Tuberculous spondylitis in Haji Adam Malik hospital, Medan

R Dharmajaya

1Head department of neurosurgery, faculty of medicine, Universitas Sumatera Utara, Haji Adam Malik General Hospital, Medan, Indonesia
2Corresponding author: marsalsurgeon@gmail.com; neurochirurgie2017@gmail.com

Abstract. Ankylosing tuberculosis is an infection caused by Mycobacterium tuberculosis in one or more components of the vertebrae; it is Pott disease or tuberculous spondylitis. It might become a potential cause of morbidity, including neurological deficits and permanent deformity of the spine. Management of TB Spondylitis, in general, is chemotherapy with anti-tuberculosis drugs (ATG), immobilization, and spine surgical interventions. A retrospective study was conducted to analyze the patients of TB Spondylitis who had undergone surgery at Haji Adam Malik hospital from June 2015 to June 2017. The most common location is thoracal (10%), lumbal (3%), and thoracolumbal junction (3%). Decompression laminectomy with fusion (18%) is the most suitable option for surgical management. The majority, pre-operation ASIA scale is D (8%), and post operation is E (8%). It means that surgical plays an important role in the management of tuberculous spondylitis.

1. Introduction
Indonesia takes the third position after India and China as a country with the most population of tuberculosis (TB).[1] At least up to 20 percent of patients with pulmonary TB will experience extrapulmonary MDR TB.[2] Extrapulmonary TB may include the brain, gastrointestinal, kidney, genital, skin, lymph, osteoarticular, and endometrial. Eleven percent of extrapulmonary TB is osteoarticular TB, and approximately half of osteoarticular tuberculosis patients develop spinal TB infection.[3]

Ankylosing tuberculosis is an infection caused by Mycobacterium tuberculosis in one or more components of the vertebrae (i.e., vertebrae, intervertebral disc, paraspinal soft tissue and epidural space). The disease was first published by Sir Percival Pott in England in 1779, so later this disease is also known as Pott disease.[4]

Tuberculous spondylitis is a potential cause of serious morbidity, including neurological deficits and permanent deformity of the spine. Therefore early diagnosis is very important. Early diagnosis of Ankylosing TB is difficult to enforce and often misinterpreted as spinal neoplasms or other pyogenic spondylitis.[5] Usually the diagnosis of TB spondylitis established after later or advanced stage, when it occurs, severe spinal deformity and significant neurological deficits such as paraplegia will develop.[6,7]

Management of TB Spondylitis, in general, is chemotherapy with anti-tuberculosis drugs (ATG), immobilization, and spine surgical interventions. Various studies have been conducted to evaluate the effectiveness of the TB spondylitis treatment approach with mixed results and recommendations.
2. Methods
A retrospective study was conducted to analyze the patients of TB Spondylitis who had performed surgery at Haji Adam Malik hospital from June 2015 to June 2017. Diagnosis in these patients was made by implementing: history taking, physical examination, Mantoux test/tuberculin test, chest X-ray, vertebrae X-ray, and spinal MRI.

The degree of severity, clinical improvement, and predict the prognosis of patients with TB spondylitis with spinal cord injury, an American Spinal Injury Association (ASIA) impairment scale classification was used. This system is an update of the Frankel classification system and has been widely accepted. ASIA impairment scale divided the spinal cord injury into five types (A, complete spinal cord injury, B - D, incomplete spinal cord injury, E, normal). All patients before and after surgery were with antituberculosis drugs, the target of therapy for 12 to 18 months. Definitive diagnosis TB spondylitis is established based on anatomical pathology results.

3. Results
There were 20 cases of TB Spondylitis in this period, with four female patients and 16 male patients (ratio: 1: 4). The average age of the patient was 34.85 years (youngest was seven years, and the oldest was 65 years) with standard deviation (SD) ± 18.37. The main complaints felt by the patient were: weak limbs and back pain.

