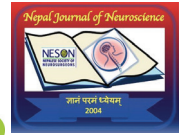


# Isolated spinal Intramedullary Neurocysticercosis: A rare case report and review of literature



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## Abstract

Neurocysticercosis is *Taenia Solium* infection of the central nervous system and meninges. Although highly uncommon, spinal cysticercosis frequently occurs in conjunction with intracranial cysticercosis. The least frequent are often those involving the intramedullary. We report a 50-year-old male patient who presented with complaints of lower back pain with a burning sensation over bilateral thighs. A magnetic resonance imaging (MRI) scan of his dorsal spine revealed a relatively well-defined lobulated lesion at T11 vertebral level. Intramedullary cysticercosis is a challenge to diagnose, and neurocysticercosis should also be considered in cases of intramedullary space-occupying lesion.

**Key words:** Intramedullary, neurocysticercosis, spinal, space occupying lesion

## Introduction

The term “neurocysticercosis” (NCC) refers to *Taenia Solium* infection of the central nervous system (CNS) and meninges.<sup>1</sup> It is most common in people who live in poverty and have poor hygiene habits. Spinal cysticercosis is a very rare condition (0.25 – 5.8%) and is most often found in combination with intracranial cysticercosis.<sup>2</sup> Spinal neurocysticercosis can be divided into extradural, intradural, extramedullary, and intramedullary. Intramedullary presentations are often the least common, and only 46 cases have been recorded.<sup>3</sup> Here, we report a 50-year-old male patient with intramedullary

cysticercosis at the T11 vertebral level. Surgical removal and histopathologic examination confirmed the diagnosis of intramedullary neurocysticercosis.

## Case Presentation

A 50-year-old male patient presented with 2 months of history of constant dull aching pain over lower back associated with a burning sensation in the bilateral thighs. He developed insidious onset and progressive weakness in bilateral lower limbs (right > left) for the last 2 weeks and was bed bound. His bowel and bladder functions were normal.

On neurological examination, he had spastic paraparesis with muscle power 2/5 in the right lower limb and 3/5 in the left lower limb. Knee reflexes were exaggerated bilaterally, and the plantar reflex was upward going in the right and mute in the left. The sensation was impaired bilaterally below the L3 level.

A magnetic resonance imaging (MRI) scan of his dorsal spine revealed a relatively well-defined lobulated lesion showing a hypointense T1-weighted image, hyperintense T2-weighted image signal intensity with high signal in fat-saturated sequences and mild cord expansion occupying the central portion of the spinal cord at T11 vertebral level. The lesion showed faint peripheral rim enhancement in the post-contrast study. Screening MRI of the brain did not show any abnormal intensity.

He underwent laminectomy of T11 and partial laminectomy of T10 and T12. Midline myelotomy was done, and the lesion was excised en bloc. Pre-operatively,

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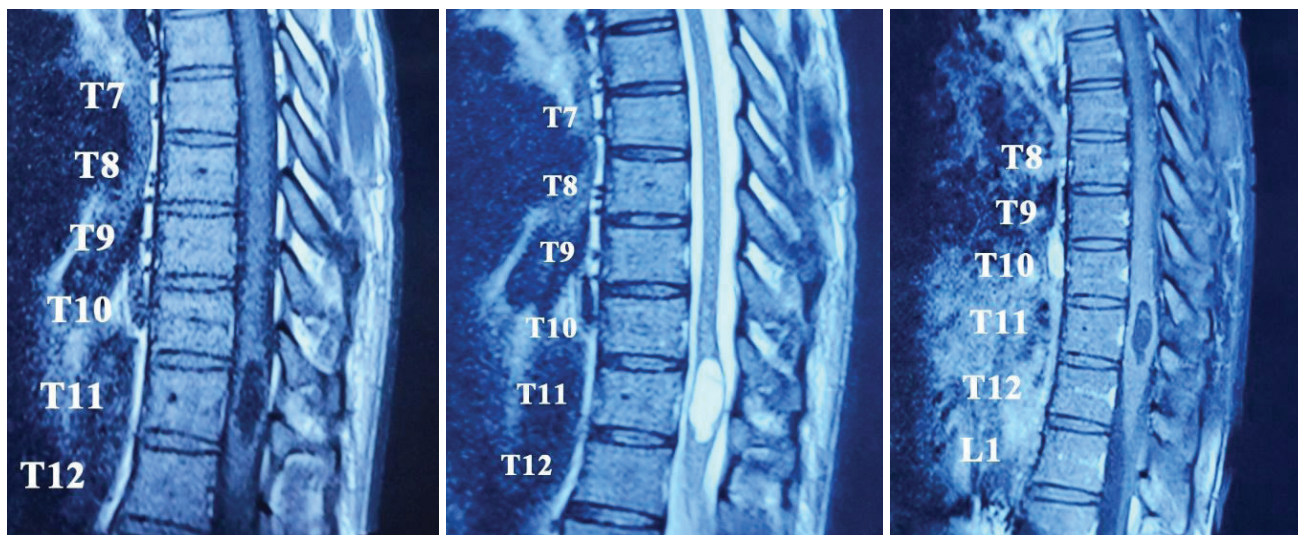


