

The hip

Additional scientific considerations on musculoskeletal medicine

By Steven De Coninck, PT, ETGOM-GCI

www.cyriax.eu



Recommended literature

“A practical approach to musculoskeletal medicine ; assessment, diagnosis and treatment” Elaine Atkins et al., 5th edition, 2024, Elsevier

“A system of orthopaedic medicine” Ludwig Ombregt, 3rd edition, 2013, Churchill Livingstone, Elsevier

Referred pain?

Pain originating from hip pathology is most commonly located in the groin (88%)

May also occur anywhere around the hip, thigh or knee

Luthra et al., 2019
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p313

Inspection

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p311

Excessive lateral rotation on walking

- May indicate a slipped epiphysis in the young
- May be present with pain or advanced capsular contracture in the elderly

Avulsion fractures

- Excessive muscle contraction, as involved in explosive sports changing rapidly from running to jumping (e.g. hurdling)
 - Can lead to avulsion fractures and chronic apophysitis in adolescents
- Occur commonly at the attachment of the hamstrings at the ischial tuberosity and the long head of the rectus femoris at the anterior inferior iliac spine

Brukner et al., 2017
“A practical approach to
musculoskeletal medicine”, Atkins et
al., Elsevier, 2024, p312

Internal derangement – loose bodies?

- Twinging pain in the groin and a sensation of giving way on weight bearing
- Similar symptoms may be associated with
 - Labral tears (trauma, athletes)
 - Anterior acetabular chondrol defects (clicking or locking may also be present)

Neumann et al. 2007; O’Kane, 1999;
Hickman and Peters, 2001
“A practical approach to
musculoskeletal medicine”, Atkins et
al., Elsevier, 2024, p314, 328

Loose body

Associated with osteochondritis dissecans in adolescents (rare)

Most commonly it occurs secondary to the onset of degenerative arthropathy

They may be chondral, osteochondral or osseous

- Can increase in size and progressively worsen the damage to the joint surfaces, as well as the clinical symptoms

Saotome et al., 2006; Tibor and Sekiya, 2008; Bianchi and Martinoli, 1999

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p328

Impingement test
may be positive too
in case of LB

- Combining forced flexion, adduction and medial rotation
- Or, flexion, adduction and lateral rotation

Martin et al., 2008; Tibor and Sekiya, 2008

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p328



Capsular pattern?

Klässbo et al., 2003

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p322

Medial rotation,
flexion and abduction
are the three most
limited movements

Difficult to identify
the exact proportions
lost to establish a
pattern

Degenerative arthropathy

Kaspar and Van de Beer, 2005
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p326

Capsular stretching may no longer provide benefit

Injection (corticosteroid + local anaesthetic) may provide short term pain relief

- But...avoid injecting into the hip withing 3 to 6 months of planned surgery
- Because there's a significantly increased rate of postoperative infection in those hips who had previous injection

In contrast to this finding

Horne et al., 2008; Wang et al., 2014;
Cameron, 1995
“A practical approach to musculoskeletal
medicine”, Atkins et al., Elsevier, 2024,
p326


No link between previous
injection and subsequent
postoperative infection
(knee and hip)

Controversy also exists
concerning repeated
steroid injections in
weight-bearing joints and
the risk of steroid
arthropathy

Greater trochanteric pain syndrome (GTPS)

- Often due to gluteus medius and minimus tendinopathy, rather than trochanteric bursitis alone
- Iliotibial band syndrome
- Tendinopathy and bursitis can coexist

Fearon et al., 2013; Silva et al., 2008
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p333



The bursa and associated tissues could be tender, even after a total hip replacement

Dennison and Beverland, 2002
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p334

Differentiate GTPS from degenerative arthropathy

Lateral hip pain: GTPS is more likely if the patient has no difficulty putting on shoes and socks

Tenderness of the greater trochanter

If the FABER test produces lateral hip pain

Fearon et al., 2013

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p334

Diagnostic accuracy of GTPS improves by using a combination of tests

- Pain on single leg stance within 30''
- Resisted medial and lateral rotation, abduction could be +
- Resisted lateral rotation (sensitivity 88% - specificity 97,3%) scores better in comparison to medial rotation and abduction
- FABER / FADER could be +
- Tenderness on greater trochanter palpation has a positive predictive value of 83%

Diagnostic accuracy of GTPS improves by using a combination of tests (2)

Positive Trendelenburg sign, when used to assess for a gluteus medius tear
sensitivity 73% - specificity 77%

Speers and Bhogal, 2017; Grimaldi and Fearon, 2015; Lin and Fredericson, 2015
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p334

ITB tightness?

