

## PRACTICE

## UNCERTAINTIES

# Is surgery effective in patients with femoroacetabular impingement syndrome?

Ruth SF Richardson *specialist registrar trauma and orthopaedics*<sup>1</sup>, Karen Lothe *general practitioner*<sup>2</sup>, Seb Sturridge *consultant trauma and orthopaedics*<sup>1</sup>

<sup>1</sup>Frimley Park Hospital, Surrey, UK; <sup>2</sup>Upper Gordon Road Surgery, Surrey, UK

## What you need to know

Consider femoroacetabular impingement syndrome (FAIS) as a possible diagnosis in young adults with hip or groin pain and features suggestive of impingement on imaging

Trials suggest improved pain and functional outcomes with arthroscopic surgery but there is uncertainty about the extent of improvement compared with physiotherapy and the long term effect of surgery

Discuss the options of physiotherapy and activity modification as alternatives to surgery. Offer referral to an orthopaedic surgeon to discuss the indication for surgery if symptoms do not improve

## What is the evidence of uncertainty?

### Search strategy

We searched PubMed and the Cochrane Library using the terms "femoroacetabular impingement," or "hip impingement," or "hip arthroscopy." We prioritised studies comparing arthroscopic surgical treatment with conservative management in patients with symptomatic FAIS. We included studies involving adults from 1990 to 2018.

We also reviewed the most recent Non-Arthroplasty Hip Registry report, for nationwide information on current trends in FAIS surgery. We cross-referenced bibliographies.

Femoroacetabular impingement syndrome (FAIS) describes motion related hip pain, which is caused by premature bony contact between deformities at the femoral neck and/or the acetabular rim<sup>1-3</sup> (fig 1). Young, active adults are commonly affected. A prospective study in the Netherlands found that 17% of adults presenting to primary care with hip/groin pain in a year (84 adults in all) were subsequently diagnosed with FAIS on radiological imaging,<sup>4</sup> and a further 30% had a high clinical suspicion. Impingement can damage the joint cartilage over time and lead to osteoarthritis.<sup>2,3,5,6</sup>

Treatment includes conservative care with analgesics, lifestyle and activity modification, and physiotherapy, or surgery. Attempts to refine diagnostic and treatment criteria have been made;<sup>7</sup> however, doubt remains about subcategories of FAIS and subgroup outcomes.<sup>8,9</sup> Yet, the volume of arthroscopic hip surgery has grown exponentially.<sup>10</sup> FAIS is the primary indication for this surgery.<sup>11</sup> Within the past decade, the number of hip arthroscopies performed in the NHS has increased 10-fold. Almost 4000 surgeries are predicted annually by 2023.<sup>10</sup> Controversy exists about how surgery compares with non-operative treatment for FAIS<sup>12</sup> and it remains unclear whether surgery can delay early joint degeneration, offsetting the need for future hip replacement.

We identified six systematic reviews investigating the management of FAIS and three randomised controlled trials comparing arthroscopic hip surgery with conservative management (table 1). The outcomes included patient reported outcome measurements (PROMS), which is a composite score derived from a set of questions on hip related quality of life. Questions cover pain and function in a range of activities, such as putting on socks, getting out of a car, participating in sports, and sex. Other outcome measures considered include complications, re-operation, return to sport, and cost analysis.

## Short term outcomes

The most recent systematic review (29 clinical studies, 1911 patients) found a statistically significant improvement across all PROMs following hip arthroscopy for FAIS,<sup>18</sup> echoing the conclusions of previous systematic reviews.<sup>16-20</sup> Of those patients, 1.7% experienced complications. Nearly 88% of patients could return to sport following surgery. The re-operation rate was 5.5%, and 77% of re-operated patients went on to have total hip replacement.<sup>18</sup>

All these systematic reviews relied on mostly low quality evidence from case series and cohort studies.<sup>16-20</sup> A Cochrane Review from 2014 confirmed that no randomised controlled trials comparing arthroscopic hip surgery with conservative management had been published.<sup>21</sup>

Over the past year, three randomised controlled studies have been published. Two well conducted trials report greater improvement in hip related quality of life at 8 months to one year with arthroscopy as compared with physiotherapy.<sup>13 15</sup> In another trial conducted in a military hospital, no difference was found between the physiotherapy and the surgery arms of the trial. However, 70% of patients in the physiotherapy arm went on to have hip arthroscopy within the follow-up period, reducing the power of the study.<sup>14</sup> These findings may not be generalisable.

