

Periarticular Hip Pain

Psoas Snapping and impingement

Sports Hip Warwick 2010

UK

Dr. Luis Perez Carro

lpcarro@gmail.com

www.santanderhipmeeting.com

INTRODUCTION

- ✓ The iliopsoas consists of both the iliacus and psoas major muscles. The fibers of these muscles converge to become one just deep to the inguinal ligament, forming the iliopsoas tendon.
- ✓ **Origin:** Psoas major part: Transverse processes, bodies, and intervertebral discs of T12 to L5. Iliacus part: Iliac fossa, ala of sacrum and anterior sacro-iliac ligaments.
- ✓ **Insertion:** Lesser trochanter of the femur via common iliopsoas tendon.
- ✓ **Innervation:** Psoas major part: Ventral rami of lumbar nerves (L1-L3). Iliacus part: Femoral nerve (L2-L4).
- ✓ **Actions:** Chief flexor of the thigh. Stabilises the hip joint. Postural muscle, ie, maintains an erect posture at the hip. Flexes the trunk rising from a supine position.

ANATOMY

Iliopsoas tendon more complex than typically described with two anatomic variations (Polster 2008)

- Fatty fascial cleft separating the iliopsoas tendon from a thin intramuscular tendon in the medial aspect of the lateral portion of the iliacus muscle.
- Iliacus fibers continue to cross down to the level of the lesser trochanter without a discernable separate iliacus tendon.

Iliopsoas bursa separates the tendon from the hip capsule and lies between the pubofemoral and iliofemoral ligaments.

ILIOPSOAS PATHOLOGY

- Muscle: Iliopsoas muscle strain
- Bursa: Iliopsoas Syndrome is a condition where a person either has iliopsoas bursitis (irritation and inflammation of the iliopsoas bursa) and/or iliopsoas tendinitis (irritation and inflammation of the iliopsoas tendon).
- Tendon: Iliopsoas Tendon Pathology. The iliopsoas can be a source of snapping hip as well as potential source of “soft tissue” impingement (as opposed to a bony impingement).
 - Iliopsoas / Internal Snapping Hip
 - Triple Impingement
 - Iliopsoas Impingement
 - Iliopsoas Impingement after total Hip Arthroplasty
- Other conditions: Rupture, tumors, hematomas, infections, etc

ILIOPSOAS MUSCLE STRAIN

Definition

Overuse of the muscle caused by repetitive stresses that exceed the physiologic limits of the tissues. Muscles are vulnerable to the effects of repetitive tensile forces.

Diagnosis

Low back pain-Lifting pain-Groin pain (Buttock, low back, hip, pseudo sciatic, anterior thigh, “paralyzed” leg)—**Shoulder pain** (The area that the psoas attaches to the spine is also the point of attachment of the latissimus dorsi)

- Difficulty straightening up, painful to stand straight especially after sitting or after sleeping
- Pain into one groin
- Pain or burning into labia or testicle
- Deep low back pain: usually lower area, one side
- Pain down inside of leg
- Numbness or burning on the side to the front of the thigh: “meralgia paresthetica”
- Whole leg goes numb/ weak – may collapse
- (Non-radicular, non-physiological weakness/“paralysis”): esp. with standing up after sleep or prolonged sitting – i.e., airplane ride
- “Clicking” or “snapping” in the pelvic or groin area

Treatment

- Education: Explain the causes and mechanisms
- Identify the aggravators: Evaluate all behaviors, activities, and anatomical conditions that are repetitive
- Balance the body: Feet, arches, leg-length, hemi-pelvis, arm /elbow length, sleep-position, transportation, vehicle, clothing / pockets, chair / arms.
- Release muscle spasm: Home Exercise Program (education, supplies) Home / daytime stretching. Night sleep position with knee immobilizer.
- Physical medicine using effective psoas-specific techniques.
- Prevent recurrence.