- **Ober's test**
 - Patient in side lying with painful side up
 - Passively extend the hip
 - Then slowly build in adduction
 - If the leg doesn't touch the treatment table: test is + for tightness

Adkins and Figler, 2000, Brukner et al., 2017; Hattam and Smeatham, 2020
"A practical approach to musculoskeletal medicine", Atkins et al., Elsevier, 2024, p335

Hamstrings muscle belly lesion: DF and...

Graded stretching exercises within the pain-free range

Focus more on the dynamic rather than the static function

Include eccentric muscle contractions and extensive lengthening

- Weight-bearing sport activities / rehabilitation under speed

Mason et al., 2008; Coole and Gieck, 1987; Brukner et al., 2017
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p339

The Knee

Knee pain in children?

Commonly referred from the hip

- Slipped upper femoral epiphysis
- Perthes' disease
- Osteochondritis dissecans
- Tumour

Bruckner et al., 2017

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p355

Gradual onset of anterior knee pain in adolescents?

Patellofemoral joint syndromes

- Walking, squatting, using stairs (particularly downstairs ; forces increase up to 3x the bodyweight)

Osgood-Schlatter's disease

- Osteochondritis at the growth plate of the tibial tuberosity
- Localised tenderness
- Pain on repeated strong knee extension (basketball, football, gymnastics)

Swelling that occurs within 2 to 6 hours after injury?

- Indicative of a haemarthrosis
- Warmth
- ACL rupture with torn synovium is the most common cause
 - In 70% of patients with an acute haemarthrosis
- In children?
 - More indicative of an osteochondral fracture

Shaerf and Banerjee, 2008; Amiel et al., 1990; Baker, 1992

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p357

Swelling that occurs over 6 to 24 hours after injury?

- Usually synovial in origin – traumatic arthritis
 - Meniscal lesions
 - Deep part of MCL
 - Subluxation or dislocation of the patella

Knee cartilage – running?

- Better creation of cartilage under compression / shearing forces
 - Runners have significantly thicker cartilage and meniscus in comparison to swimmers
- We need biomechanical stimuli to spread fibroblasts → tissue healing

Tim Daelemans, principal FICO Osteopathy Academy, personal communication during course, sept 2024

Cruciate ligaments

Rather a proprioceptive than stabilizing function

- rupture?
- Surgery + physio has the same functional outcome as only physio ; there's no higher risk for cartilage damage

Knee arthroscopy

Meniscal surgery could have a big placebo effect

- “fake” surgeries have been performed in which they just made some incisions, showing the patient “during the surgery” camera images from another surgery, giving him the impression of a real surgery

Posterior drawer test?

- Sensitive and specific test for the PCL
- As part of a complete assessment and if accompanied by other relevant tests

Malanga et al., 2003; Soames and Palastanga, 2018; Hattam and Smeatham, 2020
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p366

Anterior drawer test?

- Insensitive and poor diagnostic indicator
- As part of a complete assessment and if accompanied by other relevant tests

Wagemakers et al., 2010; van Eyck et al., 2013; Huang et al., 2016; Decary et al., 2017
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p366

Lachman test?

- Excellent diagnostic accuracy

Nickinson et al., 2010; van Eyck et al., 2013; Huang et al., 2016; Decary et al., 2017
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p366

Meniscal tests?

- Mixed support in literature for the various meniscal tests
- The **combination** of
 - McMurray test
 - Joint line tenderness
 - Specific elements from the **history**
 - → 88% accuracy for medial meniscal lesions ; 92% for lateral

Mohan and Gosal, 2007; Ryzewicz, 2007; Hegedus et al., 2007; Meserve et al., 2008; Speziali et al., 2016; Decary et al., 2017

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p367

Inflammatory arthritis

Intra-articular injection of corticosteroid

- Some evidence for relief of moderate to severe pain

Conaghan et al., 2008; Ringdahl and Pandit, 2011; Bannuru et al., 2015

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p368

Loose body?

- Typical history of momentary giving-way / twinges
- Fragment of cartilage or bone or both (osteochondral)
- Can be associated with degenerative arthropathy in the older adult

- An ACL tear can look similar clinically
 - But...there was a trauma

Saotome et al., 2006

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p369

Stable or unstable loose bodies?

- Stable
 - Fixed in a synovial recess, or bursa, or attached to synovial membrane, where they tend not to be displaced
- Unstable
 - Move freely in the joint to become trapped at irregular intervals causing intermittent symptoms

Bianchi and Martinoli, 1999

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p369

A “floating” meniscus?

