



# PRACTICE

## PRACTICE POINTER

# An approach to hip pain in a young adult

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### What you need to know

- Initial management of hip pain in young adults includes simple analgesics or non-steroidal anti-inflammatory medication (NSAIDs), activity modification, and an anteroposterior radiograph of the hip
- Refer young adults with persistent hip pain for orthopaedic/sports and exercise medicine specialist opinion, even if imaging studies in primary care are reported as normal
- Most common causes of persistent hip pain in young adults are femoroacetabular impingement syndrome (FAI), hip dysplasia, and early osteoarthritis
- Early referral and treatment can improve pain and function but might also enable joint preserving treatments before the onset of osteoarthritis
- Appropriate surgical correction of the anatomical abnormalities in FAI and dysplasia safely and reliably reduces pain and improves function; failure of these procedures usually reflects failure to identify pre-existing arthritic change in the joint or to correct the anatomical deformity

Hip pain in young adults is not normal and can be severe and disabling, affecting work, parenting, and leisure activities.<sup>1,2</sup> The causes of hip pain in young adults (aged 16-50) tend to receive less attention than those in children (including Perthes' disease, slipped capital femoral epiphysis, and septic arthritis) and in older patients (usually osteoarthritis). Imaging studies might not reveal an underlying problem, even where the patient's symptoms are a consequence of clinically significant pathology.

Research has improved understanding of the causes of hip pain in young adults, including femoroacetabular impingement syndrome (FAI) and dysplasia of the hip, and has identified new treatments, although evidence is still limited.<sup>3,4</sup> Importantly, both FAI and hip dysplasia are treatable causes of hip pain in young adults.<sup>4-6</sup> This Practice Pointer aims to help the non-specialist evaluate young adults presenting with hip pain, and provides an update on common young adult hip pathologies.

### How do patients present?

Hip problems in young adults can be considered as problems within the joint itself (intra-articular) or outside the joint (extra-articular) (see infographic). Anterior groin pain is the most common presenting symptom for intra-articular hip pathology.<sup>7,8</sup> A 2016 study from the Netherlands reported a

0.44% annual incidence of people aged 15-60 presenting to primary care with groin or hip pain.<sup>9</sup> Based on this, a practice with 8000 patients could expect around 20 presentations a year with potential young adult hip problems.

Extra-articular pathologies, such as snapping hip syndrome and tendinitis, have rather different presentations and details are included under the specific conditions below.

The hallmark of hip pathology is the relation to movement and hip position. Pain coming on entirely unrelated to hip position or movement is less likely due to the hip itself and more likely due to non-orthopaedic causes (see [box 1](#)).

### Box 1: Differential diagnosis of young adult with groin/hip pain

#### Orthopaedic

- FAI
- Adult acetabular dysplasia
- Osteoarthritis
- Stress fracture
- Avascular necrosis (AVN) of femoral head
- Bursitis/tendinopathy
- Snapping hip syndrome
- Acute fracture
- Lumbar radiculopathy (femoral nerve)
- Osteitis pubis
- Groin disruption
- Inflammatory sacroiliitis

#### Non-orthopaedic

- Inguinal hernia
- Gynaecological conditions
- Inguinal lymphadenopathy
- Gonadal tumours
- Vascular claudication
- Skin conditions (eg, dermatomycosis)

## Anterior groin pain suggestive of labral injury/irritation

Anterior groin pain is the most common symptom in FAI (80% of cases) and hip dysplasia.<sup>7,8</sup> The similarity in presentation of these two conditions is likely due to both resulting in injury or irritation to the acetabular labrum. The pain is often precisely localised and commonly described as being sharp or pinching (“it feels like a knife”). Focal, deep aching pain on aggravating activity is also common.

Labrum related groin pain might begin insidiously,<sup>10</sup> unrelated to any specific trauma, or come on following a period of increased or unaccustomed activity such as an active holiday, taking up regular running, or weight bearing exercises involving squatting or lunging. Pregnancy might also trigger symptoms. The pain is usually related to activity initially, although as symptoms progress, standing, walking, and sitting can be impaired, affecting employment, travel, and recreational activities.<sup>11</sup>

Pain while sitting is another key feature of labral pathology (as opposed to hip osteoarthritis), aggravated by confined spaces such as driving, cinema, or air travel.

