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Letter to the editor

# Degenerative Cervical Myelopathy

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**To the editor**

I read the abovementioned article as it directly relates with my clinical interest.

Wilson et al.[1] have reviewed the subject of 'degenerative cervical myelopathy' and have discussed the 'latest' advances in the subject and have evaluated the future trends in its management. I am troubled by the fact that our several PubMed and MEDLINE indexed articles on the subject published in leading journals dedicated to the study of spine have not found any place in the huge reference list of 137 articles.[2-7] Moreover, I am convinced that our articles will have significant impact on the future of surgery for degenerative cervical spondylotic radiculopathy and/or myelopathy (DCM).

Disc space reduction due to loss of its water content related to 'old' age has been identified uniformly in literature to be the nodal point of pathogenesis of spinal degeneration. Osteophyte formation, ligamentum flavum hypertrophy, and bulging disc eventually result in reduction in a single or multiple spinal levels and cause symptoms related to radiculopathy and/or myelopathy. The various vascular events identified by Wilson et al.[1] could be the ultimate cause of neurological symptoms.

In 2010, we proposed an alternative concept of pathogenesis of cervical spondylotic myelopathy.[6,7] We identified that weakness of muscles responsible for standing human position due to disuse, abuse or injury leads to 'vertical' spinal instability and listhesis of facet of rostral cervical vertebra over the facet of caudal vertebra. Buckling of the intervertebral ligaments that include posterior longitudinal ligament and ligamentum flavum, osteophyte formation and disc space reduction are a result of reduction in the vertical height of the spinal segment. Reduction in the spinal and neural canal dimensions are ultimate consequence of spinal instability. On the basis of this hypothesis we proposed distraction of facet using 'Goel facet spacers' and arthrodesis of involved spinal segments as a treatment for both radiculopathy and myelopathy for single or multiple level DCM.[2] Our article on the subject is the first in the literature wherein no direct decompression of the neural structures by bone, soft tissue, osteophyte or disc removal formed the basis of surgical treatment. Restoration of all secondary features identified with DCM following a single act of facet distraction gives credence to our hypothesis. Other authors have validated this concept.[8-10] We also used the same concept in the surgical treatment of degenerative lumbar spondylotic disease.[11]

As our understanding in the subject matured further, we realized that it is not compression or deformation but it is subtle instability related microinjury to neural structures that is the cause of symptoms in DCM. Accordingly, we resorted to 'only fixation' of the involved spinal segments using transarticular technique of fixation.[4,5,12,13] No direct or indirect decompression of bone or soft tissue and no resection of osteophyte or disc material were done. Our remarkable clinical result gives credence to the concept. We have treated cases with lumbar canal 'stenosis' with the same concept of only fixation without any decompression.[14]

The other crucial observation was that the atlantoaxial instability of 'central' or 'axial' variety is 'frequently' associated with multilevel DCM, particularly when the patient is 'old' and when the neurological deficits related to myelopathy are 'severe'.[15-17] Ignoring atlantoaxial instability can be a major cause of failure of surgical treatment. We recently reported gratifying clinical outcome in patients presenting with symptoms related to severe myelopathy treated by multilevel spinal fixation that included atlantoaxial joint in a majority of cases.[18] No 'decompression' was done.

Our studies have identified that spinal instability forms the nodal point of pathogenesis of cervical myelopathy related to ossification of posterior longitudinal ligament.[19] We reported remarkably gratifying clinical outcome following only fixation of cervical segments by transarticular technique of fixation without any anterior or posterior decompression. Atlantoaxial joint was included in the fixation construct in a number of cases. Our observations on the basis of our increasing experience is that multilevel spinal fixation that includes atlantoaxial joint can revolutionize the treatment for cervical myelopathy related to ossification of posterior longitudinal ligament.[20]

Wilson et al.[1] have identified the advancements in the imaging technology for identification and treatment of DCM. We observed that vertical instability and telescoping of spinal segments might not be identified on direct imaging due to their lateral location away from the neural structures. Direct visual assessment of instability of spinal segments by manual manipulation of bone on the basis of high level of suspicion based of guiding clinical and radiological parameters can be important in determining the levels of required fixation.[21]

**Opinion of the Editorial Board**

Editorial Board of Neurospine agrees to publish opinion from the readers of Neurospine. This piece of opinion expresses the view of its author(s), separate from those of editorial policy of Neurospine.

## CONFLICT OF INTEREST

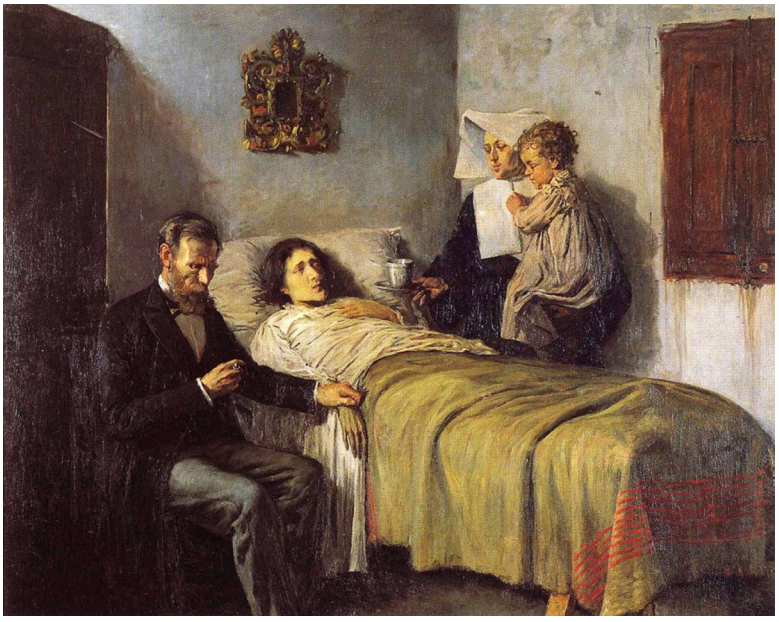
The author has nothing to disclose.

