

# Comments on “Posterior Subaxial Cervical Spine Screw Fixation: A Review of Techniques” by Joaquim et al

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To the Editor:

Recently, I read with keen interest the article titled “Posterior Subaxial Cervical Spine Screw Fixation: A Review of Techniques” by Andrei Fernandez Joaquim, Marcelo Luis Mudo, Lee A. Tan, and K. Daniel Riew.<sup>1</sup> It is really outstanding to see how many different techniques have been published regarding insertion of a screw in such a small anatomical structure (the lateral mass); but the first thing that comes to mind is the wide variability of anatomy found among the different anatomical levels (already pointed out by several authors, especially in the facet angles in the sagittal plane), so it seems unlikely that one single rule may be suitable for all, and this is a criticism to all techniques based on angles. Furthermore, posterior cervical surgery is performed usually in aged patients, so degenerative changes are present and the lateral mass is one of the most distorted anatomical structures in the spine due to degenerative changes. Ostophytes, which proportionally are probably the biggest throughout spine, and spatial deformation are considerable, and this is a criticism to all techniques based on strict anatomical references and measurements in the magnitude of 1 or 2 mm. This degenerative distortion also applies to spinous processes, and no techniques based on referencing to spinous processes are subject to variability.

So it seems clear that the concept of aiming lateral and cephalad, as proposed by the authors in the Riew technique is probably the most durable over those measuring different angles and distances in the 1-mm range in such a variable anatomical structure, as the lateral mass of the cervical vertebrae are.

After all this reasoning, probably the best scenario for the surgeon is to “navigate” each lateral mass, taking into account that a lateral mass is geometrically a slanted trapezoidal symmetrical cube, with the longest possible line within being a diagonal from the most caudal apex to the more cranial one. To avoid violating the joint, just begin with a safe margin from the lower one and aim at the opposite cranial apex aiming laterally for security reasons (root and vertebral artery). This is easily accomplished by dissection to the lateral border of the

cranial joint of the lateral mass and aiming from below-medial to top-lateral. Such a technique, based on purely spatial orientation and a “no measure” concept has been published and commented in detail.<sup>2,3</sup>

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