

Case Report

Rare Presentation of Ruptured Conus Dermoid with Lipomatous Syryinx

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Abstract: Background: Spinal dermoid cysts are rare congenital tumours, accounting for approximately 1% of spinal tumours. Rupture of these lesions is uncommon, and dissemination of lipid material typically occurs into the subarachnoid or intraventricular spaces. Isolated rupture with lipid spread into the central canal is exceptionally rare. **Case Presentation:** We report the case of a 20-year-old male who initially presented with bilateral lower limb weakness and urinary disturbances. Baseline MRI revealed a heterogeneous conus mass without evidence of rupture. During follow-up, the patient developed progressive neurological deficits over two years. Repeat MRI demonstrated multiple lipid droplets within a dilated central canal, consistent with rupture of the conus dermoid. **Discussion:** While ruptured spinal dermoid cysts have been described, dissemination of lipid material confined to the central canal is exceedingly uncommon. This case underscores the importance of long-term follow-up, as delayed rupture can result in progressive neurological deterioration. MRI plays a crucial role not only in identifying the primary lesion but also in tracking unusual dissemination patterns. **Conclusion:** Ruptured conus dermoid cysts with lipid dissemination into the central canal are rare. Early recognition and vigilant follow-up are essential for timely intervention and prevention of irreversible neurological deficits.

Keywords: Spinal dermoid cyst, Conus medullaris tumor, Ruptured dermoid cyst, MRI, Lipid dissemination, Syringomyelia.

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INTRODUCTION

Dermoid cysts are rare congenital tumours that arise from aberrant inclusion of ectodermal elements during neural tube closure, typically between the 3rd and 5th weeks of embryogenesis. They may also be acquired secondary to iatrogenic causes such as spinal surgery, lumbar puncture, or trauma, wherein dermal elements become implanted within the subarachnoid space. This anomalous implantation leads to the persistence of ectodermal tissue within the spinal canal or intracranial compartment [1]. MRI is the modality of choice for detecting dermoid tumours and tracking lipid droplet dissemination. Since the first MRI report of a ruptured spinal dermoid in 1992, only a limited number of cases with lipid spread particularly into the central canal, a potential space in adults have been documented [2].

Dermoid tumors comprise only 1.1% of spinal tumors [3].

CASE PRESENTATION

A 20-year-old male presented with the complaints of weakness in the bilateral lower limb with difficulty in walking in the last 2 years and unable to hold the urine which developed in the last 2 months. General examination of the patient was within normal limits. He also complaints of multiple joint pain. CE MRI Whole spine with brain screening was requested as a part of initial workup for the patient. It revealed heterogeneous conus mass which will discuss further in the case report.

Findings:

Magnetic resonance imaging (MRI) of the thoracolumbar spine revealed a well-defined

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heterogeneous intramedullary mass lesion (arrow head) located at the conus medullaris. The lesion demonstrated predominantly T1 hypointense and T2 heterogeneously hyperintense signal characteristics, without post-contrast enhancement. Within the dilated central canal (arrow), multiple discrete T1 hyperintense foci were noted, which suppressed on fat-saturated and STIR sequences, confirming their lipid nature. These findings were consistent with disseminated fat droplets. On sagittal T2 and STIR sequences of the cervicothoracic spine, similar hyperintense foci within the central canal were observed, also demonstrating fat suppression, further indicating lipid dissemination along the cranio-caudal extent of the spinal cord. No abnormal contrast enhancement or evidence of leptomeningeal spread was detected. The overall findings suggested a ruptured conus dermoid cyst with dissemination of lipid material into the central canal.

