Intramedullary Tuberculous Abscess

A Case Report

Murat Hanci, MD,* Ali Ç. Sarioğlu, MD,* Mustafa Uzan, MD,*
Civan Işlak, MD,† Mehmet Y. Kaynar, MD,* and Büge Öz, MD‡

Study Design. This case report shows an intramedullary thoracic spinal cord abscess secondary to *Mycobacterium tuberculosis* in a 7-year-old boy with chronic progressive paraparesis and hypesthesia below T10.

Objectives. The treatment of this patient involved drainage of pus followed by appropriate chemotherapy.

Summary of Background Data. Abscess and tuberculomas of the spinal cord are rare entities. They are indistinguishable from neoplasms. The possibility of tubercular abscess or granuloma should be kept in mind when an intraspinal mass is found, provided that the clinical history is unusual for tumor.

Methods. A left T7–T8 hemilaminectomy was performed. A quantity of pus was drained through a small myelotomy. A small specimen was taken, and antituberculosis treatment was given after surgery.

Results. Excellent clinical outcome was obtained with a combination of medical and surgical management.

Conclusion. The treatment of intramedullary abscess consists of surgical evacuation of the pus. Appropriate treatment offers a favorable prognosis even in cases with severe deficits. [Key words: abscess, spinal cord, tuberculosis] **Spine 1996;21:766–769**

Abscess and tuberculomas of the spinal cord are rare entities. Clinically, they are indistinguishable from neoplasms, and radiologic findings are unlikely to be conclusive.[6] Magnetic resonance imaging (MRI) would be an ideal method of investigation for these lesions.[24] The first report of intramedullary spinal cord abscess and tuberculoma of the spinal cord was published in 1830.[16,18] The first surgical attempt was performed by Cavazzani[5] in 1899 with a laminectomy and myelotomy. Various organisms have been isolated from spinal cord abscesses, but *Mycobacterium tuberculosis* has been shown in only three cases.[9,26] We report a case of intramedullary spinal cord tuberculous abscess that is documented by MRI.

From the Departments of *Neurosurgery, †Radiology, and ‡Pathology, Cerrahpaşa Medical Faculty, University of İstanbul, İstanbul, Turkey.
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Case Report

A 7-year-old boy presented with middorsal pain radiating to the chest wall of 8-month duration. He had retention of urine, progressive weakness of both legs for 1 week, and a severe suboccipital headache for 2 days. There was no history of trauma.

Clinical examination revealed a child with normal findings for general physical condition, higher mental functions, and apyrexial. Neurologic examination showed weakness of both lower extremities more evident on the left side. Knee and ankle jerks were hyperactive bilaterally. The middle and lower abdominal reflexes were absent. Sensory examination revealed hypesthesia below T10. The Babinski sign was present bilaterally. The patient also had a stiff neck and weakness of the right lateral rectus muscle. These findings suggested that he had meningitis. There was no spinal tenderness.

Laboratory data revealed a leukocyte count of 10,500/mm^3. Hemoglobin was 10.4 g/dl, and erythrocyte sedimentation rate (ESR) was 8 mm/h. Delayed hypersensitivity test for purified tuberculin derivatives was positive. Chest radiograph revealed interstitial infiltrations of the left lower lobe. The plain radiographs of the dorsal spine were normal. Thoracic contrast-enhanced MRI revealed a well-circumscribed, cystic-appearing intramedullary mass at T7 with ring enhancement (Figure 1). T_2-weighted images showed peripheral hypointensity and central hyperintesity. The spinal cord was locally enlarged and edematous. These findings suggested an infection rather than a tumoral lesion (Figure 2). Cranial computed tomography showed an obscure inferior vermian lesion that later turned out to be a probable tuberculoma.

After completing the laboratory investigations, under general anesthesia, a left T7–T8 hemilaminectomy was performed. There was no abnormality in the epidural space, dura was found to be tense, and the cord was swollen. The arachnoid membrane was thick and cloudy. There was a thin rounded projection from the spinal cord, thick creamy pus was aspirated and sent for immediate microscopy and culture. A quantity of pus was drained through a small myelotomy. There was no clear plane of cleavage between the abscess wall and the cord tissue. A small specimen was taken, and the cavity was washed out with saline before the wound was closed. Gram stains for bacteria were negative, but acid alcohol-fast bacilli were found after careful search of sections stained by the Ziehl-Nielsen method, permitting the diagnosis of tuberculosis abscess. Because there was an interstitial infiltration of the left lung, the infection was believed to have spread from there. The cultures were all sterile, including cultures for anaerobic organisms, fungi, and tuberculosis. His-

Figure 1. T_1-weighted gadolinium-diethylenetriaminepentaacetic acid-enhanced sagittal section shows an intramedullary lesion with peripheral enhancement and central areas of isosignal intensity at T7.

topathologic examination showed chronic inflammatory tissue and caseation necrosis. After drainage of the abscess and administration of triple antibiotic therapy with isoniazid, rifampin, streptomycin, and 40 mg/d methylprednisolone, the patient's neurologic symptoms improved, and he was discharged with moderate neurologic deficit. Seven weeks later, he was walking independently, and his sensory deficit, right lateral rectus palsy, and meningismus had completely resolved. At this time, MRI study was suggestive of a tuberculoma in the vermis cerebelli (Figure 3) and confirmed an obviously diminished abscess cavity in the spinal cord (Figure 4). At 11-month follow-up evaluation, he was being treated with isoniazid and rifampin and showed mild spasticity of both lower extremities.

