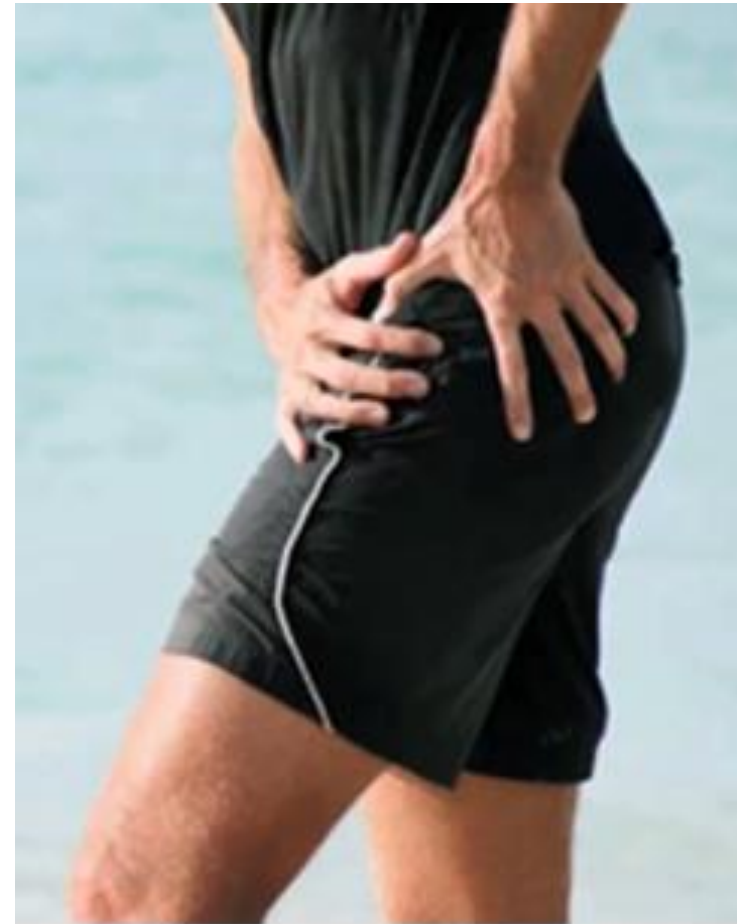


PERIARTHRITIS OF HIP REGION

Alireza Khabbazi, MD.
Connective Tissue Diseases Research
Center
Tabriz University of Medical
Sciences



Hip pain is a common entity

- Frequency of hip pain in the past 7 days: 7%

Davatchi et al. The Journal of Rheumatology 2008

- Frequency of hip pain in females (5%) and males (6.3%)

Kolahi et al. Rheumatol Int 2017

- Self-reported hip pain in 14% of the population over the age of 60 years in USA

Christmas et al. J Fam Pract 2002

Hip pain

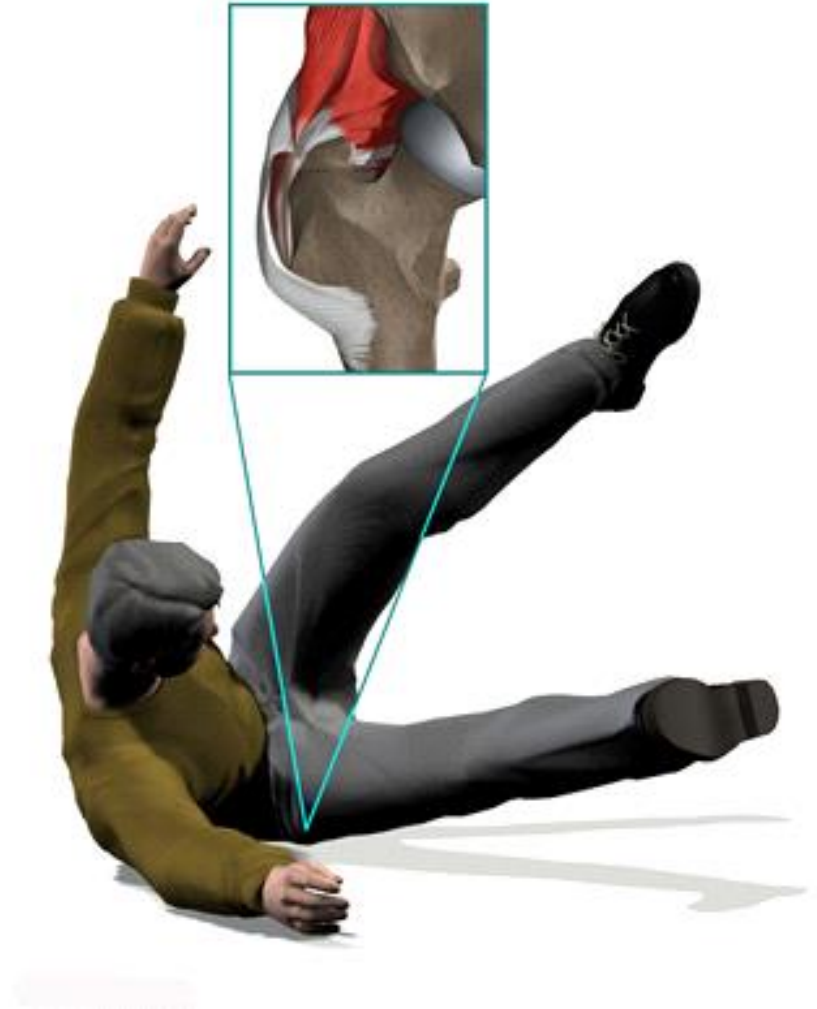
- Lateral hip pain
- Posterior hip pain
- Anteromedial hip pain

Periarthritis with lateral hip pain

Trochanteric bursitis

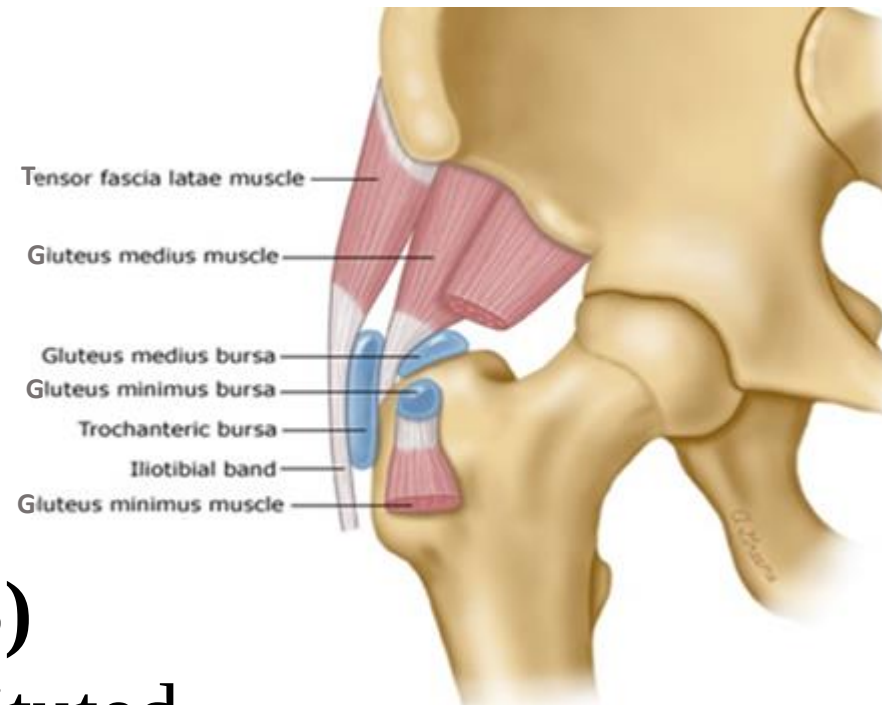
Meralgia paresthetica

TROCHANTERIC BURSITIS



Definition

- **Trochanteric bursitis:**
painful inflammation
of the bursa located just
superficial to the
greater trochanter
of the femur
- **Greater trochanteric
pain syndrome (GTPS)**
is now frequently substituted



Epidemiology

- The annual incidence of trochanteric pain in primary care: 1.8 per 1000 patients
- It affects up to 10% of the general population

Segal et al. Arch Phys Med Rehabil 2007

- Peaking between the 4th and 6th decades of life
- 4♀:1♂

Pathophysiology

- Increased repetitive friction against the bursa causes irritation and inflammation which in turn causes pain.
- Pain symptoms occur when the involved muscle contracts, when it is stretched.

Etiology

- Trauma: most frequent cause
- Hip or lumbar pathologies like OA, scoliosis
- Obesity
- Limb length inequality
- Piriformis syndrome
- Complication of arthroscopic surgery of the hip: 1.4% of cases
- Rheumatoid arthritis

Clinical manifestations

- Lateral hip region pain and pseudo radicular pain



Clinical manifestations

- Lateral hip region pain and pseudo radicular pain
- Antalgic gait
- Point tenderness
- Single leg stance test
- Lateral hip pain in passive or internal rotation or adduction.



Clinical manifestations

○Provocative tests: Lateral hip pain can be reproduced by:

- Resisted hip abduction
- Resisted hip internal rotation
- Ober test
- FABER (Patrick) test



Clinical manifestations

	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Palpation of the greater trochanter	85.7	61.1	77.4	73.3
Patrick's or FABER test	50.0	83.0	82.4	52.0
Resisted hip abduction	50.0	97.3	96.4	55.7
Single leg stance test	45.4	84.2	80.0	51.6
Resisted hip internal rotation test	40.7	94.7	91.7	52.9
Ober's test	13.1	97.6	87.5	46.6

Imaging

- X ray:

- In the presence of significant trauma
- Suspect hip OA

- US

- MRI

Rarely US or MRI are

- Differentiation from
- Suspect Tendon tears



Treatment

First line

- Stopping precipitating factor
- Rest
- NSAIDs for severe pain

Treatment

Second line - Corticosteroid injection

- In an RCT patients with GTPS (pain persisting for more than 1 week) were allocated to receive either local steroid injections (n=60) or usual care (n=60).
- After 3-month **34%** of the patients in the usual care group and **55%** in the injection group were recovered. Decrease in pain severity at rest and on activity in the injection group was more (1.2 and 1.3, respectively)

Treatment

Second line - Corticosteroid injection

- After 12 months 60% of the patients in the usual care group had recovered compared with 61% in the injection group.
- Pain severity at rest and on activity decreased in both groups and the 12-month follow-up showed no significant differences.

Treatment

Second line - Corticosteroid injection

- In the GLUTEAL (**GLU**cocorticoid injections for greater Trochant**Er**ic pain syndrome) 46 patients with GTPS were randomized in a 1:1 ratio to a single injection with a combination of local anesthetic and GC (intervention) or injection with normal saline solution (placebo).

Treatment

Second line - Corticosteroid injection

- The reduction in pain 1 month after injection was similar between the intervention group (-1.5) and the placebo group (-2.5) ($p=0.23$).
- The reduction in pain at subsequent follow-up visits in the intervention and placebo groups was also similar, with scores of -2.0 and -3.1 ($p=0.19$) at 3 months and of -2.6 and -2.7 ($p=0.85$) at 6 months, respectively.

Treatment

Recovery phase

- Exercise program, emphasizing stretching of the iliotibial band (ITB), the tensor fascia lata (TFL), the external hip rotators, the quadriceps, and the hip flexors.

Treatment

Refractory cases

- Recalcitrant cases are often due to gluteus medius (g. medius) or minimus tendon tears.
- Prospective MRI evaluation of 24 middle aged women with intractable GTPS 45.8% had g. medius tendon tears Bird et al., 2001
- Prospective US evaluation of 75 pts with GTPS
 - 53/75 had g. medius tendinopathy
 - 25 of these 53 had full or partial g. medius tears

Connell et al., 2002

Treatment

Refractory cases

- Extracorporeal shock wave therapy (ESW)
- Platelet-rich plasma (PRP) injection
- Surgical interventions

ESW

- In a case control study 33 patients with chronic GTPS received low-energy shock wave therapy (2000 shocks; 4 bars of pressure)
- Mean pretreatment VAS for the control and ESW groups were 8.5 and 8.5, respectively. One, 3, and 12 months after treatment, the mean VAS for the control and ESW groups were 7.6 and 5.1 ($P < .001$), 7 and 3.7 ($P < .001$), and 6.3 and 2.7 ($P < .001$), respectively.

Is PRP effective?

- In a systematic review for considering the efficacy PRP for treatment of GTPS, 5 full-text articles were included for analysis consisting of three RCTs and two case series (including 209 patients)
- The majority of patients were females
- The minimum duration of symptoms: 3 months

Is PRP effective?