There is great heterogeneity across the literature in outcome measurements, particularly the variety of PROMs used, which adds to the uncertainty.

## Long term outcomes

High quality, long term trials on mitigation of risk of osteoarthritis with surgery are lacking. A systematic review of medium and long term outcomes after hip arthroscopy (seven studies, 1484 hips) for FAIS found that 10% of joints required a total hip replacement within eight years of follow-up.<sup>17</sup> Conversion to hip replacement is a surrogate marker for developing osteoarthritis but is not accurate. Increasing age, degenerative joint disease, and female sex were risk factors. The evidence is of low quality and leaves uncertainty regarding the development of osteoarthritis in patients with and without surgery.

## Is ongoing research likely to provide relevant evidence?

Further surgical trials of treatment for FAIS are underway and will add to the evidence on the true efficacy of treatment of hip arthroscopy in FAIS. It will be several years before research currently in progress can indicate the longer term impact on osteoarthritis (table 2). Our analysis of the trials included a search of ISRCTN, clinicaltrials.gov, and ANZCTR using the terms “hip impingement” or “femoroacetabular impingement”. Bibliographies were cross-referenced.

The Non-Arthroplasty Hip Registry collects surgical and PROMs data from numerous orthopaedic interventions, including arthroscopic procedures for FAIS (fig 2). Although this registry is still in its infancy, it intends to follow the “lifespan” of the hips entered into its database and may be able to link to other registries, such as the National Joint Registry. This would help identify the long term survivorship of hips undergoing arthroscopy for FAIS.<sup>11</sup>

## What should we do in the light of the uncertainty?

Carefully assess young adults presenting with hip pain to rule out important differentials before considering treatment for FAIS.<sup>25</sup> Only patients with bothersome symptoms may require treatment. Asymptomatic patients with radiographic features of impingement do not require treatment.

Discuss the different treatment options. Advise the patient regarding weight loss (where applicable), activity modification, and non-steroidal anti-inflammatory drugs (where safe) for pain relief as recommended by National Institute for Health and Care Excellence (NICE) guidelines.<sup>26</sup> Suggest avoiding situations that precipitate symptoms, such as high impact or repetitive activities, or terminal ranges of movement under load. Physiotherapy focusing on movement patterns, improving

muscle control, and strengthening exercises around the hip can reduce impingement and improve patient outcomes.<sup>13</sup>

In patients with no improvement, offer referral to an orthopaedic surgeon specialising in young adult hip conditions and arthroscopy for further assessment and evaluation for arthroscopic surgery. Inform patients that the evidence base for surgery is still evolving. So far, studies have shown an improvement in patient reported outcomes after surgery.

However, the procedure typically requires two weeks off work, weeks to months off sports, and it may take up to a year for patients to feel a benefit from surgery. They may possibly see no benefit from surgery, or they may be worse off as a result.

It can be difficult to translate PROMs research for patients who want to understand the evidence base for treatment. It may be worth explaining that, in the recent FAIT trial,<sup>15</sup> 70% of patients who had arthroscopic surgery showed improvement from their baseline scores (95% confidence interval 61% to 79%). In the physiotherapy arm of the trial, 50% of patients showed an improvement from their baseline scores (95% confidence interval 40% to 60%). This suggests that even though surgery has shown better results than physiotherapy, one in three patients do not improve after hip arthroscopy.

Inform patients that there remains uncertainty about the rate of progression to arthritis and there is no solid evidence yet that surgery for FAIS will slow the development of any osteoarthritis in their hip joint.

### Education into practice

How has reading this article informed your understanding of femoroacetabular impingement syndrome and the treatment options available?

