

# Functional Pelvic Obliquity Changes Acetabular Coverage Measurements in Hip Dysplasia

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## INTRODUCTION:

Leg length discrepancy (LLD) influences coronal acetabular coverage of the femoral head. In patients with hip dysplasia, pelvic obliquity during standing may further uncover the hip of the longer leg, impacting radiographic measurements that guide diagnosis and treatment. We investigated differences in acetabular coverage between standing and supine AP pelvis radiographs in patients with hip dysplasia and pelvic obliquity.

## METHODS:

Retrospective review of 175 patients who underwent periacetabular osteotomy (PAO) for symptomatic hip dysplasia found 69 patients with both standing and supine AP pelvis preoperative radiographs, 50 (72.5%) of which demonstrated  $\geq 2$ mm of pelvic obliquity on standing AP pelvis radiographs. Lateral center edge angle (LCEA), Tonnis angle (TA), and pelvic obliquity for each hip were measured on each radiograph.

## RESULTS:

On the longer leg side, standing AP pelvis radiographs demonstrated a significant decrease in lateral acetabular coverage ( $p < 0.001$ ) and increase in acetabular sourcil obliquity ( $p < 0.001$ ) on mean standing vs. supine x-rays. On the shorter leg side, no differences were found between mean standing and supine LCEA ( $p = 0.367$ ) and TA ( $p = 0.286$ ). On the longer leg side, increased pelvic obliquity correlated with increased supine-standing differences in TA ( $p = 0.007$ ) and LCEA ( $p = 0.031$ ).

## DISCUSSION AND CONCLUSION:

In patients with hip dysplasia and LLD, measurements from standing AP pelvis radiographs revealed more severe hip dysplasia on the longer leg side. Knowledge of functional weight-bearing acetabular coverage is important in the diagnosis and operative planning for acetabular reorientation surgery. Given the high prevalence of pelvic obliquity in our study, we recommend standing AP pelvis radiographs when evaluating patients with hip pain.