- Diagnosis was made using US or MRI
- Significant improvement in patients were followed up till 12 months post treatment
- PRP is relatively safe and can be effective**
- More large-sample and high quality RCTs are required**

Surgical interventions

- Endoscopic debridement
- Longitudinal release of the ITB combined with subgluteal bursectomy (safe and effective for most patients)
- Bursectomy and partial resection of the greater trochanteric process (rarely necessary)

Treatment

- David et al. in a systematic review showed that:
- Low-energy ESW is superior to corticosteroid injection and home therapy
- In refractory cases surgical therapy is more successful than low-energy ESW, corticosteroid injection and home therapy

Prognosis

- A retrospective study of 164 patients found that at least 36% were still symptomatic after 1 year and 29% were still symptomatic after 5 years
- 4.8-fold greater risk of persistent symptoms after 1 year in patients with OA of lower limb.
- 2.7 times lower risk of persistent symptoms after 5 years in patients treated with corticosteroid injection

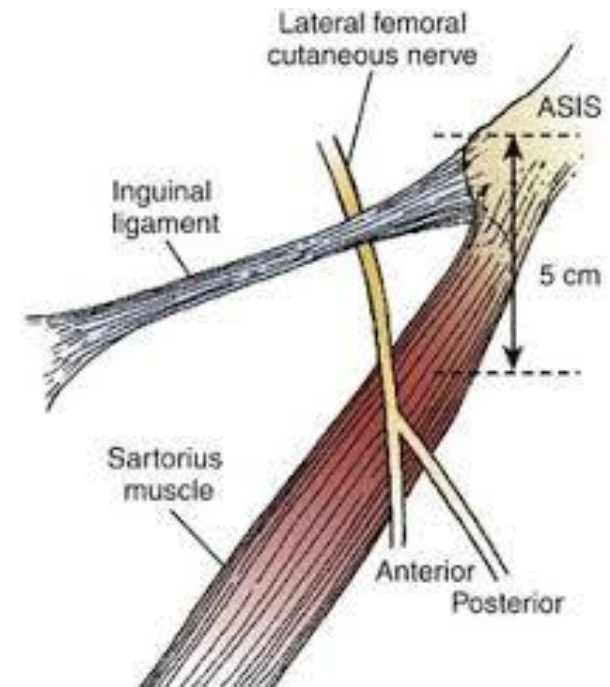
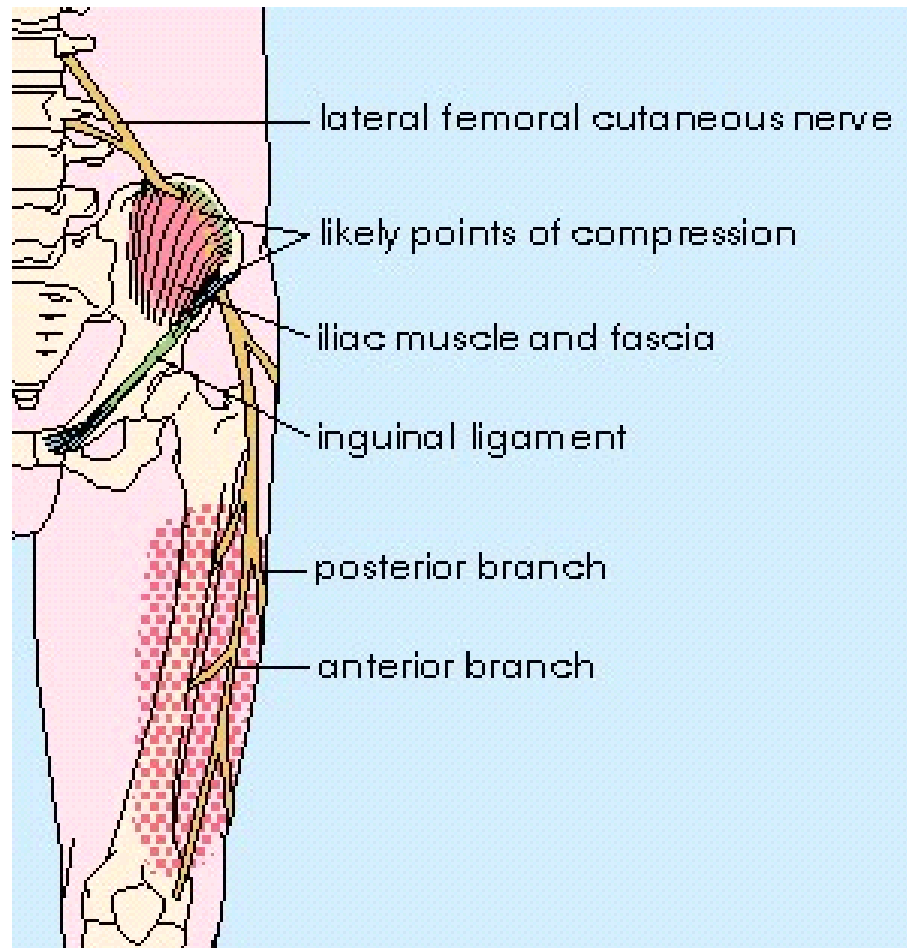
MERALGIA PARESTHETICA



Definition

- Clinical syndrome of focal entrapment of the lateral femoral cutaneous nerve (LFCN) as it passes through the inguinal ligament
- Pure sensory nerve susceptible to compression

Anatomy



Epidemiology

○ **United States:**

- In the general population: incidence of 43 per 100,000 person years
- In people with diabetes mellitus, an incidence of 247 per 100,000 patient years

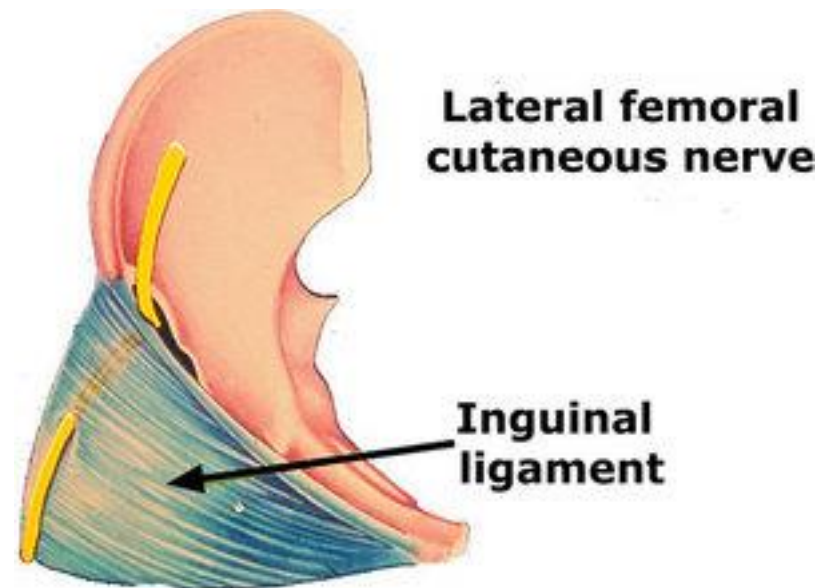
○ **Race:** No racial predilection is known.

○ **Sex:** No gender proclivity

○ **Age:** most common during middle age

Etiology

- Tight garments around the waist
- Obesity
- Pregnancy
- Ascites
- Diabetes
- Seat belt injuries



Etiology

- Trauma to the thigh or inguinal region
- Long-distance walking and cycling, possibly as a consequence of local ischemia during repetitive muscle stretching
- Impingement of the LFCN by masses (eg, neoplasms, contained iliopsoas hemorrhages) in the retroperitoneal space

Clinical manifestations

- Paresthesia or hypoesthesia in the anterolateral thigh
- Exacerbate of the discomfort with:
 - Sitting with the legs crossed
 - Prolonged standing
 - Extension of hip
 - Walking



Physical Examination

- Pinprick and light touch tend to be abnormal in a 10×6 " oval-shaped area on the anterolateral thigh
- The lower extremity neurologic examination is otherwise normal
- Tenderness in anterosuperior iliac spine
- Tapping over the upper and lateral aspects of the inguinal ligament may reproduce or worsen the paresthesia.

Physical Examination

- Neurodynamic Testing
- Pelvic compression testing:



A study in 45 patients found that the pelvic compression test had a sensitivity of 95% and a specificity of 93.3% for meralgia paresthetica.



Diagnosis

- The unique description of pain and characteristic location
- Sensory abnormalities on examination
- Absence of neurological abnormalities of the lower leg
- Absence of evidence of hip, back, or sacroiliac joint abnormality

Electromyography

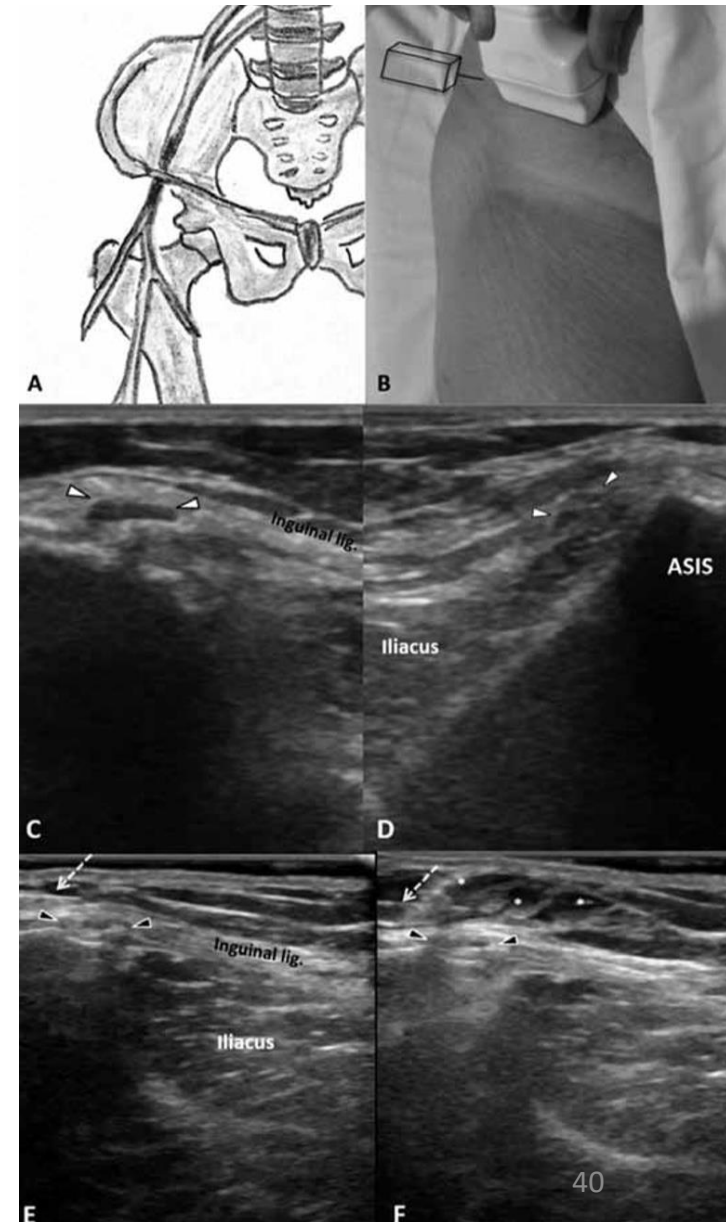
○Indications:

- Absence of risk factor
- Suspecting a mass lesions
- Presence of back pain

Ultrasound

- Confirms the entrapment morphologically
- Uncovers a likely underlying cause
- Provides immediate interventional guidance

Onat et al. Pain Physician 2016

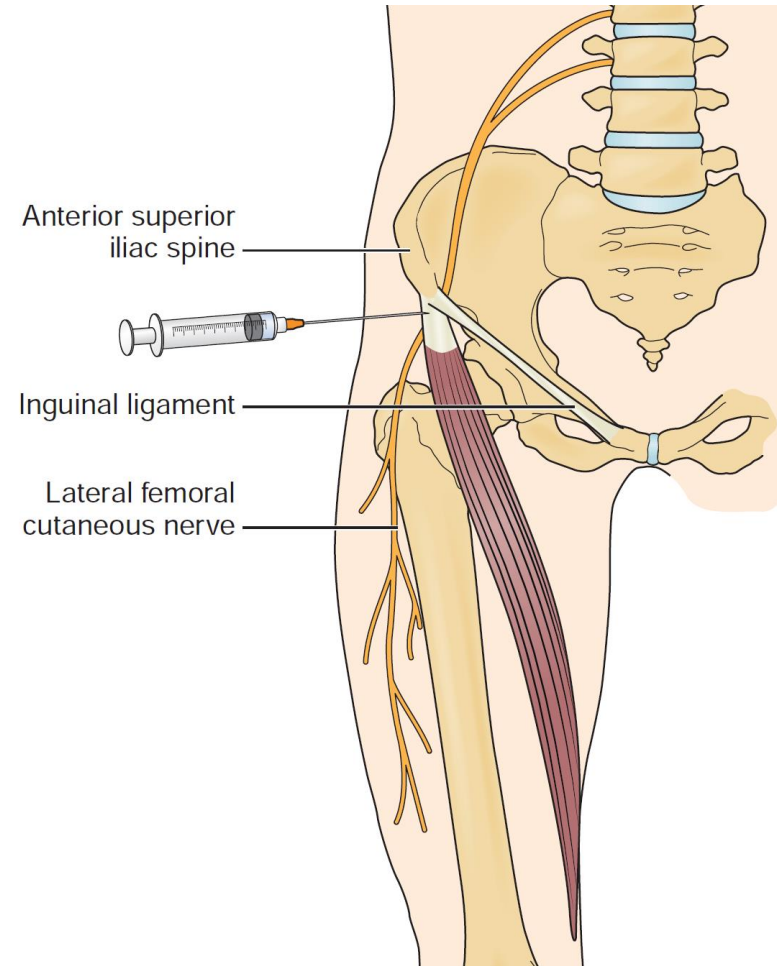


Differential Diagnosis

- Lumbar radiculopathy
- Obturator neuropathy

Treatment

- Removing the cause of compression is the best therapy.
- In severe and resistant cases: Local nerve block with a combination of steroid and lidocaine



Treatment

- Persistent symptoms more than one to two months despite the above measures:
 - Drugs: Carbamazepine, Phenytoin, Gabapentin
 - Rarely surgery: Neurolysis, Sectioning of the lateral femoral cutaneous nerve

