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Management of unusual cervicothoracic junction tuberculous spondylitis in developing country: case report and literature review



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ABSTRACT

Background: Cervicothoracic junction Tuberculous Spondylitis or Pott's Disease especially in children are extremely rare. In this case report, we report a further case to this rare entity.

Case: A twelve-year-old boy with a history of kyphosis deformity and long tract signs was presented in paraparesis condition. Spine MRI shows severe cervicothoracic junction canal compromise due to severe bone destruction. One-stage laminectomy decompression and stabilization fusion via posterior approach was performed. In the

follow-up period, the patient showed remarkable improvement of all neurological deficits.

Conclusion: Two-stage surgery via anterior and posterior approach are recommended; otherwise, it would be uncertain stability. However, in this report we would like to emphasize that not all unstable diagnosis of Pott's disease leads to circumferential stabilization. Longer level of instrumented spine segment and multilevel of osteotomies may account for adequate kyphotic correction and decompression for this disease.

Keywords: kyphosis deformity, one stage laminectomy, multilevel osteotomies.

Cite This Article: Mahadewa, T. 2016. Management of unusual cervicothoracic junction tuberculous spondylitis in developing country: case report and literature review. *Bali Medical Journal* 5(3): 547-549. DOI:10.15562/bmj.v5i3.345

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INTRODUCTION

The severity of kyphosis deformity of Pott's disease, which includes body destruction, cord compression and Konstam angle can be diagnosed preoperatively with Magnetic Resonance Imaging (MRI).¹⁻⁴ Anterior debridement and or circumferential fusion are the basic methods of treatment.^{3,5} However, there are reports of successful surgical decompression and stabilization via one stage posterior approach.⁶⁻⁸ We reported a case of cervicothoracic junction Pott's in a child who is successfully treated by one stage posterior approach only.

CASE REPORT

A twelve-year-old boy with one-week history of pain on his back, lower limb clonus, gait disturbance and presented in paralysis condition. MRI revealed multilevel bone destruction, spinal canal narrowing and kyphosis deformity (Figure 1A).

There was a Konstam angle above 90 degrees (93°) and severe canal obstruction at cervicothoracic junction until T10 (Figure 1B).

Further neurological examination revealed paralysis of both legs, paresthesia below sternum, urine retention and difficult to pass the stools. Deep reflexes were increased bilaterally. There were no lung Tuberculosis (TB) or significant family history suggesting the diagnosis. A diagnosis of cervicothoracic junction TB Spondylitis was made and

posterior surgical decompression was performed fourteen days following oral anti-TB adjuvant.

Cervicothoracolumbar midline skin incision was performed from C3 until L5. Meticulous homeostasis was done after placing automatic retractor, we observed huge epidural caseosa pus and massive debris and necrotic tissue along the spine. The necrotic tissue was pale and poorly vascularized. As

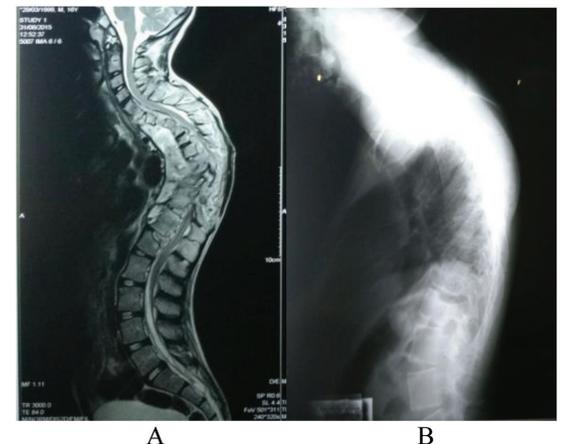


Figure 1 A: Sagittal MRI T2WI of the whole spine revealed a significant kyphotic deformity, bony destruction and gibbous formation. B: Lateral plain x-ray of Thoracolumbar shows a significant kyphosis deformity with Konstam angle more than 90 degrees.