ILIOPSOAS /INTERNAL SNAPPING HIP

Definition

- The iliopsoas tendon can snap over the iliopectineal eminence, acetabular rim, or femoral head / femoral head-neck junction (FAI).
- A greater incidence of snapping hip has been noted in ballet dancers, although it is often not bothersome in this population. Pain or discomfort associated with internal snapping is an indication of associated iliopsoas tendonitis, either as a result of acute inflammation or more chronic degeneration and tendinopathy.

Diagnosis

- Patients report anterior groin pain associated with extending the hip from a flexed position, and intermittent catching, snapping, or popping of the hip. Often is associated with a hyperlordotic lumbar spine.
- Because the iliopsoas is also a flexor of the trunk on the hip, iliopsoas tendonitis may occasionally present with associated low back pain.
- Iliopsoas tendon is tender to palpation or may be painful with resisted hip flexion.
- Moving the patient from the FABER position into extension, adduction, and internal rotation often elicits a palpable snap. The snapping is felt anteriorly not laterally.
- Snapping of the iliopsoas tendon may not be seen with ultrasound evaluations since the scans are performed with the patient supine.

Treatment

-Typically responds to relative rest, NSAIDS, Psoas stretching / muscle relaxation, core strengthening / postural training.

-Corticosteroid bursal injection can be therapeutic and diagnostic.

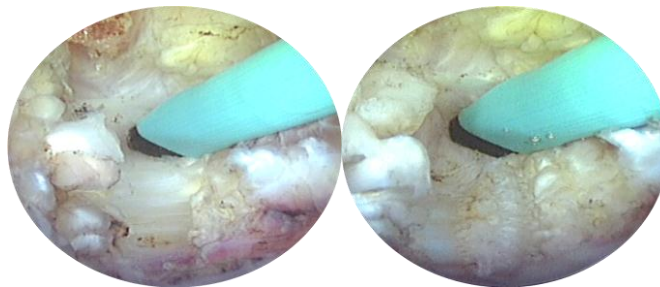
-Surgical:

- Open/Arthroscopic.
- Recent studies have shown that an arthroscopic iliopsoas tendon release can effectively treat painful snapping of the tendon. (Byrd, 2005; Ilizaliturri, 2005; Flanum & Keene, 2007)

Endoscopic/Arthroscopic: Can be done three vias:

✚ **Endoscopic at the level of lesser trochanter: (Byrd,Sampson,Ilizaliturri)**

- Release traction
- Flex and externally rotate the hip
- Localize the lesser trochanter using fluoro
- Portals: Anterolateral inferior: 2-3 cm distal and slightly anterior to the anterolateral portal/Scope. Accessory inferior: 3-4 cm distal to the inferior anterolateral portal: Working portal.
- Release the tendon

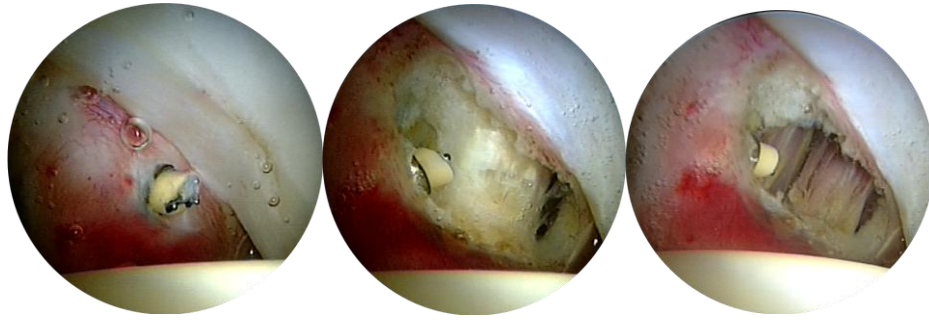


✚ **Via the peripheral compartment**

- Release traction and flex the hip
- The peripheral compartment can be entered while keeping the scope outside the joint with release of traction or it can be accessed by placing a spinal needle over the anterior femoral neck after release of traction and hip flexion.
- The iliopsoas tendon can be seen through a hiatus when present or a capsulotomy can be made medial to the zona orbicularis at the level of the inferior-medial synovial fold to visualize the tendon.
- Release the tendon until the overlying muscle is seen.

