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Case Report

Intramedullary Cervical Tuberculoma: A Case Report With Note on Surgical Management

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This study aims to report a relatively rare entity—intramedullary tuberculum of cervical spine—and describe its management and some key learning points. Intramedullary tuberculomas are rare entities. Intramedullary tuberculoma is most commonly found in the thoracic cord of a patient and is rarely seen in the cervical cord. We present an intramedullary cervical tuberculoma in a 21-year-old patient with finding of spinal cord compression. All 4 limbs were spastic, with grade 1 power on the right side and grade 3 power on the left side. Sensory deficit was found below the C6 level. Magnetic resonance imaging showed an intramedullary lesion at the C5 to C6 levels. Intramedullary tuberculoma was diagnosed based on clinical symptoms, physical examination, previous history, and magnetic resonance imaging. A C5 to C7 laminectomy was performed. Intramedullary tuberculoma was resected by microsurgery. One year after the surgery, strength returned to normal grade 5. Excellent clinical outcome was obtained with a combination of both medical and surgical treatments. Intramedullary cervical tuberculoma should be removed without delay to eliminate any mass effect on the neurons as soon as possible.

Key words: Tuberculoma – Cervical spine – Surgical treatment – Antituberculosis treatment

Neurotuberculosis is a rare disease, representing less than 2% of extrapulmonary tuberculosis infections.[1–3] The incidence of intramedullary tuberculoma (IMT) is extremely low and is seen in 2 of 1000 cases of central nervous system tuberculosis.[4,5] In most cases, IMT is found in the thoracic cord; the chance of tuberculoma growing in the cervical and lumbar regions of the cord is lower. Here we report a case of intramedullary cervical tuberculoma that was surgically managed along with antitubercular treatment.

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The study protocol was approved by the hospital and the local institutional ethics review board. A 21-

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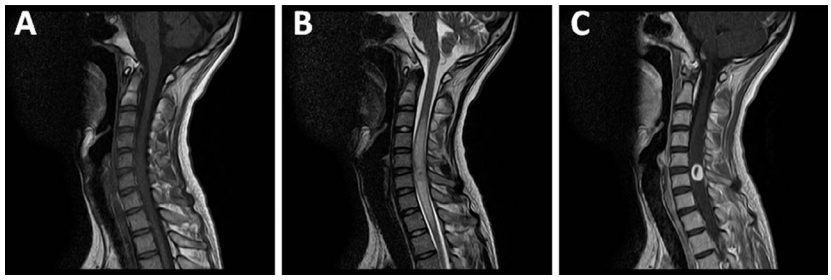

Fig. 1 (A) Sagittal MRI: T1W1 showed swollen cervical spinal cord, low signal in the lesions opposite C5 to C6. (B) Sagittal MRI: T2W1 showed typical spinal lesion at C5 to C6, a central area of hyperintensity surrounded by an area of hypointensity producing the target sign. (C) Enhanced sagittal MRI: T1W1 showed an obvious ringlike enhancement in the spinal lesion.

year-old man presented with a history of progressive numbness in the right upper limb that began 2 months ago, and weakness in both lower limbs during the last 20 days. The symptoms had progressed during last few days, and at the time of presentation he had weakness and numbness in all 4 limbs before surgery. The weakness was more in the right limb compared with the left.

Clinical examinations showed that the temperature of the patient was 37.5°C, his vitals were normal, and there was no general or systemic abnormality. He had no spinal deformity, tenderness, or spasms. All 4 limbs were spastic, with grade 1 power in his right side and grade 3 power in his left side; knee and ankle reflexes were brisk; and plantar responses were extensor on both sides. Sensory deficit was found below the C6 level.

The patient had a history of pulmonary tuberculosis 6 months prior, for which he had received antitubercular treatment for a period of 6 months. All laboratory tests, including complete blood count, erythrocyte sedimentation rate, and examination of cerebrospinal fluid, were also done, and parameters for cerebrospinal fluid were found to be in the normal range. The result of tuberculin skin test was positive. There was no abnormality in cervical spine X-ray examinations. Magnetic resonance imaging (MRI) showed an intramedullary lesion at the C5 to C6 levels (Fig. 1).