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level of the lesion was localized by marker X-ray and intra-operatively using ultrasonogram. Intraoperatively, A 1\* 1 \* 0.5 cm<sup>3</sup> size, greyish- yellow, smooth, cystic, avascular, intramedullary mass with clear demarcation from cord tissue was noted over dorsal aspect of spinal cord. Histopathologic examination revealed cysticercosis.

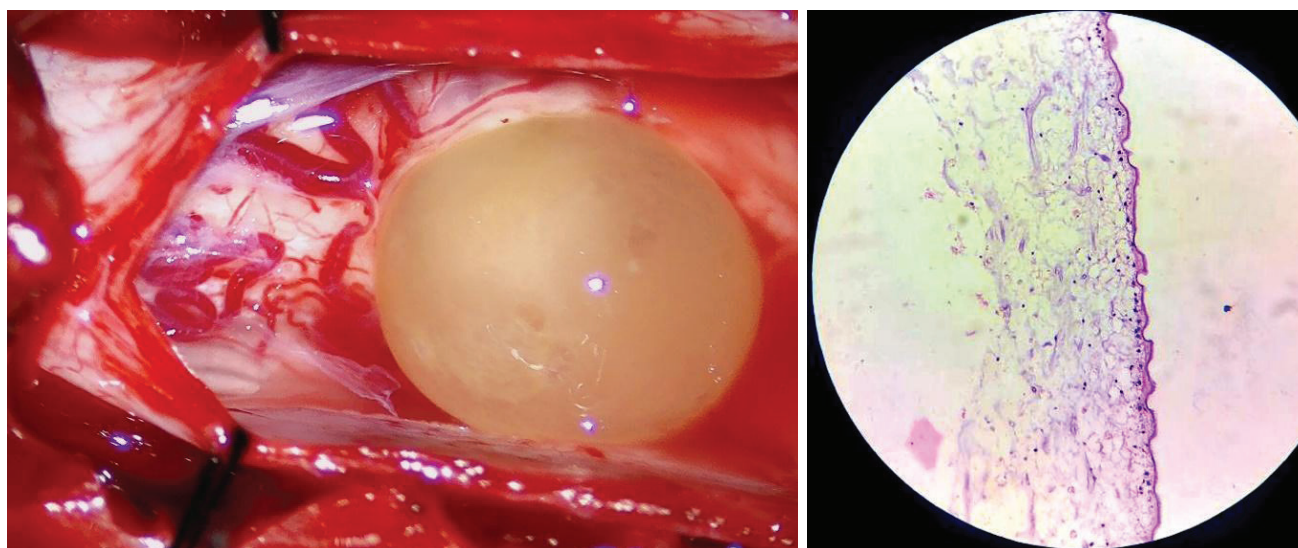
The patient was started with oral Albendazole along with oral Dexamethasone for three weeks. In immediate postoperative period his muscle strength improved to 3/5 in bilateral lower limbs with occasional burning paresthesia. On 3 months follow up his lower limbs muscle strength improved to 4+/5.