How will you explain the pathology of hip impingement and the role of hip arthroscopy to patients?

### What patients need to know

- Femoroacetabular impingement presents with pain in the hip or groin, and is diagnosed based on clinical examination and imaging
- Your doctor will advise weight loss and activity modification and prescribe analgesics for pain relief. Physiotherapy is also effective in reducing pain and improving function
- Arthroscopic surgeries for hip impingement are on the increase. Recent trials show some improvement in pain and function with surgery, however that improvement may not take the patient back to full function, sport, or work. Some patients do not see an improvement after arthroscopy
- It may take many months or even a year for recovery and to feel the full effect of the surgery
- The procedure is usually done as a day case and patients will mobilise home the same day (crutches used for 2-3 days until postoperative pain has subsided). We generally recommend two weeks off work for postoperative recovery
- Surgery carries associated risks and complications, which do not apply to physiotherapy. Every effort should be made to rehabilitate the hip, when possible, without recourse to surgery
- Impingement can damage joint cartilage and lead to osteoarthritis of the hip over time, but there is no evidence that surgery can prevent this

### Recommendations for further research

Long term follow-up data from trials to establish whether hip arthroscopy for FAIS delays the development of osteoarthritis

Evaluation of cost effectiveness of hip arthroscopy to inform the debate about a shift towards surgical management of FAIS

Most effective physiotherapy intervention to augment surgical management both pre and post-operatively

**Additional resources**

Video describing FAIS. <https://www.youtube.com/watch?v=A-r8FyJwTQ>  
 NICE patient information leaflet on surgery for FAIS. <https://www.nice.org.uk/guidance/ig408/resources/creating-hip-impingement-syndrome-with-arthroscopic-surgery-pdf-362852749>

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

We consulted a patient with femoroacetabular impingement, who had undergone both physiotherapy and hip arthroscopy, about the scope and focus of this article before drafting. The patient emphasised the benefit of both treatments and the importance of informed patient choice, which we have included in the box *What patients need to know*. She also reviewed and approved the draft manuscript. We are grateful for her input.

**Competing interests** The BMJ has judged that there are no disqualifying financial ties to commercial companies. The authors declare the following other interests: SS is part of the UK FASHIoN Study Group and contributor to the NAHR database.

Further details of The BMJ policy on financial interests is here: <https://www.bmj.com/about-bmj/resources-authors/forms-policies-and-checklists/declaration-competing-interests>

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## Tables

Table 1 | Summary of literature findings.