Table 1. Age distribution of TB Spondylitis patients from 2015 – 2017.

| Patient Age (years) | Number of Patients |
|---------------------|-------------------|
| 0 – 10              | 1                 |
| 11 – 20             | 5                 |
| 21 – 30             | 2                 |
| 31 – 40             | 1                 |
| 41 – 50             | 4                 |
| 51 – 60             | 5                 |
| >60                 | 2                 |
| **Total**           | **20**            |

Gibbus was in 15 patients (75%). Before surgery, all patients had neurologic deficits of paraparse with a motor strength of 0 to 4. The location of the infection in the spine: 2 cases in the Cervical region, 10 cases of the Thoracal region, 3 cases of Thoracolumbal region, 1 case of Lumbosacral, and 1 case with multiple lesions of cervical, thoracic and lumbar.

Table 2. Location distribution of TB spondylitis patients from 2015 – 2017.

| Location                      | Number of Patients |
|-------------------------------|-------------------|
| Cervical                      | 2                 |
| Thoracal                      | 10                |
| Lumbal                        | 3                 |
| Thoracolumbal junction        | 3                 |
| Lumbosacral junction          | 1                 |
| Multiple                       | 1                 |
| **Total**                     | **20**            |

Table 3. Type of surgery for TB spondylitis patients management.

| Type of Surgery                           | Number of Patients |
|-------------------------------------------|--------------------|
| Decompression laminectomy and fusion      | 18                 |
| Anterior corpectomy and fusion            | 1                  |
| Transoralodontoidectomy and posterior occipitocervical fusion | 1 |
Table 4. ASIA impairment scale (degree of severity).

| Frankel | Pre-operation | Post operation |
|---------|---------------|----------------|
| A       | 5%            | 0%             |
| B       | 1%            | 5%             |
| C       | 6%            | 1%             |
| D       | 8%            | 6%             |
| E       | 0%            | 8%             |

4. Discussion
TB spondylitis is a chronic and slowly developing disease with long-lasting symptoms. History of disease and clinical symptoms of the patient is important, but not always reliable for early diagnosis. Pain is the most often the main symptom. Systemic symptoms appear with the development of the disease. Persistent and local back pain, spinal cord restraints, fever and neurologic complications can occur as the destruction continues. Other symptoms that describe chronic illness are including malaise, weight loss, and fatigue. Diagnosis is usually not suspected in patients without evidence of extraspinal tuberculosis. In these patients, there was a history of back pain and weakness in chronic lower limbs that were not treated promptly. Patients come to the hospital after experiencing weakness in their limbs (hands or feet).

Tuberculous spondylitis is very potential to cause serious morbidity, including permanent neurological deficit and spinal deformity. Therefore, early diagnosis and early comprehensive treatment are very important. Unfortunately, intensive diagnosis and treatment usually are established at an advanced stage, when after the development of severe spinal deformity and significant neurological deficits such as paraplegia occur. Clinical manifestations of TB spondylitis are slow, patients usually complain of unspecified pain in the infected area of the spine, until the diagnosis is as TB spondylitis. Neurologic deficits in tuberculosis spondylitis result from the formation of cold abscesses, granulation tissue, necrotic tissue and sequestra of bone or intervertebral disc tissue, and occasionally vascular thrombosis of the spinal artery.

In patients with TB Spondylitis, there is a complaint of spine deformity (Kyphosis) occurring in 80% of cases accompanied by the occurrence of gibbus, i.e., the bending and angular back is an unstable lesion and can progressively progress.[8] In this case series, gibbuswas in 15 patients (75%).

TB spondylitis is most common in the thoracic area (71%). [9,10] In this case series, we found 10 cases of the Thoracic region, 3 cases of Thoracolumbal region (65%). The diagnosis of TB spondylitis can be established using a full clinical examination including a history of contact with TB patients, epidemiology, clinical symptoms and neurological examination. Imaging methods such as X rays, ultrasonography, CT scans, and MRI will greatly assist in the diagnosis of TB spondylitis. Laboratory examination with Mycobacterium tuberculosis bacillus and histopathological picture of tuberculosis with the discovery of histopathologic features of tissue tuberculosis infection is the finding of epithelioid cell accumulation (epithelioid granuloma), Datai langhans cells and necrosis kaseosa.[9-12]

Diagnosis of TB Spondylitis in this case report is objectively on MRI of the spine, and anatomical pathology examination based on tissue is taken Durante surgery. On histological examination will be found: giant cell type langhans, epithelioid, lymphocyte inflammatory cells and necrosis.