Periarteritis with posterior hip pain

Ischial bursitis

Piriformis syndrome

Ischiofemoral impingement

Obturator internus tendinopathy

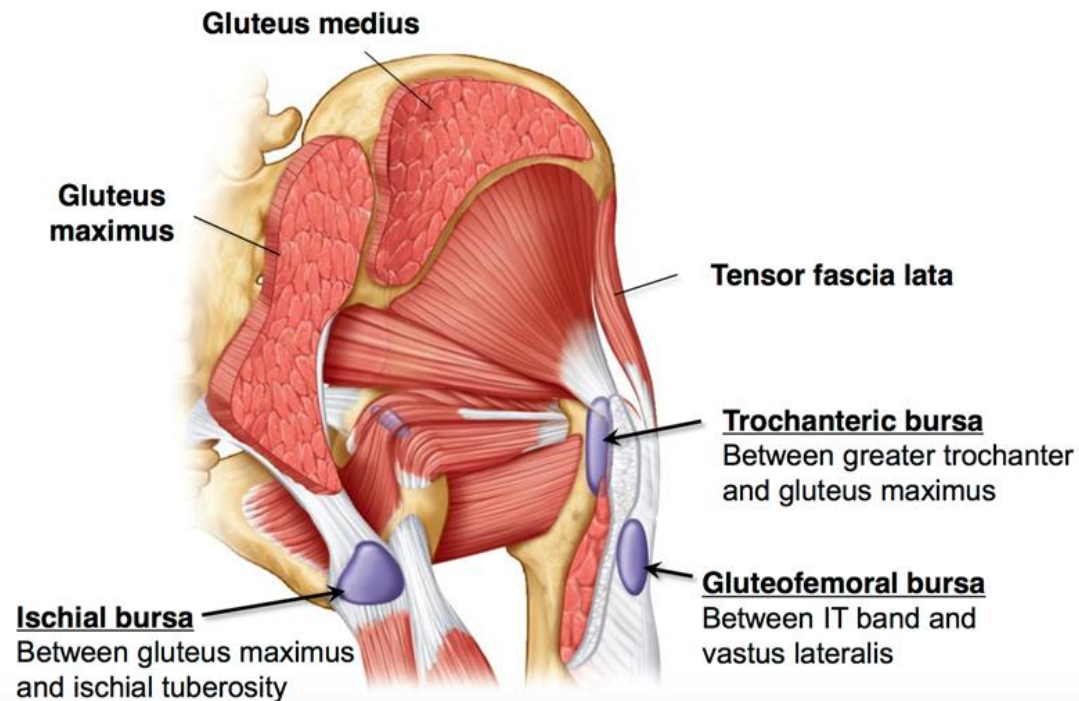
Proximal hamstring tendinopathy

ISCHIAL BURSITIS (WEAVER'S BOTTOM)



Definition and anatomy

○ Ischial bursitis is an inflammatory condition of the bursa that lies between the ischial tuberosity and the gluteus maximus

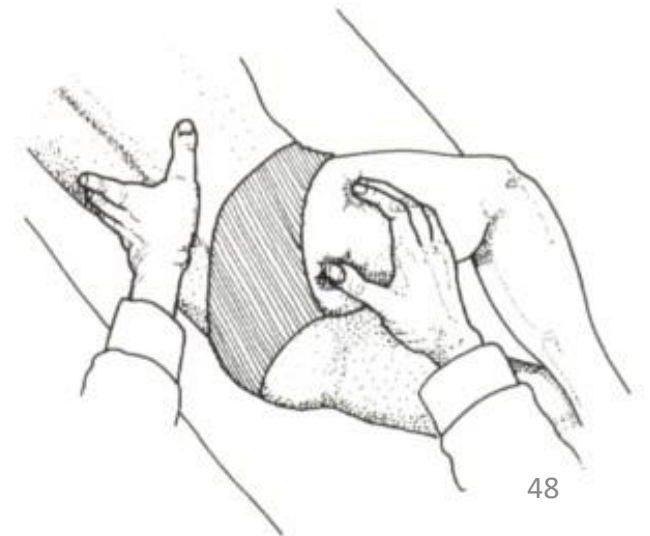


Etiology

- Sitting for a long period on hard surfaces
- Trauma
- Repetitive injury: running, jumping or kicking
- Autoimmune diseases such as RA, SLE
- Uremia
- Infectious ischial bursitis due to septicemia and septic arthritis

Clinical manifestations

- Gluteal pain and/or upper posterior thigh pain following prolonged sitting, lying or exercise
- Point tenderness
- Pain with passive flexion at the hip joint
- Inability to extend the hip



Imaging

○US

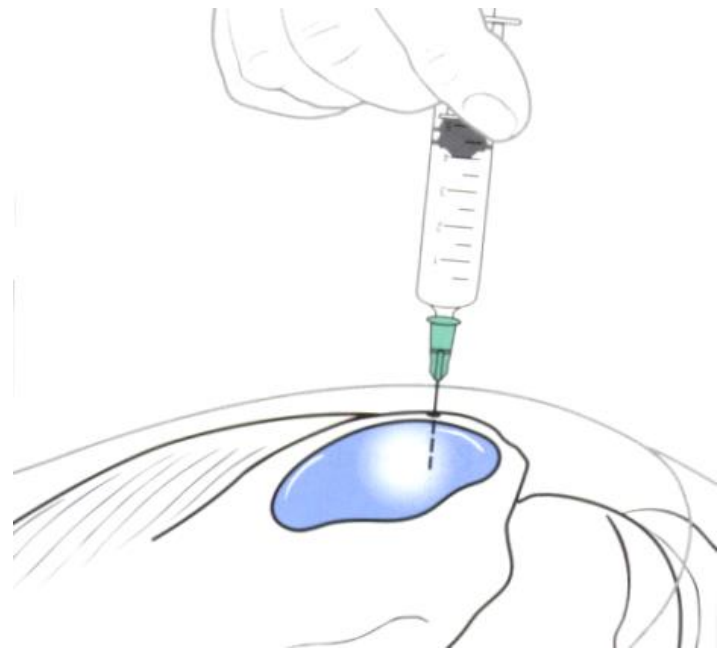
○CT scan

○MRI



Treatment

- Rest
- Cushion
- Local steroid injection



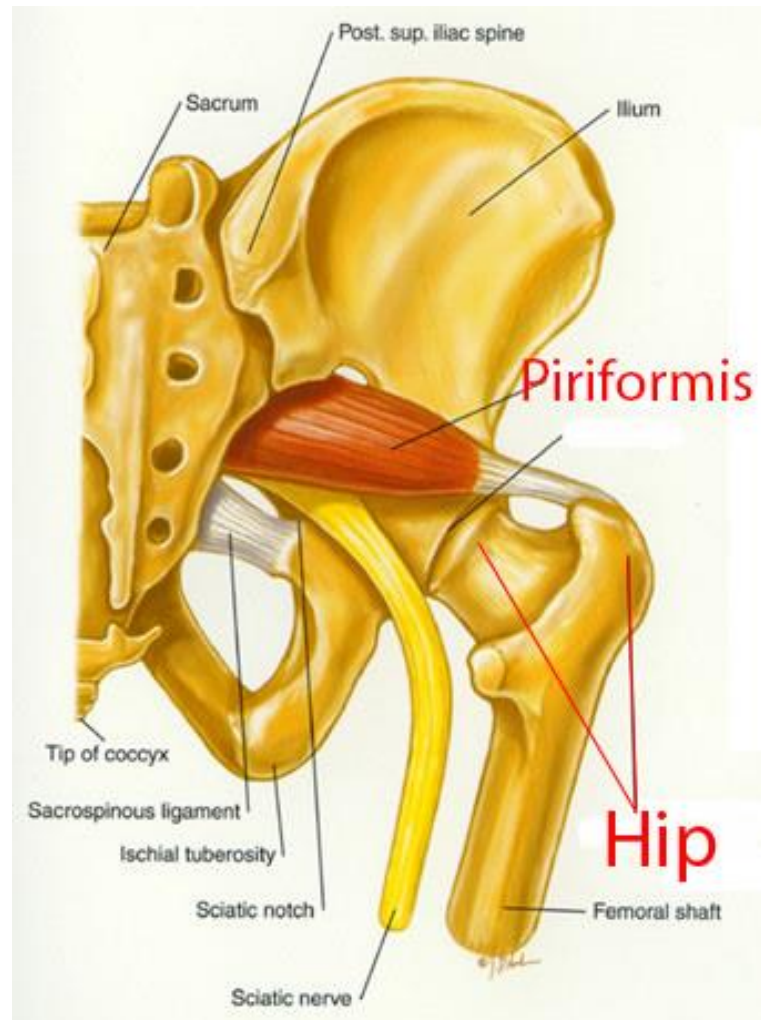
PIRIFORMIS SYNDROME



Definition

- Piriformis syndrome is a condition in which the piriformis muscle compresses the sciatic nerve and causes buttock pain.
- It may account for anywhere from 0.3% to 6.0% of all cases of sciatica and low back pain

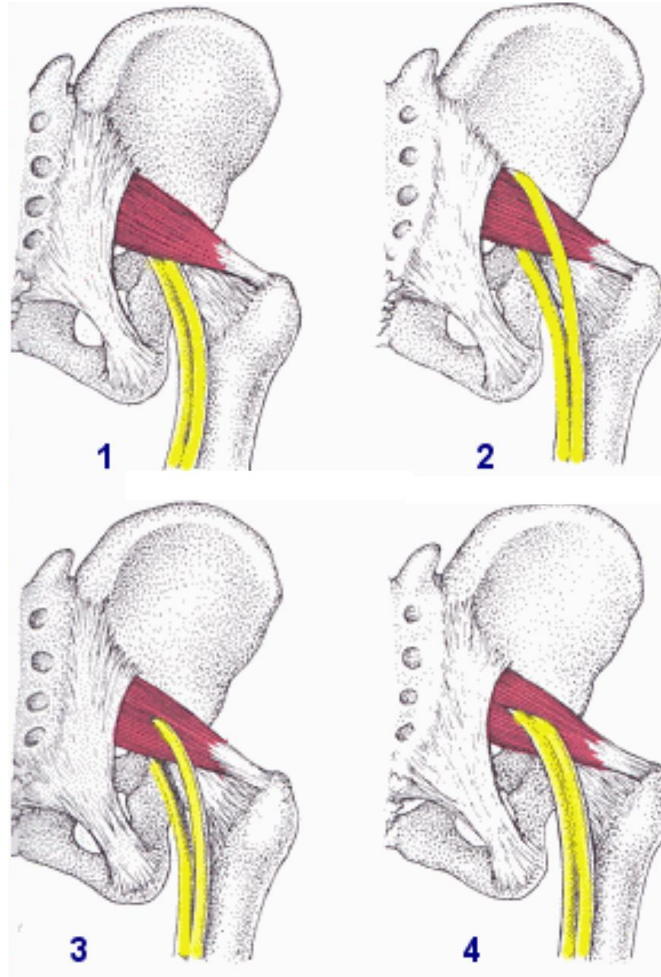
Anatomy



Etiology

- Piriformis muscle overuse such as long distance running
- Prolonged sitting
- Trauma to the hip area
- Obesity
- Anatomic abnormality

Anatomic variations



Clinical manifestations

- A dull ache in buttock (95%). Pain exacerbate with:
 - Walking up stairs, or uphill
 - Sitting for a while (97%)
- LBP
- Sciatica
- Positive SLR (30%)

Clinical manifestations

- Tenderness in palpation of the piriformis (92%)



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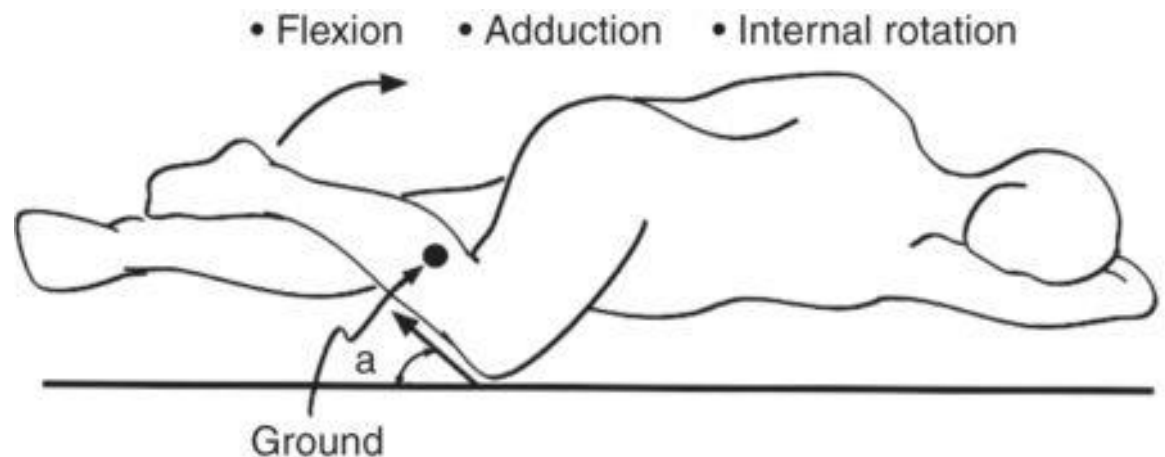
Clinical manifestations

- Tenderness in palpation of the piriformis (92%)
- Freiberg sign (63%)



Clinical manifestations

- Tenderness in palpation of the piriformis (92%)
- Freiberg sign (63%)
- FAIR (flexion, adduction, and internal rotation) test (93%)



Clinical manifestations

- Tenderness in palpation of the piriformis (92%)
- Freiberg sign (63%)
- FAIR test (93%)
- Pace sign (30-74%)



Clinical manifestations

- Tenderness in palpation of the piriformis (92%)
- Freiberg sign (63%)
- FAIR test (93%)
- Pace sign (30-74%)
- Beatty sign (50%)



Clinical manifestations

- Tenderness in palpation of the piriformis (92%)
- Freiberg sign (63%)
- FAIR test (93%)
- Pace sign (30-74%)
- Beatty sign (50%)
- Positive piriformis sign



Diagnosis

- No gold standard tests
- Standard radiographs of the pelvis and hip should be considered to rule out underlying hip pathology.
- Magnetic resonance imaging (MRI) of the pelvis to rule out an intrapelvic lesion or mass effect in the sciatic notch

Criteria	Point
Unilateral or bilateral buttock pain with fluctuating periods of pain through the day	1
No lower back pain	1
No pain upon palpation of axial spine	1
Negative result for Straight Leg Raise	1
Prolonged sitting triggers gluteal pain or sciatica	1
Fluctuating sciatica through the course of the day	1
Buttock pain near projection of piriformis reproduced by:	
- FAIR or Freiberg sign	1
- Beatty sign	1
- Palpation	1
Sciatica reproduced by:	
- FAIR, Freiberg sign	1
- Beatty sign	1
Absence of perineal irradiation	1
Total	12

Sensitivity: 96.4%; Specificity: 100%; PPV: 100%; NPV: 86.9%.

