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# The management of neglected spondylitis tuberculosis with dislocated C1 and C2 odontoid destruction: A case report

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ABSTRACT

*INTRODUCTION AND IMPORTANCE:* Spinal tuberculosis was the most common TB infection in human body. Musculoskeletal tuberculosis (TB) mostly affected lower thoracal or upper lumbar spine. However, TB infection can also occurs along vertebral spine. We reported a rare case about TB infection in cervical spine. We provided the clinical manifestation and therapeutic method for the patient. Cervical TB infection is a very rare case. Especially, when it involves in C1 and C2 like we provided on this case.
*CASE PRESENTATION:* A 24 years-old male came to the orthopaedic clinic with neck pain that aggravated by neck movement. He previously diagnosed with TB infection on his lung within 3 months. We performed x-ray data to determine the source of neck pain. Examination revealed anterior collapse of C1, destruction of odontoid process, and soft tissue swelling. We also performed MRI cervical to assess the destruction of anterior corpus C1.
*CLINICAL DISCUSSION:* We decided to operate the patient with reposition and posterior stabilization of C1 using occipital plate from posterior approach and added some synthetic bone graft. The medical treatment is anti-tuberculosis drugs, usually conducted conservatively in mild-to-moderate cases. But, if there is deterioration in neurological deficit or persisting deficit with spinal cord compression, such as C1 and C2 involvement, surgery can be considered. There are two types of surgery; posterior fixation and fusion and anterior release and posterior stabilization.
*CONCLUSION:* TB musculoskeletal infection must be evaluated regularly to consider the perfect time for additional surgical treatment. The good decision to operate the moderate to severe case could improve the patient's functional outcome.


## 1. Introduction and importance

Spondylitis tuberculosis (TB) could affect the upper cervical spine. It is a very rare case among spondylitis TB, where upper cervical spondylitis approximately 0.3–1 % of all spondylitis TB cases worldwide [1]. The treatment is usually conducted conservatively in mild-to-moderate cases. Yet, if there is deterioration in neurological deficit or persisting deficit with spinal cord compression, surgery can be considered. Posterior stabilization is one of the surgeries that is needed to stabilizing the cervical spine. It is time-saving and has few complications [2]. This case report is an example case of neglected spondylitis tuberculosis with dislocated C1 and C2 odontoid destruction which performed with reposition and posterior stabilization of C1 using occipital plate from posterior approach and added some synthetic bone graft.

## 2. Case presentation

We collected the data of a 24 years old male with a chief complaint of severe pain on his neck since one year before admission. He felt pain especially when moving his neck and doing daily activities. There was no neurological deficit. He had been taken 3 months of antituberculosis drugs. Previously he had already performed biopsy with the result of tuberculous infection histologically proofed. There is no drug history, family history including any relevant genetic information and psychosocial history. The patient agreed to participate on this report and for publication of the images by the informed consent.

From laboratory results, there was an increase in ESR (43 mm) and CRP (8.3 mg/L). From radiology examinations, on plain cervical x-ray we found the anterior collapse of C1 with C2 odontoid destruction and soft tissue swelling. From the MRI T2 sequence, we

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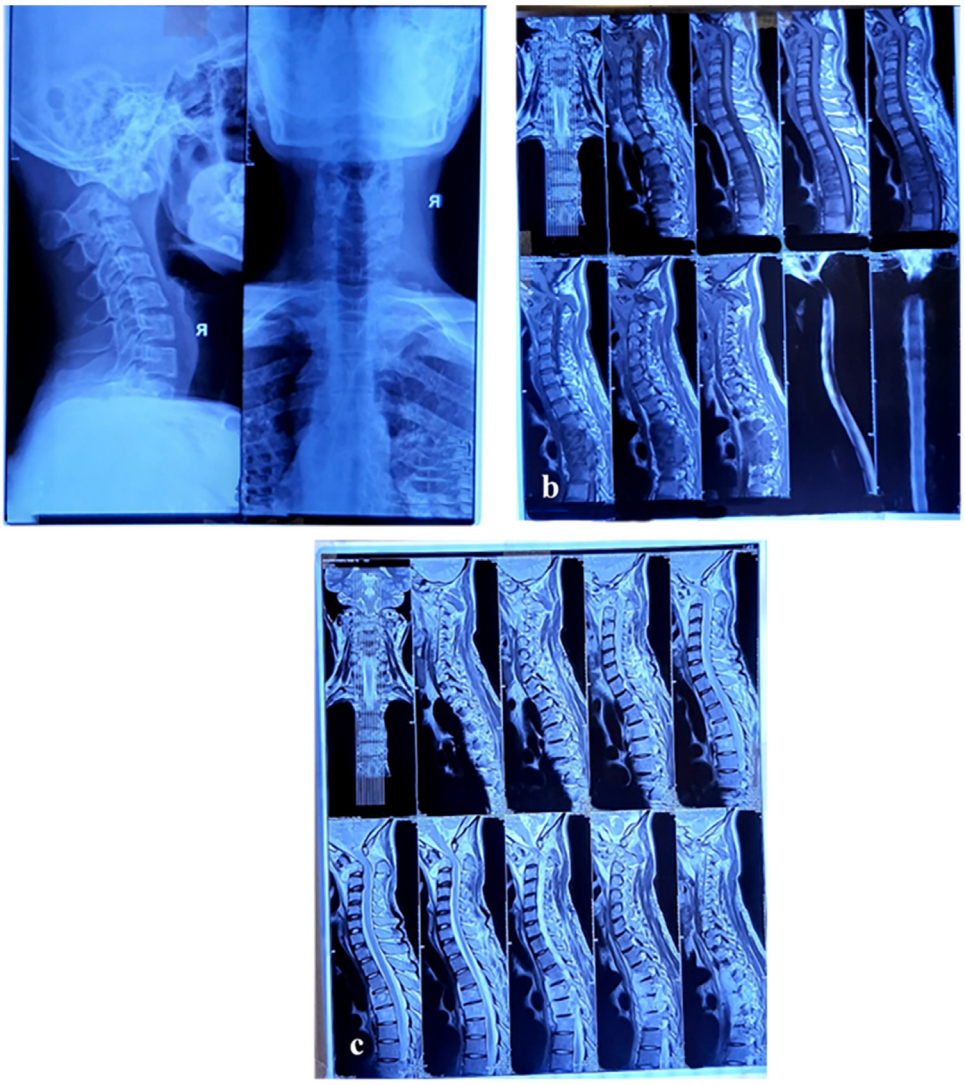