Characteristically, patients with labral pathology can often continue cycling, even when they have difficulty with walking and standing. Patients sometimes report “catching” in the hip when getting in and out of a car or rising from a seated position. Popping, locking, or grinding of the hip can also occur. Athletic patients present earlier with these conditions and might complain of loss of their top-level sporting function (eg, struggling to play football or run) with rest from exercise ineffective.

## Anterior groin pain suggestive of osteonecrosis, stress fracture, or osteoarthritis

Osteonecrosis of the femoral head most commonly presents with groin pain.<sup>12</sup> The onset is usually insidious and initially worse with weight bearing activities and relieved with rest, worsening to a constant pain as the condition progresses. Stress fractures can present similarly, though there is usually a preceding history of overuse or a change in type or intensity of physical activity.<sup>13</sup> Hip osteoarthritis can present with groin, buttock, or lateral thigh pain—stiffness and night pain characterise this common condition.

## Medial groin pain

Several sports related pathologies can present with medial groin pain. Osteitis pubis is inflammation of the pubic symphysis, which classically presents with vague anterior pelvic pain and tenderness over the pubic symphysis, and is seen in kicking sports. Adductor injuries and tendinopathy usually result in pain felt in the inner thigh with tenderness to palpation over the adductor tendons. Groin disruption (which has many other names including sportsman’s hernia, Gilmore’s groin, and athletic pubalgia) is a complex injury to the insertion of the abdominal muscles to the pelvis, resulting in medial groin pain which is worse on twisting movements and often on coughing.

## How to assess the patient

### What to ask

A targeted history and examination can help ascertain whether a patient’s symptoms are likely coming from the hip joint itself or from elsewhere. Non-orthopaedic diagnoses that can present with groin pain include gynaecological conditions, inguinal

hernia, gonadal tumours, and other causes of inguinal lymphadenopathy. Where patients present acutely, consider an ectopic pregnancy or appendicitis.

Differentiating between the causes of intra-articular hip pain based on clinical assessment alone can be difficult. [Box 2](#) suggests questions to ask.

### Box 2: Focused history of hip pain

#### \*Red flag symptoms

- Investigate details of the pain: is it in the anterior groin, buttock, lateral hip, lower back, or anterior thigh?
- Is the pain preventing sleep at night?\*
- Suggestive of severe symptoms—advanced AVN, osteoarthritis, or potentially tumour
- Is the person able to weight bear?\*
- Suggestive of severe symptoms including possible fracture, tumour, or infection
- Does the person have pain on sitting for extended periods?
- Suggestive of FAI/dysplasia (labral irritation)
- Is there a history of trauma?\*
- Acute trauma—consider acute fracture; needs urgent imaging
- Previous trauma—risk factor for AVN
- Is there a history of childhood hip problems (developmental dysplasia of the hip, Perthes’ disease, slipped capital femoral epiphysis)?
- Risk factors for FAI or osteoarthritis
- Has the person engaged in occupational or sporting activities with a recent increase in weight bearing activity?\*
- Suggestive of stress fracture; needs urgent referral
- Is there pain in other joints, or constitutional symptoms?
- Suggestive of inflammatory arthritis
- Is the person taking steroids or consuming excess alcohol?
- Risk factors for AVN

## What to do

Physical examination is generally sensitive but not specific for intra-articular hip problems.<sup>11</sup> Patients with an intra-articular source of pain can often show this using the C-sign<sup>14</sup> (cupping hand around greater trochanter, [fig 1](#)) or coordinate fingers ([fig 2](#)). Patients will often spontaneously generate these gestures simply by being asked, “Show me where your pain is?” Physical examination also helps ascertain other causes of groin pain, such as inguinal hernia, adductor injuries, or pubic bone conditions. A systematic review found inadequate evidence to recommend many of the special examination tests anecdotally advised in the assessment of young adult hip pathology.<sup>15</sup> The flexion adduction internal rotation test ([fig 3](#)) can be a valuable screening tool for FAI.<sup>15</sup> [Box 3](#) details a targeted hip examination. Gait is rarely abnormal in these pathologies and is more commonly affected in advanced osteoarthritis.