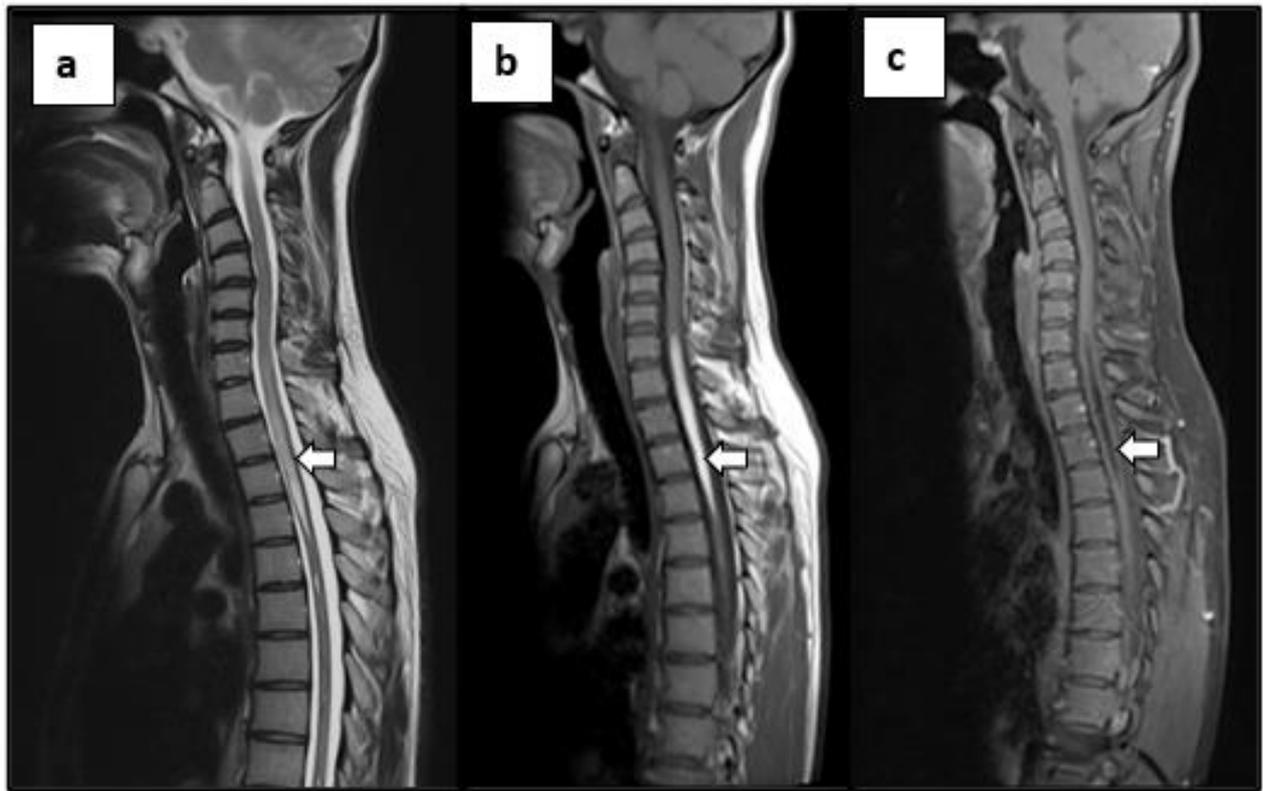
DISCUSSIONS

Spinal dermoid cysts are rare congenital tumours, constituting approximately 1% of all spinal tumours. Rupture of these lesions is an unusual occurrence, most often leading to dissemination of lipid material into the subarachnoid or ventricular spaces. Isolated rupture with lipid migration into the central canal, however, is exceptionally rare [1–3]. Although rupture can present in different patterns, symptomatic

