do not lend information as to the diagnosis of GTPS. Suggested examinations have included the FABER test, Ober Test, the Trendelenburg Test and palpation of the greater trochanter for pain (Sometimes referred to as the"Jump sign"). Fearon et al suggest that the FABER test is reliable at distinguishing GTPS but only if the pain reproduction occurs in the lateral hip, with an odds ratio of 43.[7,9] They also calculated the Ober test as having an odds ratio of 13.2 irrespective of the location of pain reproduction.[9] Trendelenburg test was found to have 73% sensitivity and 77% specificity for detecting a tendon tear of the gluteus medius.

IMAGING

Several imaging modalities are readily available for investigating lateral hip pain concerning for GTPS. Plain X-Ray, ultrasound and MRI each have a niche in exploring the anatomy and related conditions contributing to GTPS.[19]

Plain film radiography has been found useful in evaluating the arthritic nature of the joint, but also in identifying calcific tendinitis in up to 40% of patients with GTPS.[3] Trochanteric protrusions greater than 2 mm were found to correlate to abnormalities in the gluteus medius or minimus.[3] In a study by Steinert et al., 27 of 29 GTPS patients included with trochanteric surface irregularities greater than 2 mm had confirmed abductor tendon pathology.[22]

Ultrasound examination may show loss of fibrillary architecture suggestive of tendinopathy, as well as partial and complete tendon tears. It also is able to provide real-time evaluation of etiologies such as snapping hip.[12] Ultrasound is estimated to have a sensitivity of 79% and a PPV of 1.0 for gluteus medius or minimus tears and 61% sensitivity and 100% specificity for identifying bursal pathology. Ultrasound was also shown to correlate very well with intraoperative findings.[12] An investigation using ultrasound in the evaluation of GTPS in 877 patients found that 700 (79.8%) did not have bursitis on US, 438 (49.9%) had gluteal tendinosis, and 250 (28.5%) had thickened IT bands.[1]

MRI is more costly but delineates soft tissues optimally. MRI may demonstrate T2 hyper intensity in the gluteus medius, gluteus minimus or the peri-trochanteric region. MRI correlates very well with intra-operative findings, so its utilization in the preoperative period is certainly advisable. Unfortunately, due to its high sensitivity, it identified tendon pathology in 21 (53%) of asymptomatic patients in a study by Woodley et al., illustrating the high false positive rate for this modality with regards to GTPS.[23] Klontzas et all confirmed this finding by reviewing 174 examinations, 91 (52.3%) of which demonstrated peri-trochanteric edema, 34 (19.5%) had distended bursae. Of these 174 examinations, 78 (44.8%) had gluteus medius tendon degeneration. These patients were then examined with provocative tests described above to assess for GTPS. Only 8 of these 79 patients had pain on examination, compared with 4 of the remaining 95 patients without demonstrated degeneration.[13]

TREATMENT

Conservative Therapy

Patients with GTPS are largely successful with conservative measures in alleviating their pain. Rest, ice and anti-inflammatory medications are the cornerstones of initial management. Interventions such as home exercise routines, physical therapy, shock wave therapy, and corticosteroid injections are often effective at reducing pain in GTPS.

Home exercise routines include activity modification to avoid repetitive motions or lying on the affected side. Exercises are intended to address the weakness of the hip abductors and include piriformis stretching, ITB stretching, straight leg raises, wall squats, and gluteal strengthening. After 15 months, this resulted in an 80% remission rate. Initial results at one month, however, were delayed with only a 7% remission rate.[2,14]

Extracorporeal Shockwave Treatments (ESWT) was also studied. The shockwave treatment causes cortical inflammation and is believed to help initiate the healing cascade. After receiving three sessions of ESWT, patients demonstrated a 13% improvement at one month, 68% improvement at four months, and at 15 months a 74% remission rate.[15]

Corticosteroid Injections work very well in the short term with 75% improvement at one month, but after 15 months in the above study, patients saw only a 48% remission rate. There is no demonstrable benefit to performing GT steroid injections under fluoroscopy,[16] although ultrasound guided needle placement may be effective in ensuring proper needle placement, particularly in patients with larger body habitus, especially as it also offers a meaningful evaluation for tendon pathology.

