Case Report

Spinal Intramedullary Tuberculosis (SIMT) in 13 Years Old Girl

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ABSTRACT

Background: Central Nerve System (CNS) involvement in tuberculosis occurred in 10% of cases, but only 2 % developed into spinal intramedullary tuberculosis (SIMT). It is rarely found in children and often misdiagnosed as paravertebral mass.

Aims: To describe the manifestation of spinal intramedullary TB in children and to encourage awareness in diagnosing SIMT with non-invasive procedure

Case Description: A 13-year-old girl with progressive inferior paralysis, suspected as ependymoma from Magnetic Resonance Imaging (MRI). After laminectomy and biopsy procedure, chronic granulomatous tissue with positive result of acid-fast bacilli (AFB) was obtained in histopathology result. Patient got antituberculosis treatment (ATT) and rehabilitation. Gradually significant result showed after 2 months of treatment.
Conclusion. SMIT is rare in children. Early diagnose and intervention showed a good response. Though it is difficult to differ with paravertebral mass, rapid biomarker or tuberculin test could be used to diagnose SIMT before further invasive procedure.

Keywords: Diagnostic, tuberculosis, spinal tuberculosis, SIMT

INTRODUCTION

Tuberculosis (TB) still become the big burden of child health in Indonesia. Until 2019, there are 543.874 TB cases in Indonesia and 11% occurs in children 0-14 years old.1 Involvement of Central Nerve System (CNS) in tuberculosis occurred in 10% of TB cases, in which meningitis TB is the common manifestation, by contrast Spinal Intramedullary Tuberculosis (SIMT) occurs only 2% among all cases of CNS TB and common in young adult patient.[1-5]

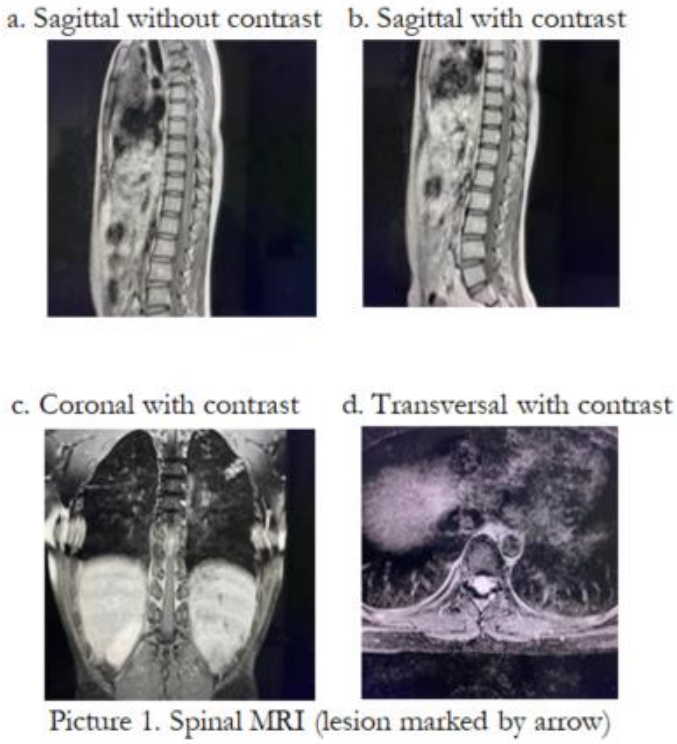
This case reports a rare case of 13 years old girl with a progressive paralysis of inferior limbs who is diagnosed as intramedullary thoracic mass in the beginning and had been diagnosed as Intramedullary TB after histopathology result.

CASE REPORT

A 13-year-old girl had a progressive weakness on both legs for 4 months before the hospital visit. There is no history of fever, cough, rhinitis, hard of breathing, night sweats, weight loss, or appetite loss. She had been stayed in a boarding school for 2.5 years, had a complete immunization, and no history of TB in the family.

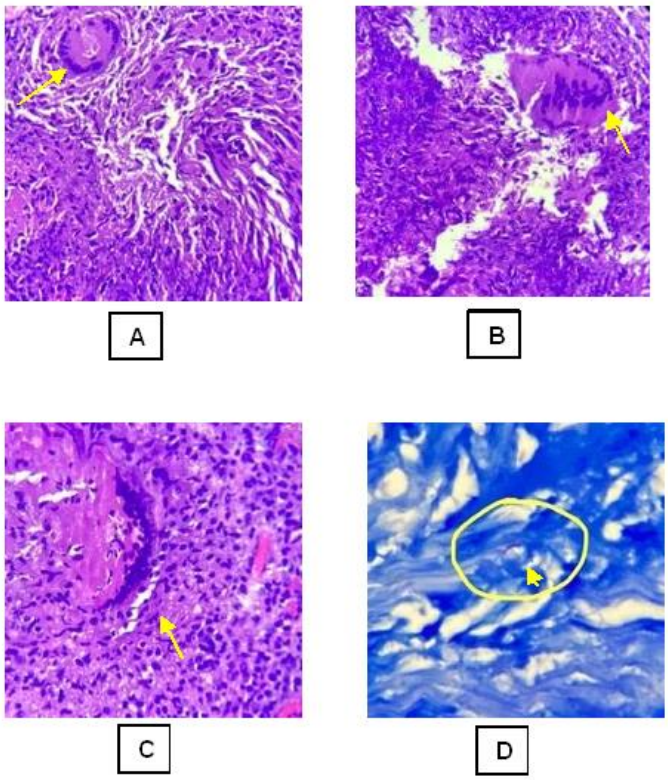
Physical examination showed paresis of both legs with level of motoric value respectively 1111/1111 and paraesthesia as high as T10 level (Frankel Score A). No vertebral deformity and autonomic nerve dysfunction. No abnormality in the blood result. MRI revealed kyphosis curve, no listhesis, intact corpus vertebrae, no compression fracture, but an hypointense lesion was found in T1-T2FSE and T2FS intradural intramedullary as high as T8-9, rounded, demarcated with irregular edge, intensity inhomogeneity with contrast, sized 1.7 x 1.3 x 1.4 cm (Picture 1).