*Figure SEQ Figure \\* ARABIC 1 (a) Sagittal T1 weighted magnetic resonance imaging showing hypointense lesion opposite T11 vertebral level.*

*(b) Sagittal T2 weighted magnetic resonance imaging showing hyperintense lesion opposite T11 vertebral level.*

*(c) Post contrast sagittal T1 weighted magnetic resonance imaging showing faint peripheral rim enhancement.*



*Figure SEQ Figure \\* ARABIC 2 (a) Intraoperative picture showing intramedullary cystic lesion.*

*(b) Hematoxylin and eosin stain showing outer cuticular layer, middle nuclear layer, and inner reticular layer of cyst wall.*

## Discussion

Neurocysticercosis is most common in Latin America, Asia, and Africa but is becoming more common in other parts of the world because of global migration. It has been known in humans since the 1500s<sup>4</sup>, and it is rare (0.25 – 5.8%) to find cysticercosis in the spine.<sup>2</sup> This is because the blood flow to the brain is much greater than the flow to the spine.<sup>5</sup> Intramedullary lesions are much more uncommon, with only 46 cases recorded, while isolated intramedullary lesions are reported in only 25 cases.<sup>3,6</sup> Intramedullary cysticercosis is most common in the thoracic spinal cord, likely due to the spread of *Taenia solium* eggs through the bloodstream. Cervical and lumbar spinal cord cases are rarer than thoracic spinal cord cases. This distribution pattern supports the idea that intramedullary cysticercosis is caused by the spread of *Taenia solium* eggs through the bloodstream since the blood supply to the thoracic cord is higher than other parts of the spine.<sup>7</sup>

The typical symptoms of spinal neurocysticercosis are myelopathy and radiculopathy brought on by spinal cord or root compression.<sup>8</sup> Some patients may have sensory impairment of upper or lower limbs along with impairment of bowel and bladder functions. The number and location of lesions determine the clinical signs and symptoms.<sup>9</sup> Our patient presented with paresthesia and spastic paraparesis without any bowel or bladder dysfunction.

Imaging and serological testing are used to make the proper diagnosis. MRI scans of patients with intramedullary cysticercosis usually show a cyst within the spinal cord that appears hypointense on a T1-weighted image and hyperintense on a T2-weighted image.<sup>10</sup> The scolex manifests as a hyperintense mural nodule inside the lesion. After the administration of contrast medium, some cysticercotic lesions show no change in size or appearance, while other lesions may show a ring-like enhancement around the edge.<sup>11</sup> Serologic tests can help to determine if someone has cysticercosis, but the diagnostic value is limited. One test that is often used is the enzyme-linked immunoelectrotransfer blot (EITB). This test is based on the detection of antibodies specific to *Taenia solium* antigens. It has a high specificity (100%) and a sensitivity (94%) for patients with two or more cystic or enhancing lesions.<sup>12</sup> However, it is less sensitive (around 72%) in patients with a single cysticercosis lesion.<sup>12</sup> Other tests, such as serum immunoblot and cerebrospinal fluid enzyme-linked immunosorbent assay (ELISA), are also reliable but less sensitive.<sup>13</sup>

Early diagnosis and treatment of neurocysticercosis can exceptionally improve the outcome in the health of patients. The current consensus guidelines for the treatment of neurocysticercosis recommend surgical resection as the primary treatment for spinal intra- or extramedullary cysticercosis (evidence III).<sup>14</sup> In our case,

the clinical diagnosis of intramedullary cysticercosis prior to treatment was difficult. Based on a pathological study, neurocysticercosis was determined to be the cause. The lesion that causes progressive spinal compression, in our case, is best removed surgically to confirm the diagnosis and address the growing neurological deficit. After surgery, anthelmintic drugs are usually recommended to prevent the cyst from returning. Postoperative treatment with Albendazole (15 mg/kg/day) and Praziquantel (50 mg/kg/day) is usually added for one to four weeks.<sup>15</sup> After treatment with an anthelmintic, the body's response can cause inflammation. This can damage the spinal cord, so steroids must be added to the treatment plan to help protect it.<sup>16</sup> Our patient received both Albendazole and Dexamethasone, which remarkably improved his health.

## Conclusion

Intramedullary cysticercosis is a challenge to diagnose, and neurocysticercosis should also be considered in cases of an intramedullary space-occupying lesion. Surgical excision helps to decompress the cord, confirm the diagnosis and provide a plan for treatment.

