Washington State Health Care Authority

Key Questions and Background

Femoacetabular impingement syndrome – re-review

Background:

Femoroacetabular impingement (FAI) results from abnormal morphology of the acetabulum and femoral head/neck resulting in abnormal contact between the proximal femur and acetabulum during the end range of hip motion, particularly flexion and internal rotation. There are two types of FAI: cam impingement (non-spherical femoral head or abnormality at the head-neck junction) and pincer impingement (deep or retroverted acetabulum resulting in overcoverage of the femoral head). Clinically, patients frequently present with a combination of both types. Morphologic characteristics of FAI and labral tears on radiographs in asymptomatic patients appear to be common.[1] Abnormal contact between the femur and acetabulum may result in impingement and pain and/or reduced function; this may depend on activity level. Repetitive motion, particularly vigorous motion may result in joint and labral damage. A recent consensus document has suggested that the term femoroacetabular impingement syndrome (FAIS) be used for symptomatic presentation of FAI.[2] There is mixed evidence linking FAI to later development of osteoarthritis (OA)[4]; some studies suggest that cam lesions may be linked to OA development, but the impact of pincer lesions is less clear.[3,5] One recent study reported no difference in the risk of OA progression between patients with FAI and those with normal hip morphology.[6]

Initial management of FAI/FAIS usually is non-operative. Proponents believe that surgical correction of the impinging deformities will alleviate the symptoms and retard the progression of OA degeneration. Surgical options to correct FAI include arthroscopy, open dislocation of the hip and arthroscopy combined with a mini-open approach. The purpose of the surgery is to remove abnormal outgrowths of bone and damaged cartilage, and to reshape the femoral neck to ensure that there is sufficient clearance between the rim of the acetabulum and the neck of the femur.

While the understanding of the etiology, history and clinical presentation of FAI/FAIS has evolved, the causes of hip pain, the natural history of FAI and its relationship to osteoarthritis remain unclear. The case definition and selection criterion of patients for surgery has historically been unclear. Furthermore, questions remain about the efficacy and effectiveness, safety and cost effectiveness of hip surgery for FAIS.

Policy context/reason for selection:

This topic was originally reviewed in 2011. It is being re-reviewed in 2019 due to newly available published evidence.

Objectives

The aim of this report is to update the 2011 HTA on Hip Surgery Procedures for the Treatment of Femoroacetabular Impingement Syndrome (FAIS) by systematically reviewing, critically appraising and analyzing new research evidence comparing the safety and efficacy of operative procedures for the

treatment of FAI/FAIS compared with non-operative treatments. Information on case definition/diagnostic criteria for FAI/FAIS and validated outcomes measures from the original report will be updated as contextual questions.

Key Questions

Contextual questions:

Is there updated information published subsequent to the 2011 report regarding a consistent or agreed upon case definition for FAI/FAIS? Are there additional/new validated outcomes measurement instruments used for evaluation of function or pain in FAIS patients in the updated evidence base? Is there information on clinically meaningful improvement for new validated measures used in the evidence base?

Research key questions:

The focus of this report is on the comparison of surgical intervention for Femoroacetabular Impingement/Femoroacetabular Impingement Syndrome (FAI/FAIS) versus non-operative treatments. When used in patients with FAI/FAIS:

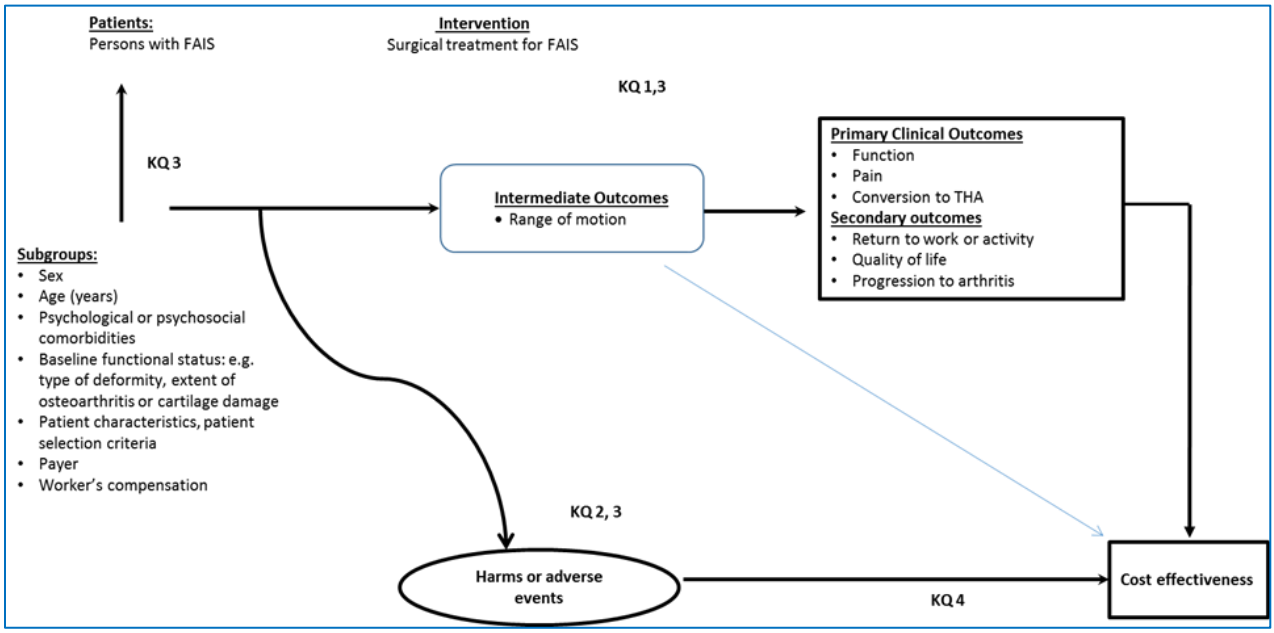
Key Question 1:
What is the evidence of efficacy and effectiveness of hip surgery (open or arthroscopic) compared with non-operative treatment for FAI/FAIS? Including consideration of short-term (≤5 years) intermediate-term (>5 years to <10 years) and long-term (≥10 years) outcomes.