Treatment

- Pain relieve
- Piriformis stretching and isometric strengthening (at least 50% improvement in 80%)
- Injection
 - Using anatomic landmarks
 - By imaging guidance

Fishman et al. did demonstrate that 79% of their patients had at least 50% pain reduction with injection of a corticosteroid and physical therapy.

Treatment

- With the patient in a prone, or side-lying position, the sacroiliac joint is identified with fluoroscopy (X) and the needle is inserted 1 cm caudal and 2 cm lateral to the lower border of the sacroiliac joint.



Treatment

- Surgery: tenotomy of the piriformis tendon and sciatic nerve decompression.
- Most case reports show good-to-excellent results in 60-70%

Treatment

Mannitol plus Vitamins B

- Twenty two patients were included in this study and received 250 ml of mannitol 20% intravenous infusion for 5 days + Vitamins B (vitamin B1 10 mg + vitamin B2 10 mg + vitamin B12 50 µg PO) for 6 weeks

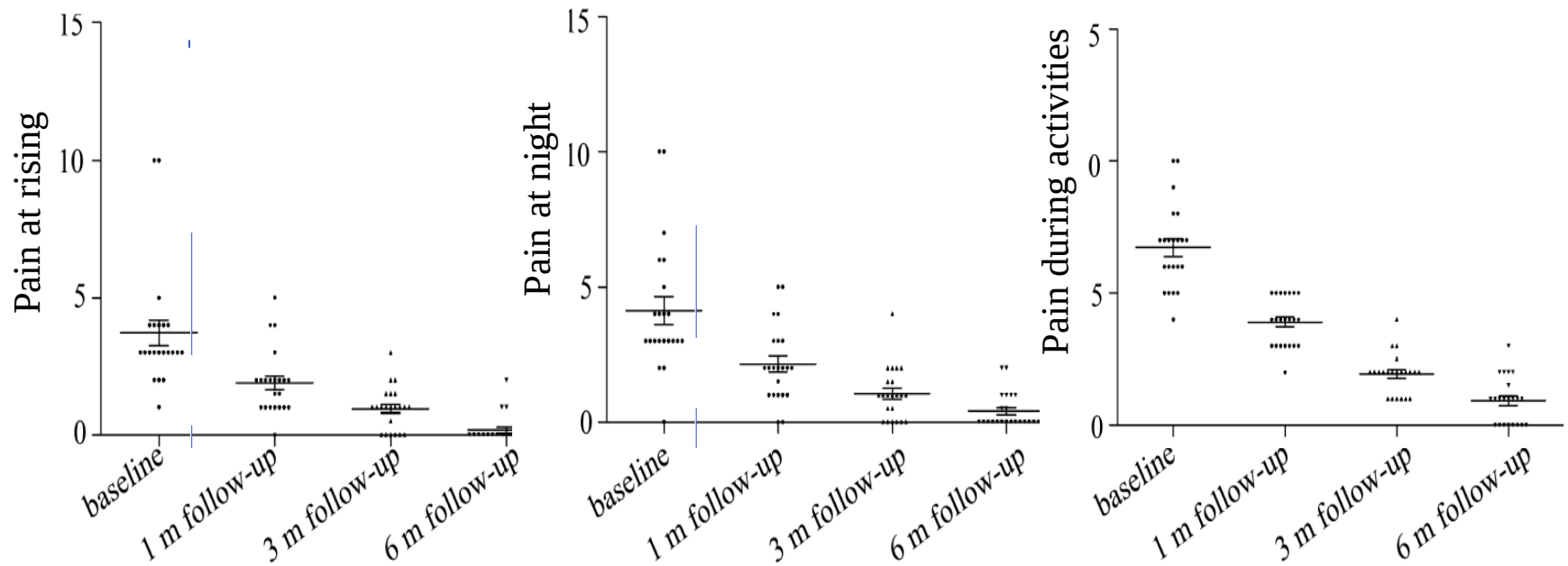
Treatment

Mannitol plus Vitamins B

	Baseline evaluation	1 month	3 months	6 months
Tenderness (±)	19/3	9/13	4/18	3/19
FAIR test (±)	19/3	10/12	6/16	5/17
Beatty's maneuver (±)	15/7	10/12	5/17	4/18
Freiberg's maneuver (±)	15/7	10/12	5/17	4/18
Pace's maneuver (±)	14/8	9/13	5/17	3/19

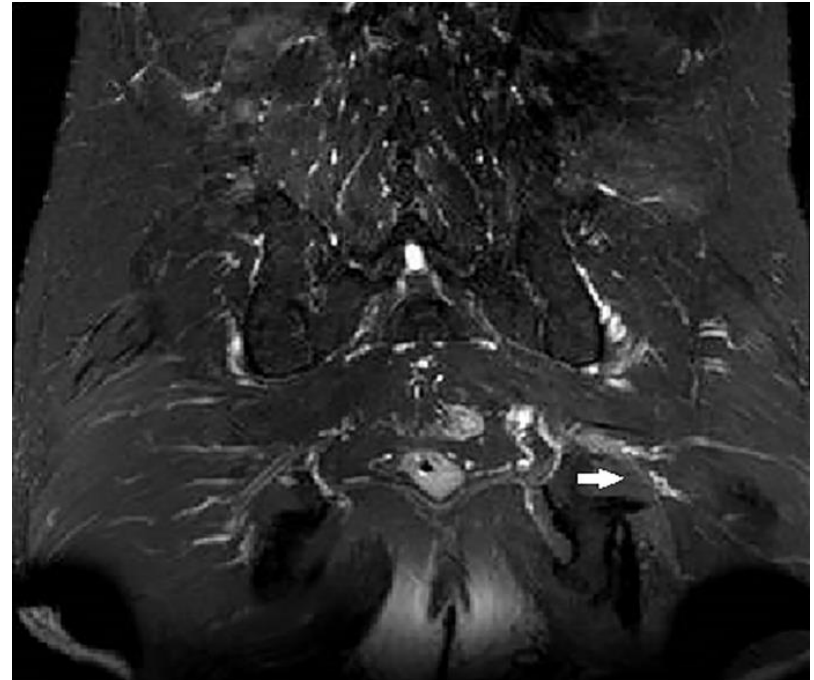
Treatment

Mannitol plus Vitamins B

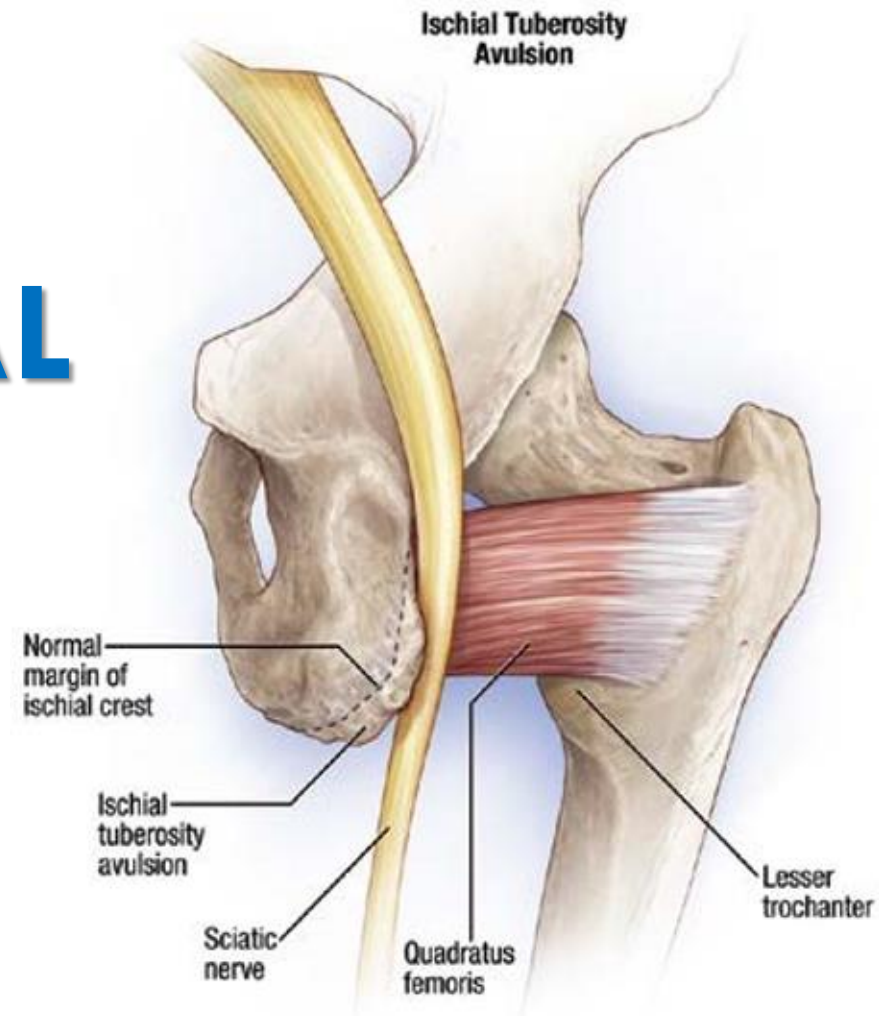


Treatment

Mannitol plus Vitamins B



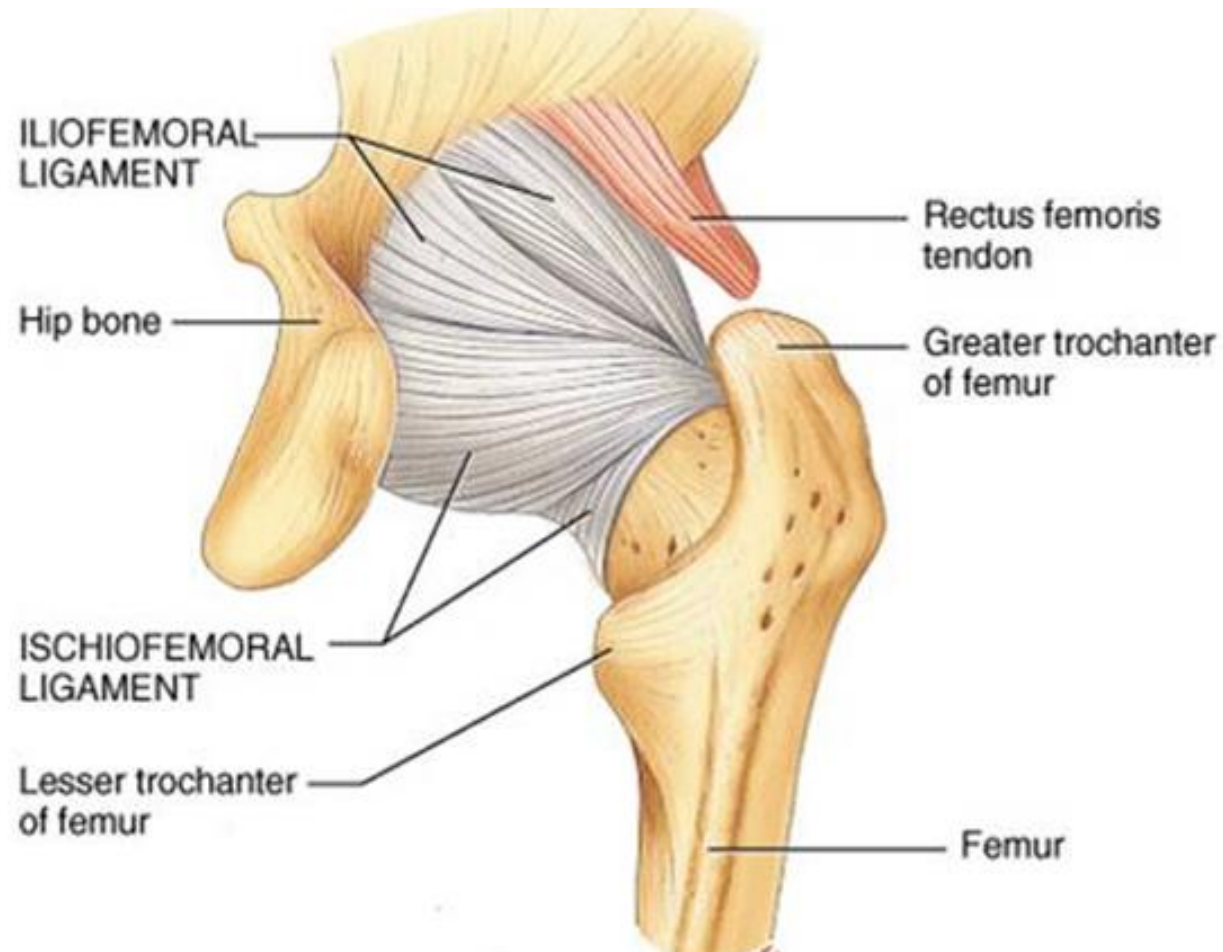
ISCHIOFEMORAL IMPINGEMENT



Definition

- The quadratus femoris is compressed directly between the lesser trochanter and the ischium
- This was highlighted initially in a 2008 case report by Patti et al.

