RETRO-ODONTOID FIBROCARTILAGINOUS MASS ASSOCIATED WITH ATLANTO-AXIAL INSTABILITY: PATHOGENESIS AND SURGICAL TREATMENT

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INTRODUCTION: Non-tumoral condition at the craniocervical junction is more common than was formerly recognized but it is difficult to diagnose clinically. We treated seven patients who developed retro-odontoid pseudotumor associated with instability of the atlanto-axial joint. Our cases differed a little from what had already been reported by Sze and Crockard. It is intriguing to speculate that mechanical dysfunction and instability may have been the underlying cause of the formation of the fibrous tissue, with hypertrophy of connective tissue elements as the abnormal response to chronic stresses. The advantage of MR imaging of the craniocervical junction is evident and it graphically and dramatically demonstrates the retro-odontoid pseudotumor and it allows repeated pre- and postoperative investigations. The pseudotumor regarded as a new entity which was easily examined by MR imaging when symptoms showed high cervical myelopathy due to atlantoaxial instability. We present here the pathogenesis and the results of surgical treatments of such pathologic condition.

METHODS: Seven patients were referred to our institution with severe symptoms of cervical myelopathy. Six were male and one female. The age ranged from 47 to 76 years (mean: 68.4). All seven patients underwent plain radiographs of the cervical spine in flexion and extension positions. All seven had MRI studies of the craniocervical junction, followed by conventional myelography and computed tomography (CT) of this area. Four obtained MR imaging enhanced by Gd-GTPA. Posterior decompression and fusion were carried out in all cases except one case which was treated by soley laminectomy. Post operatively all cases were reassessed for common clinical and radiological findings, and four were followed by the post operative serial MR imaging. Four pathological materials were examined with haematoxilin and cosin stain, immunohistochemical stains of S-100 protein and type II collagen.

RESULTS: X-rays demonstrated the instability at C1 to C2 in all cases, with narrowing of the spinal canal to less than 12 mm in flexion. MR imaging confirmed the presence of the retro-odontoid mass, which was of iso signal intensity on T1-weighted image and of low signal intensity on T2-weighted image. But the pseudotumor was not enhanced by Gd-DTPA in MR imaging.
The thickness of the masses ranged from 5mm to 11mm. Computed topography showed calcifications of the mass in two cases and computed myelogram showed the lobulation of the masses in three cases. In the first case only laminectomy of the atlas was done for decompression of the spinal cord at the craniocervical junction. In addition to decompressive laminectomy of the atlas, occipitocervical fusion with TI-Loop and titanium wiring were done without removal of the retro-odontoid pseudotumouris in the other six cases. Postoperatively all fusions except one were radiographically stable. Clinical results were judged by the cervical myelopathy scoring system of Japanese Orthopaedic Association. Preoperative scores ranged from 4 to 14 (mean: 6.7) and post-operative scores ranged from 4 to 17 (mean: 10.5). In the four cases, the small specimens were obtained from the surgical operation and one from the autopsy because the patient died from graft versus host reaction three weeks post-operatively. It was considered the pathogenesis of such pseudotumor as the reactive response due to atlantoaxial instability. Posterior occipitocervical fusion results in the spontaneous regression of the retro-odontoid pseudotumor in the post-operative MR imaging. Pathological features demonstrated the fibrocartilaginous metaplasia of the degenerative ligament.

CONCLUSIONS: We believe that the diagnosis of “pseudotumor” became possible as a new pathological entity in clinical cases with atlantoaxial instability on plain X-ray, and a history of progressive high cervical myelopathy, in which MRI shows a retro-odontoid mass compressing the neural axis. According to our clinical experience described above we conclude that it is not necessary to remove the pseudotumor completely and proper posterior decompression and fusion is enough. Therefore, it is necessary to reconsider the indication of the transoral approach for such pathologic conditions.