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Case Report

A case of transverse myelitis in a young male: a diagnostic and therapeutic challenge

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ABSTRACT

Transverse myelitis (TM) is a rare inflammatory condition affecting the spinal cord, characterized by motor, sensory, and autonomic dysfunction below the level of the lesion. It is often associated with a wide spectrum of etiologies, including infections, autoimmune diseases, and idiopathic cases. This article presents a case of a 29-year-old male with a progressive onset of lower limb weakness, numbness, urinary incontinence, and constipation. Early diagnosis and prompt treatment with corticosteroids led to a significant clinical improvement. This case emphasizes the need for a thorough diagnostic approach and timely intervention in suspected cases of transverse myelitis.

Keywords: Transverse myelitis, Inflammatory, Dysfunction

INTRODUCTION

Araujo et al reported that transverse myelitis (TM) is an uncommon but serious neurological condition marked by inflammation of the spinal cord, which can cause a variety of neurological symptoms.[1] Giraldo and Garcia et al discussed that the pathophysiology of TM involves immune-mediated damage to the spinal cord, which leads to demyelination and neuronal dysfunction.[2] Schmale et al described that early diagnosis and treatment are critical to preventing permanent disability.[3] We report a case of TM in a young male patient, highlighting the diagnostic challenges and therapeutic approach to this condition.

CASE REPORT

Patient information

A 29-year-old male presented to Sree Balaji Hospital with complaints of progressive numbness and weakness in both lower limbs, urinary incontinence, and constipation. He also reported a 2-day history of fever with chills and a 10-day history of a dry cough. The patient had no significant past medical history and denied recent infections, trauma, or exposure to toxins.

Clinical findings

On physical examination, the patient was conscious, oriented, and afebrile, with stable vital signs: blood pressure: 150/90 mmHg, pulse rate: 92 beats per minute, SpO_2: 98% on room air, random blood glucose: 132 mg/dl. Neurological examination: power: upper limbs – 5/5; lower limbs – 3/5, tone: hypotonia in the lower limbs, normal tone in the upper limbs, reflexes: mild hyperreflexia in the lower limbs (2+ for the tibialis reflex), and diminished reflexes in other joints, sensory: reduced pain sensation below the T4 dermatome and impaired proprioception in both great toes. Plantar reflexes: no response bilaterally, cerebellar signs: normal finger-nose and finger-finger tests; Romberg's test and tandem walking could not be performed due to weakness. Laboratory and imaging: complete blood count, renal function tests, liver function tests, and urine routine were all within normal limits. Cerebrospinal fluid (CSF) analysis: WBC: 85 cells/mm^3 (lymphocytic

predominance), protein: 57 mg/dl, glucose: 81 mg/dl, immunoglobulin G (IgG): 1265 mg/l, Mycobacterium PCR: negative, oligoclonal bands: negative, CSF NMO antibody: negative, and CSF cytology: showed lymphocytes with no atypical cells.

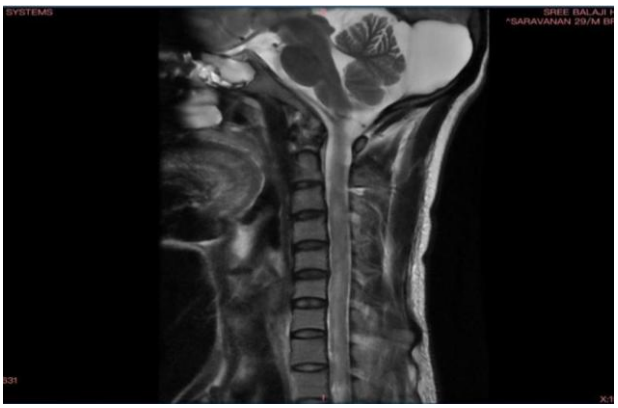

Figure 1: MRI brain -CSF filled subarachnoid space in posterior portion of posterior cranial fossa. Hyperintense signal in lower cervical spinal cord.

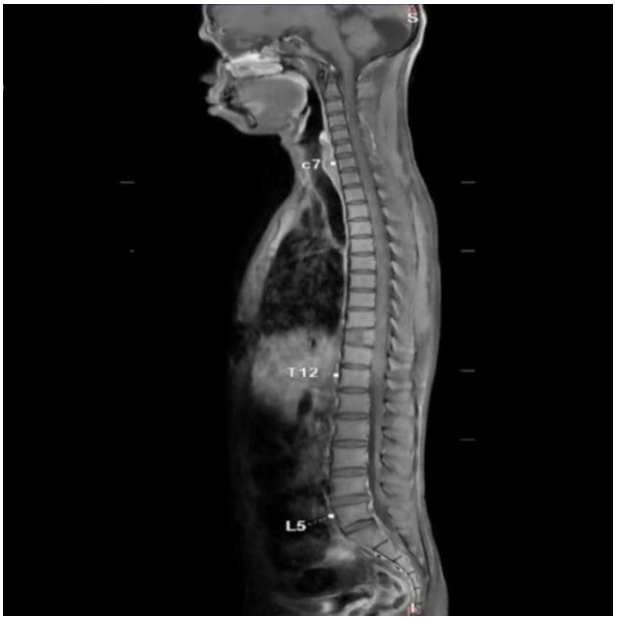

Figure 2: MRI dorsal spine with whole spine screening - hyperintense signal starting from lower cervical cord and extending into the dorsal spine.

