

Normative LCEA Values Predict Clinically Significant Outcomes following Primary Hip Arthroscopy.

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INTRODUCTION:

To determine the relationship between preoperative lateral center edge angles (LCEA) and likelihood of achievement of clinically significant outcomes (CSOs) after primary hip arthroscopy (HA) for symptomatic femoroacetabular impingement (FAI).

METHODS: A retrospective review of a prospectively maintained database was conducted to identify patients who underwent primary HA for symptomatic FAI with a minimum 5-years of follow-up. LCEA was measured on preoperative anteroposterior radiographs as the angle between a vertical line from the center of the femoral head along the longitudinal axis of the pelvis and lateral most point of the acetabular sourcil along on the acetabular rim. Rim trimming was performed for non-dysplastic patients. Patient reported outcomes (PROs) were obtained preoperatively and at 5-years. CSOs were assessed by achievement of previously defined threshold scores to achieve a Minimal Clinically Important Difference (MCID), Patient Acceptable Symptom State (PASS), and Substantial Clinical Benefit (SCB) for the HOS-ADL, HOS-SS, mHHS, and iHOT-12. A Cox proportional hazards regression model with cubic splines was used to assess the relationship between LCEA and risk of failure to meet MCID, PASS, and SCB for any PRO.

RESULTS:

A total of 934 patients (631 females, 297 males, age: 34±12 years, BMI: 26±5.4 kg/m²) were included with a mean follow-up of 5.2 years (range: 5.0-10.0). The mean preoperative LCEA was 31.5±6.5° (interquartile range: 27.4-35.6°). General linear Cox proportional hazards regression demonstrated no significant linear relationship between LCEA any ability to achieve CSOs in mHHS, HOS-ADL, HOS-SS, or iHOT-12 ($p \leq 30$), highlighting the utility of continuous, non-linear methods. On cubic spline-based regression, hazards of failure to attain CSO increased with decreasing and increasing LCEA from a normative value. Namely, a preoperative LCEA of 32.2° (mHHS), 34.2° (HOS-ADL), 33.5° (HOS-SS), and 34.8° was found to provide the lowest risk of not meeting CSOs, with progressive under and over-coverage conferring increased failure risk.

DISCUSSION AND CONCLUSION:

Patient with normal acetabular coverage demonstrate increased rates of meeting CSOs at 5-year minimum follow-up as compared to peers with both dysplasia and preoperative pincer lesions. This data highlights the biomechanical and clinical importance of acetabular coverage and helps with mid-term prognostication following primary HA.

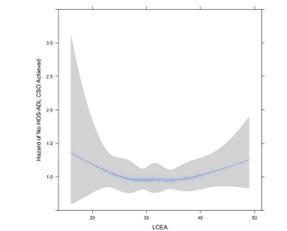


Figure 2: Cox proportional hazards regression model between Lateral Center Edge Angle and risk of failure to achieve clinically significant outcomes (CSOs) as defined by achievement of a minimum Hip Outcome Score - Activities of Daily Living subscale (HOS-ADL) greater than a threshold score to achieve a Minimally Clinically Important Difference (MCID) or Patient Acceptable Symptomatic State (PASS).

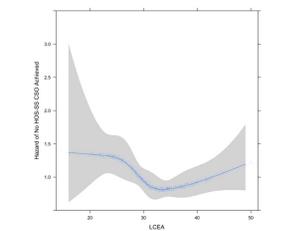


Figure 3: Cox proportional hazards regression model between Lateral Center Edge Angle and risk of failure to achieve clinically significant outcomes (CSOs) as defined by achievement of a minimum Hip Outcome Score - Sports subscale (HOS-SS) greater than a threshold score to achieve a Minimally Clinically Important Difference (MCID) or Patient Acceptable Symptomatic State (PASS).

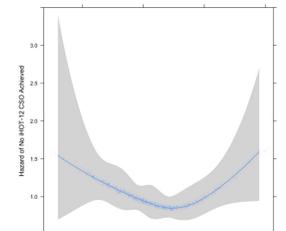


Figure 4: Cox proportional hazards regression model between Lateral Center Edge Angle and risk of failure to achieve clinically significant outcomes (CSOs) as defined by achievement of a minimum International Hip Outcome Tool 12 (iHOT-12) greater than a threshold score to achieve a Minimally Clinically Important Difference (MCID) or Patient Acceptable Symptomatic State (PASS).

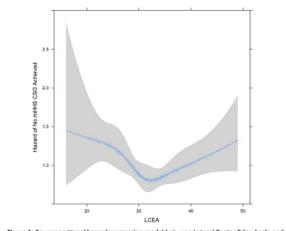


Figure 5: Cox proportional hazards regression model between Lateral Center Edge Angle and risk of failure to achieve clinically significant outcomes (CSOs) as defined by achievement of a minimum modified Harris Hip Score (mHHS) greater than a threshold score to achieve a Minimally Clinically Important Difference (MCID) or Patient Acceptable Symptomatic State (PASS).