Anatomy



Etiology

- The distance between lesser trochanter and the ischium reduced as a result of previous intertrochanteric fracture, surgery, or migration of the femoral head due to arthritis.

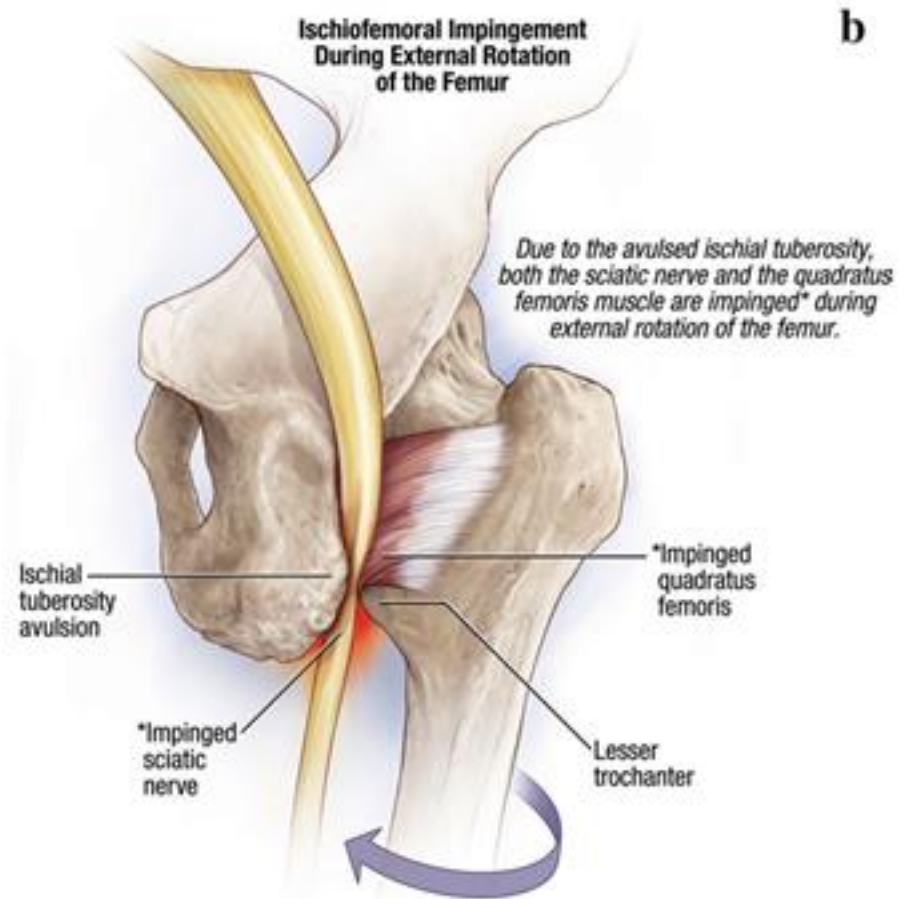
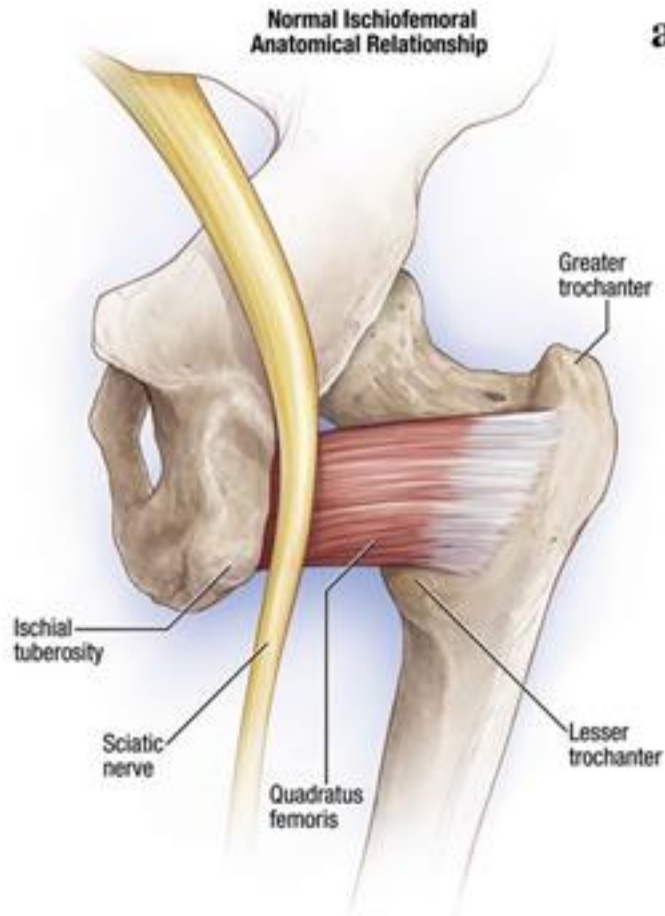
Etiology



Clinical manifestations

- Chronic pain in the groin and/or buttock without a precipitating injury.
- The pain may radiate distally.
- Symptoms of impingement can be reproduced by a combination of extension, adduction and external rotation of the hip

Clinical manifestations

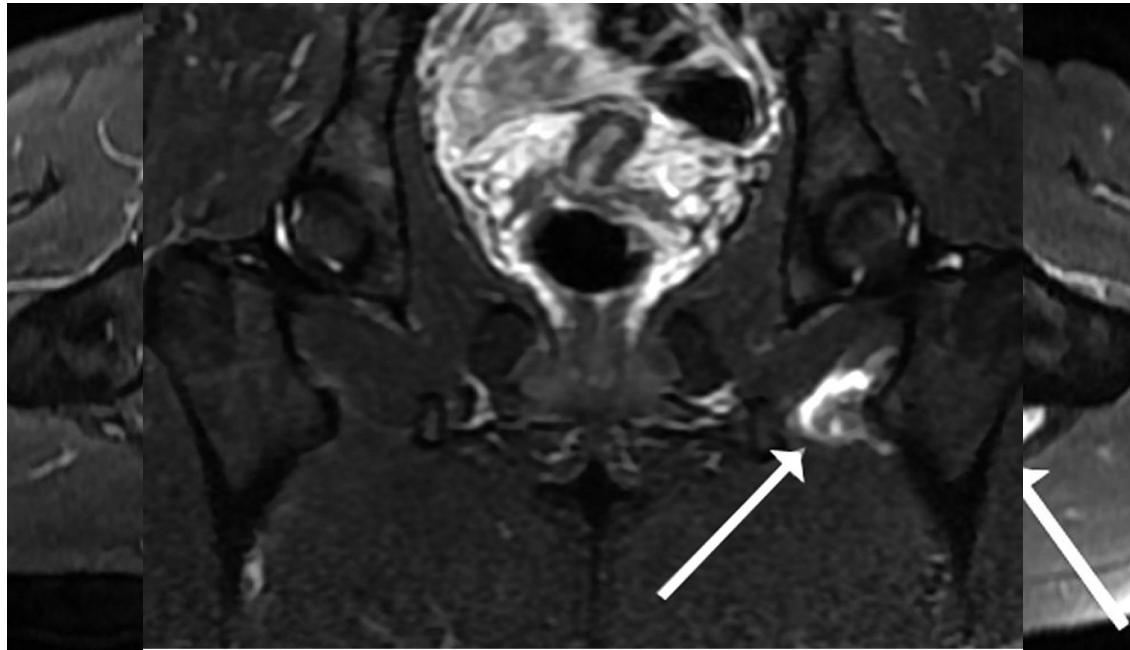


Diagnosis

- Atypical hip pain in patients with normal radiological and ultrasound appearances may reflect ischiofemoral impingement.
- Reproduction of symptoms by a combination of extension, adduction and external rotation of the hip
- MRI is the imaging modality of choice

Diagnosis

- MRI is the best way of demonstrating pathology of the quadratus femoris.



T2-weighted MRI of the hip joint showing a large, bright, irregular mass in the quadratus femoris muscle between the lesser trochanter and the ischial tuberosity.

Treatment

- Injection
- Excision of the lesser trochanter
- Endoscopic decompression around the hip

A systematic review reported good short- to medium-term outcomes with a low rate of complications with all of them. However, there are no comparative studies to assess the superiority of one technique over another, thus further research with RCTs is required in this arena.

Nakano et al. Knee Surg Sports Traumatol Arthrosc. 2018

Peri arthritis with anteromedial hip pain

Pubalgia

Iliopsoas bursitis

Adductor tendinitis

Ischiogluteal bursitis

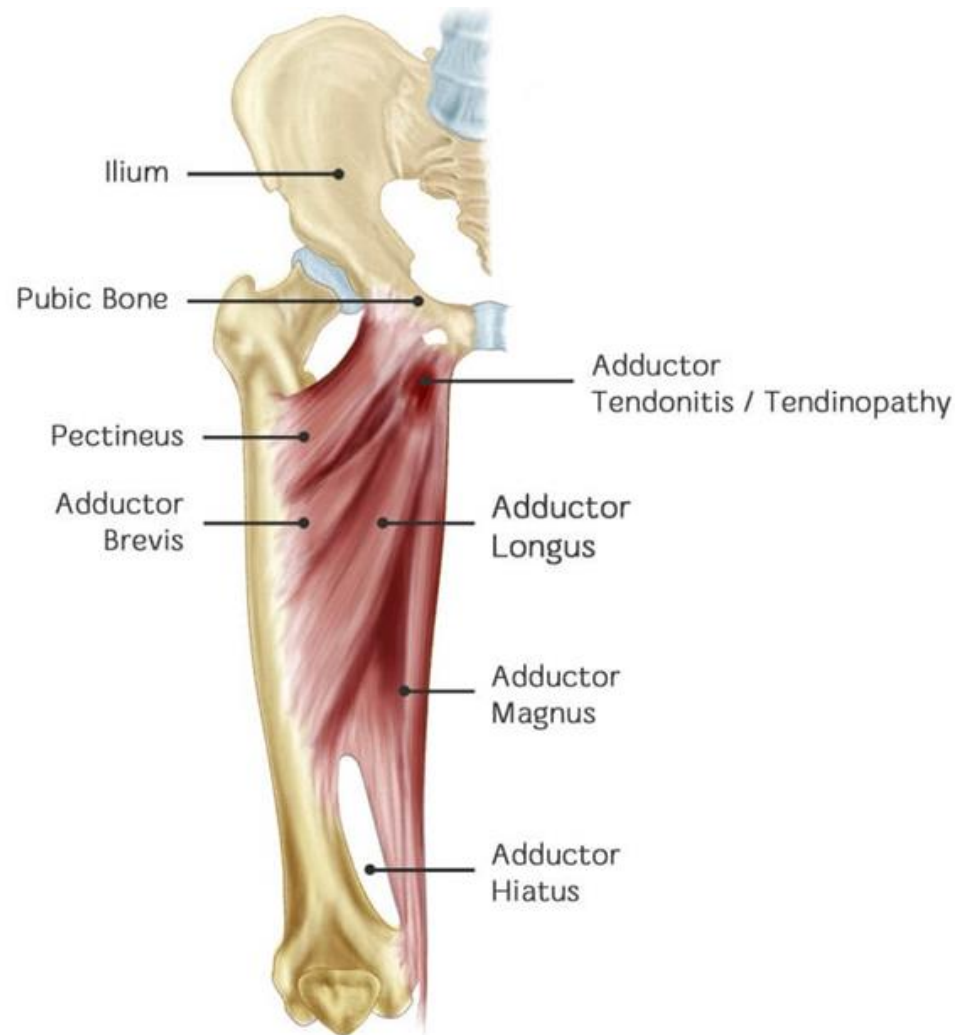
Obturator neuropathy

Iliohypogastric neuropathy

ADDUCTOR TENDINITIS



Anatomy



Etiology

- Excessive stretching or violent contraction of the adductor muscles
 - Straddling sports
 - In all sports where sudden rotation and acceleration are required e.g. soccer and rugby
 - Long-distance running

Epidemiology

- 30% of chronic groin pain is attributable to adductor injuries.
- Adductor strain is the most common cause of acute groin pain in athletes
- Injuries to the groin account for 5% of all soccer injuries and 2.5% of karate injuries.