Imaging

Magnetic resonance imaging (MRI) brain revealed an arachnoid cyst in the posterior cranial fossa and increased CSF in the posterior portion of the cranial fossa. MRI dorsal spine with whole spine screening showed a hyperintense signal from the lower cervical spinal cord extending into the dorsal spinal cord, suggesting an inflammatory process affecting the spinal cord. Electrophysiology showed nerve conduction studies (NCS) of all four limbs were normal.

Diagnosis

Based on the clinical presentation, imaging, and CSF findings, the patient was diagnosed with transverse myelitis. While infectious causes such as tuberculosis and viral infections were excluded, the elevated IgG in the CSF suggested an immune-mediated inflammatory process. Negative tests for neuromyelitis optica (NMO) and multiple sclerosis (MS) markers pointed towards idiopathic transverse myelitis.

Management

The patient was initially treated with intravenous methylprednisolone, followed by oral steroids (Tab Wysolone). Supportive care included intravenous fluids, antibiotics, and antiemetic medications. The patient also received regular physiotherapy to improve muscle strength and mobility.

Outcome and follow-up

Within days of initiating treatment, the patient showed marked improvement in lower limb strength, with power increasing to 4/5 bilaterally. The patient's urinary incontinence and constipation gradually resolved. He was discharged with a tapering dose of oral steroids and advised to continue physiotherapy.

DISCUSSION

Abbatemarco et al described transverse myelitis as a rare but serious condition with a diverse range of etiologies, including infections, autoimmune diseases, and idiopathic causes.[4] The diagnosis of TM is primarily based on clinical findings, MRI, and CSF analysis, with an exclusion of other potential causes of spinal cord dysfunction. In this patient, the acute onset of sensory and motor deficits, coupled with autonomic disturbances such as urinary incontinence and constipation, suggested a spinal cord lesion. Tur et al noted that the MRI findings of hyperintense signals in the lower cervical and dorsal cord, along with CSF analysis showing lymphocytic pleocytosis and elevated IgG, confirmed the diagnosis of transverse myelitis. Importantly, infections and autoimmune conditions such as multiple sclerosis and neuromyelitis optica were ruled out.[5]

Corticosteroids are the first line of treatment for TM, aimed at reducing inflammation and immune-mediated damage to the spinal cord. Kalani et al highlighted early intervention in this patient resulted in significant neurological improvement, highlighting the importance of prompt diagnosis and treatment in such cases.[6]

Table 1: Study comparison.

Study (year)	Method and focus	Key findings	Conclusion
Araujo et al (2024)[1]	Case study of 31-year-old male with schistosomal transverse myelitis; T2W MRI + eosinophilia (18%)	MRI: hyperintensity at T5-T10; CSF protein elevated (78 mg/dl); stool showed *Schistosoma mansoni* eggs	Antiparasitic + steroids improved motor recovery in 4 weeks
Perez Giraldo et al (2021)[2]	Review on immune-mediated myelopathies; 25 references analyzed	NMOSD markers: AQP4-IgG+ (70% cases); MS plaques on T2W MRI; CD4+ T-cell elevation	Early immunosuppression reduces long-term spinal cord damage
Schmale et al (2022)[3]	CSF rhinorrhea imaging study; N=15	80% presented with pneumocephalus; β2-transferrin detection rate: 93%; CT cisternography confirmed leak in 12 cases	Timely repair prevents meningitis and ascending myelitis
Abbatemarco et al (2021)[4]	Review of transverse myelitis causes; >40 peer sources	MRI lesions span ≥3 segments in LETM; ANA+ in 52% autoimmune TM; CSF WBCs >20 cells/mm³	Etiology-based management improved recovery rate to 68%
Tur et al (2022)[5]	Meta-review on DMTs in MS/NMOSD; 60+ trials	Rituximab: 2.3x infection risk; Ocrelizumab: 13% viral reactivation; 70% infections were respiratory or urinary	Risk stratification needed in immunosuppressive therapy
Kalani et al (2024)[6]	Review of AI in neurology (30 papers)	AI diagnostic accuracy: 92% in TM prediction; NLP used in 17 EMR systems; CNNs outperform radiologists in 3/5 cases	AI integration speeds diagnosis and predicts relapses with 85% precision

Continued.

CONCLUSION

This case underscores the significance of early recognition and treatment of transverse myelitis. Although rare, TM should be considered in any patient presenting with progressive motor and sensory deficits, particularly when accompanied by autonomic symptoms. Prompt steroid therapy can lead to significant clinical improvement, as seen in this patient. Long-term follow-up is necessary to monitor for potential relapses and evaluate for other underlying conditions, such as multiple sclerosis.

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