Study	Size	Conclusions	Uncertainty
Griffin D, et al <sup>13</sup> UK FASHIoN multicentre RCT comparing hip arthroscopy and best conservative care for FAIS June 2018	348 Patients across 23 UK centres with 27 treating surgeons	Primary outcome measurement iHOT-33 (a 100 point hip related quality of life measurement) showed improvement in both the surgical and physiotherapy arms; however, the treatment effect was greater in those having hip arthroscopy (adjusted mean difference of 6.8 points 95% confidence interval 1.7 to 12.0, P=0.0093). This score was clinically as well as statistically significant	Patient iHOT-33 scores taken at 12 months from randomisation; so conclusions can only be drawn in the short term. Cost analysis also showed arthroscopy to be more expensive than physiotherapy (£3042 v £155)
Mansell, N et al <sup>14</sup> RCT comparing arthroscopic surgery and physiotherapy for FAIS in USA military personnel. February 2018	80 Patients from a single military hospital treated by a single surgeon	There was improvement in PROMs in both arms at 2 years, but the mean difference between physiotherapy and surgery was not statistically significant (HOS Hip Outcome Score for Sport, 1.8 (95% confidence interval -11.2 to 14.7) and HOS for activities of daily living, 3.8 (95% confidence interval -6.0 to 13.6) and for iHOT-33, 6.3 (95% confidence interval -6.1 to 18.7)	70% of patients in the physiotherapy arm converted to surgical treatment within the follow-up period. This affects the power of the study and raises the possibility of a "false negative" finding, also known as a type II error
Palmer AJ et al <sup>15</sup> FAIT multicentre RCT comparing arthroscopic hip surgery and physiotherapy for femoroacetabular impingement January 2019	222 Patients from 7 NHS hospitals	Primary outcome measure HOS ADL (a validated score for hip arthroscopy). The mean HOS ADL in the arthroscopic surgery group was 10.0 points (95% confidence interval 6.4 to 13.6, P=0.001) higher than in the physiotherapy group at 8 months post-randomisation	Minimum clinically significant difference in the HOS ADL is 9 points. The 95% confidence interval falls below this. Follow-up was 8 months from randomisation. Medium and long term follow-up data are still required
Fairley J et al <sup>16</sup> Systematic review of outcomes in management of FAIS 2016	18 Studies	Conservative measures may avert surgery in 39-89% of people with FAIS. All surgical studies showed improvement in PROMs, regardless of procedure (open or arthroscopic) but with additional benefit from arthroscopic surgery	No studies compared conservative treatment with surgery. Hence it cannot conclude whether one approach is superior to the other. With lack of follow-up, there is no evidence that surgical intervention alters the natural history of FAIS
Nwachukwu B et al <sup>17</sup> Systematic review of arthroscopic versus open treatment FAIS 2015	16 Studies	7% Conversion to hip replacement after open procedures and 9% conversion after arthroscopic surgery for FAIS (difference not statistically significant P=0.06)	Conversion to hip replacement is a surrogate marker for the development of osteoarthritis but it is not necessarily accurate. Studies with long term follow-up are required to investigate further
Minkara A et al <sup>18</sup> Systematic review and meta-analysis of outcomes following arthroscopy for FAIS January 2018	29 Clinical studies (1911 patients)	5.5% Risk of re-operation, (95% confidence interval 3.6-7.5), of which 77% had hip replacement 1.7% complication risk (95% confidence interval 0.9-2.5). 87.7% of patients returned to sport (95% confidence interval 82.4 to 92.9) All PROM scores improved post-operatively (10 different scoring systems used)	Mean follow-up was 29 months so longer term progression to osteoarthritis was not shown with these data. Wide 95% confidence interval on PROM scores and heterogeneity of scores make conclusions less compelling
Wall P et al <sup>19</sup> Systematic review of non-operative treatment for FAIS 2013	5 Studies	3 Of the 5 primary studies reported favourable outcomes with physiotherapy. The other literature considered by the authors suggested a trial of conservative treatment for FAIS was appropriate	The quality and quantity of studies is poor and meaningful conclusions on non-operative management cannot be drawn
Clohisy J et al <sup>20</sup> Systematic review of surgical treatment for FAIS 2009	11 Studies	All studies showed short term improvement in PROMs in the majority (65-96%) of patients. Radiographic progression of osteoarthritis was noted in 0%-33% of patients post-operatively in 5 studies	Only 4 studies used arthroscopic procedures (193 patients). The wide variation in findings of progression to osteoarthritis indicates uncertainty on the issue
Wall P et al <sup>21</sup> Cochrane review of surgery for FAIS 2014	No research studies identified which met the inclusion criteria	No research studies of sufficient quality have been completed to provide an estimate of whether surgery benefits patients with FAIS	At the time of this publication in 2014, there were no randomised controlled trials looking at the efficacy of surgery for FAIS

RCT: randomised controlled trial

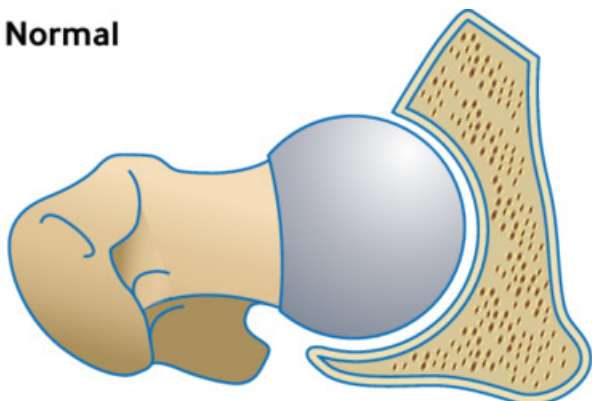
Table 2| Randomised controlled trials in progress

