

# Cam Recurrence and Functional Outcomes Following Arthroscopic Femoral Osteoplasty in Adolescents

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# Disclosures

- **Ryan Degen, MD**
  - **I have no financial relationships to disclose**

# Intro

## - Background:

- The cam deformity in femoroacetabular impingement (FAI) is theorized to form in response to high activity levels during adolescence
  - Particularly with participation in cutting and pivoting sports, such as soccer, football and ice hockey <sup>1,2,3</sup>
- Many adolescents undergo arthroscopic femoral osteoplasty as part of their treatment for refractory clinical symptoms of FAI <sup>4,5</sup>
- However, concern exists over the possibility of cam recurrence following osteoplasty due to ongoing stresses to the unfused proximal femoral physis

# Intro

## - Purpose:

- To report the radiographic recurrence rate of the cam deformity in a cohort of adolescent patients following arthroscopic femoral osteoplasty for FAI
- To report patient-reported outcome measures (PROM) compared with a matched control cohort of non-adolescent patients

## - Hypothesis:

- There will be a higher rate of cam recurrence in the adolescent cohort
- Clinical outcome scores will be equivocal between groups

# Case Example



Figure 1. Representative case of an adolescent patient with AP pelvis radiograph [A]. Pre-operative Dunn lateral with alpha angle of  $62.5^{\circ}$  [B], 2-week post-operative Dunn lateral with alpha angle of  $37.4^{\circ}$  [C] and 2-year post-operative Dunn lateral with alpha angle of  $36.9^{\circ}$  [D].

# Methods

## - Patient Identification

- Retrospective review of our prospectively-collected hip registry from 2010 to 2013,
- Inclusion criteria: alpha angle  $> 50^\circ$ , surgery before 18 years of age, follow-up  $> 1$  year
- Matched, control cohort of patients  $>18$  years of age with similar inclusion criteria were also included

## - Data Collection

- Demographics and radiographic parameters recorded
- Patient-reported outcomes collected at 6 weeks, 3 months, 6 months, 1 year and 2 year
  - Modified Harris Hip Score (mHHS)
  - Hip Outcome Score – Activities of Daily Living (HOS-ADL) and Sport-specific subscale (HOS-SSS)
  - International Hip Outcome Tool (iHOT-33)

# Results

## - Demographics

- 45 patients (63 hips) with an average age of 15.7 years (range 13-17) were identified.
- Mean clinical follow-up was 25.2 months (range 11.4-46.8).
- A subgroup of 24 patients (30 hips) had minimum 2-year radiographs available for review.
- A control cohort of 320 patients (385 hips) meeting these same criteria, with the exception of age (mean 30.2, range 18-59), was selected as our non-adolescent group

# Results

## - Radiographic data

- Alpha angle improved from  $55.4 \pm 12.4^\circ$  pre-operatively to  $38.7 \pm 5.2^\circ$  at 6-weeks post-operatively ( $p < 0.001$ ).
- At 2 years, the alpha angle remained at  $39.1 \pm 11.5^\circ$ , which did not differ from 6-week measurements ( $p = 0.38$ ).
- One patient (1/30) demonstrated radiographic evidence of cam recurrence on 2-year radiographs

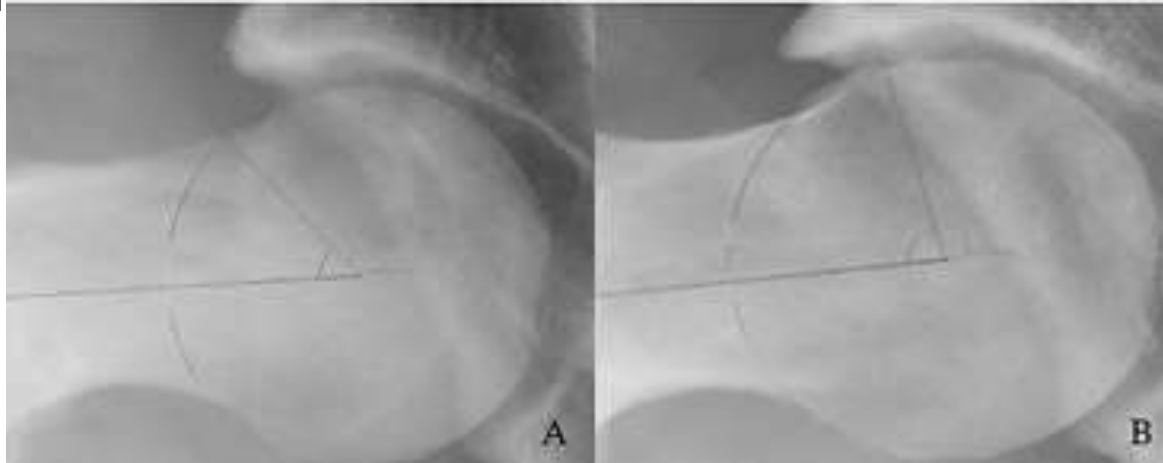


Figure 2. 6-week post-operative radiograph demonstrating alpha angle of  $49.2^\circ$  (A). Evidence of cam recurrence with a corresponding increase in alpha angle ( $80.6^\circ$ ) (B)



# Results

## - Patient Reported Outcomes

- There were statistically significant improvements on all immediate and final post-operative PROM (mHHS, HOS-ADL, HOS-SSS and iHOT-33,  $p < 0.001$ ).
- Comparisons with a non-adolescent control cohort of 320 patients (385 hips) did not identify any statistically significant differences in outcome scores ( $p \geq 0.107$ ).
- Two patients (3.2%) in the adolescent group required revision surgery, compared with 15 patients (3.9%) in the control group.

Survey	Variable		Adolescent	Non-adolescent	P value
modified Harris Hip Score			n=43	n=302	
	Preop score	Mean $\pm$ SD	67.4 $\pm$ 15.1	63.8 $\pm$ 12.1	0.140
	Post-op score	Mean $\pm$ SD	86.3 $\pm$ 13.9	83.9 $\pm$ 15.9	0.713
Hip Outcome Score - Activities of Daily Living			n=45	n=318	
	Preop score	Mean $\pm$ SD	75 $\pm$ 17.7	74.8 $\pm$ 16.1	0.951
	Postop score	Mean $\pm$ SD	91.7 $\pm$ 10.9	90.6 $\pm$ 12.7	0.555
Hip Outcome Score - Sport Specific Subscale			n=45	n=303	
	Preop score	Mean $\pm$ SD	57.8 $\pm$ 23.4	52.8 $\pm$ 23.2	0.174
	Postop score	Mean $\pm$ SD	83.9 $\pm$ 18.4	79.4 $\pm$ 24.1	0.429
International Hip Outcome Tool - 33			n=32	n=236	
	Preop score	Mean $\pm$ SD	45.7 $\pm$ 18.4	41.2 $\pm$ 17.3	0.170
	Postop score	Mean $\pm$ SD	81.4 $\pm$ 16.1	71.7 $\pm$ 24.6	0.107

Table 1. Patient Reported Outcome Measures

# Discussion

## - Conclusion

- There was limited radiographic evidence (3.3%) of cam recurrence following hip arthroscopy and femoral osteochondroplasty for FAI among our cohort of adolescent patients at 2-year follow-up.
- Significant clinical improvements were noted in all patient-reported outcome measures at most recent follow-up, with no significant differences when compared with a control cohort of non-adolescent patients

# References

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# Thank You