**Box 3: Targeted hip examination**

- Look
  - Limp—gait can be subtly disrupted in early hip problems in young adults with a reduced range of movement in the hip (extension, adduction, and internal rotation), while patients with more severe pathology might limp with an antalgic gait.
  - Spontaneous gestures when pointing to the pain: C-sign (fig 1), and coordinate fingers (fig 2) are commonly seen with labral irritation
- Feel
  - Greater trochanter for tenderness suggestive of trochanteris bursitis, or snapping hip syndrome
  - Adductor tendons for tendinopathy/adductor injury
- Move
  - Range of motion, compare with other side
- Impingement test for labral injury
  - Flex hip to 90°, gentle adduction and internal rotation (fig 3). Positive if reproduces patient's typical pain
- Other causes of pain
  - Hernia examination (eg, cough impulse), lumbar spine (eg, femoral stretch test), adductor related pain (eg, pain on resisted adduction of the hip)

**Young adult hip pathologies**

Evidence is limited regarding the relative frequency of different conditions presenting with groin pain in primary care. In one primary care study nearly 50% of young adults presenting with groin pain were suspected of having FAI, with 34% having adductor tendinitis and 5% having osteoarthritis.<sup>9</sup> The most common conditions seen in tertiary care by those specialising in young adult hip disorders are FAI, dysplasia, and femoral head osteonecrosis. In those patients requiring non-arthroplasty hip surgery, FAI is by far the most common indication, with dysplasia being substantially rarer.<sup>16</sup>

**Femoroacetabular impingement**

FAI syndrome is the process where a variant in hip anatomy results in excessive contact between the acetabulum and femur when the joint is in certain positions. Two types of abnormal anatomy have been described: cam morphology with excess bone at the femoral head neck junction, and pincer morphology with excessive bone at the acetabular rim.<sup>3</sup> A combination mixed morphology can also occur.<sup>17</sup> Repetitive collisions between the bones can result in injury to the soft tissues of the hip, especially the labrum and cartilage, and can eventually cause arthritis.<sup>18</sup> It typically affects active individuals between 30 and 45 who have commonly played regular sport. Elite athletes or dancers can present in their teens or twenties. The typical symptom is anterior groin pain as described above.

**Adult acetabular dysplasia**

Hip dysplasia describes an abnormally formed hip joint, most frequently a shallow or upward sloping acetabulum.<sup>19</sup> Most commonly, though not exclusively, adult dysplasia results from undiagnosed developmental dysplasia of the hip (DDH). Many people with DDH receive a diagnosis and treatment in childhood, although some remain without a diagnosis until adolescence or later. Labral hypertrophy can temporarily compensate for the lack of bony acetabular cover for the femoral head, allowing the patient to remain asymptomatic until it eventually tears and symptoms develop.<sup>20</sup> Dysplasia is a leading precursor of hip osteoarthritis, seen in 20%-40% of cases.<sup>21</sup> The typical symptom is anterior groin pain as described above. FAI and dysplasia symptoms are similar as the end pain generating lesion (the labral injury) is the same.

**Stress fracture**

Repetitive loading of the femoral neck can cause a stress fracture.<sup>13</sup> Runners who are new to the sport or who have recently increased their training, and women with inadequate calorie intake and menstrual irregularities are particularly at risk.<sup>22,23</sup> Typical symptoms are activity related groin pain, initially during running or weight bearing, which can progress to constant pain.

**Osteonecrosis**

Femoral head ischaemia can result from traumatic injury compromising the blood supply (femoral head or neck fracture) or idiopathically, with known risk factors including steroid usage, excess alcohol consumption, diving, autoimmune conditions, and hypercoagulable states.<sup>24,25</sup> It is classically associated with long term systemic corticosteroid usage (for example, for SLE or asthma) but can also be associated with endogenous excess corticosteroids. It is more common in men, with an average age of 35-50 at presentation, and has a reported incidence of up to 20 000 new presentations a year in the United States.<sup>26</sup> It is characterised by insidious onset, with an initial activity related groin pain, progressing to constant pain.

**Bursitis/tendinopathy**

The bursa overlying the greater trochanter and the iliopsoas bursa are the most common sites of bursitis around the hip. There is frequently an associated tendinopathy of the gluteus medius/minimus or iliopsoas. Overuse, postural abnormalities, and trauma are common causes of hip bursitis/tendinopathy. Trochanteric bursitis is most common and is characterised by an isolated lateral sided hip pain typically in a middle aged woman, with tenderness over the greater trochanter.

**Snapping hip syndrome**

A snapping or clunking sensation and occasionally an audible noise can be generated by certain tendons moving over bony prominences around the hip (either of the iliotibial band over the greater trochanter or the iliopsoas tendon over the anterior hip structures).<sup>27</sup> Patients can often reproduce the symptom on demand. Athletes, and especially dancers, are at risk. The sensation can cause annoyance and can also result in bursitis.

