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Masterclass

Evaluation and management of greater trochanter pain syndrome

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ABSTRACT

Greater trochanteric pain syndrome is an enigmatic but common cause of lateral hip symptoms in middle-aged active women. The most common manifestation of this syndrome is a degenerative tendinopathy of the hip abductors similar to the intrinsic changes seen with rotator cuff pathology in the shoulder. There are no definitive tests to isolate the underlying pathology and palpation is a non-specific means by which to differentiate the source of the pain generator. The physical examination must comprehensively evaluate for a cluster of potential impairments and contributing factors that will need to be addressed to effectively manage the likely functional limitations and activity challenges the syndrome presents to the patient. Compressive forces through increased tension in the iliotibial band should be avoided. Intervention strategies should include education regarding postural avoidance, activity modifications, improvement of lumbopelvic control, and a patient approach to resolving hip joint restrictions and restoring the tensile capabilities of the deep rotators and abductors of the hip. A number of reliable and validated hip-specific self-report outcome tools are available to baseline a patient's status and monitor their progress. Further investigations to identify the epidemiological risk factors, establish effective treatment strategies, and predict prognosis are warranted.

The term greater trochanteric pain syndrome (GTPS) is a label that references a variety of chronic hip pain diagnoses. These conditions typically encompass several soft tissue lesions including coxa saltans (external snapping hip), trochanteric bursitis, and gluteus medius and minimus tendinopathies (Strauss, Nho, & Kelly, 2010). The commonality of these conditions is prolonged, intermittent peritrochanteric pain accompanied by tenderness to palpation overlying the lateral aspect of the hip. Historically, this syndrome has been referred to as a "bursitis", but ironically, the presentation is rarely accompanied by the cardinal symptoms of inflammation including erythema, edema, and rubor (Williams & Cohen, 2009). While trochanteric bursal inflammation is often implicated it is rarely the culprit responsible for the patient's symptoms (Del Buono, Papalia, Khanduja, Denaro, & Maffulli, 2012; Silva, Adams, Feinstein, & Arroyo, 2008), Bird (Bird, Oakley, Shnier, & Kirkham, 2001) showed magnetic resonance imaging (MRI) evidence in a group of 24 subjects that nearly all had gluteus medius abnormalities but bursitis was only present in 8% of the subjects. GTPS is a more apt description of this geographically located disorder allowing for the possibility of many contributors to the symptoms. This paper will discuss the differential diagnosis of numerous potential sources of the lateral hip pain that require unique treatment approaches to affect a remedy. These could include musculotendinous degeneration, myofascial inflammation, compressive friction, or referred pain from intra-articular or lumbopelvic pathology.

The pathophysiology of GTPS can be classified by a variety of mechanisms such as the source of the symptoms (neurologic, soft tissue, skeletal, systemic, or referred) (Fig. 1), the location of the symptoms, or the mechanism of onset (traumatic vs. overuse). This review will focus on the most typical variety of GTPS in which the symptoms emanate from soft tissue disorders. In this regard the soft tissues structures in the trochanteric area are similar to those in the area of the greater tuberosity of the shoulder. Like the supraspinatus and infraspinatus, the gluteus medius and minimus tendons are prone to trigger points, tendon degeneration, or tendon failure. Likewise, the subacromial bursa of the shoulder or deep trochanteric bursae in the hip have potential for inflammation. It has even been postulated that overlying rigid and unyielding structures such as the acromion and coracoacromial ligament in the subacromial space or the iliotibial band (ITB) at the hip may cause external impingement or compressive irritation (Ho & Howard, 2012).

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Peripheral Nerve	Soft Tissue	Skeletal	Systemic	Nerve Root Referred
Meralgia Paraesthetica	• Bursopathy • Intrinsic Degenerative Tendinosis • Traumatic Tendon Avulsions • Calcific Tendonitis • Myofascial • Snapping Hip • Iliotibial Band Syndrome	Fracture Enthesophyte Arthritis	• Cancer Prostate • Endrometriosis • Irritable Bowel Syndrome • Ovarian Cyst • Inguinal Hernia	L2-3 Radiculopathy

Fig. 1. GTPS classification by source.

While GTPS can stem from a variety of mechanisms the most common onset is from degenerative, interstitial changes in the hip abductor tendons. This is similar to the intrinsic tendon changes seen in rotator cuff pathology (Connell, Bass, Sykes, Young, & Edwards, 2003; Grumet, Frank, Slabuagh, Virkus, Bush-Joseph, & Nho, 2010; Kagan, 1999; Kong, Van der Vliet, & Zadow, 2007). Similar to the shoulder, impingement forces through external compression may then be magnified by altered biomechanics and functional compensations. Histological investigation and evidence from MRI (Fearon, Scarvell, Cook, & Smith, 2010; Schapira, Nahir, & Scharf, 1986) or ultrasound identification (Kingzett-Taylor et al., 1999) of calcific changes about the greater trochanter in 13–40% of patients with chronic GTPS substantiate this perspective.

