

An unusual cause of external snapping hip

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ABSTRACT

The external snapping hip syndrome is a condition characterized by palpable or audible snap on the lateral region of the hip occurring during movements and sometimes associated with pain. It is typical of young adults and athletes and can be favored by the abnormal sliding of the iliotibial band or of the gluteus maximus muscle over the greater trochanter. We present a case of external snapping hip syndrome occurring in a young woman secondary to a dysmorphic sickle-shaped myotendinous junction of the gluteus maximus muscle. Diagnosis was allowed by an integrated clinical and radiological approach, based on dynamic ultrasound and magnetic resonance imaging (MRI).

CASE REPORT

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A 34 year old female presented with an audible click in the lateral region of the left hip associated with pain during flexion and external rotation, lasting for several years. She also reported difficulties in climbing stairs, running and kneeling. She reported no history of trauma, congenital hip abnormalities or other significant medical problems.

An audible and palpable snap in the lateral region of the left hip could be reproduced at clinical examination by femoral rotation and flexion.

Radiograph of the hip was normal (Fig.1). Dynamic ultrasound examination of the hip, performed using a linear 5-12 MHz probe, revealed an abrupt and painful abnormal snap associated with the anterior dislocation of the gluteus maximus muscle over the greater trochanter (Fig.2 a,b) during hip motion in abduction and external rotation.

MRI study (Signa, GE Medical System 1.5 T) showed an evident dysmorphism of the left anterior part of the gluteus maximus muscle, characterized by a sickle-shaped myotendinous junction, associated with a fatty degeneration of the muscle (Fig. 3a,b). An edematous area adjacent to the left posterior greater trochanter, caused by friction syndrome, was detected by an area of low signal intensity on T1-weighted spin echo sequence (Fig.3a), and an area of high signal intensity on T2 fat-saturated sequence (Fig.3c,d).

The patient's symptoms progressively improved with non-steroidal anti-inflammatory drugs (NSAIDs) and stretching exercises. Because of the beneficial effect of the therapy, the patient decided to continue medical treatment and refused surgery.

DISCUSSION

The "snapping hip syndrome" or "coxa saltans" is a well-recognized complex symptom, characterized by an audible snapping during hip motion sometimes associated with hip pain. The identification of the underlying anatomical defect is often very challenging and radiological investigation is mandatory.

Snapping hip syndrome occurs in 5 to 10% of the general population [1,2], and is often bilateral [1]. Teenagers and young adults are typically affected [1,2]. In most of the cases, it is not associated with any favoring occupational or athletic activity, nor to traumatic events, even if a higher incidence has been reported in people participating in activities requiring the extremes of hip motion (dancers, soccer players and runners) [1,2,3].

It can be ascribable to intra-articular [1,4] or extra-articular causes [1,2].

Extra-articular causes, responsible for an abnormal motion of the hip tendons, include two different forms [1,2]: lateral (or external) and medial (or internal) snapping hip.

Lateral (or external snapping hip) is caused by an abnormal anterior motion of the iliotibial band, or, more rarely, by an abnormal motion of the gluteus maximus muscle over the greater trochanter during flexion and external rotation of the hip. In most of the cases, it is related to a thickening of the iliotibial band; rarely, it is due to a fibrotic myotendinous junction of the gluteus maximus muscle [5]. To our knowledge, this is the first case showing a dysmorphic sickle-shaped myotendinous junction of the gluteus maximus muscle, responsible for lateral snapping hip, diagnosed with radiological procedures. Only another case diagnosed by findings at surgery has been reported [6]. Usually, patients present with pain in the lateral region of the hip or in the buttock.

Painful snapping hip is usually associated with tendinosis or bursitis, related to secondary of chronic irritation caused by a friction syndrome [7]. Patient complains of dull hip pain associated with an audible snap, occurring when the hip is abducted and externally rotated [1,2].

