Magnetic resonance imaging findings of remnants of an intradural oil-based contrast agent: report of a case

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Background: Myodil (iopendylate), an oil-based positive contrast media, now discontinued, was widely used for performing myelography 30–70 years ago. We identified this agent as the explanation for uncommon magnetic resonance imaging (MRI) findings in a patient with thoracic spinal fracture.

Design: Case report and literature review.

Findings: An 81-year-old man complained of back pain after falling down stairs. Anamnesis revealed that he had undergone myelography with an oil-based contrast agent about 60 years previously as a part of the diagnostic workup for back pain and sudden onset of gait difficulty. Plain radiography of the thoraco-lumbar spine showed a fracture of the eleventh thoracic vertebra and a radio-opaque, oval shadow at the level of the T9–T10 vertebrae. Many small radio-opaque dots with the appearance of a string of pearls were seen from T8 to L3 vertebrae. MRI revealed a sharply demarcated intradural extramedullary mass, of approximately 5 mm in diameter on the left side of the dura in the region of the T9–T10. The mass showed high signal intensity on T1-weighted MRI, and low signal intensity on T2-weighted MRI.

Conclusions: Increased awareness of this rare presentation of procedures performed in the past is essential when atypical radiographic images are encountered. This case illustrates rare sequelae of Myodil use manifesting decades after administration.

Keywords: Vertebral fracture, Contrast media, Arachnoiditis, Myodil (iopendylate), Neuroimaging, Spinal mass, Myelography, Ventriculography, Cisternography, Axial computed tomography, Magnetic resonance imaging

Introduction

Myodil (iopendylate, a fatty acid, formerly manufactured by Glaxo Laboratories (London, UK); also known as Pantopaque in the USA) is an oil-based positive contrast media that has been widely used in myelography, ventriculography, and cisternography. The use of oil-based contrast agents such as Myodil has been discontinued, and images of intradural oil-based contrast are rarely encountered at present. We incidentally detected Myodil remnants in a patient with a thoracic vertebral fracture. We present this case with a review of the relevant literature regarding oil-based contrast agents.

Case report

An 81-year-old man complained of back pain after falling down stairs. He was taken to a hospital and underwent radiographic examination. Plain radiography suggested fracture of the T11 vertebra. Magnetic resonance imaging (MRI) confirmed this diagnosis and disclosed the presence of a mass suggestive of spinal cord tumor at the level of the T10 vertebra. The patient was subsequently referred to our hospital.

Anamnesis revealed that he had undergone myelography with an oil-based contrast agent about 60 years previously as part of the diagnostic workup for back pain and sudden onset of gait difficulty. That myelography yielded normal results and symptoms resolved without any treatment.

Neurological findings and hematological examination were normal on presentation to our hospital, and except for hypertension and the previous myelography, his past

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Figure 1 Plain radiograph of the thoraco-lumbar spine: (A) anteroposterior radiograph and (B) lateral radiograph.

Figure 2 MRI of thoraco-lumbar spine: (A) sagittal T1-weighted image, (B) sagittal T2-weighted image, and (C) axial T1-weighted image at the level of the T9-T10 vertebrae.

Figure 3 Computed tomography: (A) axial CT at the level of the T9–T10 vertebrae and (B) sagittal constructed CT of thoraco-lumbar spine.

history was unremarkable. Plain radiography of the thoraco-lumbar spine showed a fracture of the 11th thoracic vertebra and a radio-opaque, oval shadow at the level of the T9–T10 vertebrae, mostly on the left side of the spinous processes. Many small radio-opaque dots were seen from T8 to L3 vertebrae on both anteroposterior and lateral radiography. The dots appeared similar to a string of pearls in different sizes in the position of spinal canal, and most of them were seen at the dorsal of the spinal cord (Figs. 1A and B). MRI revealed compression fracture of the T11 vertebra and an oval, sharply demarcated intradural extramedullary mass, of approximately 5 mm in diameter on the left side of the dura in the region of the T9–T10 vertebrae. The mass showed high signal intensity on T1-weighted MRI (Fig. 2A), and low signal intensity on T2-weighted MRI (Fig. 2B). No thoracic spinal cord compression was evident, and no remnants of oil-based contrast agent were seen. Axial T1-weighted MRI (Fig. 2C) revealed a high-density oval lesion on the left side at the level of the T9–T10 vertebrae, and gadolinium-enhanced MRI showed no enhancement of the extramedullary mass. Axial computed tomography (CT) (Fig. 3A) demonstrated a high-density oval lesion on the left side at the level of the T9–T10 vertebrae and sagittal CT (Fig. 3B) showed small dots in the spine similar to a string of pearls from T8 to L1 vertebrae.

On the basis of imaging and clinical history, the patient was diagnosed with fracture of the T11 vertebra and intrathecal remnants of an oil-based contrast agent.

The fracture appeared stable with no signs of neurological deficit, and the patient regained the ability to walk after conservative treatment.

Discussion

From 1946 to 1988, Glaxo produced and marketed a spinal radiographic contrast medium called Myodil. For a number of years, particularly from 1946 onward, this was the only contrast medium available for myelography. Myodil was sold in approximately 50 countries, including the United Kingdom. On 19 September 1988, Glaxo notified the Department of Health that sale of Myodil was to be discontinued in the United Kingdom for commercial reasons, but they wished to retain the product license issued in June 1987, as the product was not being discontinued worldwide.

Myodil remained a widely used substance until the 1980s, gradually becoming replaced by water-soluble media.¹ Many reports have documented rare side effects of intrathecal Myodil. Myelography using Myodil has been associated with arachnoid adhesions and cysts causing spinal cord syrinxes, compression, or nerve root irritation.^{2–4} The reported incidence of clinically significant arachnoiditis is approximately 1% and sequelae such as arachnoid cysts are uncommon.^{5,6} Such agents are absorbed very slowly, with a half-life in the body measured in terms of months or even years, and can remain in the thecal sac for years after a procedure.⁴ Myodil usually appears as intradural dorsal droplets. Myodil is also found in the lumbar

spine, but rare cases of detection in the thoracic segment have been documented.⁷ According to the basic principles of MRI, fat and fat-like structures show high signal intensity on T1-weighted imaging and low signal intensity on T2-weighted imaging. Myodil shows MRI characteristics similar to those of fat or blood and thus may mimic the appearance of lipoma or hemorrhage.⁸ Typically, Myodil appears hyperintense on T1-weighted MRI and isointense to hypointense lesions have been described in T2-weighted MRI studies, depending on the repetition and echo times.^{9,10}

The differential diagnosis of residual Myodil in the spine, based on MRI, includes lipomas, hemangiomas, hemorrhages, and even melanomas.^{7,8} Radiographically, Myodil remnants in our patient showed a unique presentation that imitated an intradural, extramedullary thoracic lesion.

Conclusion

In the modern era of CT and MRI, the need for myelography has decreased and the use of iophendylate (Myodil) was officially discontinued in 1988. We report a unique case of asymptomatic dorsal Myodil remnants six decades after intrathecal injection. Increased awareness of this rare presentation of sequelae of past procedures is essential when atypical radiographic images are encountered. Our patient illustrates

rare sequelae of Myodil use, manifesting decades after administration.

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