✚ **Can be done via the Central compartment**

- Can be seen at or inferior to the anterior portal if hiatus present.
- Anatomic landmark: (Psoas facet) There is usually a groove or indentation at 2-3 o'clock in the anterior lip of the acetabulum where the psoas crosses it. Sometimes the psoas tendon indent the medial joint capsule at this point (Capsule hour-glass restriction)_Needle from an anterior portal to this point.
- Capsulotomy is made at the psoas facet (Two-three o'clock) and a motorized shaver/radiofrequency carefully removes capsular tissue exposing the tendon.
- Release the tendon until the overlying muscle is seen



TRIPLE IMPINGEMENT

Pincer-type pathology, labral pathology and internal or psoas snapping hip have been termed by Kelly as “triple impingement.” (AANA meeting 2008)

Definition

- Pincer impingement
- Labral pathology
- Psoas snapping / tight psoas

Diagnosis

- Groin pain with associated snapping
- Physical examination reveals a positive anterior impingement sign, with psoas snapping, and or pain with resisted hip flexion
- Radiographs show evidence for pincer impingement
- Intraarticular injection may give partial relief of the presenting pain, and a psoas bursal injection may give further relief confirming this association

Treatment

- Rim resection
- Labral debridement vs Refixation
- Iliopsoas release

ILIOPSOAS IMPINGEMENT

Introduction

- ✓ Several authors (Kelly, Domb) (Hip and pelvic injuries in sports Medicine 2010, 196-198) have implicated iliopsoas impingement on the anterior labrum as a cause of labral tears.
- ✓ They have stated that a tight iliopsoas tendon could cause compression over the anterior capsulolabral complex, leading to labral lesions. Labral tears and echymosis at the 3 o'clock position of the acetabulum (see images below) are directly under the iliopsoas tendon. This labral tear is considered an anterior tear, while most labral tears caused by trauma, femoroacetabular impingement, capsular laxity/hip mobility, dysplasia or degeneration are usually found at the 11:30 to 1 or 2 o'clock position.
- ✓ Reportedly common reason for failed hip arthroscopy (Heyworth, Arthroscopy 2007)
- ✓ In a series of athletes with groin pain, iliopsoas tendonitis was the most common cause of groin pain in runners (Hölmich, Br J Sports Med 2007)

Etiology suggested

- Frictional contact: Tight and inflamed iliopsoas tendon causes impingement of the anterior labrum with the hip in extension: Pressure and friction exerted on the femoral head and anterior labrum could cause labral damage.
- Scarring and adhesions would result in repetitive traction on the capsulolabral complex with hip flexion.
- Hyperactive iliocapsularis muscle that create excessive traction on the anterior labrum resulting in injury

Factors associated with higher pressures beneath the tendon at the location of contact with the femoral head (Yoshio 2002)

- Large femoral head (Psoas tendon angle more acute than normal)
- Tendon that is wide and thin at the point of contact with the femoral head
- Small neck shaft angle
- High degree of femoral anteversion
- Relative small angle at the level of pulley