The diagnosis is usually made from clinical examination, during which provocative tests (such as femoral rotation, flexion and abduction) are very useful [1]. Imaging is used to confirm the diagnosis and identify the underlying anatomical defect [1,2]. In case of extra-articular snapping hip, radiograph of the pelvis is normal [1,2]. Dynamic ultrasound represents the gold standard diagnostic technique to point out the abnormal movement of the iliotibial band or of the gluteus maximus muscle [2,8]. The linear transducer (9-12-MHz) is placed transversely over the greater trochanter, and the patient is asked to flex and externally rotate the hip: the abrupt snapping tendon during hip motion can be detected [2,8]. Because of its high sensitivity and panoramic view, MRI has to be used in order to detect joint and tendon abnormalities, as tendinopathies [1,7] or dysmorphisms [6], associated with

peritendinous fluid, bursitis, atrophy and fatty muscle degeneration, and edema of the soft tissue caused by friction syndrome. Finally, MRI is also useful to exclude other extra or intra-articular hip abnormalities [1,4,9].

Because most of external snapping hip cases resolve with conservative treatment (based on rest, stretching, anti-inflammatory medications and injections into the trochanteric bursa), a correct diagnosis is fundamental to avoid unnecessary surgical procedures, that should be performed only in cases refractory to conservative treatment [1,10]. Surgical treatment is reserved for cases refractory to medical therapy and is usually associated with complete resolution of the snap and pain relief [1,10]. However, a mild to moderate trendelenburg gait and persistent hip abduction weakness were reported in few cases represent possible surgical complications [1,10].

Differential diagnosis includes:

a) *Medial or internal snapping hip*: this pathological entity is characterized by an abnormal motion of the iliopsoas tendon over the iliopectineal eminence of the pelvis, or over the lesser trochanter [3,9]. It is usually associated with bursitis and pain in the anterior thigh or groin [3]. Dysfunction of the iliopsoas increases the anteriorly directed force from the femur to the acetabulum, increasing the risk of hip labral tear [4]. Radiography and CT of the pelvis show no bone abnormalities. Diagnosis is allowed by dynamic ultrasound that shows the abnormal motion of the iliopsoas tendon. MRI T1 and T2 fat-saturated sequences show signal intensity abnormalities of the iliopsoas tendon and peritendinous soft tissues. MRI arthrography is useful to exclude the presence of a labral tear. Surgical treatment is required in most of the cases [3].

b) *Intra-articular causes*, including cartilage defects, loose bodies, acetabular labral tears and femoro-acetabular impingement [1,4]. MRI arthrography represent the gold standard technique to assess the presence of intra-articular abnormalities. Radiography and CT can detect calcific loose bodies and bone alterations [1,4].

c) *Bone dysmorphism*, including coxa vara and dysplastic hip. Both entities could be detected using radiography, that shows acetabular or femoral epiphysis dysmorphism such as in the dysplastic hip or a decrease of femoral neck angle such as in the coxa vara. CT is used only for pre-surgical planning. MRI and ultrasound are not routinely used [11,12].

TEACHING POINT

Ultrasound and MRI are fundamental to point out the underlying anatomical defect when snapping hip syndrome is clinically suspected. Even if rare, a dysmorphic myotendinous junction of the gluteus maximus muscle has to be considered among the possible causes of external snapping hip.

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FIGURES



Figure 1: 34 year old female affected by external snapping hip. Antero-posterior radiograph of the pelvis showing no abnormalities.

