Assessment of cup position from plain radiographs: impact of pelvic tilting.

Abstract:
The acetabular cup position after total hip arthroplasty (THA) regarding its inclination and version angles are influential parameters concerning the postoperative range of motion and dislocation stability. Standard anterior-posterior X-rays remain an important diagnostic instrument to observe the postoperative outcome and to secure quality control after THA, where an optimal positioning of the patient is recommended when taking these X-rays. The purpose of this preliminary study was to determine the effect of pelvic tilting regarding the positioning calculation of the acetabular cup from standard radiographs using a modified method according to Pettersson et al. (Acta Radiol Diagn, 23:259-263, 1982). In our model experiment, we were able to show that pelvic tilting to either side causes a considerable difference between the radiographic and calculated version angles following approximately linear functions. However, pelvic tilting to either side, leads, regarding the calculation of the inclination, to an average deviation between radiographic and calculated inclination angles less than 2 degrees.