## REFERENCES

1. Wilson JRF, Badhiwala JH, Moghaddamjou A, et al. Degenerative cervical myelopathy; a review of the latest advances and future directions in management. Neurospine 2019;16:494-505.
2. Goel A, Shah A. Facetal distraction as treatment for single- and multilevel cervical spondylotic radiculopathy and myelopathy: a preliminary report. J Neurosurg Spine 2011;14:689-96.
3. Goel A, Shah A, Patni N, et al. Immediate postoperative reversal of disc herniation following facetal distraction-fixation surgery: report of 4 cases. World Neurosurg 2016;94:339-44.
4. Goel A. 'Only fixation' as rationale treatment for spinal canal stenosis. J Craniovertebr Junction Spine 2011;2:55-6.
5. Goel A, Dharurkar P, Shah A, et al. Facetal fixation arthrodesis as treatment of cervical radiculopathy. World Neurosurg 2019;121:e875-81.
6. Goel A. Facet distraction spacers for treatment of degenerative disease of the spine: Rationale and an alternative hypothesis of spinal degeneration. J Craniovertebr Junction Spine 2010;1:65-6.
7. Goel A. Facet distraction-arthrodesis technique: can it revolutionize spinal stabilization methods? J Craniovertebr Junction Spine 2011;2:1-2.
8. Cofano F, Sciarrone GJ, Pecoraro MF, et al. Cervical interfacet spacers to promote indirect decompression and enhance fusion in degenerative spine: a review. World Neurosurg. 2019;126:447-52.
9. Tan LA, Gerard CS, Anderson PA, et al. Effect of machined interfacet allograft spacers on cervical foraminal height and area. J Neurosurg Spine 2014;20:178-82.
10. Maulucci CM, Sansur CA, Singh V, Cholewczynski, et al. Cortical bone facet spacers for cervical spine decompression: effects on intervertebral kinetics and foraminal area. J Neurosurg Spine 2016;24:69-76.
11. Goel A, Shah A, Jadhav M, et al. Distraction of facets with intraarticular spacers as treatment for lumbar canal stenosis: report on a preliminary experience with 21 cases. J Neurosurg Spine 2013;19:672-7.
12. Goel A. Is it necessary to resect osteophytes in degenerative spondylotic myelopathy? J Craniovertebr Junction Spine 2013;4:1-2.
13. Goel A. Vertical facetal instability: is it the point of genesis of spinal spondylotic disease? J Craniovertebr Junction Spine 2015;6:47-8.
14. Goel A, Ranjan S, Shah A, et al. Lumbar canal stenosis: analyzing the role of stabilization and the futility of decompression as treatment. Neurosurg Focus 2019;46:E7.
15. Goel A. Role of subaxial spinal and atlantoaxial instability in multisegmental cervical spondylotic myelopathy. Acta Neu-

 https://doi.org/10.14245/ns.1938384.192

rochir Suppl 2019;125:71-78.
16. Goel A. Posterior atlantoaxial 'facetal' instability associated with cervical spondylotic disease. J Craniovertebr Junction Spine 2015;6:51-5.
17. Goel A. Atlantoaxial instability associated with single or multilevel cervical spondylotic myelopathy. J Craniovertebr Junction Spine 2015;6:141-3.
18. Goel A, Vutha R, Shah A, et al. Cervical spondylosis in patients presenting with "severe" myelopathy: analysis of treatment by multisegmental spinal fixation - a case series. J Craniovertebr Junction Spine 2019;10:144-51.
19. Goel A. Is atlantoaxial instability the cause of "high" cervical ossified posterior longitudinal ligament? Analysis on the basis of surgical treatment of seven patients. J Craniovertebr Junction Spine 2016;7:20-5.
20. Goel A. Ossification of the posterior longitudinal ligament: analysis of the role of craniovertebral and spinal instability. Acta Neurochir Suppl 2019;125:63-70.
21. Goel A. Beyond radiological imaging: direct observation and manual physical evaluation of spinal instability. J Craniovertebr Junction Spine 2017;8:88-90.



Title: Science and Charity
Artist: Pablo Picasso
Year: 1897
In 1897, Picasso, following the advice of his father, painted a huge canvas in the academic manner. Of course, in duty to his father's wishes, Picasso, who unwittingly discovered expressionism last summer and painted one of the best Spanish portraits - a portrait of a devout and crazy Aunt Pepa, - became much more conservative at the time. "The Science and Charity" is no more than a usual genre painting, the composition of which is surely thought-out by Pablo's father; furthermore, it is evident that its theme and composition are inspired by the painting by Enrique Paternina, "Mother's Visit". It must be noted that this work continues to admire people, who are not into art, wondering how a 15-year-old teenager managed to paint such a perfect picture.
More information: https://www.pablo-ruiz-picasso.net/work-11.php