Letter to the Editor concerning “Far lateral approaches (XLIF) in adult scoliosis” by P. Berjano and C. Lamartina (Eur Spine J. 2012 Jul 27. [Epub ahead of print])

The order of the factors does affect the product: considerations on why coronal (and not sagittal) imbalance should dictate the sequence of the ‘combined XLIF/posterior approach’ to adult degenerative scoliosis

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To the Editor

We read with great interest the article by Berjano et al. published in the European Spine Journal entitled “Far lateral approaches (XLIF) in adult scoliosis”, with special attention to the new classification of adult degenerative scoliosis proposed to guide the surgical strategy involving lateral access fusion approaches [1].

Although the authors rigidly divide patients with complex curves in basically two groups, depending on the predominant imbalance (either sagittal or coronal), the fact is that a significant proportion of patients with adult degenerative scoliosis will present both severe coronal imbalance (with curves $>30^\circ$)—which would prevent them of being included in Group IV of Berjano’s classification—as well as significant sagittal imbalance (SVA >5 cm)—which would prevent them of being included in Group III of Berjano’s classification—Fig. 1. For example, a recent epidemiological study of the radiographic parameters of patients with ‘de novo’ adult degenerative scoliosis found a mean SVA of 61.1 mm with a mean Cobb angle of 33° for the thoracolumbar curve [2].

Regardless of the classification scheme employed, in such scenario, the great question which still remains unanswered by the current literature on the issue (assuming, of course, that there would be a role for the combined XLIF/posterior approach in the treatment of adult degenerative scoliosis, as several recent studies have suggested [1–4]) is: Which would be the optimal order of these procedures?

Although the therapeutic algorithm proposed by Berjano et al. seems to give priority to the posterior approach (with either PSO or multiple SPOs osteotomies) whenever significant sagittal imbalance is present, in our opinion, in patients presenting with both significant sagittal and coronal imbalance, a combined approach beginning with multiple-level XLIFs would be preferred.

In our experience (and in accordance with the other literature reports) [3], we have perceived that the XLIF approach provides not only important correction of the coronal deformity but also a significant change in the sagittal plane balance, such that there were several patients who, at the initial evaluation, we believed would certainly require multiple posterior osteotomies to correct the sagittal imbalance, but who presented such a remarkable correction of the lumbar lordosis after the XLIF procedure, that the posterior approach could be limited to decompression of the symptomatic levels and pedicle screw instrumentation (Figs. 2, 3).

In summary, we congratulate the authors for their efforts in formulating a new classification scheme, which provides a general orientation regarding the possible surgical strategies involving far lateral approaches to adult degenerative scoliosis. Nevertheless, we found important to highlight that such classification does not seem to clearly address those patients with concomitant significant coronal and sagittal imbalance. In such scenario, we believe that a combined strategy beginning with multiple XLIF procedures would provide better results and, in most cases, simplify the second surgical procedure eliminating the necessity of multiple osteotomies for correction of the sagittal imbalance (Fig. 2). Furthermore, such approach avoids the technical difficulties associated with XLIF approaches after posterior fixation (which have been properly emphasized by Berjano et al. in their paper).

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Fig. 1 Pre-operative imaging of a patient with adult degenerative scoliosis presenting with refractory back pain, neurogenic claudication symptoms and radicular pain. AP X-ray (a) demonstrating a primary lumbar curve of 38.2°. Lateral X-ray (b) demonstrating significant loss of lumbar lordosis (0.51° of kyphosis) as well as significant sagittal imbalance (SVA = +88.3 mm). MRI of the

lumbar spine demonstrating multiple-level degenerative disc disease and endplate changes with marked L3/L4 and L4/L5 lumbar canal stenosis. Again all the sagittal and coronal angles provided in the figures section were measured from the inferior endplate of T12 to the superior endplate of L5—the levels treated with the XLIF approach in this specific case

Fig. 2 The patient was submitted to a 5-level (T12–L5) far lateral approach (XLIFs). Intra-operative fluoroscopy (a AP and b lateral) demonstrating significant correction of the coronal imbalance (final Cobb angle -5.94°) as well as restoration of the lumbar lordosis

(34°). Again all the sagittal and coronal angles provided in the figures section were measured from the inferior endplate of T12 to the superior endplate of L5—the levels treated with the XLIF approach in this specific case

Fig. 3 Final uprights X-rays (**a** AP and **b** lateral) after decompression of the lumbar canal from L3 to S1 and posterior pedicle screw instrumentation from T10 to pelvis demonstrating a satisfactory correction of both coronal (Final Cobb angle 11.2°) and sagittal imbalance (Final lumbar lordosis 20.4°). Note that a natural loss of the obtained correction is expected when comparing intra-operative

XLIF fluoroscopy images with post-operative uprights X-rays due to the effect of the patient's lateral positioning on the curve. Again all the sagittal and coronal angles provided in the figures section were measured from the inferior endplate of T12 to the superior endplate of L5—the levels treated with the XLIF approach in this specific case

Conflict of interest The author declares no conflict of interest.

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