Figure 2. T_2-weighted sagittal image reveals that its periphery is now isointense with central hyperintensity, and adjacent cord is edematous.

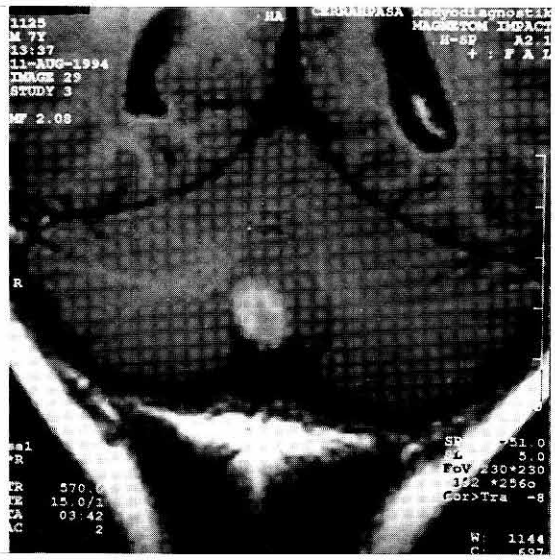

Figure 3. T_1-weighted contrast-enhanced coronal sections of the posterior fossa shows hyperintense nodular lesion in the cerebellum consistent with a tuberculoma.

Chest radiographs and spinal MRI revealed no evidence of active tuberculosis (Figure 5).

■ Discussion

Tuberculosis is a chronic bacterial infection by *Mycobacterium tuberculosis* and usually characterized by the formation of granulomas or infrequently by abscess formation in infected tissue.[2] The possibility of tubercular abscess or granuloma should be considered in countries where neurotuberculosis is prevalent.[24] Central nervous system tuberculosis is a rare entity, affecting 0.5–2% of patients with systemic tuberculosis. The spinal cord is much less commonly involved than the brain at a ratio

Figure 4. Seven weeks after surgery, T_1-weighted gadolinium-diethylenetriaminepentaacetic acid-enhanced sagittal section magnetic resonance imaging defined the decrease of size of the intramedullary lesion.

Figure 5. Eleven months after surgery, T_1-weighted gadolinium-diethylenetriaminepentaacetic acid-enhanced sagittal section magnetic resonance imaging shows completely healed intramedullary abscess and the deformation of the spinal cord T7; no enhancement is seen, indicating that the abnormal process is now inactive.

of approximately 1:42.[7] Intramedullary tuberculomas are extremely rare, seen at a rate of two per 1000 cases of tuberculous of the central nervous system. Approximately 109 cases of spinal cord tuberculoma have been reported in the literature.[6,7,12,14,20,23,26]

Intramedullary spinal cord abscess is also a rare condition. Only 75 cases[1,3,4,8,10,11,17,19,21,24] have been found since the original case documented by Hart.[16] Some of these cases are secondary to spinal disraphism[9,13,15,25] or are a complication of a diagnostic spinal puncture.[22] Several cases with good functional recovery after surgery have been reported. The return of function in these cases contrasts with that of an epidural spinal abscess, in which a good functional recovery is almost unknown once conduction in the spinal cord has become seriously affected.[21] Presumably, the centrally placed abscess is less likely to produce irreversible vascular changes in the spinal cord.[4] The pus spreads by tracking along the gray matter or between white matter fascicles longitudinally rather than destroying fiber pathways.[15] Intramedullary tuberculous infection, such as abscess or granulomas, has been identified by histologic examination,[12] acid-fast bacilli staining in the tissue,[5,18,24] or positive cultures.[6,10,23] Nearly half of the cases have negative cultures. Thirty-seven cases of intramedullary abscess have been reported in past 50 years, 11 of them have sterile cultures, and two of them did not have cultures.[3,21] Magnetic resonance imaging would be an ideal mode of study of these lesions. Computed tomography and myelography simply show an expanded cord, but this is generally unhelpful. However, MRI shows the extent of the disease, can distinguish solid lesions, and may suggest its nature as well.[15,23,24] A gadolinium-diethylenetraiminepentaacetic acid-enhanced MRI would have shown the classic ring sign of an abscess.[10,24] The treatment of intramedullary abscess consists of surgical evacuation of the pus, combined with the use of appropriate antibiotics and steroids to reduce edema.[15,21,24] This concept is adequate for tuberculous abscess. It is not necessary to excise the lesion totally; after drainage of pus, antitubercular drugs can resolve the lesion completely.[24] It would appear that aggressive management offers a favorable prognosis even in those cases with severe deficits.

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Addendum

While this manuscript was in preparation for publication, another case of tuberculous abscess was reported. Tacconi L, Arulampalam T, Johnston FG, Thomas DGT. Intramedullary spinal cord abscess: Case report. Neurosurgery 1995;37: 817–9.

Address reprint requests to

Murat Hanci, MD
Department of Neurosurgery
Cerrahpasa Medical University of Istanbul
P. O. Box 792 8220 Sisli
Istanbul
Turkey