Retro-Odontoid Pseudotumor Without Radiographic Instability with Congenital C1 Assimilation and C2-C3 Fusion - A Case Report

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Disclosure Declaration
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Retro-odontoid pseudotumor (ROP)

- Non-neoplastic mass seen at the craniocervical junction (CVJ)
- Causes cervicomedullary compression
- Pseudotumor: a testament to its queer nature and obscure pathogenesis
- Causes: Rheumatoid and non-Rheumatoid
- Mechanism of formation of ROP in RA is unclear
- Synovitis: primary reason for pathology “pannus” (misnomer)
- Treatment is controversial
AIM
We report a case of ROP secondary to C1 assimilation and C2-C3 congenital fusion without radiographic instability treated with posterior atlantoaxial fusion.

Case Details
- A 61-year-old right-handed lady
- Gradually progressive worsening of neck pain
- Weakness in both upper limbs
- Walking difficulty for the last 6 months
- Wheelchair-bound by the time she presents

Neurological examination
- Cervical myelopathy with spastic quadriplegia (grade 4/5)
- Myelopathic gait
- Nurick grade 5
- Sparing of the sphincters

- No history of RA
- Anti-CCP antibodies and RA factor negative
- No crystal deposition disease
- Uric acid levels were normal
Fig. 1: Preoperative MRI images A) T2WI showing mixed-intensity within the pseudotumor, B) T1WI showing isointense signal of the pseudo tumour C) Axial T2WI at the level of the odontoid process showing severe spinal cord compression.

Fig. 2: A and B) CT scan in extended position showing slight posterior subluxation of the C1-C2 joint. C1 is occipitalised and C2-C3 shows congenital fusion. C and D) CT scan in flexion showing slight malalignment of the C1-C2 joints.
**Surgery**: Occipito-cervical fusion and a C1 laminectomy

**Fig.3**: Postoperative X-rays at two years post-surgery showing successful fusion following occipito-cervical fusion.

**Fig.4**: MRI images at 2 years follow up showing A) complete resolution of the ROP. B) Axial T2WI at CVJ and C) axial image at the C3-4 disc showing effacement of the CSF with cord indentation due to adjacent segment degeneration.
Results

• Started to walk with support within 3 days of surgery
• By 7th day she was walking independently but with spastic ataxia
• 3-months postoperatively, only subclinical upper motor neuron signs but no symptoms of cervical myelopathy
• Nurick grade 1
Conclusion

- O-C1 joint: ball and socket joint, highly conformal
- In congenital C2-3 fusion & C1 assimilation, the stresses on the C1-C2 joint are undoubtedly exaggerated.
- This probably is the cause of abnormal hypermobility and beginning of the final common pathway for the development of ROP.
- This case suggests that a posterior fusion only approach for patients with this congenital anomaly will result in spontaneous regression of ROP.
Flowchart
Treatment of retro-odontoid pseudotumor without radiologic instability (RPWRI)

- CPDD, calcium pyrophosphate deposition disease
- RP, retro-odontoid pseudotumor

Always consider anterior or posterior mass resection in cases of large lesions causing severe neural compression.
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**Thank You**

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