Mantoux examination Tests were performed on patients who have not been proven to have pulmonary TB. The best and sensitive laboratory examination performed to enforce TB Spondylitis is the examination of Polymerase Chain Reaction (PCR) Mycobacterium tuberculosis with 80-98% sensitivity rate with the results of examination can be known less than 24 hours. In the patients in this series of case report was not carried out PCR tuberculosis examination. Because it is not an SOP (Standard Operational Procedure) of management of TB Spondylitis in RSUP Haji Adam Malik and also not supported by BPJS so that examination of PCR Tb in patients of TB spondylitis in RSUP Haji Adam Malik was not performed.
Antituberculosis drugs are all patients who have been diagnosed as Spondylitis TB either diagnosed with MRI or based on anatomical pathology results. Based on WHO recommendation, TB Spondylitis can be included in category I, that is 2 HRZE and then continued with 4 HR or 6 HE. With dose of Isoniazid 5-15 mg / kg (maximum dose 600 mg), Rifampicin 10-20 mg / kg (maximum dose is 600 mg), ethambutol 15-30 mg / kg (maximum dose is 1600 mg) and Pyrazinamide 30-40 mg (maximum dose is 2000 mg). Until now, ATD treatment in patients with TB Spondylitis is still controversial, and there is no uniformity. Even in the WHO's last recommendation issued in 2017 has not issued an agreement on the duration of OAT administration in patients with TB spondylitis.

The duration of OAT administration in the second phase is that after the first two months the ATD are very diverse, each country has different recommendations: 6, 9, 12, or 18 months. WHO has so far not issued a specific recommendation regarding the duration of OAT administration in cases of TB Spondylitis. The American Thoracic Society recommends a total of 9 months; The Canadian Thoracic Society recommends 9-12 months. For TB Spondylitis in children, The United State of Disease Control recommends administering OAT for at least 12 months.

Patients with TB Spondylitis at Haji Adam Malik Hospital, ATD administration, was administered for 12-18 months. All patients taking ATD are advised to be laboratory tests and CXR at the end of 2, 4, 6, and 8 months. At 8th month the patient should also be evaluated with spinal MRI using contrast. Treatment of ATD will continue longer if MRI results do not show significant improvement. MRI, CXR and laboratory tests are repeated after months 12 and 18. If MRI results show improvement/healing, ATD administration may be discontinued. The physical and neurological development of the patient should be evaluated every six months fortwo years after consuming the ATD. Surgical indications of TB Spondylitis are: [9,11,12]

1. Acute and progressive neurologic deficits: Paraparesis or paraplegia.
2. Unstable spinal deformity or accompanied by pain, in this case, progressive kyphosis (30 ° for adults and 15 ° for children)
3. Unresponsive chemotherapy for four weeks
4. Extensive abscess
5. Diagnosis cannot be established by percutaneous biopsy, as well as in microbiology / PCR
6. Severe pain due to compression of abscess

5. Conclusion

TB spondylitis is a problem with the complex disease with varying clinical manifestations. TB spondylitis has the potential to cause serious morbidity, including permanent neurological deficits and spinal deformities. Therefore diagnosis and optimal management are essential. MRI is currently one of the best adjuvant aids in diagnosis while excluding other differential diagnoses. However, if facilities are inadequate, CT scan, X-ray, and other imaging can help. The gold standard for diagnosis must still use a histological and microbiological examination of the tuberculosis biopsy specimen.

Surgical therapy combined with ATD chemotherapy for 12-18 months is the best choice in the management of TB spondylitis. The prognosis depends on the course of the disease, the management, and the accompanying complications.

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