Trial name	Interventions	Number of patients	Location	Additional information
Australian FASHIoN <sup>22</sup>	Hip arthroscopy v physiotherapy led non-surgical care	140	Australia	This trial focuses on the link with osteoarthritis and will monitor cartilage health by magnetic resonance imaging. Results not yet available
FIRST <sup>23</sup>	Arthroscopic surgical correction (osteochondroplasty +/-labral repair) v arthroscopic lavage	220	Canada and Finland (±expansion to Denmark and the USA)	This would be a "sham surgery" trial. Results not yet available
HIPARTI and HARP <sup>24</sup>	Arthroscopic hip surgery v sham surgery	140 (HIPARTI) and 100 (HARP)	Norway	The HARP part of the trial will look at long term prognostic factors. Estimated to complete in December 2020

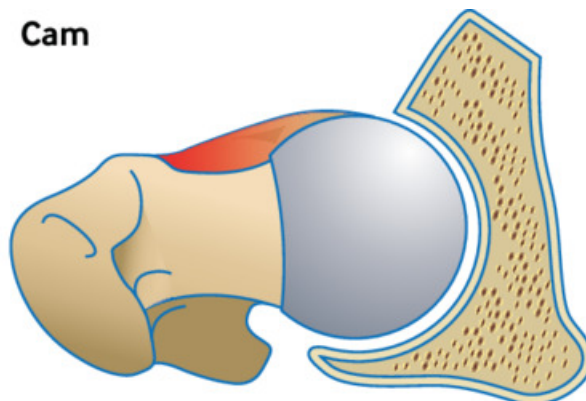


## Figures

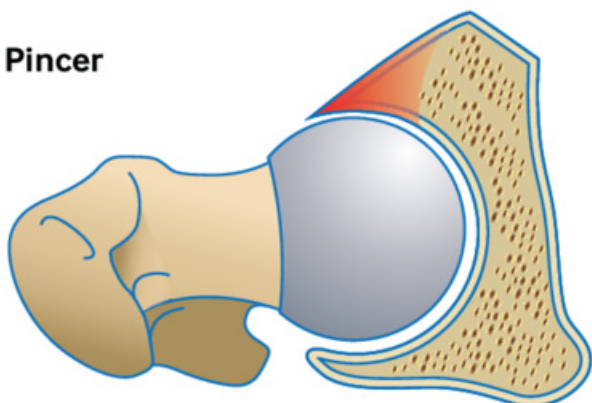
**Normal**



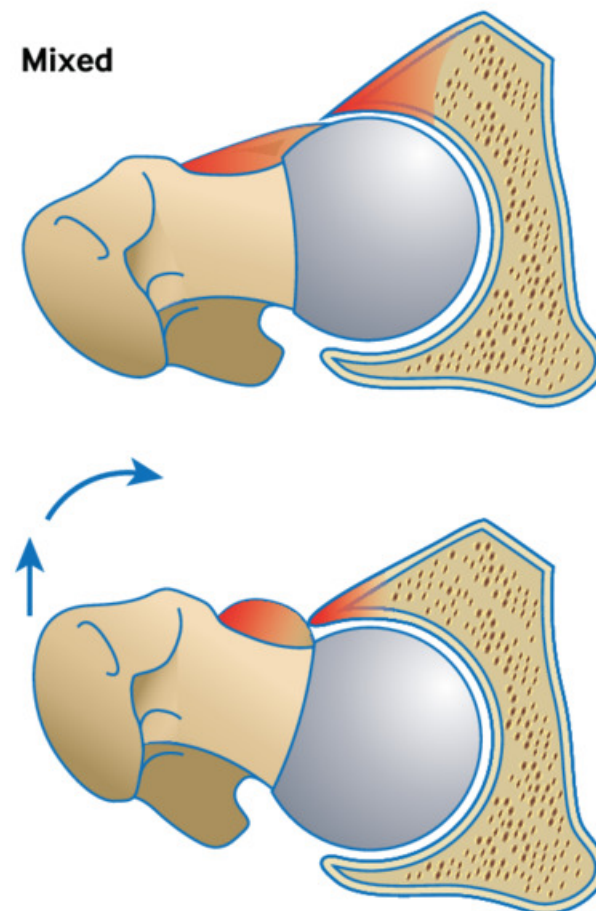
**Cam**



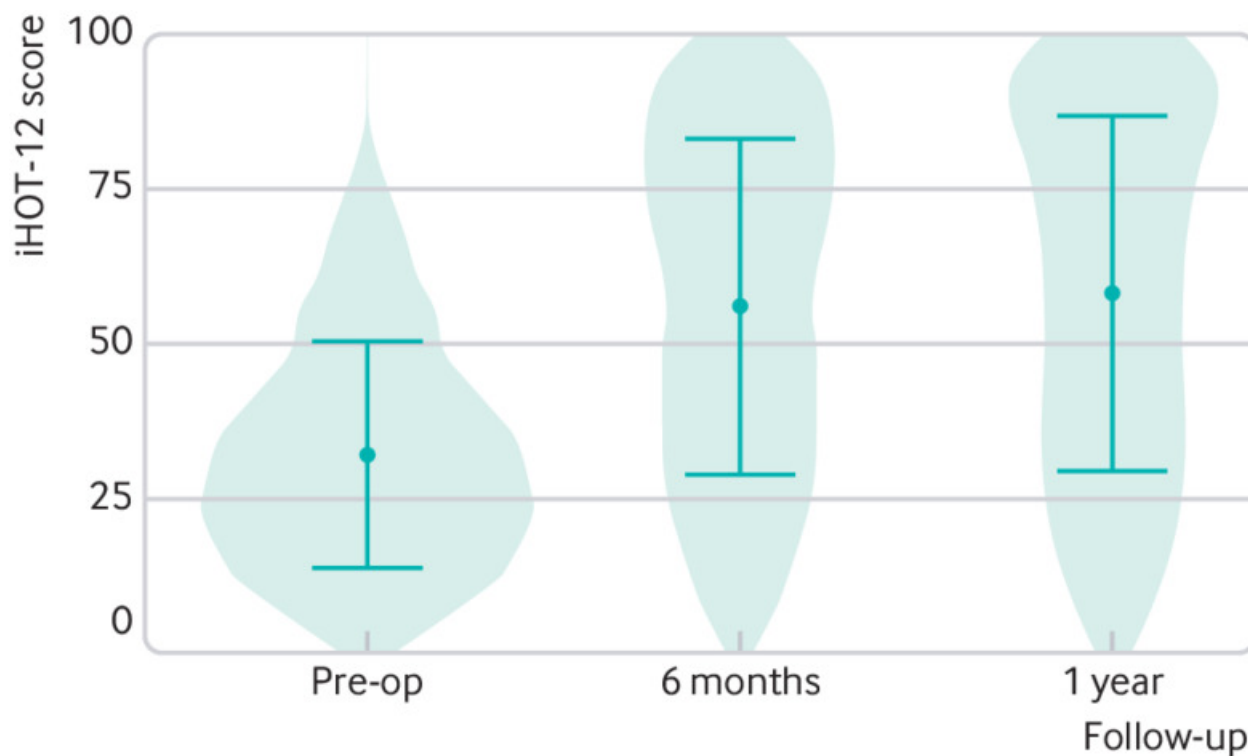
**Pincer**



**Mixed**



**Fig 1** A bony enlargement on the anterior femoral neck (cam impingement), and/or at the acetabular rim (pincer impingement), causes premature contact especially during flexion and internal rotation. This repetitive trauma damages the labrum and the joint cartilage



**Fig 2** Graph taken from the NAHR 2nd Annual Report 2017. Scores show statistically significant improvement in the iHOT-12 at six months (n=661, P<0.0001) and 12 months (n=528, P<0.0001) postoperatively compared to pre-operative baseline (paired t-test)<sup>11</sup>