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we went deeper, the border between necrotic tissue and normal spine bone tissue was not clearly distinguished. Further surgical debridement and decompression revealed that the lesion involved anterior part of the spine as well; there was no infiltration of the dura mater and the pleura. Cervical screw placement at C5 and C6 using Sky lateral mass titanium screw® diameter 3.5 mm, GS Medical thoracic pedicle titanium screw® diameter 4.5 mm were placed at T3, 6, 11 and 12. Lumbar screws diameter 5.5 were

placed at L2 and L3. Smith-Peterson Osteotomies (SPO) was done to release the facet joint from T3 until L1. Kyphosis correction was done by placing the cervical rod connected to thoracolumbar rod using Sky rod connector at C7-T1 level. Complete posterior decompression and correction were achieved in this case.

The patient had a good recovery. Motor paralysis improved remarkably and gait disturbances were reduced. On discharge, the patient was able to walk although a fair unstable and had minor difficulty to urinate and defecate. Over the following six-month period, there was complete resolution of all neurological deficits except for very mild gait disturbance. Control plain X-ray after surgery revealed significant Konstam angle reduced (from 93° to 65°) and the sagittal balance was achieved well (Figures 2a-b).

Pathology report revealed a multinucleated giant cell; formed of multiple macrophages that have fused together (Datia Langhans) and multinucleated giant cell surrounding the lesion (necrotic caseosa) (Figure 3). On the basis of this pathological report, the patient was diagnosed as tuberculous spondylitis. We did not do immunohistochemistry study in this case because of the unique and specific pathology lesion.

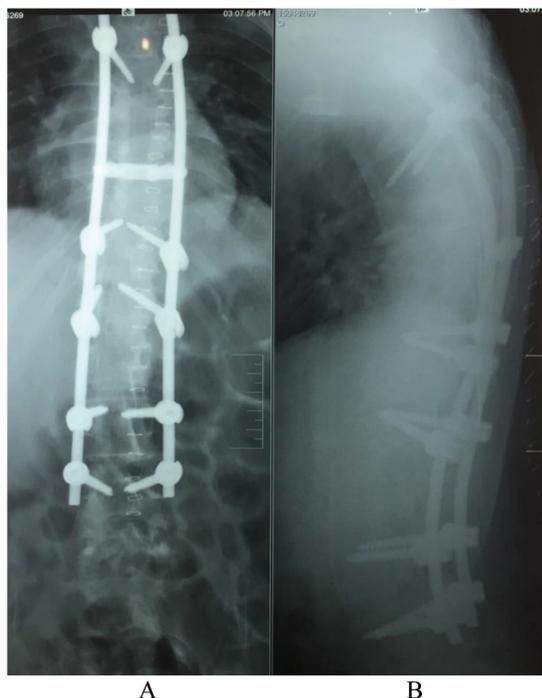


Figure 2 Plain X-ray of the spine shows post laminectomy area (Th6-10) and fixation screws from cervical area until L4 (Fig 2a). Significant improvement of Konstam angle after fixation of the sagittal balance was achieved well.

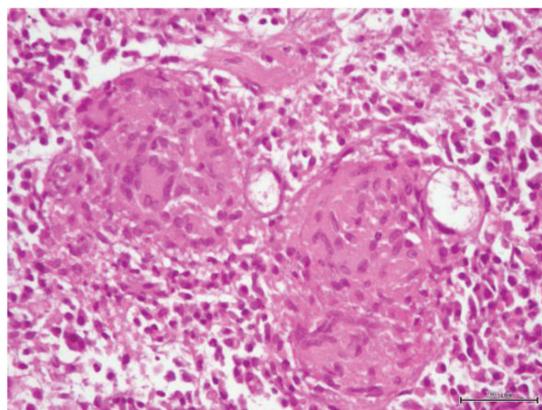


Figure 3 Microscopic image (H&E) revealed multinucleated giant cell; formation of multiple macrophages that have fused together (arrow)