Surgical Interventions

For patients suffering refractory GTPS pain, and for those for whom a prolonged period of inactivity is intolerable, surgery is an option. There have been several proposed procedures to address GTPS. The most commonly performed is a repair of the gluteus medius or minimus tendons. If there is no gluteal tendinopathy

present, then lengthening of the ITB has been proposed as well as trochanteric bursectomy.[2] These interventions have good efficacy for the recalcitrant GTPS patient. In addition, a recent publication on endoscopic surgical treatment of GTPS has proven effective and safe.[17]

Future research options:
Osteopathic Treatment & Regenerative Medicine

Osteopathic Manipulative Treatment (OMT) is intended to help support the intrinsic mechanisms for healing within the body by way of improving mechanical factors, removing restrictions to free movement and relieving musculotendinous barriers, identified as somatic dysfunctions. Osteopathic evaluation for GTPS focuses upon motion dynamics in the lumbar spine and pelvis which may be contributory to creating an aberrant motion dynamic in the femoro-acetabulum which puts excessive strain on the hip adbuctors.

Furthermore, OMT pays particular attention to the role of agonist-antagonist relationships. As has already been discussed, in post-stroke patients who have sudden onset of adductor-abductor imbalance, GTPS may evolve rapidly and will hinder recovery potential. Restoration of the balance within the hip should be a priority with GTPS patients. Techniques such as muscle energy are of particular utility in this condition. Muscle Energy was first described by Fred Mitchell, Sr, D.O. and involves the positioning of a body segment in a position so as to stretch the targeted muscle to its extreme dysfunctional barrier. Once in this position, a gentle contraction of the afflicted muscle is elicited from the patient, and is resisted isometrically for several seconds. This process is repeated three to five times, with repositioning in the new barrier after each serial contraction-relaxation cycle. Similarly, while performing isolytic muscle energy, the operator meets and exceeds the force supplied by the patient, resulting in a lengthening of the affected muscle during contraction, as well as resetting the dysfunctional barrier.[18] Isolytic Muscle Energy treatment of the adductor magnus on the ipsilateral side has a pronounced and immediate effect on Greater Trochanteric tenderness. Anecdotally, it has also shown promise in long term resolution of GTPS, especially when adductor stretching exercises are added to the home exercise regimen, and research into this approach is underway.

DISCUSSION

GTPS is a complicated clinical condition that has a multitude of possible etiologies. Historically considered to be a result of greater trochanteric bursitis, imaging and intra-operative studies have failed to document significant inflammation for most GTPS patients.

Gluteus medius and Gluteus minimus tendon pathology has also been implicated, and surgical repair in refractory GTPS with coexistent tendon pathology does improve pain scoring, however, several studies have documented MRI confirmed tendon pathology in the absence of clinical symptoms, suggesting that this may only play a role in a subset of GTPS patients.

Consideration of the agonist-antagonist theory merits consideration, but to date, no studies have sought to explore this etiology for GTPS. Certainly, Koseoglu et al. have reported a prominent denovo incidence rate among post-stroke patients,[8] lending credence to the consideration that adductor-abductor imbalance may pre-dispose patients to the development of GTPS, ITB thickening as well as tears of the gluteus medius and minimus in their attempts to counteract the adductor magnus spasticity. OMT to address these inequities has been effective anecdotally, but clinical research to date is lacking. One study investigating the efficacy of OMT for GTPS is underway.

In addition, research exploring the value of regenerative medicine, ie. Platelet Rich Plasma (PRP) or prolotherapy has not been pursued to date. However, ESWT has been proven effective in GTPS, and the mechanism of action is analogous to that of PRP and prolotherapy, however PRP and prolotherapy allow for more targeted application of healing elements particularly if aided by ultrasound assisted needle placement.

SUMMARY

GTPS is a pain condition that limits older adults in their capacity to work full time, as well as for athletes whose performance is limited by the pain. It is a complicated clinical condition which may be diagnosed effectively by a history of lateral hip pain, worse with weight-bearing, a positive FABER test with lateral hip pain or a positive Ober's test. It may be effectively treated by conservative means such as home exercise, physical therapy, corticosteroid injections, and extracorporeal shock wave therapy (ESWT). Current therapies provide either short- or long-term benefit, but should be used in combination to maximize recovery. Refractory cases may be eligible for surgical interventions. Promising clinical adjuncts include osteopathic manipulative treatments and platelet rich plasma (PRP) or prolotherapy treatments to address this condition. Further research into these emerging treatments is needed.

AUTHOR DISCLOSURES:
No relevant financial affiliations

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