Purpose: to identify the location and magnitude of difference in acetabular rim morphology between the symptomatic and asymptomatic acetabula in a cohort of patients with symptomatic unilateral pincer-type or mixed FAI.

Hypothesis: The acetabular rim would be more prominent on the affected side as compared to the healthy, unaffected side.

Methods

- **Subjects:** 33 patients with unilateral hip pain that underwent acetabular trimming for femoroacetabular impingement
- **Radiographic Inclusion Criteria:** Increased anterior or lateral center edge angle (LCEA) >39 degrees OR an LCEA >30 degrees with a 5 degree increase compared to the asymptomatic
- **Image Analysis:** Preoperative CT data was segmented using 3D reconstruction software (Figure 1). The segmented data was then converted to a point cloud model using previously validated software and the symptomatic side was mapped onto the asymptomatic side (Figure 2).
- **A 3D-3D registration method** was then used to determine points of focal protrusion (red) or indentation (blue) (Figure 3). Rim morphology was broken into quadrants using the clock face method to analyze the degree increase compared to the asymptomatic

Results

- **33 patients (16 Female) with an average age of 35.7 and BMI of 24.3.**
- **Preoperative LCEA on the symptomatic side was 37.5 ± 7.2 degrees compared to 29 ± 5.1 degrees on the asymptomatic side (p<0.001).**
- **On average, the acetabular rim was 0.43 ± 0.18mm thicker on symptomatic side compared to the asymptomatic side.**
- **The symptomatic acetabular rim was significantly thicker at the 12-3 position compared to the 3-6 (p=0.005), 6-9 (p<0.001) and 9-12 (p<0.001) positions.**
- **Increasing age was positively correlated with the magnitude of rim protrusion in the 12-3 position (p=0.04).**

Conclusion

- **Significant differences exist in acetabular rim thickness between symptomatic and asymptomatic hips. Significant differences exist in acetabular rim thickness between the symptomatic and asymptomatic sides at the 12-3 position.**
- **The largest difference in magnitude between symptomatic and asymptomatic hips occurs at the 12-3 position.**

Clinical Relevance: Small changes in acetabular rim morphology, on the order of 0.5 mm or less can be the difference between symptomatic FAI and the healthy, asymptomatic state.

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3. Preoperative LCEA on the symptomatic side was 37.5 ± 7.2 degrees compared to 29 ± 5.1 degrees on the asymptomatic side (p<0.001).

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Introduction

- Femoroacetabular impingement (FAI) is comprised of abnormal osseous morphology at the femoral head-neck junction (Cam) and acetabular rim overcoverage (Pincer)
- Acetabular overcoverage is managed arthroscopically with rim trimming
- Appropriate resection is critical to avoid residual acetabular overcoverage or iatrogenic undercoverage.

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