

Femoroacetabular impingement: The pursuit of evidence

AKADEMISK AVHANDLING

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien,
Göteborgs universitet kommer att offentligen försvaras i R-husets Aula,
Göteborgsvägen 31, Sahlgrenska Universitetssjukhuset Mölndal

Måndag den 13 november 2017 kl 09.00

av

Olufemi R Ayeni
MD MSc FRCSC

Fakultetsopponent:

Professor Lars Engebretsen

Institut for klinisk medisin, ortopedisk avdeling, Oslo

Avhandlingen baseras på följande delarbeten

- I. Ayeni OR, Belzile EL, Musahl V, Naudie D, Crouch S, Sprague S, Bhandari M. Results of the Perception of femoroacetabular impingement by Surgeons Survey (PROCESS). *Knee Surg Sports Traumatol Arthrosc.*
- II. Khan M, Ayeni OR, Madden K, Bedi A, Ranawat A, Kelly B T, Sancheti P, Ejnisman L, Tsiridis E, Bhandari M. Femoroacetabular impingement: have we hit a global tipping point in diagnosis and treatment? Results from the International Femoroacetabular Impingement Optimal Care Update Survey (IN FOCUS). *Arthroscopy.* 2015;32:779-87.
- III. Khan M, Oduwole KO, Razdan P, Phillips M, Ekhtiari S, Horner NS, Samuelsson K, Ayeni OR. Sources and quality of literature addressing femoroacetabular impingement: a scoping review 2011-2015. *Curr Rev Musculoskelet Med.* 2016; online publicerat
- IV. Yeung M, Khan M, Schreiber VM, Adamich J, Letkemann S, Simunovic N, Bhandari M, Musahl V, Philippon MJ, Safran MR, Ayeni OR. Global discrepancies in the diagnosis, surgical management, and investigation of femoroacetabular impingement. *Arthroscopy.* 1625-33.
- V. Sim Y, Horner NS, de Sa D, Simunovic N, Karlsson J, Ayeni OR. Reporting of non-hip score outcomes following femoroacetabular impingement surgery: a systematic review. *J Hip Preserv Surg.*
- VI. Hetaimish 3M, Khan M, Crouch S, Simunovic N, Bedi A, Mohtadi N, Bhandari M, Ayeni OR. Consistency of reported outcomes after arthroscopic management of femoroacetabular impingement. *Arthroscopy.*
- VII. Khan M, Bedi A, Fu F, Karlsson J, Ayeni OR, Bhandari M. New perspectives on femoroacetabular impingement syndrome. *Nat Rev Rheumatol.* 2016;12(5):303-10.
- VIII. FIRST Investigators. A multi-centre randomized controlled trial comparing arthroscopic osteochondroplasty and lavage with arthroscopic lavage alone on patient important outcomes and quality of life in the treatment of young adult (18-50) femoroacetabular impingement. *BMC Musculoskelet Disord.*

SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER



ABSTRACT

Femoroacetabular Impingement (FAI) is an important cause of hip pain in the young adult. It is the result of abnormal contact between the femoral head and neck junction and the acetabular rim. Although FAI has only recently been recognized as a medical and surgical condition, there has been a dramatic rise in diagnosis, treatment and scientific publications addressing this entity. Despite initial promising reports of outcomes following surgical management of this condition, there remains controversy about the best approach to diagnosing and managing this condition. This thesis aims to evaluate the current state of the evidence, the global perceptions of the condition from clinicians and world experts, as well as provide a study design that can definitively evaluate the efficacy of surgical intervention.

Study 1 is a survey of 202 surgeon members of the Canadian Orthopaedic Association, evaluating their perceptions of the evidence for the management of FAI. The majority of surgeons were unsure of the existence of evidence supporting the best clinical test for FAI, the use of a diagnostic intra-articular injection for diagnosis of FAI, and for non-operative management of FAI.

Study 2 is a survey of international surgeons from global organizations evaluating the state of opinions in terms of the diagnosis and treatment of FAI as well as exploring the current demographic characteristics of surgeons performing FAI surgery. The survey was completed by 900 respondents. Surgeons performing a higher volume of FAI surgery (> 100 cases per year) were significantly more likely to have practiced for more than 20 years, to be practicing at an academic hospital, and to have formal arthroscopy training. High-volume surgeons were over two-fold more likely to practice in North America and Europe than the rest of the world.

Study 3 is a systematic review of the literature that assesses the quality of the literature addressing FAI over the 5-year span of 2011-2015. The review demonstrated that in comparison with previous work, there has been 3.5-fold increase in the number of publications over the past 5 years with a shift towards improving the level of evidence available guiding the arthroscopic management of FAI.

Study 4 is a systematic review of the world's English literature to assess the current strategies used to diagnose and treat FAI. We identified 105 studies reporting surgical interventions for FAI. Most studies were completed in North America and in Europe. Asia and Oceania had smaller contributions with no studies from South America or Africa. Most research performed in North America, Europe, and Oceania investigated arthroscopic FAI surgery followed by surgical dislocation, and mini-open and combined approaches. Methods of diagnosis were consistent worldwide, with radiography being the mainstay of diagnostic evaluation.

Study 5 is a systematic review of the literature that evaluated the reporting of non-hip score related outcomes following FAI surgery. The most common non-hip score outcomes reported included; patient satisfaction, symptom improvement, pain improvement, hip range of motion. The most frequently reported standardized hip outcome scores used were the modified Harris Hip Score (mHHS) and Non-Arthritic Hip Score (NAHS).

Study 6 is a systematic review of the literature evaluating the consistency of reporting clinical and radiographic outcomes follow FAI surgery. There was a lack of consensus and consistency with regard to reported outcomes (clinical and radiographic) after arthroscopic treatment of FAI

Study 7 is a narrative review with global content and research experts evaluating the current state of the evidence pertaining to FAI as well as proposing critical questions needing addressing with rigorous scientific investigation.

Study 8 is a study protocol for investigating the surgical efficacy of FAI surgery with a randomized controlled trial. This study has received ethics approval at the primary site as well as other international sites. This study demonstrates the feasibility of a prospective randomized controlled trial addressing FAI.

Keywords: Femoroacetabular impingement, evidence based medicine, hip, systematic review, survey.