Clinical manifestations

- Groin and medial thigh pain
- Antalgic gait
- Point tenderness
- Pain in passive abduction, excessive hip internal or external rotation
- Groin pain in FABER test

Clinical manifestations

- Pain resisted adduction of hip
- Adductor squeeze test



Treatment

- Rest
- NSAID
- Stretching exercise
- Local steroid injection: injection of local anesthetic with or without steroids into the tendon periosteal area if conservative treatment has been unsuccessful for 2-4 months.
- PRP injection

PRP injection

- In a retrospective pilot study 408 consecutive patients with persistent tendinopathy referred for PRP after initial conservative treatment failure.
- Intratendinous injection of PRP in the tendinosis area under US guidance was performed

PRP injection

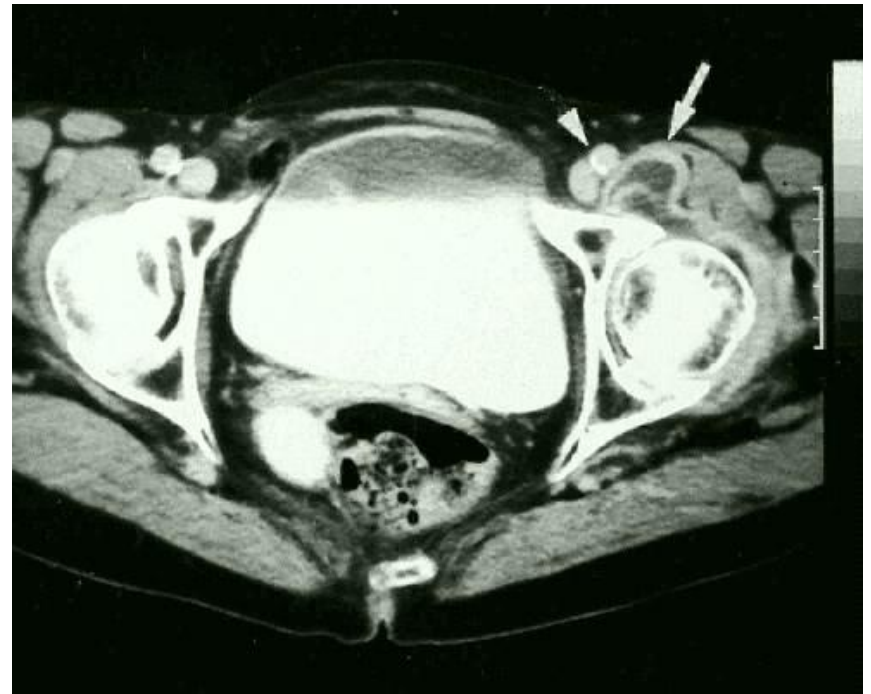
Lower Limb WOMAC

	Baseline	Week 6	Long term follow up
Achilles tendons	36.6±20	12.6±9.6	11.7±4
Patellar tendons	38.1±16.6	16.1±13.5	6±6.9
Hip tendons	32.9±18.8	11.9±9.3	5±5.8
Ankle tendons	33.6±16.4	9.6±5.1	5.4±4.2

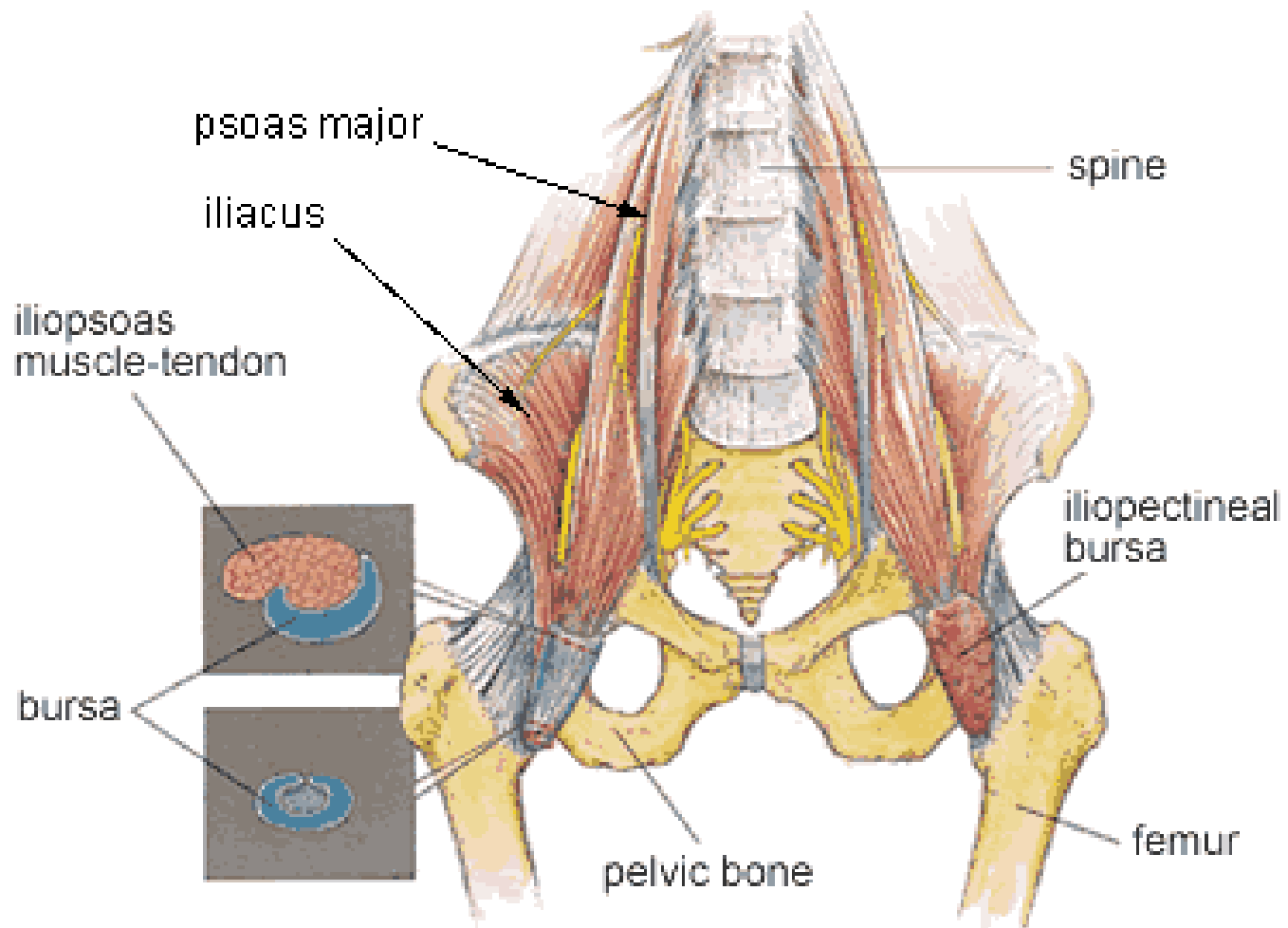
Prognosis

- 42% of athletes with groin muscle-tendon injuries could not return to physical activity after more than 20 weeks following the initial injury.

ILIOPSOAS BURSITIS



Definition



Epidemiology

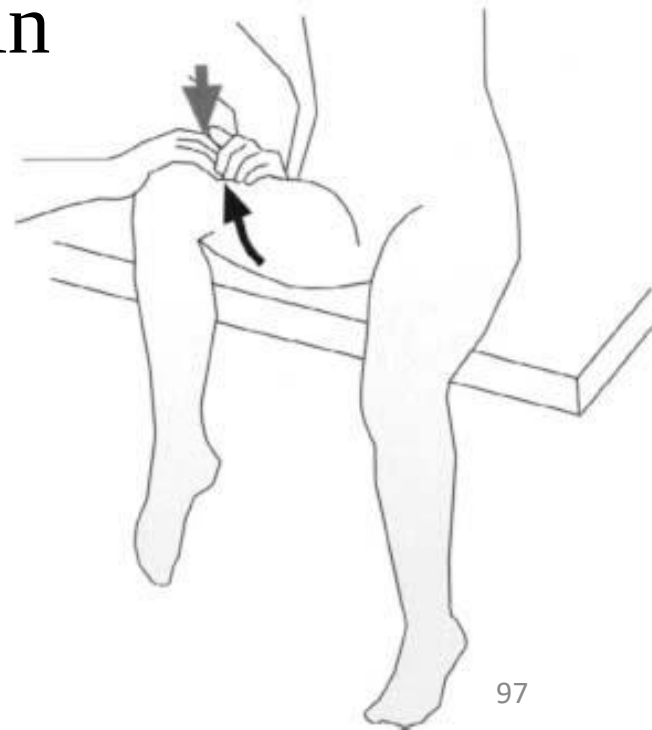
- Affect young adults more commonly
- A slight female predominance

Etiology

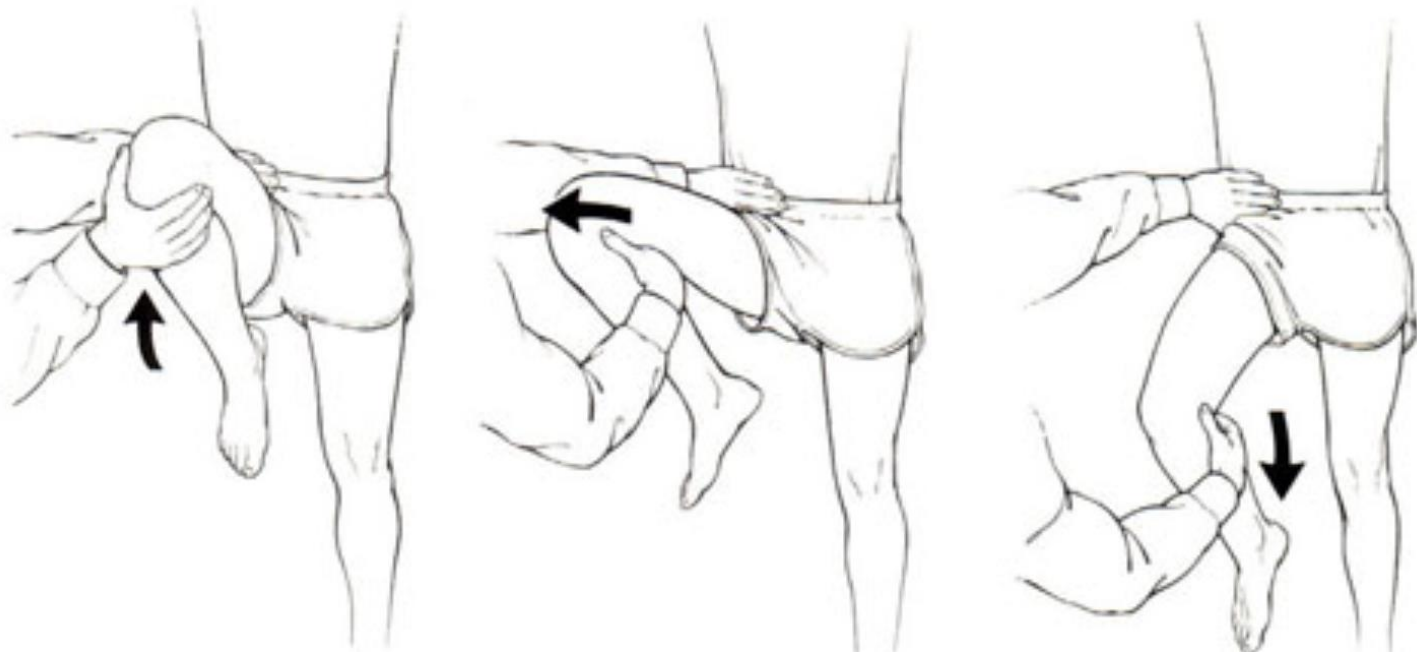
- Repetitive trauma (most frequent cause):
Activities cause eccentric contraction of the iliopsoas muscle (repeated hip flexion or external rotation of the thigh)
- Hip disease

Clinical manifestations

- Groin pain
- Cruralgia
- Snap or click in the hip or groin
- Pain in extension
- Ludloff sign
- Snapping hip sign



Clinical manifestations



Diagnosis

- Pelvic anteroposterior radiograph

Radiographs typically are normal in cases of iliopsoas tendinitis, but may demonstrate other bony pathology, which may contribute to the patient's symptom complex.