## References:

1. Webb CM, White AC. Update on the Diagnosis and Management of Neurocysticercosis. *Current Infectious Disease Reports* 2016 18:12 2016;18:1–8. <https://doi.org/10.1007/S11908-016-0547-4>.
2. Callacondo D, Garcia HH, Gonzales I, Escalante D, Nash TE. High frequency of spinal involvement in patients with basal subarachnoid neurocysticercosis. *Neurology* 2012;78:1394–400. <https://doi.org/10.1212/WNL.0B013E318253D641>.
3. Dhar A, Dua S, Singh H. Isolated Intramedullary Lumbar Spine Neurocysticercosis: A Rare Occurrence and Review of Literature. *The Surgery Journal* 2021;07:e327–36. <https://doi.org/10.1055/S-0041-1739118>.
4. Ignacio Olivé J, Angulo-Rivero P. Cysticercosis of the nervous system. *J Neurosurg* 1962;19:632–4. <https://doi.org/10.3171/JNS.1962.19.8.0632>.
5. Isidro-Llorens A, Dachs F, Vidal J, Sarrias M. Spinal cysticercosis. Case report and review. *Paraplegia* 1993;31:128–30. <https://doi.org/10.1038/SC.1993.23>.
6. Andino D, Tsiang JT, Pecoraro NC, Jani R, Iordanou JC, Zakaria J, et al. Case report and review of literature: Isolated intramedullary spinal neurocysticercosis. *Front Neurol* 2022;0:2551. <https://doi.org/10.3389/FNEUR.2022.1030468>.
7. Dantas FLR, Fagundes-Pereyra WJ, de Souza CT, Vega MG, de Souza AA. Intramedullary

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- cysticercosis: case report. *Arq Neuropsiquiatr* 1999;57:301–5. <https://doi.org/10.1590/S0004-282X1999000200023>.
8. Colli BO, Assirati Júnior JA, Machado HR, dos Santos F, Takayanagui OM. Cysticercosis of the central nervous system. II. Spinal cysticercosis. *Arq Neuropsiquiatr* 1994;52:187–99. <https://doi.org/10.1590/S0004-282X1994000200007>.
  9. Qazi Z, Ojha BK, Chandra A, Singh SK, Srivastava C, Patil TB. Isolated intramedullary spinal cord cysticercosis. *J Neurosci Rural Pract* 2014;5:S66. <https://doi.org/10.4103/0976-3147.145209>.
  10. Parmar H, Shah J, Patwardhan V, Patankar T, Patkar D, Prasad S, et al. MR imaging in intramedullary cysticercosis. *Neuroradiology* 2001;43:961–7. <https://doi.org/10.1007/S002340100615>.
  11. Yang C, Liu T, Wu J, Xie J, Yu T, Jia W, et al. Spinal cysticercosis: a rare cause of myelopathy. *BMC Neurol* 2022;22:1–11. <https://doi.org/10.1186/S12883-022-02589-2/FIGURES/5>.
  12. Wilson M, Bryan RT, Fried JA, Ware DA, Schantz PM, Pilcher JB, et al. Clinical Evaluation of the Cysticercosis Enzyme-Linked Immuno-electrotransfer Blot in Patients with Neurocysticercosis. *J Infect Dis* 1991;164:1007–9. <https://doi.org/10.1093/INFDIS/164.5.1007>.
  13. del Brutto OH, Rajshekhar V, White AC, W. Tsang VC, Nash TE, Takayanagui OM, et al. Proposed diagnostic criteria for neurocysticercosis. *Neurology* 2001;57:177. <https://doi.org/10.1212/WNL.57.2.177>.
  14. García HH, Evans CAW, Nash TE, Takayanagui OM, White AC, Botero D, et al. Current Consensus Guidelines for Treatment of Neurocysticercosis. *Clin Microbiol Rev* 2002;15:747. <https://doi.org/10.1128/CMR.15.4.747-756.2002>.
  15. Izci Y, Moftakhar R, (WMJ) MS-... MJ, 2008 undefined. Spinal intramedullary cysticercosis of the conus medullaris. *WmjonlineOrg* 2008;107.
  16. Nash TE, Garcia HH. Diagnosis and treatment of neurocysticercosis. *Nature Reviews Neurology* 2011 7:10 2011;7:584–94. <https://doi.org/10.1038/nrneurol.2011.135>.