A laminectomy biopsy was performed for diagnostic procedure. Small fragment stroma pollinated by lymphocyte with epithelioid cells, datia langhans cells and necrotizing foci found in histopathological test and acid-fast bacilli test showed a positive result (Picture 2).



Picture 1. Spinal MRI (lesion marked by arrow)

According to histopathology result, she was diagnosed as Spinal Intramedullary TB and got 1st line intensive phase of anti-tuberculosis treatment (Rifampicin, Isoniazid, Pyrazinamide, Ethambutol). After 2 months of treatment and rehabilitation, she could walk though needed a company, nevertheless the motoric value increased to 4444/4444 (Frankel Score D).



Picture 2. Chronic granulomatous tissue with Datia Langhans cells (A, B, C) and positive Acid-Fast Bacilli (AFB) Test (D)

DISCUSSION

TB infection of central nerve system (CNS) is divided into 4 categories: Potts's disease (spondylitis TB), non-osseus spinal tuberculoma (extra-dural, intra-dural extramedullary, intra-medullary), tuberculous arachnoiditis, and meningitis TB.[3]

Spreading mechanism of spinal tuberculosis is similar with spondylitis, through blood flow (hematogenous) of epiphyseal arteries or batson venous plexus from paravertebral vein branches. It associated with the riches of vascularization in young patient compared to the elder. [6,7] It is common in thoracic spinal cord region (55%), because of its high mobilization to endure a pressure, and patient with immunodeficiency.[6-9]

SIMT could be performed with or without systemic symptoms of TB or primary lung TB infection. Therefore, SMIT is difficult to diagnose early and often misdiagnosed as paravertebral mass. Ming Lu reported differential diagnose including astrocytic glioma, ependymoma and hemangioblastoma. It could be differed from MRI, in early phase showed severe edema around lesion without capsule but as developing caseation.

process, a specific "target sign" showed in radiological finding.4,10 Previous study of SIMT in adult patient, SIMT didn't consider early because no primary TB, vertebral deformity, or typical MRI finding, that commonly found in spinal TB. Though antitubercular didn't administer early but after acid fast bacilli test or surgery procedure, it still showed a good response [3,6-9] It was similar with this case, the patient also diagnosed as intramedullary thoracic mass and suspected as ependymoma in the beginning. Laminectomy was performed to reduce vertebral cord pressure and biopsy. After the histopathology finding showed a positive result of tuberculosis infection, antituberculosis drugs administered to the patient along with rehabilitation, that was performed 1 months after surgery. [3,6-9]

The gold standard method in diagnosing extrapulmonary TB is positive TB culture from the tissue, however a rapid biomarker or Mantoux test could be conducted to diagnose spinal TB before collecting tissue sample from an invasive procedure, especially in children. Hiroaki Torii et al reported SIMT case in adult, primary diagnosed as SIMT from tuberculin test and MRI.9 Despite the patient finally got a surgery procedure to reduce spinal cord pressure, diagnostic of SIMT enforced since beginning and that was quite certain moreover histopathological finding revealed positive TB infection. ChangHua Chen et al also described patients with spinal tuberculosis showed a positive result of Interferon-γ release assays (IGRA) and TB smear/culture of tissue. Granulation inflammation and caseous necrosis also found in histopathological finding.11 This result suggests that chronic granulation with caseous necrosis from histopathological finding in patient with progressive clinical manifestation of spinal mass could be considered as TB, since it significantly represents mycobacteria infection even though in some cases culture or acid-fast bacilli test showed a negative result.4,6

Surgical intervention should be performed where were an involvement of bone deformity, abscess, enlargement of the lesion or the worsen symptoms after antitubercular treatment.3,6-9 In this case, despite the patient started antitubercular treatment after 8 days of surgery, however motoric skill gradually improve after 2 months of treatment and laminectomy, hence the continuous phase of antitubercular treatment continue for 1 year along with rehabilitation. Because rehabilitative treatment in Spinal TB infection, evidently increases a significant clinical improvement during treatment with/without surgery. [6,12]

CONCLUSION

SIMT is a rare manifestation of extrapulmonary TB in children, however, early diagnosis and intervention would give a good prognosis. Even though it is difficult to differ SIMT with paravertebral mass from radiological finding, but this case brings to mind an awareness to diagnose spinal TB with a non-invasive procedure first when encounter children with similar symptoms of progressive weakness of extremities with vertebral mass from radiological finding with/without bone deformity, moreover, who lived in endemic area.

DECLARATION OF PATIENT CONSENT

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in

the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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