



Editorial on ‘*Functional outcomes and cam recurrence after arthroscopic treatment of femoroacetabular impingement in adolescents*’

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Introduction

Femoroacetabular impingement (FAI) syndrome is defined as having symptoms, clinical signs and diagnostic imaging findings of pincer and/or cam morphology (1). The treatment of FAI syndrome can be conservative by physiotherapy or surgically, mostly by arthroscopy. Functional outcome after hip arthroscopy can be quantified in several ways. Patient-reported outcome measures (PROMs) via hip specific questionnaires and return-to-play (RTP) time or percentage for athletes are most often used.

Degen *et al.* (2) identified patients under 18 years with FAI syndrome who had arthroscopic treatment of the hip with at least 2-year follow-up. A non-adolescent group with the same criteria for inclusion (except of 18 years or older) was included to compare. The authors used the Hip Outcome Score (HOS), modified Harris Hip Score (mHHS) and International Hip Outcome Tool 33 (iHOT-33) to assess the clinical outcomes. In total, 34 adolescents (38 hips), with an average age of 16 years old were included. The mean follow-up period was 36.1 months in the patient group without reoperation and 29.6 months in the patient group with reoperation. The control group existed of 296 non-adolescents (306 hips), with a mean age of 31 years old and a mean of 34.1-month follow-up without reoperation and a mean follow-up of 15.1 months with reoperation.

Functional outcomes after hip arthroscopy

The authors hypothesized that there would be significantly

improvements found in clinical outcomes in both patient groups. Corresponding to this hypothesis, they did find statistically significant improvements (all $P < 0.001$) in all of the outcome measures [HOS-ADL, mHHS, HOS-Sport Specific Subscale (SSS) and iHOT-33 score] in adolescents and non-adolescents after hip arthroscopy. These findings correspond to other research performed. O'Connor *et al.* (3) found in their systematic review and meta-analysis an improvement of PROMs and a high overall rate of RTP after hip arthroscopy. In 1,296 patients with 1,442 hips, a mean RTP duration of 7.4 months and return rate of 84.6% after 25.8 months was observed. The mean mHHS improved 33.3% and the Non-arthritic Hip Score 40.7%. Philippon *et al.* (4) studied 28 professional hockey players (average age 27 years, 24 months follow-up) with debilitating hip pain who underwent hip arthroscopy with labral repair. Average return to skating and hockey drills was 3.4 months, and PROMs via mHHS improved from 70 to 95 at follow-up.

The authors also hypothesized that no significant differences between groups in clinical outcome would be observed. Indeed, they did not find a significant difference between adolescents and non-adolescents after hip arthroscopy. These findings partly correspond to other recent literature. Mygind-Klavsen *et al.* (5) collected PROMs from 2,054 FAI surgical procedures in the Danish Hip Arthroscopy Registry (DHAR) and presented data from the Hip And Groin Outcome Score (HAGOS), Hip Sports Activity Scale (HSAS) and Numeric Rating Scale (NRS), which showed poorer outcomes in the older age group

as compared to the younger <25 year age group, at both 1- and 2-year follow-up.

Treatment: arthroscopy versus physical therapy

In our opinion, before deciding to perform operative treatment, conservative treatment must always be considered. Mansell *et al.* (6) is the first, recently, published randomised controlled trial (RCT) who compared the effectiveness of hip arthroscopy and physical therapy for FAI syndrome. In their study, 80 patients participated and were randomised. They concluded no significant difference between the groups at 2 years on HOS, iHOT-33, Global Rating of Change (GRC) and return to work at 2 years. Although limited by several methodological flaws including a very high cross-over rate from the physiotherapy group to the surgical group (26 of 37, 70.3%). Another RCT on the same subject was performed very recently by Griffin *et al.* (7) In this study, 348 participants were randomised for one of both therapies. Their primary outcome was the hip-related quality of life, which was quantified by the iHOT-33, 12 months after the first randomisation. Based on arthroscopy, the iHOT-33 increased from 39.2 to 58.8 and based on the personalised hip therapy this score increased from 35.6 to 49.7. The mean adjusted difference was 6.8 points, which was just above the minimal clinically important difference of 6.1 points. This means that both therapies work, with a greater improvement in favour of hip arthroscopy.