**Fig. 1.** Radiology examination (a) plain cervical x-ray showed anterior collapse of C1 with C2 odontoid destruction and soft tissue. (b) MRI T2 sequence showed hyperintense lesion on the anterior C1-C2. (c) MRI T1 sequence showed hypointense lesion at the same level.

found a hyperintense lesion on the anterior C1-C2 and from MRI T1 sequence, we found a hypointense lesion at the same level (Fig. 1). Those examinations were taken at the hospital and confirmed by clinical pathologist and radiologist.

The patient was diagnosed with cervical spondylitis TB with dislocated C1 and C2. By posterior approach, we performed reposition of C1, posterior stabilization using an occipital plate, lateral mass screw-on C3-4-5, rod and sublaminar wire on C1. We also inserted synthetic bone graft intraoperatively.

First, we performed posterior midline incision from occipital to C5. After the cervical spine vertebra was exposed, we found the C1 was dislocated about 2 cm anteriorly. The ligament of spinous and dura mater was surrounded by fibrotic tissues. After that, we did occipital plate placement, followed by lateral mass screw, rod, and nut. Then, we performed laminectomy decompression of C2 and flavectomy to prevent further compression of the medulla spinalis. Then, we inserted the sublaminar 1.0 C-wire of C1. The wire was fixed to the rod by twisting it gently and simultaneously. We saw that the C1 was gradually back to its position (Fig. 2).

Then, we irrigated the operating field with normal saline and povidone-iodine. We also gave synthetic bone graft and streptomycin intraoperatively. We inserted a vacuumed drain and closed the field layer-by-layer. Surgery was done by orthopaedic surgeon spine consultant in Indonesia Army Central Hospital, Jakarta, Indonesia.

After performing surgery, patient wore soft collar neck and was observed in ICU for 24 h then stepped down to common ward before discharged and continue with home care and visited by nurse. A week after discharged, the patient came back to check up in orthopaedic clinic and had done post-operative plain X-ray examination (Fig. 3). Patient could walk without any complaint and with no walking assistant device. Sensory and motoric examination were performed, there was no neurological deficit after surgery and the alignment was restored. The patient had no neck pain anymore and can do any daily activities without pain.

## 3. Clinical discussion

Spondylitis TB in the cervical spine commonly causes osteoligamentous, the destruction that could affect in neurological deficit [1]. On this case, C1 dislocated from C2 and there was destruction of odontoid process. Fortunately, it did not disturb neurological function. The patient only felt neck pain in daily activity.