**How to manage initially**

Management might include a period of rest and simple analgesia or a short course of non-steroidal anti-inflammatory drugs. Where symptoms improve, patients can usually be further managed with physiotherapy, focused on stretching and strengthening exercises to increase the tolerance of the hip to activity, and are advised to avoid aggravating activities. In patients who do not improve rapidly, an anteroposterior radiograph of the pelvis is an appropriate first line investigation. This can exclude severe dysplasia, acute fracture, and well established osteoarthritis, and can show evidence of FAI-type anatomy or osteonecrosis. Evidence suggests frequent incorrect reporting of hip radiographs as normal where FAI abnormalities exist on closer inspection.<sup>28</sup> Therefore, it might be appropriate to consider further investigation in the presence of continued pain even where a radiograph is considered normal.

**When to refer**

Refer patients who fail to improve with simple conservative treatment for orthopaedic or sports and exercise medicine

assessment. Magnetic resonance imaging scans are usually requested in specialist young adult hip clinics where there are musculoskeletal radiologists with specific experience in young adult hip conditions. Unfortunately, many hospitals in the UK have no dedicated service for young adults with hip disease, making referral to centres with the appropriate expertise challenging.

Femoroacetabular impingement syndrome and dysplasia of the hip have both been implicated as precursors of hip osteoarthritis, and some patients might benefit from early intervention.<sup>29</sup> Symptomatic patients with radiographic evidence of dysplasia might be candidates for surgery to realign the hip.<sup>21</sup> Early referral (within six months) might enable this treatment before the development of osteoarthritis. Patients with osteonecrosis or certain types of stress fracture might also benefit from early surgical intervention.

## What treatments are available in secondary care?

### Conservative

Commonly, FAI is initially managed with physiotherapy, with the aim of improving hip stability, neuromuscular control, strength, range of motion, and movement patterns.<sup>30</sup> This is common practice; however, a systematic review found little evidence to support it.<sup>31</sup>

Intra-articular steroid injections can play diagnostic and therapeutic roles in FAI. A reduction in symptoms with an injection is supportive of an intra-articular source of pain.<sup>32</sup>

Bisphosphonates have a role in the early stages of managing osteonecrosis.<sup>33</sup> Most types of stress fracture can be successfully managed with a period of non-weight bearing followed by physical therapy.<sup>34</sup> Tendinopathy and bursitis can be managed with extracorporeal shock wave therapy or injection of corticosteroid.<sup>35</sup>

### Surgical

Surgery is recommended in cases where conservative treatment has failed to relieve pain and restore function.

For FAI, hip arthroscopy can reshape the bones and repair or debride the labrum and other soft tissue structures.<sup>29</sup> Surgery for FAI can result in successful short to mid-term outcomes. A systematic review found 87% of 977 athletes with FAI returned to sports after surgery, with 82% returning to the same level as before symptoms started.<sup>36</sup>

Several randomised controlled trials currently under way are likely to provide high quality evidence by comparing patient reported outcomes following either arthroscopic surgery or conservative care in those with FAI. The Non Arthroplasty Hip Registry was set up by the British Hip Society in 2012 to specifically evaluate the medium term outcomes of hip preservation surgery in the UK.<sup>37</sup>

Surgical options for dysplasia include osteotomies around the hip, most commonly a periacetabular osteotomy (PAO). Twenty year follow-up results of PAO (75 hips in 63 patients) published in 2008 found that, of those who did not have pre-operative arthritis, 75% had not required a total hip replacement.<sup>38</sup>

Early osteonecrosis can be treated with surgery to decompress the femoral head if it has not collapsed.<sup>24</sup> Certain types of stress fractures benefit from surgical fixation.

If substantial osteoarthritis has developed in any of these conditions, hip arthroplasty surgery might be indicated.

### Education into practice

How will your overall approach to young patients with groin pain change after reading this article?

How confident do you feel deciding when to refer patients with non-arthritic hip pain for specialist opinion?

How would you discuss the potential causes of hip or groin pain with a patient?

### How patients were involved in the creation of this article

We asked young adults with hip disorders to provide feedback on this article. They reported that the description of pain strongly resonated with them, especially struggling to sit or stand for extended periods, with driving being an especially irritable activity. The comments predominantly changed the descriptive terminology used in the section "How patients present."

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## Figures



**Fig 1** The C-sign: cupping of the hand around the affected hip with the index finger in the groin and the thumb on the buttock



**Fig 2** Coordinate fingers: using two fingers to try to show the location of the pain deep within the groin



**Fig 3** Flexion adduction internal rotation test