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Letter to the editor: "Is there a difference between narrowing of the spinal canal and neurological deficits comparing Denis and Magerl classifications?" (MFS Caffaro and O Avanzi) Spinal Cord. 2011 (49) 297-301

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Dear Editor,

We have read with great interest the retrospective study by Caffaro and Avanzi¹ evaluating the relation between narrowing of the spinal canal and neurological deficits in patients with burst-type fractures of the spine. The authors are to be commended for obtaining detailed neurological and radiological data in a large cohort of 227 patients. The authors conclude: "*The percentage of narrowing of the spinal canal proved to be a pre-disposing factor for the severity of the neurological status in thoracolumbar and lumbar burst-type fractures according to the classifications of Denis and Magerl.*" Although this conclusion is mainly in accordance with previous findings,^{2, 3} we would like to comment on the methodological approach applied in the current study.

One of the study objectives was to evaluate the correlation between the presence of neurological deficits and the degree of spinal canal narrowing by comparing the Denis and Magerl classification. Patients with Denis burst-type fractures were selected for inclusion and were re-classified according to the Magerl classification (A3.1, A.3.3 and B1.2). The distance between the spinous processes was used to distinguish type A from type B fractures. The authors did

not provide a cut-off level for this distance however. Moreover, this type of measurement has never been validated as a measure to distinguishing type A3 from type B1 fractures. In fact, it has been demonstrated that distinguishing these two fracture types based on radiographs and computed tomography alone is unreliable.^{4, 5} Finally, no correlation data between the two classification systems were presented, leaving the primary research question unanswered.

The midsagittal diameter (MSD) of the spinal canal was measured to assess the degree of canal narrowing. In 1994, Rasmussen et al. demonstrated that measurement of the mean transverse spinal area (cm²) is a more accurate method for evaluating neural canal encroachment when compared to the MSD.⁶

In the discussion section, the authors presented data on the correlation between the presence of neurological deficits and the degree of spinal canal narrowing. Remarkably enough, patients with Frankel grades A, B, C and D were combined and compared to those without neurological deficits for this purpose. By using this dichotomous approach the authors failed to support their conclusive finding by saying that "*the percentage of narrowing of the spinal canal proved to be a pre-disposing factor for the **severity** of the neurological status...*".

Finally, and perhaps most importantly, the authors did not consider the impact of the vertebral level of injury in the analyses. Several studies have shown that a certain degree of narrowing of the spinal canal at the thoracic spine (medulla/epiconus level) results in a higher risk of neurological deficits when compared to the lumbar spine (cauda equina level).^{2, 3}

Despite the impressive number of patients investigated, the authors failed to provide medical professionals with methodologically sound evidence. In order to identify scientifically plausible causal relations between the degree of spinal canal narrowing and the severity of neurological deficit, it is of imminent importance to use validated instruments and to include previously identified factors related to the neurological status.

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