Cam recurrence after hip arthroscopy

Cam morphology arises during adolescence when the growth plate is active and mechanical loading on the hip joint influences this development (8-10). Therefore, we think that it could be important to differentiate between age groups in future studies (immature/adolescents and mature/adults), because of the different bone growth potential. Degen *et al.* (2) showed no cases of cam recurrence in their adolescent patient group. However, the mean age of the adolescents was 16 years, while cam morphology usually develops between 12 and 18 years of age. One should therefore still be cautious with osteoplasty by immature adolescents younger than 18 years of age, as there might still be potential for cam recurrence in this young group. The results are comparable to Gupta *et al.* (11) who published first on prospectively collected data of adult patients (average age 37.2 years) who underwent hip

arthroscopy with femoral neck osteoplasty with a 2-year follow-up period. They showed no recurrence of cam morphology after 2 years, based on alpha angle and femoral offset measurement. During this study, patient reported outcomes were improved significantly after 3 months, in comparison with pre-operative scores, and continued to improve after 2-year follow-up. This suggests that the risk of cam recurrence after hip arthroscopy on mature patients is probably negligible.

What are the next steps?

In our opinion, the next steps for research in this specific field should focus on comparing arthroscopic treatment with physiotherapy or comparing femoral osteoplasty with sham surgery in a randomised or prospective fashion with a sufficient period of follow-up. At this moment, several RCTs are underway that might provide answers to this question. Probably, not all people with FAI syndrome will benefit from physiotherapy and not all will benefit from surgery. Data of upcoming RCTs should therefore also focus on prognostic factors for a good clinical outcome. With these data, it might be possible to find out which persons have the better or worse outcomes after arthroscopy, based on for example gender, age, BMI, activity level, severity and type of FAI syndrome among other factors.

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References

1. Griffin DR, Dickenson EJ, O'Donnell J, et al. The Warwick Agreement on femoroacetabular impingement syndrome (FAI syndrome): an international consensus statement. *Br J Sports Med* 2016;50:1169-76.
2. Degen RM, Mayer SW, Fields KG, et al. Functional Outcomes and Cam Recurrence After Arthroscopic Treatment of Femoroacetabular Impingement in Adolescents. *Arthroscopy* 2017;33:1361-9.
3. O'Connor M, Minkara AA, Westermann RW, et al. Return to Play After Hip Arthroscopy: A Systematic Review and Meta-analysis. *Am J Sports Med* 2018. [Epub ahead of print].
4. Philippon MJ, Weiss DR, Kuppersmith DA, et al. Arthroscopic labral repair and treatment of femoroacetabular impingement in professional hockey players. *Am J Sports Med* 2010;38:99-104.
5. Mygind-Klavsen B, Lund B, Nielsen TG, et al. Danish Hip Arthroscopy Registry: predictors of outcome in patients with femoroacetabular impingement (FAI). *Knee Surg Sports Traumatol Arthrosc* 2018. [Epub ahead of print].
6. Mansell NS, Rhon DI, Meyer J, et al. Arthroscopic Surgery or Physical Therapy for Patients With Femoroacetabular Impingement Syndrome: A Randomized Controlled Trial With 2-Year Follow-up. *Am J Sports Med* 2018;46:1306-14.
7. Griffin DR, Dickenson EJ, Wall PDH, et al. Hip arthroscopy versus best conservative care for the treatment of femoroacetabular impingement syndrome (UK FASHIoN): a multicentre randomised controlled trial. *Lancet* 2018;391:2225-35.
8. Palmer A, Fernquest S, Gimpel M, et al. Physical activity during adolescence and the development of cam morphology: a cross-sectional cohort study of 210 individuals. *Br J Sports Med* 2018;52:601-10.
9. Agricola R, Heijboer MP, Ginai AZ, et al. A cam deformity is gradually acquired during skeletal maturation in adolescent and young male soccer players: a prospective study with minimum 2-year follow-up. *Am J Sports Med* 2014;42:798-806.
10. Agricola R, Bessems JH, Ginai AZ, et al. The development of Cam-type deformity in adolescent and young male soccer players. *Am J Sports Med* 2012;40:1099-106.
11. Gupta A, Redmond JM, Stake CE, et al. Does the femoral cam lesion regrow after osteoplasty for femoroacetabular impingement? Two-year follow-up. *Am J Sports Med* 2014;42:2149-55.

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