Based on the symptoms, physical examinations, and MRI findings, the patient was scheduled for surgery. During the operation, C5, C6, and C7 pedicle screws, laminectomy, and decompression were performed, and the tuberculoma was microsurgically resected from the posterior midline and longitudinally resected after the cottonoid patties was divided (Fig. 2). Histopathologic examination revealed a granulomatous lesion containing Langhans-type giant cells and lymphocytes (Fig. 4). Cervical plain X-ray anteroposterior and lateral views show C5, C6, and C7 pedicle screw instrumentation (Fig. 3). Antituberculosis treatment was continued for 9 months after the surgery.

At discharge, patient recovered his strength to grade 4 power in his right side and grade 5 power on his left side. He walked home with Philadelphia cervical collar support. His strength returned to normal and he could resume playing basketball 1 year after the surgery.

Discussion

China has about 1.4 million new cases of tuberculosis every year.[6,7] IMT occurs rarely and usually presents with progressive compressive myelopathy.[8,9] If patients can be diagnosed in the early stage and treated properly, they are expected to have excellent neural recovery.[10] Gadolinium-enhanced MRI is considered to be the diagnostic tool of choice in patients with ongoing inflammation. In T1W1, swollen cervical spinal cord was seen, and there was very low signal in the lesions; in T2W1 there was a central area of hyperintensity surrounded by an area of hypointensity producing the target sign; the enhanced MRI showed an obvious ringlike enhance-

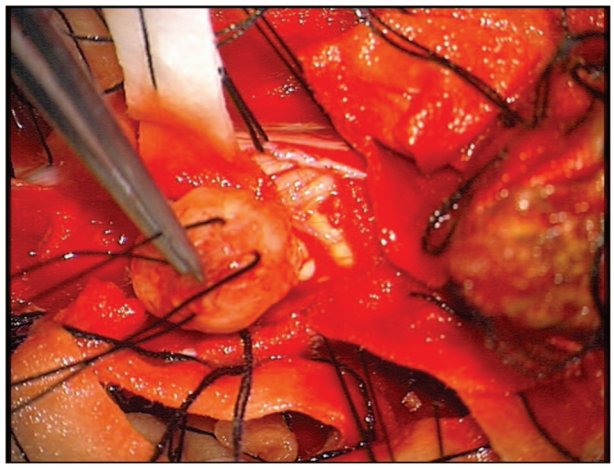

Fig. 2 Intraoperative picture of excision of the tuberculoma.

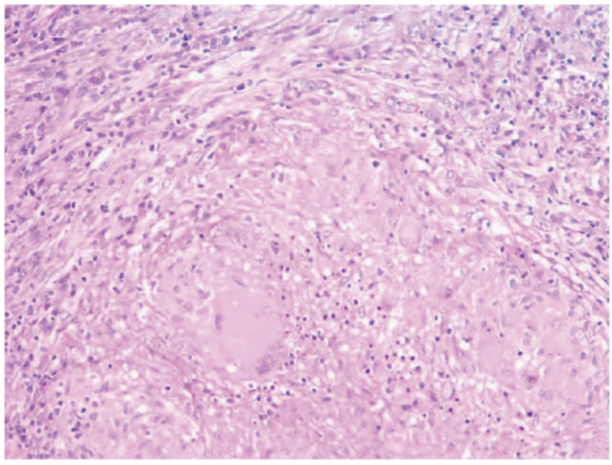

Fig. 3 Pathologic finding demonstrating classical tubercular lesion.

ment in the spinal lesion. It is better to state the correlation of pathologic evolution of the granuloma and the corresponding changes in the T1, T2, and T1Gd appearance. The MRI findings of IMT are well documented.[11] The IMT was clearly shown with enhanced MRI in the patient in our study, which helped to reach a prompt diagnosis.[12]

Although there are reports that suggest that IMTs can recover completely with antituberculosis chemotherapy alone,[13] in this patient we went ahead with microsurgical resection and long-term antitubercular therapy in view of the progressive neurologic deficit.