DISCUSSION

TB recently considered as one of the most lethal disease in the world, the World Health Organization (WHO) reported more than 8 million new cases per year. About 20-30% world population are infected by *mycobacterium tuberculosis*. Indonesia as the third biggest contributor after India and China.⁶

Tuberculosis lesion in the spine was originating from discitis, evolving and destructing the bone due to osteolysis, gravitational force, thoracolumbar muscle shearing, secondary ischemia then compression wedge fracture formation. Kyphosis deformity occurs most likely at thoracic level and lumbar area less likely to be happened in cervical area. About 5% cases have multiple lesions and for children most likely affected upper thoracic level.⁷

In 1779, Percival Pott was the first to describe TB in vertebral column. Destruction of discs and adjacent bodies directing to progressive kyphosis well known as Pott's disease.⁴ Patients with Pott's disease usually present with a long tract signs related to cord compression due to mass effect of the necrotic tissue that occupying the spinal canal, such as clonus, spasticity and or bladder-fecal incontinence. Acute-onset of cord compression symptoms, characterized by a rapid onset of paraparesis/plegic and sudden cauda syndrome is rarely reported.¹⁻⁴ Our patient showed this acute-onset symptom.

Microscopic pathology of tuberculosis is unique and well described, therefore we did not perform immunohistochemistry study in this case. The histopathological findings consist of macrophages (Datie Langhans cells), accumulated epithelioid cells and multinucleated giant cell surrounding the lesion (necrotic caseosa) (Fig 3).

In children, the source of infection is mostly from primary infection in the lung and spread to the spine via Batson paravertebral venous plexus. Our patient was a child and had no history of Lung TB nor TB contact history.⁸⁻¹⁰

On MRI, there are abnormal well circumscribed paraspinous signal, presence of paraspinous and intraosseous abscess, thin and delicate abscess wall, sub ligament extension more than 2 vertebrae, involvement of thoracic vertebrae and multiple noncontiguous lesion. Anterior vertebrae destruction lead to kyphosis angulation in severe angulation called gibbous, which is a characteristic appearance of Pott's disease.⁸

Cervicothoracic patients with TB are more likely to experience neurologic deficits such as tetraparesis or tetraplegia so the choice of surgery with or without instrumentation more elected than treated only with anti-TB drugs. Especially the thoracic region that the area is known as the watershed area highly vulnerable to neurological disorders especially when kyphosis correction should be made.⁹

In cases of severe kyphosis, correction is generally carried out through the anterior and or posterior approach. The anterior approach has a higher risk of bleeding because of many organs and large blood vessels inside the rib cage but can be easy to clean the abscess up or infected vertebral bodies. Posterior approach may have a smaller risk of bleeding, but access to the anterior become lesser, so some surgeons perform a combination of anterior and posterior approach or vice versa.^{8,9,10}

Cervicothoracic area specifically for TB is still very less report so that the handling of reported cases there has been no specific consensus. In this case report, the authors reported posterior approach to correct angulation of severe kyphosis or Pott's disease. Author performed multilevel osteotomy of the cervical to the lumbar by Smith Peterson Osteotomy technique (SPO). At the thoracic region other than spinal nerves are fragile, easily disrupted

supply areas, the narrow nerve space so kyphosis correction becomes dangerous and difficult to handle.¹⁰ Wang et al 2009, also reported good result for Pott's disease correction using posterior approach only with Konstam's angle above 90.

CONCLUSION

Multilevel osteotomy of the cervical to the lumbar by SPO technique and longer fixation by posterior approach only, provide an acceptable kyphosis correction. The selection of approach for correction of Pott's disease and combined with adequate medical management has improved outcome of the patient, despite the presence of severe kyphosis and neurological deficits. Young patient, radical surgery and effective chemotherapy have been proposed as good prognostic factors.

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