

Editorial

Retro-odontoid mass: An evidence of craniovertebral instability

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Journal of Craniovertebral Junction and Spine 2015, 6:2

Retro-odontoid “bony” or “cartilagenous” mass has been referred to by various names including pseudotumor, inflammatory granulation tissue, degenerative fibrochondral-like tissue, and cystic deterioration. The lesion can sometimes grow in size, and imaging shows severe compression of the craniocervical cord. The lesion was earlier considered to be a kind of tumor, and surgical efforts were concentrated on methods and techniques that would be able to best resect this mass. Transoral surgery, lateral cervical approach, and similar such approaches have been designed to resect the lesion. Goel suggested for the first time that retro-odontoid tissue is a manifestation of atlantoaxial instability and need not be directly addressed, and the surgical efforts should be focused on atlantoaxial fixation.^[1,2] Subsequently, several authors have performed atlantoaxial fixation for such lesions and have even demonstrated resolution of the retro-odontoid mass.^[3]

Our further analysis of the subject reveals that retro-odontoid tumor is in fact a kind of “osteophyte” that results as a manifestation of atlantoaxial instability related to degenerative spondylotic changes in the region that starts laterally in the facets. The retro-odontoid osteophyte frequently is small, but in some cases becomes large and “tumor-like.” The retro-odontoid tissue is a result of buckling of the posterior longitudinal ligament that results from reduction in the joint space laterally in the facets. We speculated earlier that instability manifested at the facets is the primary point of pathogenesis of spondylotic

spinal disease. Instability at the facets that is the only true joint of the spine is secondary to weakness of the muscles of the nape of the neck related to muscle abuse or disuse. We had proposed a similar hypothesis in the formation of retro-odontoid pannus in cases with rheumatoid arthritis.^[1,2] We had mentioned that in rheumatoid arthritis, there is a lateral mass collapse and the buckling of the posterior longitudinal ligament is pronounced, resulting in a greater bulge of the posterior longitudinal ligament, and in the form of a pannus.^[1,2] We suggested that pannus may not be a manifestation of inflammation but is a result of buckling of the posterior longitudinal ligament. We have reported immediate post-operative regression of the “pannus” following surgery that involves distraction of the facets, stabilization, and aiming at arthrodesis.^[4]

The instability in spinal degenerative problems is subtle, long standing, and several secondary ligaments, disc, and bone changes are apparent when the diagnosis is made. Circumferential buckling of the ligaments of the spinal canal is a result of vertical instability or dislocation and telescoping of the spine. The posterior longitudinal ligament buckles in the anterior aspect of the dural tube. “Periosteal reaction” and osteophyte formation is a result of buckling of the ligaments and their separation from the bone surface. Similar osteophyte formation occurs in the ligamentum flavum, which may appear hypertrophic and thick and pathological. Disc space reduction is secondary effect of the primary vertical instability of the spine.^[5-9] Essentially it means that instability is the primary event and other physical, morphological musculoskeletal, disc, and even neural alterations are secondary effects. The primary pathology is instability that may not be obvious in the subaxial spine due to oblique profile of the facets and the difficulty in radiologically viewing them. However, the facets of atlas and axis are large and are horizontal in their lay and can be relatively easily visualized.

Access this article online	
Quick Response Code:	Website: www.jcvjs.com
	DOI: 10.4103/0974-8237.151578

In the presence of retro-odontoid mass, the instability of the atlantoaxial joint is relatively subtle. The atlantoaxial instability can be visualized on dynamic flexion-extension images. The movements of the odontoid process and the increase in atlantodental interval may not be as wide as seen in cases with congenital atlantoaxial dislocations. The dislocation is more often subtle. In cases where the odontoid process related instability is not obvious, attention should be directed towards instability of facets. Frequently, the instability of the facets can be visualized on sagittal imaging. We recently presented an alternative classification of atlantoaxial dislocation on the basis of facet alignment.^[10] Type I facet dislocation is when the facet of atlas is located anterior to the facet of axis. Type 2 facet dislocation is when the facet of atlas is dislocated posterior to the facet of axis. In Type III facet dislocation, the facets are in alignment, but their instability can be clearly appreciated during surgery that involves facetal handling. In cases with retro-odontoid osteophyte, Type II facet dislocation is frequent and should be evaluated. Type B instability can be a frequent indicator of instability of the region and suggests the need for surgical stabilization.

Retro-odontoid tissue may be in the form of ossification/calcification or even in the form of cystic degeneration. The underlying soft tissue usually elevates the posterior longitudinal ligament. Facetal space reduction and instability is the primary issue in such cases. Fixation of the lateral masses forms the treatment. As we discussed earlier and questioned the need for resection of the osteophyte in cases with degenerative spinal disease, we believe the retro-odontoid soft tissue is a secondary event and need not be primarily addressed.

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How to cite this article: Goel A. Retro-odontoid mass: An evidence of craniovertebral instability. *J Craniovert Jun Spine* 2015;6:6-7.

Source of Support: Nil, **Conflict of Interest:** None declared.

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