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 $^{1,2,3}$
- Many adolescents undergo arthroscopic femoral osteoplasty as part of their treatment for refractory clinical symptoms of FAI $^{4,5}$
- 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° [B], 2-week post-operative Dunn lateral with alpha angle of 37.4° [C] and 2-year post-operative Dunn lateral with alpha angle of 36.9° [D].
Methods

- **Patient Identification**
  - Retrospective review of our prospectively-collected hip registry from 2010 to 2013,
  - Inclusion criteria: alpha angle > 50°, 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 (\(p\geq0.107\)).
  - Two patients (3.2%) in the adolescent group required revision surgery, compared with 15 patients (3.9%) in the control group.
<table>
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<th>Non-adolescent</th>
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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

Thank You