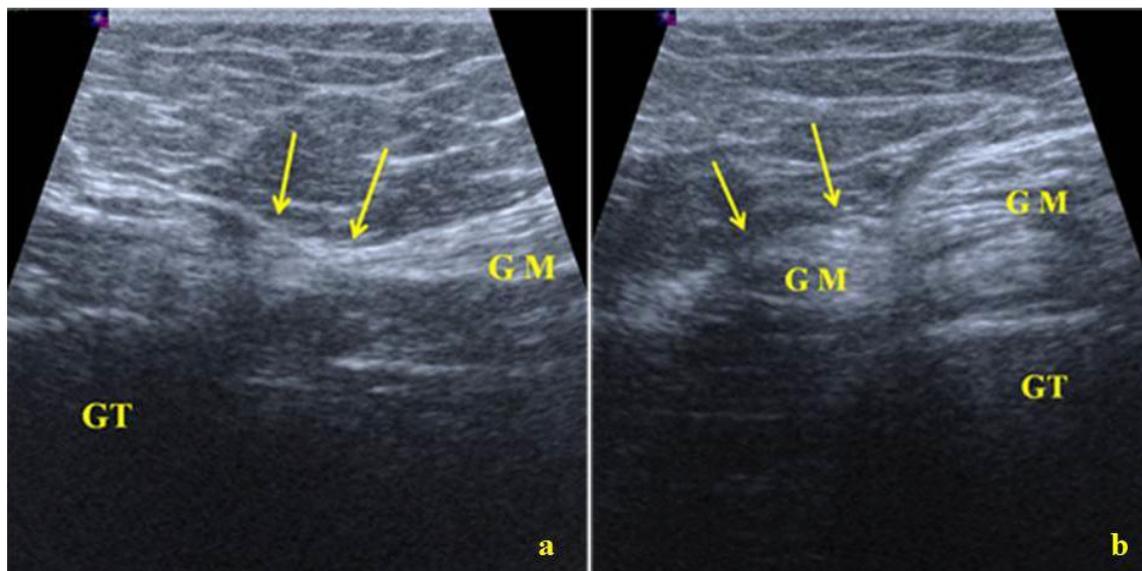


Figure 2: 34 year old female affected by external snapping hip. Transverse sonograms (linear 5-12 MHz probe) were performed at the level of the left greater trochanter. When the hip is adducted and extended, the miotendineous junction of the gluteus maximus muscle (GM) (arrows) is located in the posterior side of the greater trochanter (GT) (a). During flexion with abduction and external rotation of the hip, dynamic sonography shows abnormal movement of the miotendineous junction of the gluteus maximus muscle (GM) (arrows) that suddenly snaps anteriorly to the greater trochanter (GT) (b).