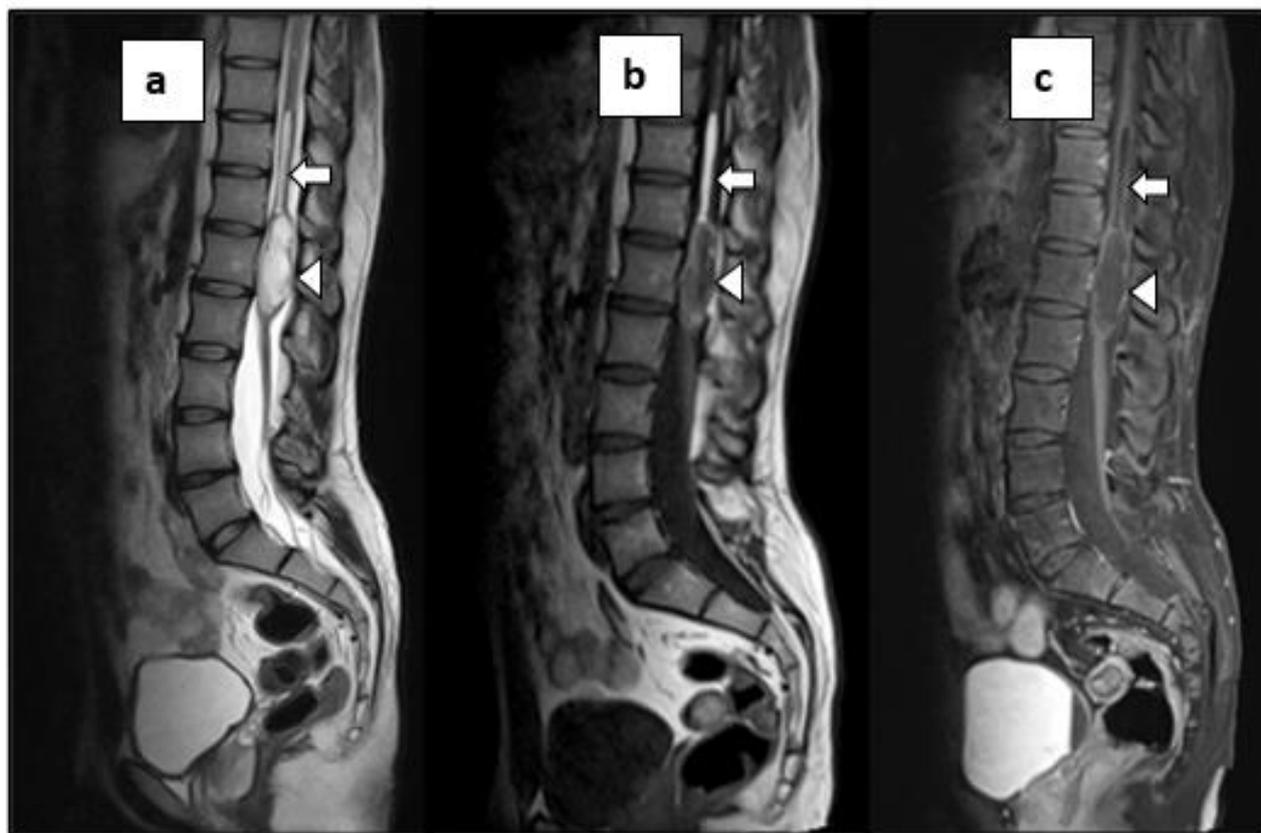
central canal rupture has occasionally been reported, unmasking an otherwise silent conus dermoid [4]. Larger series have also documented cases where rupture extended lipid droplets into syrinx cavities, further illustrating the variability in pathways of dissemination and clinical sequelae [5].

The clinical presentation of rupture is highly variable, ranging from incidental radiological detection to severe neurological deficits. This variability is likely related to both the site of rupture and the extent of lipid spread. While long-term outcomes following surgical management are generally favourable, recurrence and delayed neurological deterioration have been observed, highlighting the need for prolonged follow-up [3]. MRI remains the modality of choice in evaluation, as it clearly demonstrates lipid droplets within the spinal canal and can identify both the primary lesion and secondary dissemination [2]. Characteristic imaging features, especially hyperintense foci on T1-weighted sequences within the central canal or syrinx, should prompt consideration of rupture in the differential.

In the present case, isolated lipid dissemination was observed in the central canal without subarachnoid involvement, a pattern infrequently documented in the literature. Recognition of this unusual presentation is essential, as it may alter both surgical planning and prognostication.



- a. T2 sagittal images of cervicothoracic spine shows multiple T2 hyperintense signal foci in central canal (arrow)
- b. T1 sagittal images of cervicothoracic spine shows multiple T1 hyperintense signal contents in central canal (arrow).
- c. T1FS post contrast images of cervicothoracic spines show corresponding hypointense area (arrow)



- a. T2 sagittal images of lumbosacral spine shows T2 hyperintense mass lesion in lumbar spinal cord (arrow). There is T2 hyperintense contents are seen in central canal.
- b. T1 sagittal images of lumbosacral spine shows T1 hypointense mass lesion (arrow) in lumbar spinal cord with T1 hyperintense contents (arrowhead) in central canal.
- c. T1FS post contrast images of lumbosacral spine show no enhancement and suppression of T1 hyperintense contents (arrowhead).

CONCLUSION

Ruptured spinal dermoid are rare, and dissemination of lipid droplets into the central canal is an exceptionally uncommon finding. Our case emphasizes the importance of long-term clinical and radiological follow-up in patients with spinal dermoid, as delayed rupture may present with progressive neurological deficits. MRI remains the modality of choice not only for diagnosis but also for tracking the unusual dissemination pathways of lipid material. Early recognition of such changes may help guide timely intervention and prevent further neurological deterioration.

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