Diagnosis

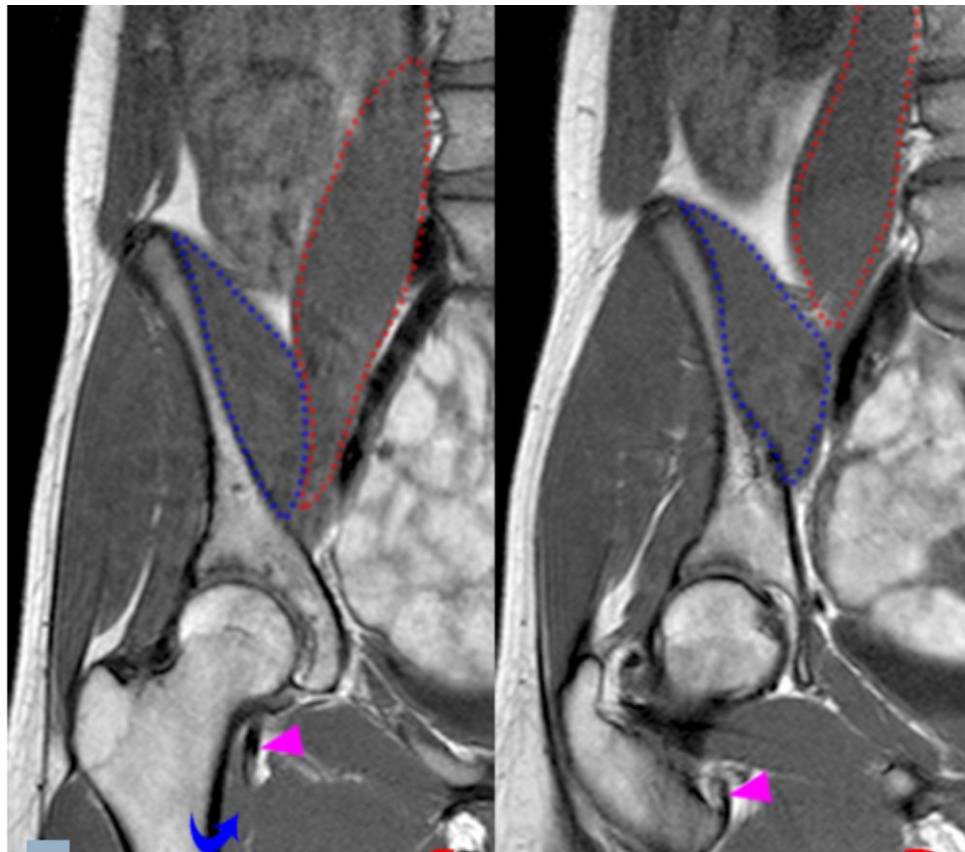
○Sonography

- Thickened tendon
- Fluid in the iliopsoas bursa



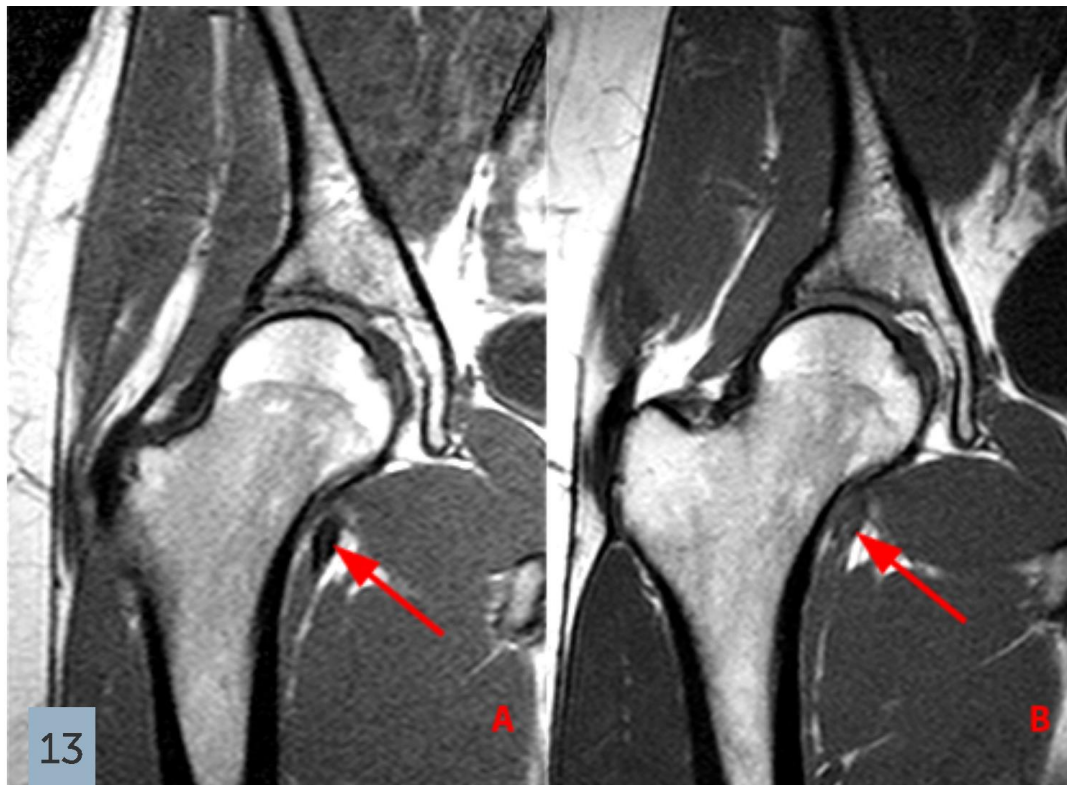
Diagnosis

○MRI



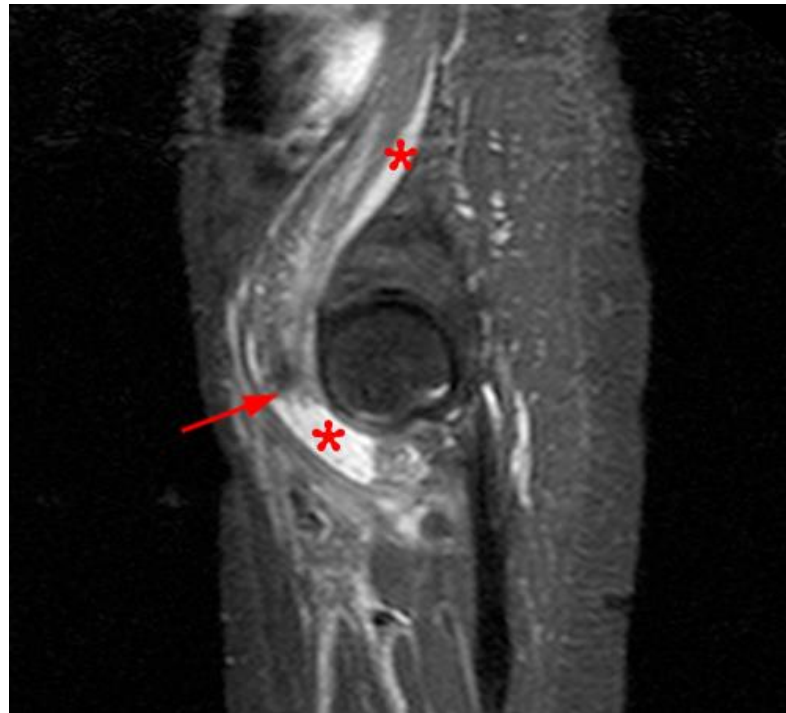
Diagnosis

○MRI



Diagnosis

○MRI



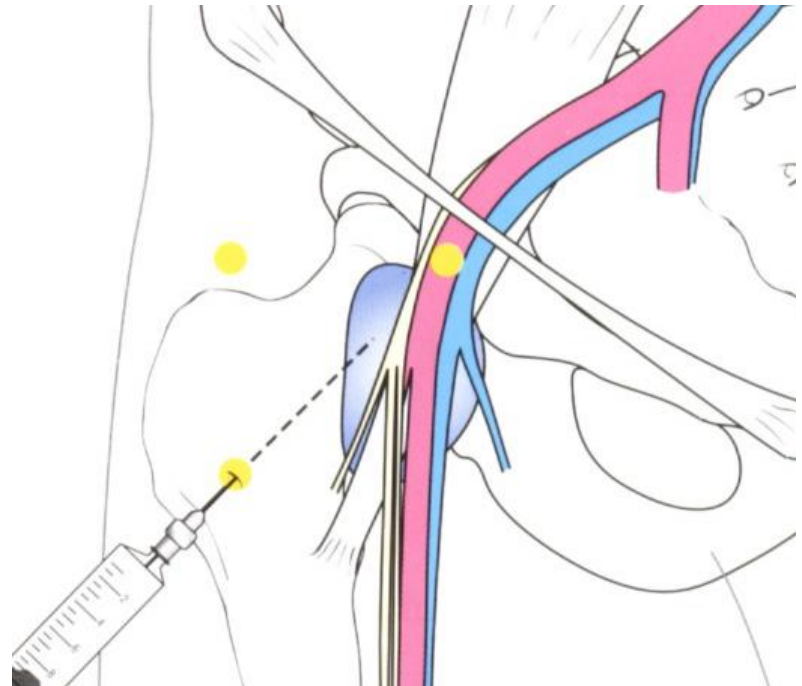
Diagnosis

○MRI



Treatment

- Rest
- Steroid injection
- Stretching exercise
- Surgery



Surgery

- Surgical techniques

- Complete release of the iliopsoas tendon
- Partial release by transection of the posteromedial aspect of the iliopsoas tendon

- Gruen et al. reported 73% of patients returned to previous athletic activities, with 45% also returning to their previous level of athletic participation

Surgery

- Hoskins et al.: Complications were noted in one third of patients and mostly included persistent hip pain, sensory deficits, and hip flexor weakness.

PUBALGIA (ATHLETIC HERNIA)



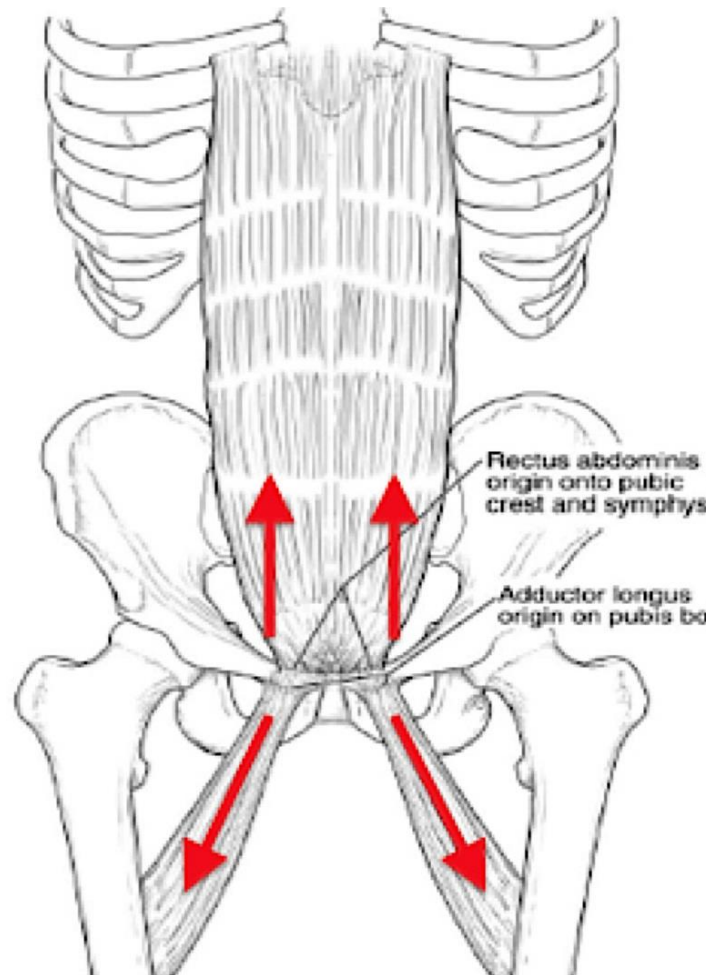
Definition

- Pain in the groin or lower abdominal area, typically in athletes who engage in activities involving repetitive sprinting, kicking, or twisting movements.
- These patients have no obvious hernias or symptoms, such as numbness, clicking, a lump, or dysuria, to suggest other causes.

Etiology

- Pubalgia is caused by damage to the muscles, ligaments, or tendons in the groin area.
- The injury is usually caused by twisting the body, suddenly changing directions, or doing repetitive movements.
- Due to weakness of the rectus abdominus

Etiology



Clinical manifestations

- Vague and diffuse pain in the area of the lower abdomen, groin, or medial thigh.
- The pain is often insidious in onset
- The symptoms are worse during and after strenuous activity and exacerbated by an increase in abdominal pressure, such as coughing or sneezing.

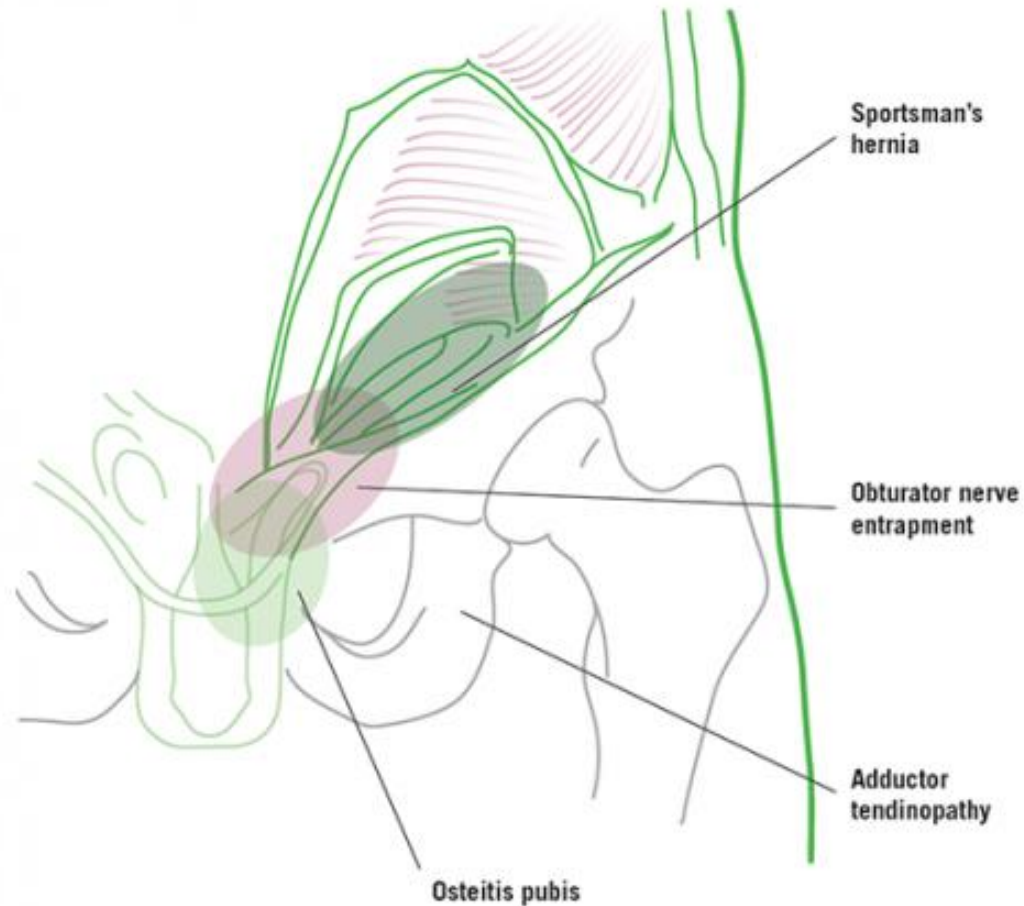
Clinical manifestations

- In men, the pain can radiate into the testicle on the involved side and to the surrounding areas of the abdomen and lower back.
- Women may complain of a dull ache in the groin aggravated by physical exertion or intermittent neurologic pain in the distribution of the ilioinguinal nerve

Clinical manifestations

- Tenderness in the area of the pubic symphysis
- Pain on contraction of the hip flexors, hip adductors, or abdominal muscles
- Pain and tenderness at the external inguinal ring without a frank lump