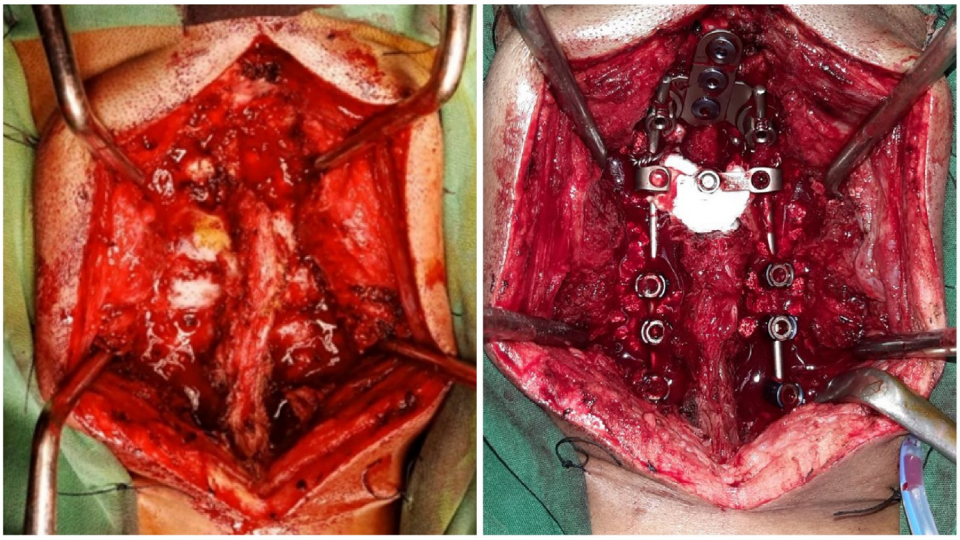

**Fig. 2.** The view of pre-instrumentation (left) and post-instrumentation (right) of C1 and C2 spine (Cranial on the upside position and Caudal on the downside position).

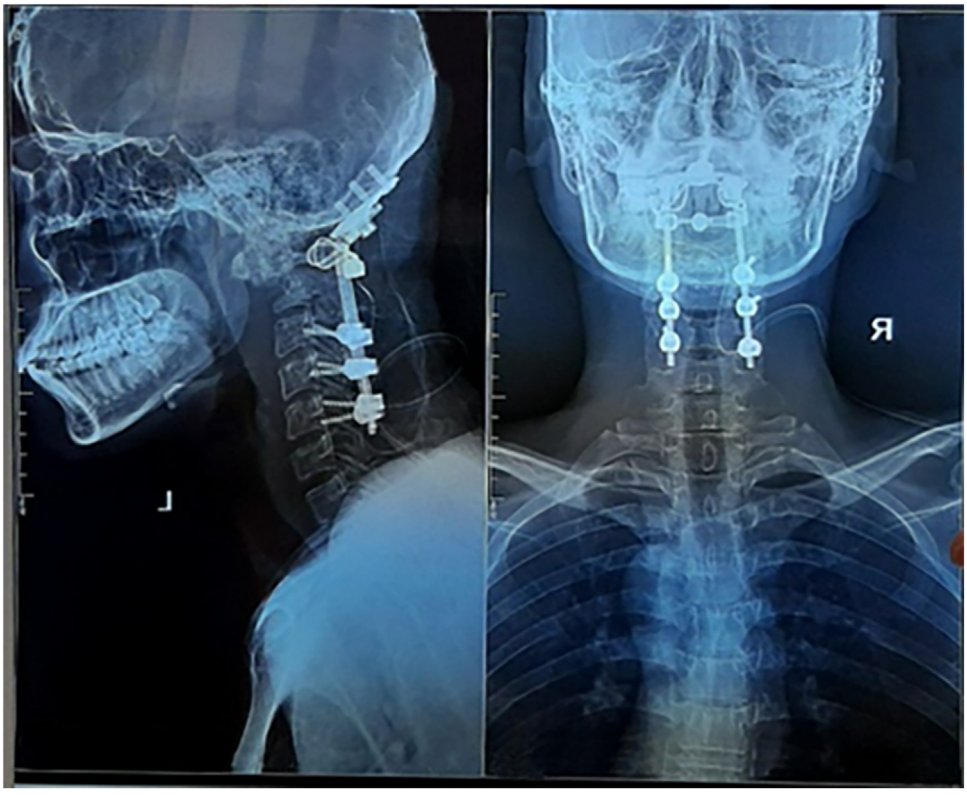

**Fig. 3.** Postoperative plain x-ray showed plate, screw, rod, nut, and wire in cervical spine.

According to Rajasekaran, the patient underwent surgery due to deformity and incapacitating pain [3]. There are two types of approaches for managing dislocated C1. Posterior fixation and fusion is recommended for reducing atlantoaxial dislocation as performed in this case. Second, anterior release and posterior stabilization, this method is useful when the dislocated atlantoaxial joint is irreducible in the posterior only approach [4].

In term of complete reduction rate, post-operative Japanese Orthopaedic Association (JOA) score and fusion rate, there was no significant outcome between patients performed by posterior-only fusion compare to posterior fusion after anterior release and traction [5].

## 4. Conclusion

Spondylitis TB with dislocation of C1 and destruction of C2 odontoid is a rare case. The cornerstone of treatment is antituberculosis drugs. Posterior only stabilization and fusion is recommended for unstable case [6]. The outcome is quite great that the patient has no complaint of pain and could do daily activity as usual. The work has been reported in line with SCARE 2018 criteria [7].

## Declaration of Competing Interest

The authors declare no conflicts of interest.

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## Ethical approval

Ethical approval was not required in the treatment of the patient in this report.

## Consent

Written consent has been received from the subject.

## Author's contribution

Jursal Harun contributes in the study concept or design, data collection, analysis and interpretation, oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team

Danar Lukman Akbar contributes to the study concept or design, data collection and writing the paper.

## Registration of research studies

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## Guarantor

Jursal Harun is the sole guarantor of this submitted article.

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