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PERSPECTIVE

"Should we measure?" and more importantly, "should we report?" Perspective from an adult orthopaedic deformity surgeon

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Our understanding of spinal deformity has dramatically increased over recent years. It has become clear that a relationship exists between the loss of both coronal and sagittal alignment and a decrease in health-related quality of life outcomes [1]. Spinopelvic parameters can help deformity surgeons to better understand patient alignment and define important radiographic relationships. In a recent study, Takahashi and colleagues found that 70% of the respondents stated that currently no standard template for full spine dictations existed at their respective institutions [2].

Although an interesting finding, there are arguments that can be made against the routine reporting of spinopelvic data. Some of these arguments can be loosely grouped into:

1. Concerns regarding the difficulties in obtaining accurate spinopelvic values
2. Which representative values are most important to report
3. The medicolegal implications of reporting these values

The challenges in obtaining consistent radiographic measurements have been well described. These challenges extend beyond the issue of inter- and intraobserver variability [3, 4]. In fact, even simple agreement among definitions such as lumbar-lordosis remains under debate and confusion. Frenkel and colleagues found that discrepancies were pervasive throughout the literature, and found that in some cases, the same primary author, or large spine study groups, utilized different definitions in different publications [5]. Furthermore, variations in patient positioning during radiographs adds additional complexity to the clinical significance of the values obtained.

More recently, the wider use of full-body radiographs has brought other issues to light. In particular, the importance of extraspinal alignment parameters, such as cranial sagittal vertical alignment, and their relationship with the hip, knee, and ankle. As a result, over recent years, there has been an explosion in the number of new radiographic alignment parameters being described, making it unclear which of these radiographic parameters to report. This is even more difficult because there is currently no consensus on which parameter, or combination of parameters, best correlates with improved clinical outcomes. It has been shown that, even when surgical realignment is corrected to "calculated" values, recurrent deformity, proximal junctional breakdown, and implant failure can still occur [6]. What has been agreed upon is that absolute radiographic parameters do not provide the complete clinical picture.

There is even debate regarding who should be performing the measurements, with some believing that ultimately the spinopelvic parameters should be measured by those who use the values the most: deformity surgeons. It has been suggested that because spinal deformity surgeons are not scouring radiographs for lytic lesions, chest nodules, intra-thoracic gastric bubbles, and other important pathological extraspinal conditions, it becomes even more important for the radiologist to be focusing on these issues rather than on spinopelvic values. Furthermore, there is an intrinsic concern regarding qualitative descriptors versus quantitative values. Although "moderate to severe spinal stenosis" on an MRI lends itself to some degree of subjective interpretation, discrete numerical values such as a "pelvic incidence to lumbar lordosis (PI-LL) mismatch of 11-degrees" is open to much less interpretation. These concerns can lead to a quandary as to how to utilize these values if discrepancies exist between those listed in the final radiology report and the intended plan, which of course can have medicolegal implications.

However, all of these concerns are by no means insurmountable. A thoughtful discussion, between the radiologists and the deformity surgeons, can help to clarify definitions,

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standardize techniques, and identify parameters of interest. Medicolegal concerns, though understandable, should not be the reason for avoiding the reporting of spinopelvic measurements. In fact, it is important for deformity surgeons to recognize that quantitative values are already routinely included in radiology readings. Measurement of the size of aortic aneurysms on CT, and the percentage of carotid artery stenosis on ultrasound, for example, are not only routinely performed, but are now arguably expected in the final radiology report [7–9]. Therefore, in the end, if the answer to the question of whether or not we should be measuring spinopelvic parameters is "yes," then we should measure those parameters; and if they are worth measuring, then we should consider reporting them.

Compliance with ethical standards

Conflicts of interest There are no conflicts of interest to declare.

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