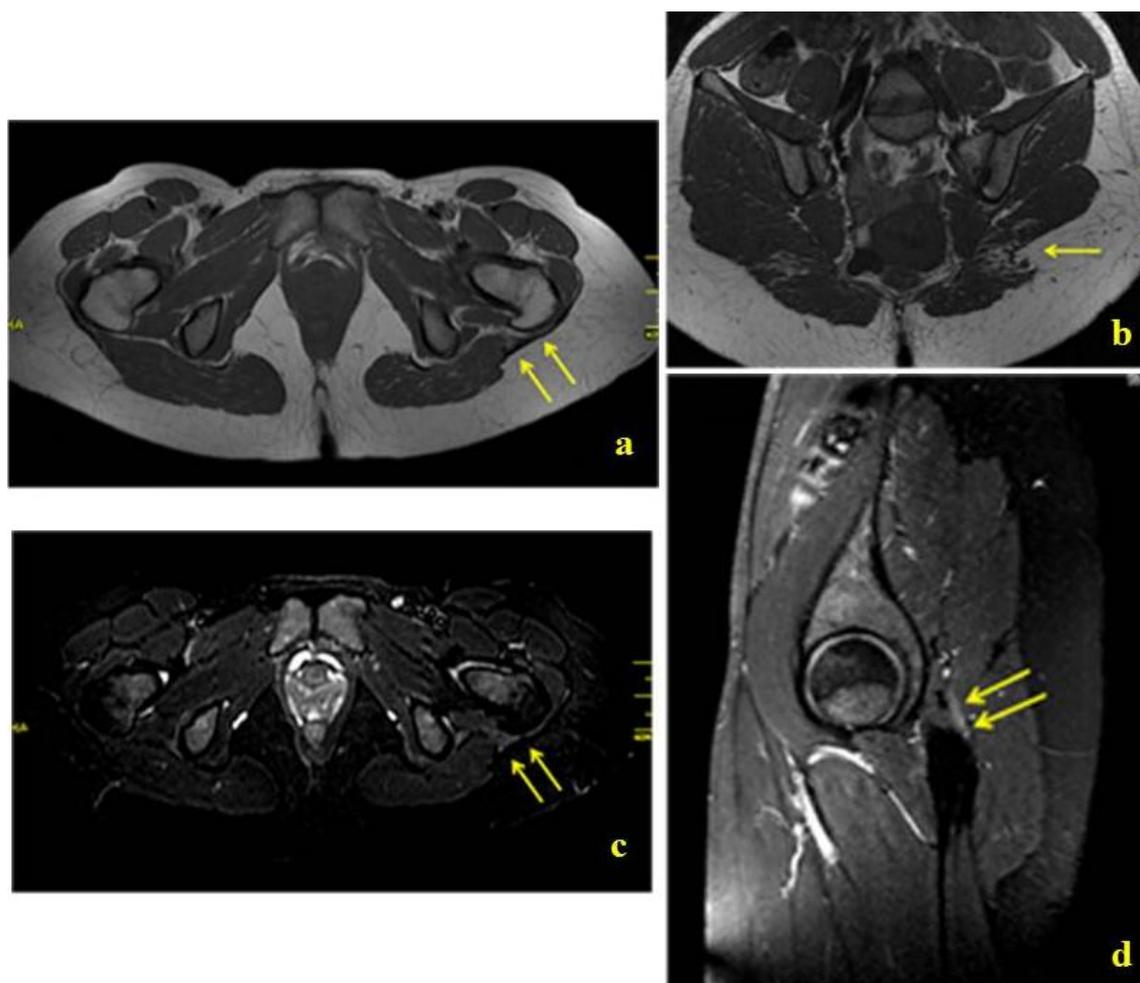


Figure 3: 34 year old female affected by external snapping hip. MRI images (Signa, GE Medical System, 1.5 T) of the pelvis. T1-weighted spin echo sequence, axial (a) and coronal (b) planes showing a sickle-shaped myotendinous junction of the gluteus maximus muscle (arrows) (a) and the atrophy and fatty muscle degeneration (arrows) (b), respectively. T2 weighted fat saturated sequence, axial (c) and sagittal (d) planes, showing a small area of high signal intensity (arrows) corresponding to a small edematous area adjacent to the left posterior greater trochanter.

	External snapping hip	Internal snapping hip	Intra-articular snapping hip	Bone dysmorphism (Coxa vara, dysplastic hip)
X-ray	No bone abnormalities	No bone abnormalities	can detect calcific loose bodies and bone alterations	Abnormal acetabular or femoral epiphysis or neck angle
CT	Not routinely used	Not routinely used	can detect calcific loose bodies and bone alterations	Not routinely used, sometimes for presurgical planning
US	Abnormal motion of iliotibial band or gluteus maximus muscle tendon over the greater trochanter	Abnormal motion of iliopsoas tendon over the iliopectineal eminence or the lesser trochanter	Not routinely used	Not routinely used
MRI - T1	hypointensity of the iliotibial band or myotendinous junction gluteus maximus muscle and greater trochanteric bursa corresponding to edema or inflammatory tissue	hypointensity of the iliopsoas tendon, iliopsoas bursa and lesser trochanter bursa corresponding to edema or inflammatory tissue	Hypointensity of the loose bodies and joint fluid. MRI arthrography detects the intra-articular lesion	Not routinely used
MRI - T2	hyperintensity of the iliotibial band or myotendinous junction gluteus maximus muscle and greater trochanteric bursa corresponding to edema or inflammatory tissue	hyperintensity of the iliopsoas tendon, iliopsoas bursa and lesser trochanter bursa corresponding to edema or inflammatory tissue	Hypointensity or intermediate signal intensity of the loose bodies and hyperintensity of the joint fluid	Not routinely used

Table 1: Differential diagnosis table of snapping hip

Etiology	<p>External snapping hip: friction of the iliotibial band or gluteus maximus muscle over the greater trochanter.</p> <p>Internal snapping hip: friction of the iliopsoas tendon over the iliopectineal eminence or over the lesser trochanter</p> <p>Intra-articular snapping hip: cartilage defects, loose bodies, acetabular labral tears and femoro-acetabular impingement</p>
Incidence	5-10% of the general population, often bilateral
Gender ratio	slight predilection for females
Age predilection	teenagers and young adult (15 to 40 year of age)
Risk factors	activities requiring the extremes of hip motion (dancers, soccer player, runners)
Treatment	conservative medical management and surgery for refractory cases
Prognosis	favorable in the majority of patients
Findings on imaging	abnormal motion of tendon, tendon and peritendon and muscle and bursa abnormalities

Table 2: Summary table of snapping hip

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ABBREVIATIONS

MRI = magnetic resonance imaging
 NSAIDS= non-steroidal anti-inflammatory drugs
 MHZ= mega Hertz

KEYWORDS

snapping hip; coxa saltans; iliotibial band; gluteus maximus muscle

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