Definition

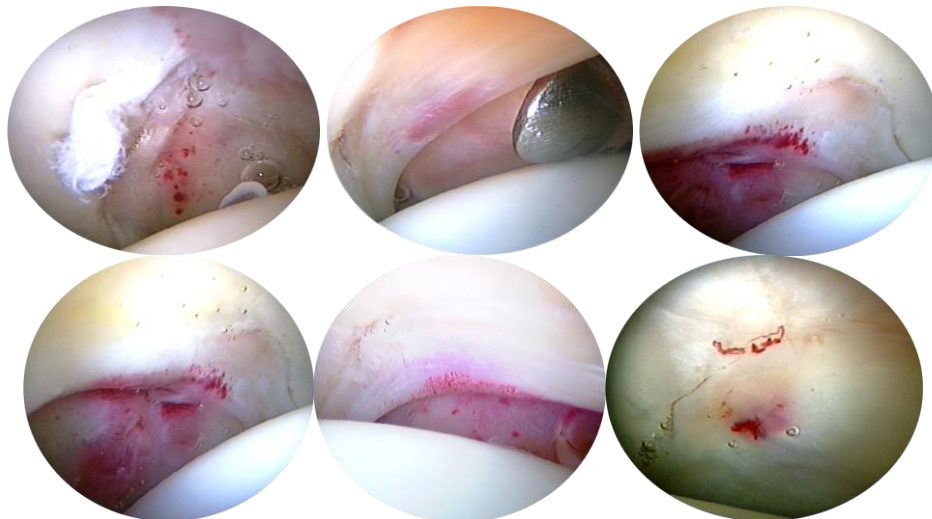
- Labral pathology (Torn, inflammation, echymosis or partially delaminated) at 3 o'clock position without any evidence of FAI, bony abnormality or trauma.
- MRI: May demonstrate a focal adhesion of the psoas tendon to the labrum or an edema pattern deep to the psoas tendon and adjacent to the labrum
- Tight psoas / psoas adherence to capsule

Diagnosis

- Pain with anterior impingement testing and resisted hip flexion
- Hip snapping in some patients
- Pain or apprehension with resisted straight leg raise
- Hyperlordosis of lumbar spine sometimes noted
- Intra-articular injection variable relief (When an MRA with anesthetic does not relieve an athlete's hip pain, consider an ultrasound-guided iliopsoas bursa injection).
- Psoas bursal injection more complete relief (Ultrasound evaluation of the tendon & injection of the psoas bursa will help in confirm that the tendon is the cause of the athlete's hip pain).
- Radiographs show no bony deformities

Arthroscopy

- Central compartment arthroscopy reveals anterior / anteroinferior labral pathology at 2-3 o'clock
- Labral Morphology: Normal
- Labral lesion: Inflammation, labral tear , mucoid degeneration, echymosis.
- Scarring of psoas tendon to capsule



Treatment

- ✚ Labral debridement / repair
- ✚ Psoas release at the central compartment at the level of the anterior acetabular rim:
 - Anatomic landmark: ("Psoas facet") There is usually a groove or indentation at 3 o'clock in the anterior lip of the acetabulum where the

psoas crosses it. Sometimes the psoas tendon indent the medial joint capsule at this point (Capsule hour-glass restriction) Needle from an anterior portal to this point

- Capsulotomy at the “psoas facet” is made and a motorized shaver/radiofrequency carefully removes capsular tissue exposing the tendon.
- Release the tendon until the overlying muscle is seen.

ILIOPSOAS IMPINGEMENT AFTER TOTAL HIP

Definition

- Anterior / groin pain after THA
- May be the cause of painful THA in up to 4.3% of patients (Bricteux 2001)
- Related to: Prominent or malpositioned (Retroverted) acetabular component, retained cement, excessively long screws or the presence of an acetabular cage or reinforcement ring.

Diagnosis

- Patient history and physical examination only suggestive.
- “Car sign” Pain getting in and out of a car.
- Pain with resisted hip flexion and exacerbated by stair climbing.
- Pain getting into and out of the bed and rising from a seated position
- Often patients do not have pain with ambulation.
- Occasionally snapping or “clunking” hip anteriorly.
- May be confirmed by one or more studies (TAC, MRI, Ultrasonography) in combination with a diagnostic injection.
- Differential diagnosis: Low-grade infection, acetabular or femoral loosening, occult pelvic or acetabular fracture, lumbar spine, intraabdominal, retroperitoneal, or vascular pathology.
- Imaging guide diagnostic-therapeutic injection into the ileopsoas tendon or bursa: Temporary relief of pain strongly suggest that the ileopsoas tendon is the source of pain.

