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***The distance between the midline of the pelvis and the centre of the femoral head in adult humans***

Dear Sir,

We wish to commend Dr Hogervorst for his article,<sup>1</sup> which describes a novel approach to the understanding of the pathogenesis of osteoarthritis of the hip. We have found this to be an excellent piece of work that every orthopaedic surgeon should find interest in reading.

Spurred by previous observations of our senior author,<sup>2</sup> we recently conducted a radiological study on the position of the centre of the femoral head relative to the midline of the pelvis (unpublished data). In brief, the radiographs of 150 patients (150 hips) with unilateral total hip replacements and contralateral non-arthritic, and otherwise not diseased, hip joints were analysed by two observers independently.

Our key findings indicated that the distance of the centre of the femoral head from the pelvic midline had very little variability overall (mean, 89.2 mm (95% confidence interval (CI), 88.3 to 90.2)). In fact, we have found a significant correlation (correlation coefficient [ $r$ ] = 0.59,  $p < 0.01$ ) between this distance with a single morphological parameter of the pelvis, that being the diameter of the femoral head. As this is, on average, larger in males (50.9 mm vs 44.5 mm in our series,  $p < 0.01$ ), we have found that the mean distance of the centre of the femoral head to the pelvic midline was slightly larger in males than in females (90.6 mm (95% CI, 89.4 to 91.9) vs 87.8 mm (95% CI, 86.5 to 89.1),  $p = 0.002$ ). This is in contradiction to a pertinent statement made by Hogervorst.<sup>1</sup> Of note, the distance from the midline to the floor of the acetabulum was remarkably constant, irrespective of gender, in our series.

In recent years, several investigators have attempted to predict<sup>3,4</sup> or localise<sup>5-8</sup> the centre of the femoral head in humans. The authors of a prospective study<sup>7</sup> with use of CT in 200 Indian adults concluded there was a small but significant ( $p < 0.001$ ) difference in this distance, with females demonstrating slightly increased values (8.1 cm (95% CI, 8.0 to 8.1) vs 7.9 cm (95% CI, 7.8 to 8.0)). Compared with our results, the smaller absolute values reported in this study are likely due to racial differences. One may surmise that such differences could also be contributing to the reversal of gender predominance.

The presence of an increased distance between the two anterior superior iliac spines in females has been documented in the orthopaedic

literature.<sup>3</sup> More recently, further widening of the pelvis, in both genders, with age has been suggested.<sup>9</sup> Our study shows that the increased width of female pelvis does not translate to the femoral head being lateralised away from the midline to the same extent (at least in Caucasian populations). Perhaps it is the different development of the iliac wings in females that accounts for their increased pelvic girth. The distance from the midline, as a landmark of locating the centre of the femoral head, has also very recently been reported to be superior to other radiological techniques in defining the mechanical axis of the femur.<sup>8</sup> Consequently, it may prove to have practical implications as well (e.g., during total knee replacement surgery).

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