

**Title**

Can the sagittal pelvic tilt be predicted from AP pelvic radiographs?

**Authors**

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**Background:**

Spinopelvic characteristics can identify patients with increased dislocation-risk post-THA. Sagittal spinopelvic X-rays are associated with increased radiation/cost. The aim was to assess whether pre-operative AP pelvic radiographs can be used to identify patients with abnormal pelvic tilt (PT), and describe features that can estimate sagittal PT from AP pelvic radiographs.

**Methods:**

In this prospective, consecutive, case series from a tertiary referral center, THA patients (n=300) (64.8±11.4years; 53.5% females) underwent pre-operative standing and supine AP pelvic radiographs to measure: distance between several anatomical landmarks (sacroccygeal joint, femoral heads, sacro-iliac (SI) joint, transischial line, trans-ASIS line, height and width of obturator foramen), and sacro-femoral pubic angle (SFP). On a standing, lateral, spinopelvic radiograph, pelvic tilt (PT) was measured. PT>19° was considered high.

**Results:**

PT was moderately correlated with pubic symphysis to SI index (PS-SI) ( $\rho=0.426$ ), ratio between height of foramen obturator and distance between tear drops ( $\rho=0.455$ ), sacro-femoral-pelvic angle ( $\rho=-0.421$ ) and vertical distance from symphysis to transischial line (TSITA) ( $\rho=0.414$ ). An SFP value <60° was indicative of risk for high PT (sensitivity 88%; specificity 59%).

**Conclusion:**

TSITA (vertical distance from symphysis to transischial line) and ratio between height of foramen and distance between tear drops are variables that can help to assess PT on standing AP pelvis. None of the variables on an AP pelvis strongly correlated with PT, showing the need for additional spinopelvic radiographs in at least those with low SFP and patients at-risk of adverse spinopelvic characteristics (age, degenerative lumbar spine or arthrodesis).

Figure 1. Measurements of parameters on AP pelvic radiograph