Treatment

- Nonsurgical treatment is successful in 39% of patients
- Although the tendon is considered to be extraarticular, if the anterior capsule has been divided or resected during THA the tendon is then intraarticular.
- Surgical treatment:
 - Intracapsular release
 - Lesser trochanteric release: Easier exposure

Results

Study showed equivalent results with open psoas tenotomy when compared to acetabular cup revision with less complications with tenotomy (Dora et al., JBJS Br 2007)

RESULTS OF ILEPSOAS RELEASE

- Normal strength between 3-6 months
- Patients could not actively flex their hip immediately after surgery
- Regained active hip flexion power by 6 weeks and get off crutches between 6-8 weeks
- Competitive athletes back to their preop sports \leq 9 months (Anderson&Keene)
- Caution: Open series: Flexor weakness in 3% to 42% of the cases
- Caution: Heterotopic ossification

REFERENCES

- 1-Alpert JM, Kozanek M, Guoan Li, Kelly BT. Cross-sectional analysis of the iliopsoas tendon and its relationship to the acetabular labrum: an anatomic study. *Am J Sports Med*, 2009;37(8):1594-1598.
- 2-Anderson SA, Keene JS. Results of arthroscopic iliopsoas tendon release in competitive and recreational athletes. *Am J Sports Med* 2008; Dec 36(2):2363-71.
- 3-Bricteux S, Beguin L, Fessy MH: Iliopsoas impingement in 12 patients with a total hip arthroplasty. *Rev Chir Orthop Reparatrice Appar Mot* 2001; 87:820-825.
- 4-Dobbs MB, Gordon JE, Luhmann SJ, Szymanski DA, et al. Surgical correction of the snapping iliopsoas tendon in adolescents. *J Bone Joint Surg (U.S.)*, 2002;84:420-424.
- 5-Domb BG, Shindle MK, Asnis PD et al. Iliopsoas impingement. A newly identified cause of labral pathology in the hip. In press.
- 6-Dora C, Houweling M, Koch P, Sierra RJ, Iliopsoas impingement after total hip replacement: the results of nonoperative management, tenotomy, or acetabular revision. *J Bone Joint Surg Br* 2007; Aug 89(8):1031-5.
- 7-Heyworth BE, Shindle MK, Voos JE, et al. Radiologic and intraoperative findings in revision hip arthroscopy. *Arthroscopy*, 2007;23:1295-1302.
- 8-Hammer W. "The Iliopsoas and the Hip Vascular-Compression Theory." *Dynamic Chiropractic*, March 26, 2007.
- 9-Heyworth BE, Shindle MK, Voos JE, Rudski JR, Kelly BT. Radiologic and intraoperative findings in revision hip arthroscopy. *Arthroscopy* 2007; Dec 23(12): 1295-302.
- 10-Ilizaliturri VAA, Chaidez C, Villegas P, Briseno A, Camacho-Galindo J. Prospective randomized study of 2 different techniques for endoscopic iliopsoas tendon release in the treatment of internal snapping hip syndrome. *Arthroscopy* 2009; Feb 25(2): 159-63.
- 11-Kelly BT. Labral Pathology associated with psoas impingement. AANA Annual Meeting. Washington, D.C. April 24-27, 2008. SS-60.
- 12-Polster JM, Elgabaly M, Lee H, Klika A, Drake R, Barsoum W: MRI and gross anatomy of the iliopsoas tendon complex. *Skeletal Radiol* 2008;37:55-58.
- 13-Mason JB. Acetabular labral tears in the athlete. *Clin Sports Med*,2001;20:779-790.
- 14-Wettstein M, Jung J, Dienst M. Arthroscopic psoas tenotomy. *Arthroscopy* 2006; Aug 22(8):907
- 15-Winston P, Awan R, Cassidy JD, Bleaknery RK. Clinical Examination and ultrasound of self reported snapping hip syndrome in elite ballet dancers. *Am J Sports Med* 2007; Jan 35(1): 118-
- 16-Yoshio M, Murakami G, Sato T et al. The function of the psoas muscle: Passive kinetics and morphological studies using donated cadavers. *J. Orthop Sci* 2002;7(2)199-207.