

Frog-leg Lateral Pelvic Radiographs are Reliable for the Measurement of Acetabular Index in Developmental Dysplasia of the Hip

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BACKGROUND

The acetabular index (AI) is the most commonly utilized radiographic measure for developmental dysplasia of the hip (DDH). However, there is variability in measurement of acetabular index (AI) which makes it less reproducible. We have observed that frog-leg lateral (FL) positioning allows more consistent visualization of the acetabular sourcil compared with AP.

PURPOSE

The purpose of this study is to determine if there is any difference in AI measurements on AP versus FL radiographs and if there is less measurement variability on FL than AP radiographs.

METHODS

- Retrospective cohort study
- 274 hips underwent screening AP and FL radiography for DDH
- Radiographs were reviewed using a standard measurement technique for AI
- Interobserver measurement differences and the differences between measurements made on AP and FL radiographs were calculated

Total Hips n=274	Normal Hips n=233	DDH n=41
Sex		
Male	85 (36.5%)	5 (12.2%)
Female	148 (63.5%)	36 (87.8%)
Laterality		
Left Hips	114 (48.9%)	23 (56%)
Right Hips	119 (51.1%)	18 (43.9%)
Reason for Screening		
Evaluate for DDH	54 (23.2%)	18 (43.9%)
Gait Abnormality	34 (14.6%)	2 (4.9%)
Exam Abnormality	71 (30.5%)	7 (17.1%)
Click, Pop, or Clunk	33 (14.2%)	5 (12.2%)
Hip Pain	12 (5.2%)	4 (9.8%)
Abnormal ROM	8 (3.4%)	2 (4.9%)
Born Breech	21 (9.0%)	3 (7.3%)

Table 1: Demographics and Clinical Indications for Screening of Study Population

DDH = developmental dysplasia of the Hip; ROM = Range of Motion; n= number; % = percentage



Figure 1: Measuring Acetabular Index (AI) on Anteroposterior (AP) and Frog Lateral (FL) radiographs

A: AI measurement on AP radiograph of pelvis B: AI measurement on AP with two sclerotic lines C: AI measurement on FL with single clear sclerotic line

RESULTS

- 233 hips (85%) were normal, and 41 hips (15%) had DDH
- The average AI on AP vs FL was not significantly different with a measurement of 24.13 and 23.66 degrees respectively (P=0.147)
- There was a significant difference in measurement in variability for the interobserver difference for AI on AP with 0.48 (P=0.001)
- However there was not a significant difference for AI on the FL with 0.18 (P=0.114)

CONCLUSION

AI had less variability on the FL view than the AP view. The increased reliability on FL positioning is likely due to a more orthogonal projection of the sourcil creating a single sclerotic line with which to perform measurements. Using the FL view to measure AI can improve ease and reproducibility of this measurement. We recommend using the FL radiograph as a supplement to the AP radiograph for measuring AI for following up patients diagnosed with DDH.

REFERENCES

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