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Case Report

Retro-odontoid pseudotumor presenting double layer on MRI: A case report

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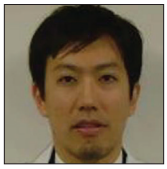

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ABSTRACT

Background: Retro-odontoid pseudotumors (ROPs) typically present as a single mass posterior to the odontoid ranging from isointense to hypointense relative on T1-weighted magnetic resonance (MR) imaging (MRI T1WI). Here, a patient with ROP exhibited the double-layer sign on the MRI T1WI characterized by an initial ventral layer posterior to the odontoid process followed by a secondary dorsal layer.

Case Description: An 84-year-old male presented with cervical myelopathy attributed to ROP resulting in atlantoaxial instability on dynamic X-ray studies, and the double-layer sign on the T1 MR accompanied by a cystic component. MR following C1–C2 posterior fusion, the patient's myelopathy resolved and both layers spontaneously regressed on the follow-up MR studies.

Conclusion: The MR-documented double layer sign with ROP, likely attributable to reactive hypertrophy of the transverse ligament with cystic components, may demonstrate spontaneous MR regression with symptom resolution following a C1–C2 posterior fusion.

Keywords: Double layer, Pseudotumor, Retro-odontoid tumor

INTRODUCTION

Double-layer retro-odontoid pseudotumors (ROPs) are nonneoplastic inflammatory lesions (i.e., most likely due to mechanical stress and composed of fibrous granulation/fibrocartilaginous tissues) that may extend from the clivus to the C2–C4 levels and contribute to spinal compression.[1-3] Both layers are hypointense to isointense on T1-weighted magnetic resonance (MR) imaging (MRI T1WI) and hypointense to mixed intensity on T2-weighted MR studies. Here, we describe an 84-year-old male whose preoperative double-layer ROP findings of spinal cord compression regressed on follow-up MR studies after a C1–C2 posterior fusion.

CASE DESCRIPTION

An 84-year-old male presented with cervical myelopathy due to ROP. Flexion-extension roentgenograms showed atlantoaxial subluxation. T1 and T2 MR studies demonstrated ROP and

the double-layer sign; T1 unenhanced MR studies showed that both layers were isointense areas while T2 MR showed a mixed intensity secondary dorsal layer [Figures 1a and b]. The patient's cervical myelopathic deficits resolved following a C1–C2 posterior decompression and fusion. On follow-up MR studies, both layers regressed [Figure 2].

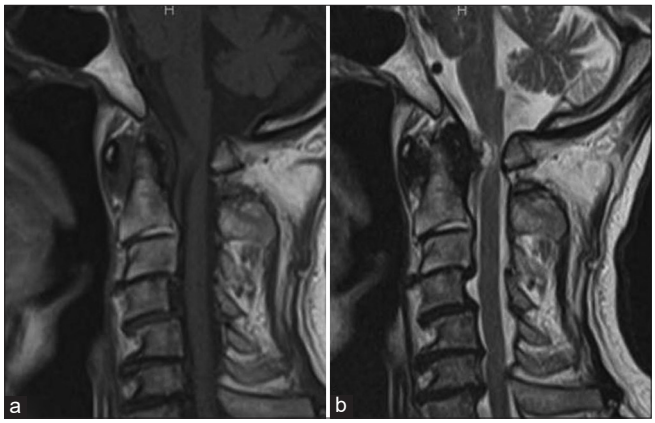

Figure 1: Preoperative magnetic resonance imaging (MRI) T1WI and T2WI sagittal view. T1-weighted magnetic resonance (MR) imaging demonstrated retro-odontoid pseudotumor with double-layer sign; T1 MR showed both layers with isointense areas (a) while T2 MR showed mixed intensity areas of a secondary dorsal layer (b).

Figure 2: Postoperative MRI T1WI. The patient was treated by posterior fusion and both layers were regressed.

Table 1: A summary of causative factors forming retro-odontoid pseudotumor.

Reactive hypertrophy of transverse ligament
Pannus from rheumatoid arthritis
Calcium pyrophosphate dehydrate deposition disease
C2–3 herniated intervertebral disc
Atlantoaxial degenerative articular cyst

DISCUSSION

Etiology of ROP double-layer sign

Some causes of ROP involve cyst formation, which can potentially grow to exceptionally large sizes extending from clivus to the caudad C2–C4 levels [Table 1].[1-3] ROP cysts are likely attributed to atlantoaxial degenerative articular cyst formation and may reflect;[1] micro-bleeding,[5] loculated collections of mucinous fluid from synovium,[4] and relatively higher amounts of hyaline cartilage.[6] Here, the composition of the ventral layer of ROP was attributed to a thickened transverse ligament with fibrocartilage metaplasia, while the dorsal layer was due to a cystic component (i.e., the septum of the posterior longitudinal ligament/tectorial membrane).

CONCLUSION

The MR-documented double-layer sign with ROP was likely attributable to reactive hypertrophy of the transverse ligament with cystic components. Spontaneous regression of the double-layer sign after posterior C1–C2 fusion correlated with the patient's resolved myelopathy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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