Surgery is generally indicated[14,15] when (1) there is no response to chemotherapy, (2) the diagnosis is in doubt, and (3) there are large lesions with rapid deterioration in neurologic function.[16] Our patient presented with paraplegia with classical imaging features of IMT and with documented pulmonary and extrapulmonary tuberculosis. The patient had received antitubercular treatment for a period of 6 months because of the history of pulmonary tuberculosis 6 months prior to this presentation. It is generally recommended that patients receive the antituberculosis medicine treatment at least 3 weeks before the surgery to prevent the bacteria from spreading all over the body; there is a need to achieve the optimal blood drug level in the body, although it is difficult for the antituberculosis medicine to reach the inner area of the tuberculoma because of the thick package of the tuberculoma. The neurologic symptoms progressed even after an aggressive antituberculosis chemotherapy before the surgery, and they improved after the surgery. We think that the decision to undertake surgery should be based on the neurologic status of the patient, and not just on the imaging features, even though the imaging features of IMT are quite characteristic. Patients who present with profound neurologic deficits should undergo early surgical decompression. This type of intramedullary lesion should be removed without delay to eliminate any mass effect on the neurons. An extended course of antituberculosis treatment should be instituted at the earliest possible time after the lesion is removed.[17] We

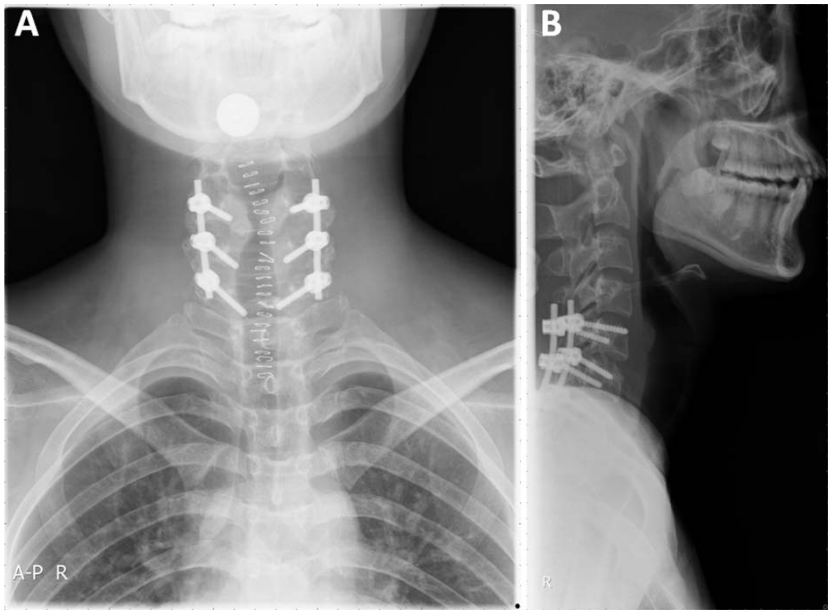

Fig. 4 Cervical plain X-ray anteroposterior and lateral views showing C5, C6, and C7 pedicle screw instrumentation.

believe that early surgery for removal of IMTs is necessary; despite chemotherapy, the intramedullary location and expansion of the cord with demyelinating destruction of tracts could worsen the clinical status and lead to irreversible cord damage.

In summary, cervical spinal IMT is a very rare disease. The optimal treatment for cervical IMTs is a combination of microsurgical resection and ATT. Surgery in spinal IMTs should be considered for: (1) large lesions with rapid deterioration of the neurologic status, and (2) paradoxical increase in the size of the lesion despite the patient being on ATT.

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