In an industrial society the prevalence of GTPS is approximately 10–25% in between the fourth and sixth decades of life and is 2–5-times more likely in females but represents only 2.5% of hip injuries in a sporting population (Anderson, Strickland, & Warren, 2001; Bird et al., 2001; Shbeeb & Matteson, 1996; Williams & Cohen, 2009). Segal et al. (2007) showed the prevalence of unilateral and bilateral GTPS to be 15% and 8.5% in women and 6.6% and 1.9% in men respectively. In a primary care setting the reported incidence of GTPS is around 2 per 1000 per year (Lievense, Bierma-Zeinstra, Schouten, Bohnen, Verhaar, & Koes, 2005). Similar incidence was found in a survey of active U.S. military service members with a fivefold higher risk in women (Blank, Owens, Burk, & Belmont, 2012). These authors speculated that this female predisposition may be secondary to anatomical differences stemming from a relatively wider pelvis, which alters the muscle biomechanics of the gluteal muscles and the ITB in the area of the greater trochanter. At this time it unclear as to the specific incidence of gluteus medius and minimus tendinopathy as the primary cause of GTPS. One study reported an incidence of gluteal tendinopathy in the range of 9–23% in an age-matched group of patients undergoing alternative hip surgical procedures (Howell, Biggs, & Bourne, 2001). Since these rates are similar to the overall incidence of GTPS one could speculate that a large percentage of GTPS is associated with gluteal tendinopathy.

A number of risk factors have been implicated in the likelihood of developing GTPS. Because of the functional connection between the lumbopelvic and hip region it is not surprising to see that a concurrent or past history of low back pain was found in 20–62% of patients with GTPS (Collée, Dijkmans, Vandenbroucke, Rozing, & Cats, 1990; Schapira et al., 1986; Segal et al., 2007; Tortolani, Carbone, & Quartararo, 2002). In a cross-sectional, multi-center observational study, Segal (Segal et al., 2007) additionally found that ITB tenderness and knee osteoarthritis were positively related to the presence of GTPS. It is postulated that these confounding variables adversely alter lower-limb biomechanics and create abnormal force vectors at the hip. In contradiction to popular clinical sentiment, Segal (Segal et al., 2007) could not find a positive relationship based on obesity (>30 BMI) or limited hip internal rotation mobility. Unproven, but possible extrinsic risk factors for the athletic patient may include asymmetrical shoe wear, running on a cambered or crowned surface, or an unreasonably rapid progression in the intensity, duration, or frequency of training. It is also hypothesized that inadequate core stability, gluteal weakness, functional limb-length discrepancies, and alterations in the pronation-supination sequence could contribute to the probability of developing GTPS. Runners who adduct the hip beyond midline in the gait cycle are predisposed to this problem particularly if they routinely run on cambered surfaces that create limb length inequality (Anderson et al., 2001).

1. History

Differential diagnosis is difficult given the geographic proximity of many potential tissues that could be involved in the symptomatic complaint. A thorough patient interview and detailed physical exam can help tease out the specific source of the patient's chief complaint. Generally, anterior hip and groin pain comes from intra-articular disorders while lateral hip pain is more likely from extra-articular disorders that are more insidious in their onset (Grumet et al., 2010). For GTPS, solicitation regarding the primary complaint typically yields a concern of intermittent, yet persistent lateral hip pain that is often exacerbated by lying on the affected side, sitting with the legs crossed, prolonged weight-bearing in unilateral stance, and a reduced tolerance for physical exercise (Kimpel, Garner, Magone, May, & Lawless, 2014). Symptoms may also extend laterally down the thigh or posteriorly into the gluteal region in a non-dermatomal pattern, particularly in the more acute phase of the injury (Fig. 2).

Again analogous to the onset of shoulder pain in the adult, the mechanisms of injury have been attributed to a variety of sources. Traumatic impact to the soft tissues or acute tendon tears are possible but insidious onset secondary to intolerance to eccentric tensile strain and cumulative microtrauma is more common. Tendon degeneration, poor postural habits, or faulty mechanics from lower extremity malalignment may all contribute to this more gradual commencement of the problem.

2. Physical examination

Because of the propensity for referred pain and frequent concurrent presence of intervertebral disc pathology, facet joint degeneration, or sacroiliac joint dysfunction the examiner should perform a neurological and screening examination for the lumbosacral spine. Less likely causes of referred lateral hip pain from non-musculoskeletal origin could include endometriosis, prostate disease, inflammatory bowel disease, ovarian cysts, or inguinal hernias. Meralgia paresthetica is a nerve entrapment that results in