

## Intramedullary Abscess of the Spinal Cord without any Predisposing Factor: A Case Report and Review of the Literature

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### Abstract

Intramedullary spinal cord abscess (ISCA) in children without meningitis is an extremely rare condition of the central nervous system, although this condition is one of the treatable causes of paresis, but if diagnosed late, it could have devastating consequences. We have concluded that early diagnosis and treatment is crucial; before a dangerous vascular insult of the spinal cord is established from rapid formation of the abscess and expansion of spinal cord within the limited intraspinal space. In this communication, we report a case of a child that has been treated successfully with surgical resection, intravenous antibiotics and neuro rehabilitation between 2016 and 2017 and discuss the result.

**Keywords:** Intramedullary spinal cord abscess; Dermal sinus; Myelotomy

### Introduction

Intramedullary spinal cord abscesses are infrequently encountered in daily neurosurgical practice. Hart reported the earliest documented spinal cord abscess in 1830. Since then fewer than 120 cases have been reported in the literature [1-3]. They can difficultly be distinguished from neoplasms. making an early diagnosis based on clinical suspicion and radiological findings is essential. Subsequent administration of appropriate antibiotic therapy and surgical intervention are crucial to reduce the mortality and neurological sequelae. Several cases of ISCA were reported with the magnetic resonance imaging (MRI) findings in previous literature, but to the best of our knowledge, only one case of ISCA without any predisposing factors has been reported.

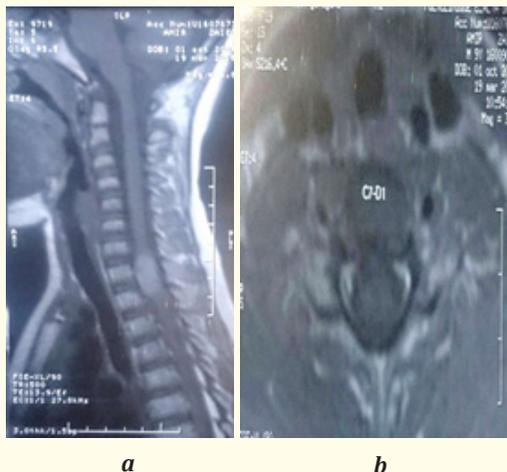
Dermal sinus tract is to be implicated as a source of this pathology in children. Spinal cord abscess may involve any part of the spinal cord but the thoraco-lumbar spine is the most frequent. In children, limited laminectomy with myelotomy focused above the most bulbous segment of the spinal cord for drainage of the abscess and adequate antibiotics is the treatment of choice.

### Case Report

**Clinical presentation:** In March 2016, a 10-year-old boy was referred to our out patients clinic with history of back pain and rapid progressive leg weakness. no history of fever, chills or myalgia. On examination, the child was restless, his temperature was 36.5. There was no anal cleft dimple, or any skin abnormality, meningeal irritation signs were negative. There was no history of infection, trauma, fever, or spinal surgery. Upper limbs were normal, whereas the lower extremities were flail and hypotonic with observed no movement. The muscle strength was estimated to be 5/5 in the upper limbs; while the power in his legs was graded as 1/5, he had no tendon reflexes elicited.

On blood testing at admission, the white blood cell count (9100/ $\mu$ L) was normal and the C-reactive protein level (4.5 mg/dL).

Radiological findings: the radiologist diagnosed the lesion as intramedullary S.O.L as the imaging study demonstrated a swollen spinal cord with intramedullary well circumscribed cystic lesion extending from C7 til D 2, no dermal sinus tract and the dimple could also be noticed on the MRI image, eventually we decided to go for surgery to biopsy the lesion.

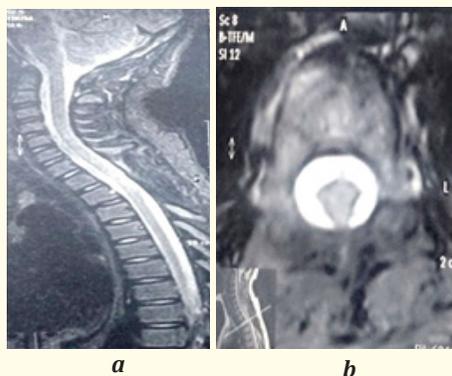


**Figure 1:** Cervico-dorsal spine preoperative MRI images T 2 sagittal(a) and T 1 axial (b) at C7-D1 level show intramedullary S.O.L.

**Intervention:** The child underwent an urgent surgical intervention within a few hours of his presentation C7 til D 2 laminectomy was done, using the microscope, the tense dura was opened above and below and reflected. a myelotomy was then made at C7, D1, D2 level; a cystic lesion was opened from which a significant amount of viscous purulent fluid flowed. A swab was taken for histopathology, then, with gentle aspiration more purulent material was obtained, irrigation with normal saline was then carried out. The tension within the spinal cord relieved and the cord was restored back to normal. The dura was then closed in a watertight fashion, as was the wound. The patient commenced intravenous antibiotics (Rocephine) for one week followed by oral antibiotic (Keflex) for another week.

**Pathology:** Evaluation of Gram-stained sample revealed no bacteria. Cultures of blood and the pus aspirate were negative.

**Postoperatively:** the patient started to have some movements in his legs from day 5. The leg strength continued to improve steadily. One month later, the child was able to move his legs spontaneously but still had significant residual weakness. Antibiotics were ceased after 2 weeks and he was sent for neuro-rehabilitation. The postoperative MRI spine revealed a full resolution of the abscess and the regeneration of the cord was almost complete.



**Figure 2:** Cervico-dorsal spine preoperative MRI images T 2 sagittal(a) and T 2 axial (b) at D1-D2 level show complete removal of the abscess with complete cord regeneration.

The child displayed a steadily significant neurological improvement on the regular assessment as an outpatient for nearly 11 months. And now he is capable of playing football.

### Discussion

SCA is a rare condition since the normal spinal cord tissue has remarkably high resistance to infection. The etiology of this condition is variable, from the mucosal surfaces extraspinal sites of infection [6]. Metastatic abscess infection [7,8]. Congenital midline defects [6,7]. Other causes are direct trauma or neurosurgical intervention [4].

Although 30% of cases are microbiologically sterile, various organisms have been isolated, including *Staphylococcus*, *Streptococcus pneumoniae*, *Haemophilus*, *Proteus*, *Listeria*, *Actinomyces*, *Pseudomonas cepacia* and *Mycobacterium tuberculosis* [9]. In adults, blood route is the main source of ISCA. Congenital dermal sinus is implicated as the leading cause of ISCA in children. The triad of ISCA is fever, pain and neurological deficits, but this does not occur in all patients [6]. Even with a marked reduction in the mortality and morbidity rate in the post antimicrobial era, this infection may result in a considerable damage to the spinal cord and the neurological outcome may remain critical. Still, early diagnosis and appropriate surgical intervention with administration of wide spectrum antibiotics is the main stay to prevent neurological disability and to improve the functional outcome.

Magnetic resonance imaging with gadolinium contrast is the gold-standard investigation, MRI is also helpful in demonstrating the co-existence of congenital anomalies. However, there has been only one report that has described the diagnostic value of DWI and ADC in ISCA [4].

### Conclusions

Suspicion of spinal cord abscess should be high in patients with dermal sinus and rapid progressive weakness in particular those who develop febrile illness. Entire spine MRI is essential in assessing all patients and for planning surgery. Before irreversible spinal cord damage can occur; timely surgical drainage through laminectomy and myelotomy with adequate antibiotics is considered as the preferred mode of treatment with good results. In case a dermal sinus exist, it is still highly recommended to be eradicated.

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