



Case Report

# Regression of retro-odontoid pseudotumor following botulinum injection into cervical muscles

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## ABSTRACT

**Background:** Posterior fixation of C1/2 has become more commonly performed to treat retro-odontoid pseudotumor (ROP). Here, we report a 60-year-old female with cervical dystonia (CD), whose ROP regressed and whose quadriparesis improved after a series of cervical intramuscular botulinum injections.

**Case Description:** A 60-year-old female with 30 years of CD newly presented with a progressive quadriparesis. When the MRI showed ROP compression the cervical spinal cord, she refused surgery and underwent multiple cervical muscular botulinum injections over the next 2 years. Following these injections, the patient's quadriparesis improved as the ROP regressed on subsequent MR studies.

**Conclusion:** Over a 2-year period, multiple cervical botulinum injections caused regression of a retro-odontoid cervical pseudotumor improvement in the patient's quadriparesis.

**Keywords:** Botulinum, Regression, Cervical dystonia, Retro-odontoid pseudotumor

## INTRODUCTION

Retro-odontoid pseudotumor (ROP) is a nonneoplastic mass that forms behind the dentate ligament located dorsal to the axial vertebrae. Posterior fusion is the typical treatment of choice for ROP-related atlantoaxial instability (AAI). Here, a 60-year-old female with 30 years' duration of cervical dystonia (CD) newly developed a progressive quadriparesis attributed to ROP that markedly improved following repeated botulinum injections over a 2-year period.

## CASE REPORT

### Clinical presentation

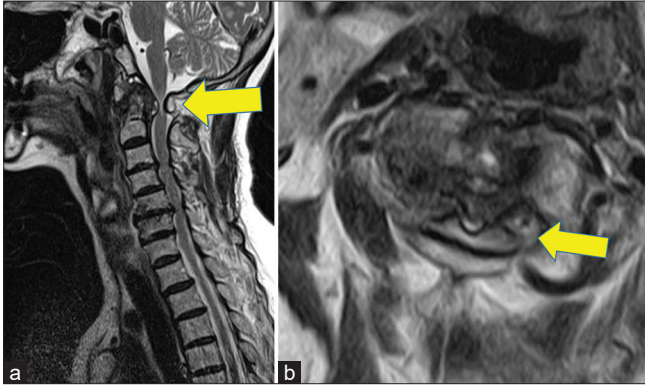
A 60-year-old female, with CD for 30 years' duration, newly presented over the past 2 years with a progressive quadriparesis. On neurological examination, she was quadriparetic, exhibiting right more than left clumsiness of the hands and a spastic lower extremity paresis.

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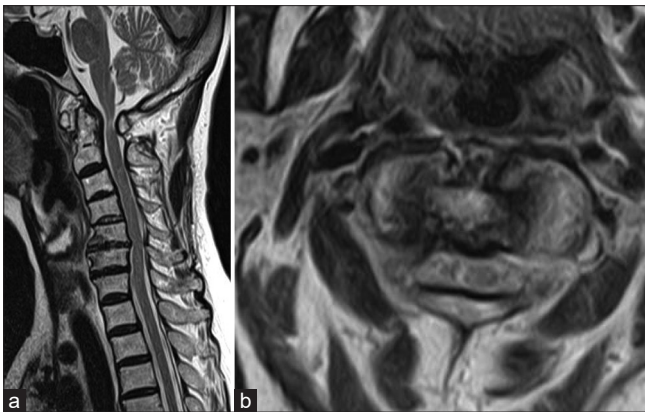
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## MR examination and botulinum injections

The cervical MR showed a low-intensity mass behind the odontoid process that compressed the cervical spinal cord and resulted in a high intrinsic cord signal [Figure 1]. The first choice for treatment was to inject botulinum into the cervical muscles; trapezius muscles, suboccipital muscles on the left, and sternocleidomastoid muscle on the right. As the patient refused, she underwent over the next 2 years, serial intramuscular botulinum injections. Over this interval, her quadriparetic and MR findings improved proportional to the extent of ROP



**Figure 1:** (a) Initial sagittal T2-weighted image showing the abnormal high intensity (yellow arrow) of cervical cord compressed by retro-odontoid pseudotumor, (b) initial axial T2-weighted image showing markedly compressed cervical cord (yellow arrow) by retro-odontoid pseudotumor.



**Figure 2:** Two years later, T2-weighted images after botulinum muscle injection showing reduced retro-odontoid pseudotumor and resolution of cervical cord compression. (a) sagittal, (b) axial.

**Table 1:** Pertinent literature findings.

Author	Important findings
Neeraja	Cervical dystonia leads to cord compression at the craniocervical junction
Traynelis	Botulinum is pre-injected into the cervical muscles followed by a C1/C2 fusion for cervical dystonia
Watanabe	Occipital atlantoaxial fusion reduced retro-odontoid pseudotumor due to torticollis

regression. Two years later, the MR confirmed the reduction in size of the ROP mass that correlated with the regression of cord compression and the high intrinsic cord signal [Figure 2].

## DISCUSSION

Acquired CD usually occurs between the ages of 20 and 60. It often leads to progressive cervical spinal degeneration most typically involving the C5/6 level. Interestingly, it rarely occurs above C2, and when it is present, which is seen in conjunction with AAI and myelopathy. Neeraja *et al.* reported that long-standing CD can lead to cord compression at the craniocervical junction and result in myelopathy [Table 1].<sup>[3]</sup> Watanabe *et al.*, further, noted that a patient with cervical myelopathy due to ROP due to torticollis required an occipital atlantoaxial fusion that reduced ROP and improved symptoms.<sup>[5]</sup>

### Posterior surgery for ROP

In general, posterior fixation of C1/2 has generally is typically required to treat ROP with AAI.<sup>[1,2]</sup> For the treatment of CD, botulinum is pre-injected into the cervical muscles to stop excessive cervical motion and is usually followed by a C1/C2 fusion.<sup>[4]</sup> Here, as the patient refused a C1/2 fusion surgery, it was elected, over a 2-year period, to perform successive intramuscular injections of botulinum into the cervical muscular to reduce the size of the ROP thus contributing to a reduction of cord compression/high cord signal, and improvement in the patient's myelopathic/quadruparetic deficit.

## CONCLUSION

In a 60-year-old female, repeated intramuscular cervical botulinum injections over a 2-year period caused regression of ROP. This results in improvement of her quadriparetic in proportion to progressive resolution of her cord compression and high cord signal.

### 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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