Case study

Gadolinium enhancement in cervical myelopathy: Case report of a surgically treated patient.

Running title : Gadolinium enhancement in myelopathy.

Abstract

Background: Spinal cord contrast enhancement is an unusual radiological finding in chronic degenerative disorders of the spine and often it is misdiagnosed with neoplastic or inflammatory disease.

Case Description: Here we present the case of a 62-year-old male with cervical degenerative spondylosis at the C4–C5 and C6-C7 level. Preoperative magnetic resonance imaging showed severe spinal cord compression with intramedullary hyperintensity on T2-weighted sequences and spinal cord enhancement at the C4-5 level after administration of Gadolinium. The patient with several weeks' history of worsening spastic tetraparesis, underwent two-level anterior discectomy with fusion and anterior stabilization at the myelopathy level.

Conclusion: Intramedullary gadolinium enhancement due to cervical spondylotic myelopathy (CSM) is an important consideration in the differential of inflammatory disease or intramedullary tumors, especially since misdiagnosis may result in serious consequences, including neurological disability from delayed surgical interventions and unnecessary treatments. Persistent enhancement for months to years following decompressive surgery is usual. Recognition is important to prevent inappropriate interventions or delay in consideration of a potentially beneficial decompressive surgery.

Keywords:

Intramedullary gadolinium enhancement, Cervical myelopathy, cervical spondylosis, contrast enhancement, intramedullary lesion, spinal tumors

Introduction

Spinal cord contrast enhancement is a rare radiological finding in chronic degenerative disorders of the spine and may result in misdiagnoses like neoplastic or inflammatory myelopathy and unnecessary treatments; therefore, it represents an important consideration in the differential diagnosis of myelopathy.

Here, we present the case of a 62-year-old male with cervical degenerative spondylosis at the C4–C5 and C6-C7 level whose magnetic resonance imaging (MRI) revealed hyperintensity of the cord on the T2-weighted image and contrast enhancement. This article highlights the significance of correct differential diagnosis of hyperintense signals in the cervical cord and emphasizes how preoperative noncontrast/contrast enhanced MR scans can be useful to help differentiate degenerative spondylosis from intramedullary tumors or inflammatory disease. Furthermore, successive postoperative MR studies help confirm the correct diagnosis of a compressive myelopathy.

CASE REPORT

We present the case of a 62-year-old male with no relevant antecedents except arterial hypertension. He was admitted at the neurology department with lowered strength and numbness involving all four extremities with progressive worsening over several weeks. There was no history of any prior traumatic accident. MR revealed C4-5 and C6-7 spinal cord compression associated with an extensive intramedullary high cord signal images at the C4-5 level (Fig. 1a). After gadolinium injection there was intramedullary enhancement (Fig. 1b). The working diagnosis was for myelitis, and treatment with corticosteroids was initiated. Since there was no improvement, we proposed decompressive surgery.

Operation and postoperative evaluation

The patient underwent an anterior cervical discectomy and fusion with anterior stabilization at C4-5 level and anterior discectomy and fusion at C6-7 level with PEEK intervertebral cages.

There was significant postoperative neurological improvement. The enhanced MR revealed decreased size of the lesion at C4-5 level (Fig. 1c), at the 6- and 12-months follow-up.

DISCUSSION

Cervical spondylosis is the commonest cause of myelopathy accounting for 23.6% of all non-traumatic myelopathies[1]. It is essential to recognize the spectrum of radiological features of CSM, including those that are atypical[2,3], given its frequency and the potential for successful treatment with surgical decompression

Intramedullary gadolinium enhancement due to CSM has been reported in literature, though it is an atypical feature of this type of myelopathy[4-6]. Certain features may distinguish spondylotic myelopathies (SM) from inflammatory myelopathies or intramedullary tumors[7,8]. Various patterns of enhancement have been described in SM[9]. In the present case as described by Eoin et al.[9] the entirety of the enhancement lies within and is smaller than the associated abnormal T2 hyperintensity. The duration of contrast enhancement in one study[8] showed that persistent enhancement after decompressive surgery occurred with a median of 7.5 months after surgery, but could persist even longer as shown also in the present case. This radiological feature of SM often leads to misdiagnosis as inflammatory or neoplastic conditions, delay of potentially effective surgical treatment and occasionally inappropriate biopsy[10]. In the present case there was also present a different level of spondylotic medullary compression raising the odds that both compressions were due to the same and not to different pathologies.

CONCLUSIONS

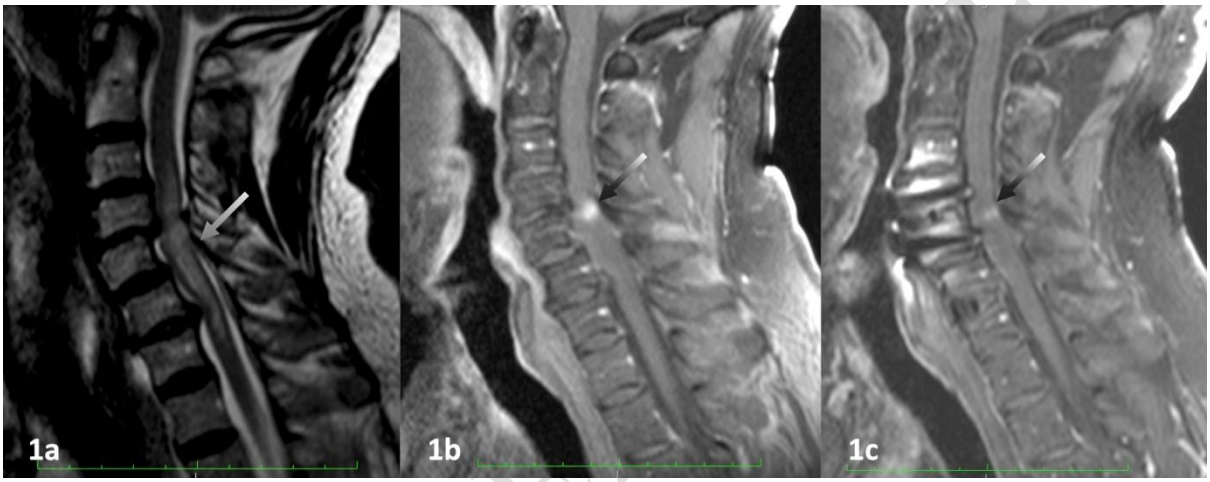
Several conditions may simulate a CSM. An awareness of atypical MR imaging findings of CSM is important to avoid diagnostic delay and unnecessary diagnostic procedures. The presence of enhancement must not exclude the CSM in the differential diagnosis. The presence of multiple levels compression increases the chances the etiology of contrast enhancement is spondylotic.

Figure 1.

1a: T2 weighted sagittal image showing extensive medullary hypersignal.

1b. Post contrast T1 weighted sagittal image showing intramedullary enhancement.

1c. Post operative post contrast T1 weighted sagittal image showing persistence of the intramedullary enhancement.



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