- Coronary ligaments are disrupted or stretched
- The meniscus commonly stays intact

Bikkina et al., 2005

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p369

Patellar tendinopathy

- Physical training, including eccentric exercises, appears to be the treatment of choice...
- **However...**
 - Adding eccentric exercise as part of rehabilitation for athletes in a high-load environment (volleyball, basketball) **can be detrimental to the tendon**

Rodriguez-Merchan, 2013; Rudavsky and Cook, 2014;
Brukner et al., 2017
“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p382

The ankle and the foot

Achilles tendon

Has a zone of relatively poor vascularity 2 to 6 cm above its insertion and is prone to overuse, degeneration and rupture, particularly at this site

Chandnani and Bradley, 1994; Pufe et al., 2001;
Alfredson et al., 2002
“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p394

Anterior talofibular ligamentous laxity

- Anterior drawer test
 - Increased posterior movement of the fibula is a positive sign and indicates laxity or rupture
 - A “suction sign” or dimple may be observed on the lateral aspect of the ankle if the ATFL is ruptured

Marder, 1994; Hattam and Smeatham, 2020; Lee and Maleski, 2002

“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p404

Lateral ligament complex / sprain

85% to 90% of
ankle sprains

ATFL is the
weakest of the
ligaments

Calcaneofibular
ligament: involved
in 50% to 75%

PTFL rarely injured

Stanley, 1991; Liu and Jason, 1994; Hur et al., 2020;
Ferran and Maffulli, 2006
“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p410

Kerkhoffs et al., 2002; Vuurberg et al., 2018; Hur et al., 2020

“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p411

Up to 70% of
patients who
sustain an acute
lateral ankle sprain
can develop
chronic ankle
instability

Early mobilisation
and exercise are
the keys to
restoring function
in all grades of
ligamentous sprain

Acute ligamentous injury

- NSAID's, to reduce pain and swelling, may suppress the healing process!
- DF as early as possible, according to the irritability of the lesion, together with active (grade A) mobilisation
- From days 3 to 5 onwards there should be sufficient tensile strength to allow an increasing depth of DF

Vuurberg et al., 2018
“A practical approach to musculoskeletal
medicine”, Atkins et al., Elsevier, 2024, p411

Plantar fasciitis

- Common injury in the running athlete
 - Approx. 10% of running injuries
- Mechanism
 - Repetitive microtrauma through **overloading** of the longitudinal arch, which produces focal tears at the insertion of the plantar fascia
 - It may be a **traction injury**, during the push-off phase of gait
 - Calcaneal spurs are present in 50% of the patients with plantar fasciitis and in 19% of patients without
 - Not helpful towards prognosis or diagnosis!

Gibbon and Cassar-Pullicino, 1994; Cole et al., 2005; Trojian and Tucker, 2019
“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p417

Differential diagnosis?

- **Fat pad contusion**
 - occurs acutely following a fall onto the heel
 - Or, chronically through poor heel cushioning

Brunker et al., 2017

“A practical approach to musculoskeletal medicine”,

Atkins et al., Elsevier, 2024, p417

“Snapping ankle”

- Disruption of the retinacula
- Test
 - Active dorsiflexion + resisted eversion, which recreates the subluxation of the peroneal tendons

Lee and Maleski, 2002

“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p421

Achilles tendinopathy - treatment

Reactive stage

- Reducing the load on the tendon will allow the tendon to adapt and the matrix to assume a more normal structure ; this is likely to relieve pain

Disrepair and degeneration stage

- Treatment modalities that stimulate cell activity, increase protein synthesis and restructure the matrix are suitable
 - E.g. transverse friction, ESWT
- Progressive loading exercise!

Cook and Purdam, 2009

“A practical approach to musculoskeletal medicine”, Atkins et al., Elsevier, 2024, p426

4-stage program for midportion achilles tendinopathy

- Isometric exercises (pain relief)
 - Isotonic strength endurance
 - Energy storage exercises
 - Energy storage and release exercises
-
- Return to activity and training, if those exercises can be performed repeatedly with no increase of symptoms the following morning

Treatment...

- In degenerate tendons, an increased pain level is acceptable while performing eccentric exercise
- A combination of both eccentric and concentric exercises are as beneficial as eccentric exercises alone
- Expected recovery time may well be > 3 months, due to the slow progression of tendon healing

Cook and Purdam, 2009; Brukner et al., 2017; Scott et al., 2013

“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p427

The “heel drop” eccentric exercise

- Is not as effective for lesions at the achilles insertion into the calcaneus as for “mid-portion” lesions

Thomas et al., 2001; Brukner et al., 2017; J.L. Cook, conference lecture, 2008
“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p429

Gastrocnemius lesion or deep vein thrombosis?

Thrombosis

- Constant pain
- Tenderness
- Heat
- Swelling
- A positive Homan's sign? Pain on passive overpressure of dorsiflexion with the knee in extension (*not sensitive nor specific...*)

Brukner et al., 2017

"A practical approach to musculoskeletal medicine",
Atkins et al., Elsevier, 2024, p430

Healing of a gastrocnemius muscle tear

Mild tear

- Takes about 1 to 3 weeks

Severe
tear

- May take 8 to 12 weeks

“A practical approach to musculoskeletal medicine”,
Atkins et al., Elsevier, 2024, p430