Key Question 2:
What is the evidence of the safety of hip surgery for FAI/FAIS compared with non-operative treatment?

Key Question 3:
What is the evidence that hip surgery for FAI/FAIS compared with non-operative treatment has differential efficacy or safety in subpopulations (e.g. age, sex, psychological or psychosocial comorbidities, baseline characteristics, deformity type, degree of osteoarthritis or cartilage damage, provider type, payer type)?

Key Question 4:
What is the cost-effectiveness of surgery for FAI/FAIS compared with non-operative treatments in short and long-term?

Analytic framework



Scope for research questions

The report will focus on comparative studies of surgical treatment versus non-operative treatments.

Inclusion/exclusion criteria

Study Component	Inclusion	Exclusion
Population	• Patients undergoing primary/initial treatment for FAI (any age, symptomatic or asymptomatic)	• Congenital hip dysplasia, slipped capital femoral epiphysis, Legg-Calve-Perthes • Studies including <80% FAI/FAIS patients • Patients presenting for revision surgery
Intervention	• Operative treatment for FAI/FAIS (open, arthroscopic or combination)	
Comparator	• Focus: Non-operative care (activity modification, NSAIDs, injections, etc.) • Other: Comparison of surgical interventions (e.g. open vs. arthroscopic)	
Outcomes	**Primary** • Functional outcome (validated patient- and clinician-reported hip scores, validated activities of daily living) • Pain (validated measures) • Conversion To THA ("continuing" or "subsequent intervention" that is not	• Non-clinical outcomes

Study Component	Inclusion	Exclusion
	THA will be reported in the safety section) **Secondary** • Range of motion (intermediate) • Return to work or activity • Quality of life • Progression to arthritis **Harms/Safety:** • Complications/adverse events (peri-operative or longer-term) • Revision surgery • Heterotopic ossification • Trochanteric nonunion • Failure of labral re-fixation • Nerve damage • Mortality	
Timing	• Short- (≤5 years), intermediate- (>5 years to <10 years) and long-term (≥10 years)	
Study Design	• High quality (low risk of bias) comparative studies (e.g., randomized controlled trials, prospective observational studies) will be considered for questions 1-3. The report will focus on comparative studies. • Case series with ≥ 50 patients that are designed specifically to evaluate safety or comprehensive systematic reviews specifically on safety will be considered for inclusion. Case series focused on safety with fewer patient may be considered for rare outcomes • Full economic studies for question 4	• Non-clinical studies • Case reports • Case series designed specifically for safety with <50 patients • Case series not specifically designed to evaluate safety • Imaging studies
Publication	• Studies published in English in peer reviewed journals, technology assessments or publically available FDA reports • Studies published subsequent to the 2011 report • For question 4 full, formal economic analyses (e.g., cost-effectiveness, cost-utility studies) published in English in a peer reviewed journal	• Abstracts, editorials, letters • Duplicate publications of the same study that do not report different outcomes or follow-up times • Single reports from multicenter trials • White papers • Narrative reviews • Articles identified as preliminary reports when full results are published in later versions • Incomplete economic evaluations such as costing studies

FAI/FAIS = femoroacetabular impingement/femoroacetabular impingement syndrome; FDA = Food and Drug Administration; NSAIDs = non-steroidal anti-inflammatory drugs; THA = total hip arthroplasty.

References

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4. Murphy NJ, Eyles JP, Hunter DJ. Hip Osteoarthritis: Etiopathogenesis and Implications for Management. Adv Ther 2016;33:1921-46.
5. Nakano N, Khanduja V. Femoroacetabular impingement: the past, current controversies and future perspectives. Phys Sportsmed 2018;46:270-2.
6. Wyles CC, Heidenreich MJ, Jeng J, Larson DR, Trousdale RT, Sierra RJ. The John Charnley Award: Redefining the Natural History of Osteoarthritis in Patients With Hip Dysplasia and Impingement. Clin Orthop Relat Res 2017;475:336-50.

Public comment and response