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Letter to the Editor

Letter to the Editor on “Abnormally High Dislocation Rates of Total Hip Arthroplasty After Spinal Deformity Surgery”

To the Editor:

We read with great interest the study by Bedard et al [1] regarding the high dislocation rates of total hip arthroplasty (THA) in patients with concurrent spinopelvic fusion but we believe that some limitations cannot be overlooked.

The evaluation of spinopelvic alignment is gaining an increasing importance, not only in spinal surgery but also in THA [2–4]. Although pelvic incidence (PI), pelvic tilt (PT), sacral slope (SS), lumbar lordosis, and sagittal vertical axis parameters have recognized importance in spinal sagittal alignment, they have largely been neglected in THA. The concept of PT is defined differently between spine and hip surgeons. PT measured for hip navigation is a deviation of the anterior pelvic plane from the global coronal axis of the body. When measured as a spinopelvic parameter, PT is a measure of the relative position of the sacrum to the center of the femoral heads when compared with the vertical axis and the patient is in the standing position.

PI is a constant morphologic parameter dependent upon the position of the hip center and the obliquity of the sacrum relative to the ilium. Its normal value must be between 35° and 85° and is unchangeable during the life.

PT and SS are positional parameters, strongly related to the PI, according to the formula $PI = PT + SS$, and to the ability of the pelvis to rotate around the femoral heads, following the bicoxofemoral axis [5,6]. An intimate relationship exists between PI, PT, SS, and lumbar lordosis. When the pelvis rotates backward (retroversion), PT increases whereas when the pelvis rotates forward (anteversion), PT decreases. This is the best mechanisms of regulation of sagittal balance. Achieving a postoperative PT of $<20^\circ$ is an important aim of the spinal corrective surgical procedure. Obviously, patients with a small PI have a small capacity to compensate their sagittal imbalance through pelvis retroversion. In recent years, the correlation between PT and acetabular anteversion changes, and the effect of PT on acetabular cup positioning have attracted several authors [5,7–11].

Lembeck et al [9] reported that acetabular cup anteversion in THA must be $0.7^\circ \times PT$.

Babisch et al [10] confirmed this evidence adding that cup inclination must be $0.3^\circ \times PT$. According to these reports, the PT cannot be ignored during spinal surgery procedures performed after THA if we want to avoid that the change in PT angle could induce a THA dislocation [9–11].

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Inaba et al [12], in a recent prospective study, underline that the risk of THA displacement is very low if the preoperative plans are made with consideration of preoperative PT.

We applaud the authors for raising the problem of THA dislocation in patients with concomitant THA and spinopelvic fusion; however, we believe readers should be aware that the THA dislocation rate could not be related to spinal fusion surgery without any consideration to PT.

Correction of sagittal malalignment will decrease acetabular anteversion by its effect on reducing PT increasing the risk of posterior dislocation.

In patients with coexisting spinal pathologies and hip arthrosis, when performing THA before spinal correction, it is important to understand the PT and the implications of future spinal correction on it when planning acetabular orientation.

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