Differential diagnosis



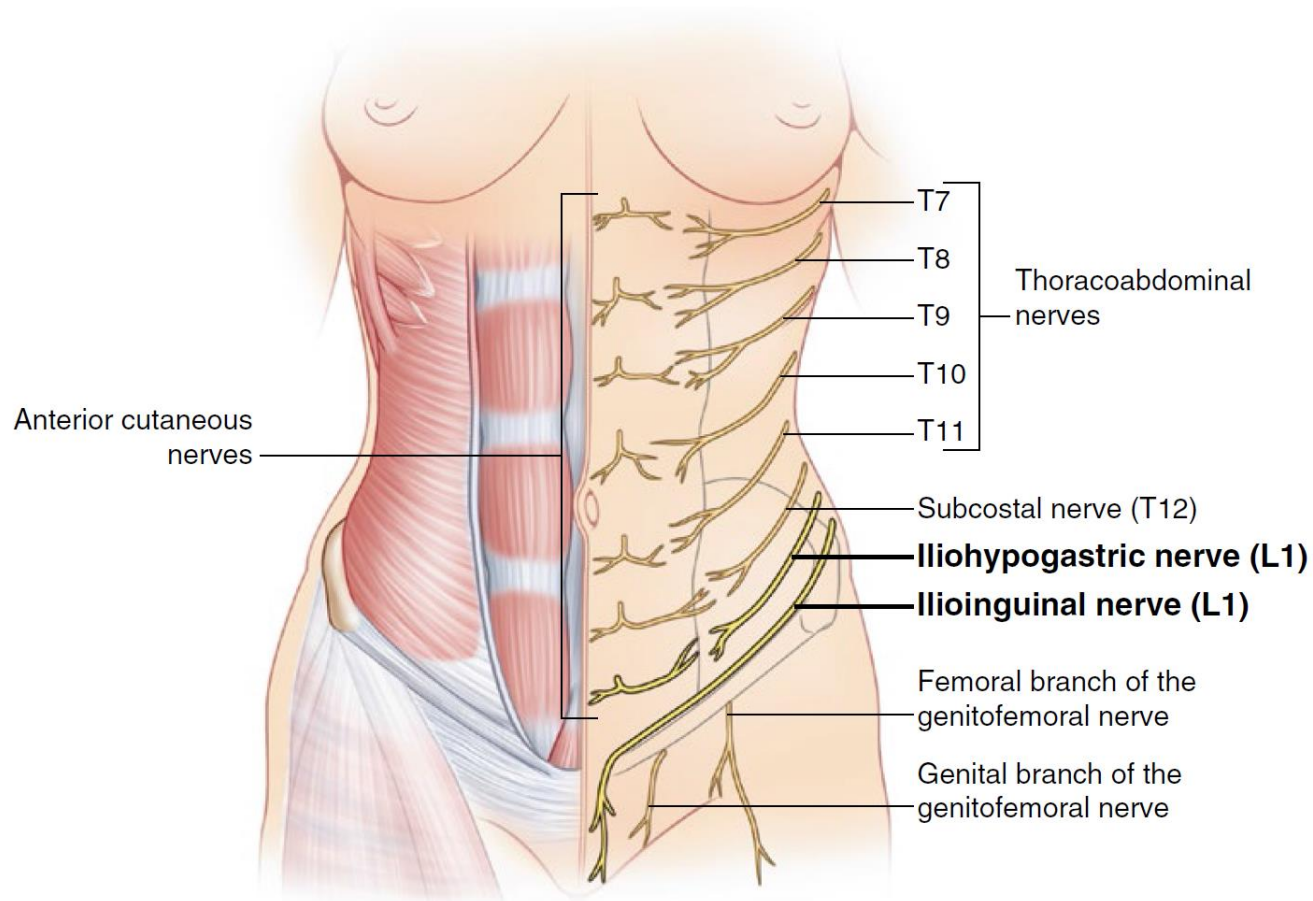
Treatment

- Resting for 1-2 weeks
- Stretching and strengthening exercises
- Surgery

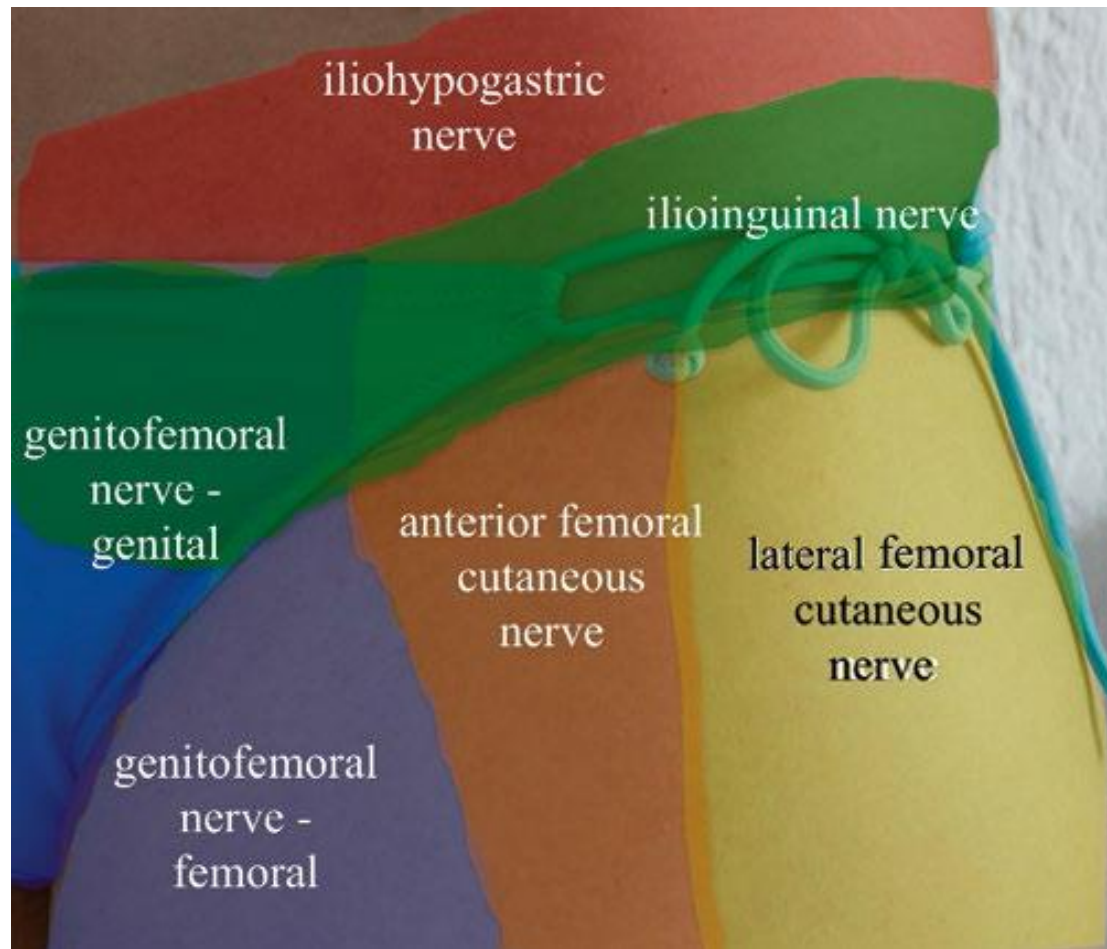
Ilioinguinal and Iliohypogastric Nerve Entrapment



Definition



Definition



Etiology

○Surgery

- Inguinal hernia repair
- Pelvic open and laparoscopic surgeries
- Trocar trauma from laparoscopic surgery
- Appendectomy, hysterectomy

○Blunt abdominal trauma

○Spontaneous

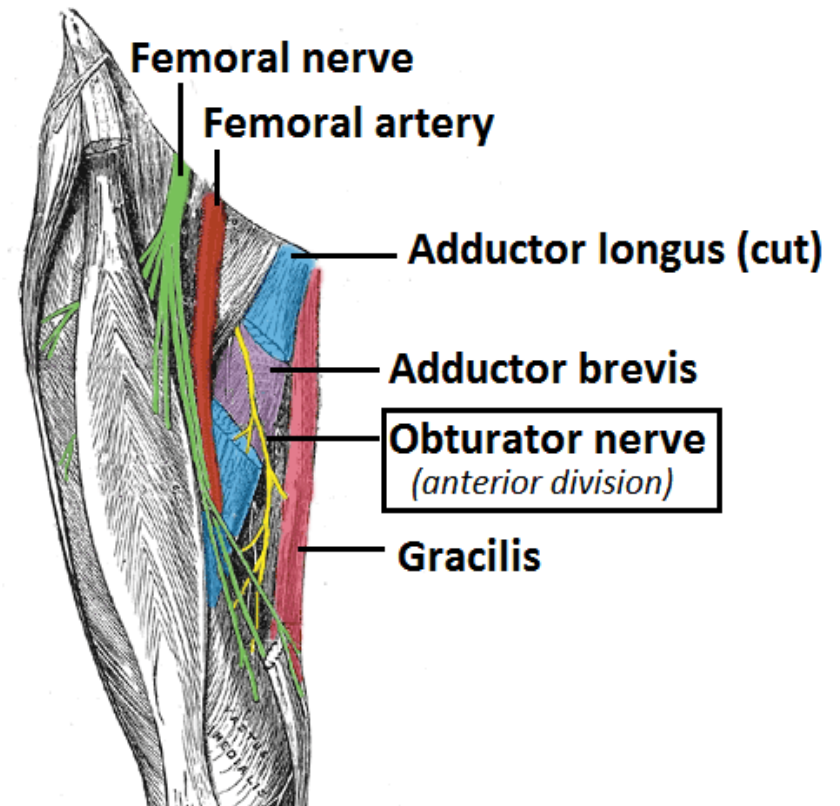
Clinical Presentation

- Pain originating in the iliac fossa and radiating into the ipsilateral groin and anteromedial thigh.
- Sensory changes such as dysesthesia or hypesthesia in the nerve distribution
- Patients may note pain with hip extension
- Trigger point site where the nerve exits through the abdominal muscles

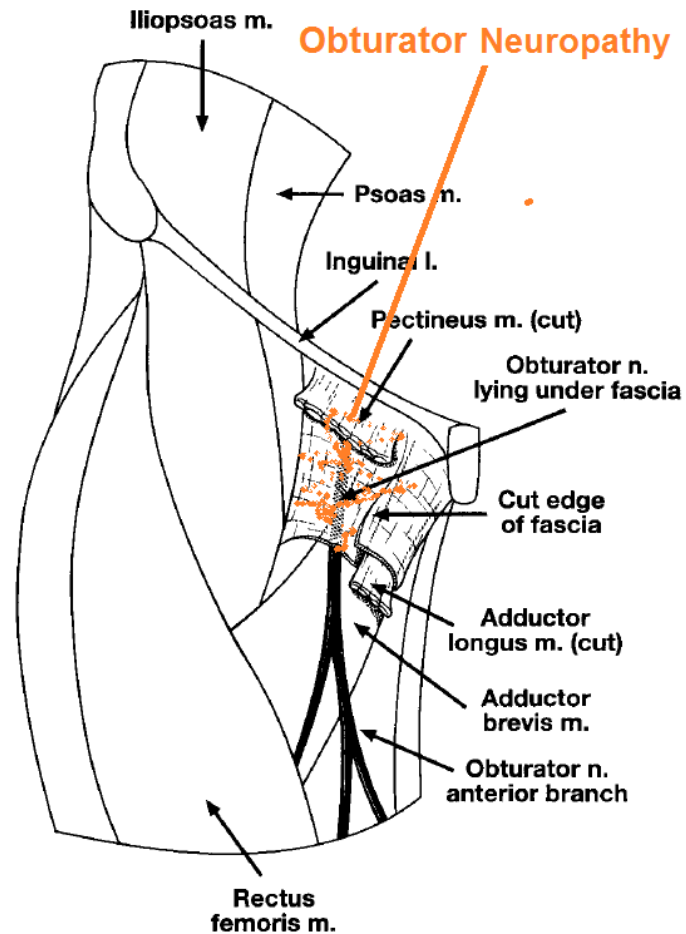


Ilioinguinal nerve exam at the iliac crest

OBTURATOR NEUROPATHY

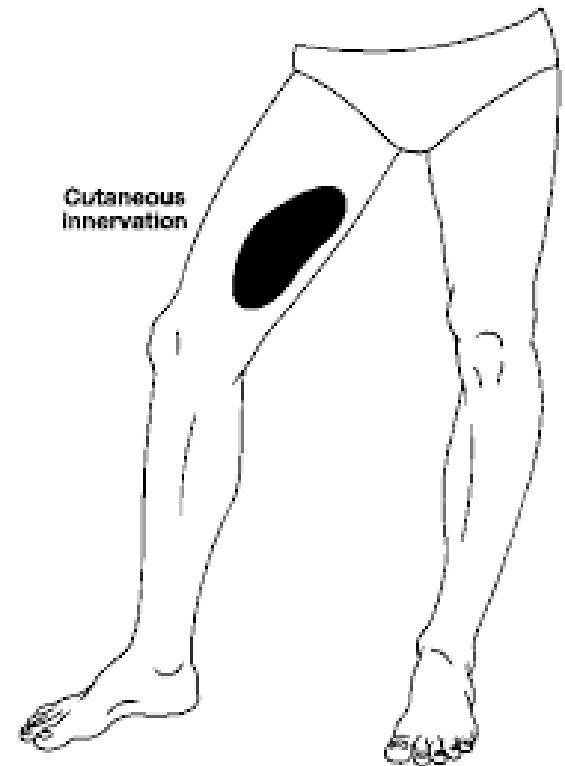


Anatomy



Clinical manifestations

- Postexercise medial thigh pain and adductor muscle weakness
- Paresthesia in the cutaneous distribution of the obturator nerve



Diagnosis

- Imaging does not play a significant role in confirming the diagnosis, but may be important in excluding other diagnoses, such as stress fracture of the femoral neck or pubic ramus.
- EMG studies, performed by inserting the needle into the belly of the patient's adductor muscles, show a pattern of denervation in the adductor longus and brevis muscles

Treatment

- Conservative treatment, consisting of electrical stimulation of the adductor and hip flexor muscles, stretching, and myofascial massage, has not been successful in resolving this condition.
- Surgery is the preferred treatment for patients