



# International Journal of Orthopaedics Sciences

E-ISSN: 2395-1958  
P-ISSN: 2706-6630  
IJOS 2022; 8(4): 178-180  
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[www.orthopaper.com](http://www.orthopaper.com)  
Received: 29-08-2022  
Accepted: 19-10-2022

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## Imaging review in case of cervical spine tuberculosis

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DOI: <https://doi.org/10.22271/ortho.2022.v8.i4c.3259>

### Abstract

Tuberculosis of the cervical spine differs from other vertebral localizations by its extreme rarity, the clinical images are very diversified, the radiological measurements allow a good diagnostic orientation and specifically the MRI which allows a multi-planar study of the various lesions. Only bacteriological evidence can confirm the diagnosis. The treatment is based on a 12-month antituberculosis multidrug therapy and much debate upon the surgical indication.

**History:** In this case, the patient presented with pain in cervical region with restricted movements of the neck and pain on examination at the mobilization of the cervical spine. Biopsy of the cervical lymph node had already been done which was positive for Koch's etiology.

**Discussion:** Cervical CT scan and a cervical MRI were performed, showing changes of spondylitis involving C1-C3 vertebrae with adjacent large loculated abscess in prevertebral and bilateral paravertebral regions and cord compression at the level of C2 vertebrae. Findings favoring an infective etiology.

**Conclusion:** Cervical spine tuberculosis is considered a catastrophic disease due to the associated probability of spinal cord compression and quadriplegia. This emphasizes the importance of early diagnosis in the management of cervical tuberculosis with radiological and clinicopathological correlation.

**Keywords:** Cervical spine, tuberculosis, radiological measurements

### Introduction

Tuberculosis of the cervical spine differs from other vertebral localizations by its extreme rarity, the clinical images are very diversified, the radiological measurements allow a good diagnostic orientation and specifically the MRI which allows a multi-planar study of the various lesions. It constitutes for 0.3 to 1% of all tuberculosis cases and 3 % of spinal tuberculosis [1, 2]. Cervical spine involvement should be suspected in cases with cervical tuberculous lymphadenopathy or retropharyngeal abscess, especially, in India, where tuberculosis has been an endemic disease since decades. Only bacteriological evidence can confirm the diagnosis. The treatment is based on a 12-month antituberculosis multidrug therapy and surgical intervention, if necessary.

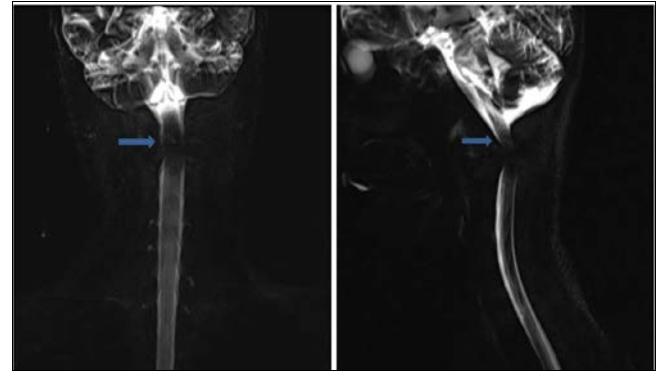
### Case Report

A 29 year old male patient presented with complaints of pain in cervical region with restricted movements of the neck, cervical swelling since three months, and pain on examination at the mobilization of the cervical spine. Neurology was normal. Biopsy of the cervical swelling was done which was later positive for Mycobacterium tuberculosis.

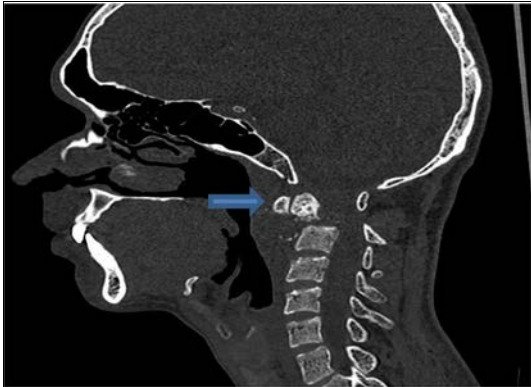
Radiological imaging showed erosion in C1, C2 and C3 vertebrae with collections in pre- and para-vertebral and epidural regions as shown in figures below. Patient was then commenced on antitubercular drugs. Later, he underwent occipito-cervical fusion and a cervical collar was applied. The patient made an uneventful recovery with improvement of symptoms on follow up.



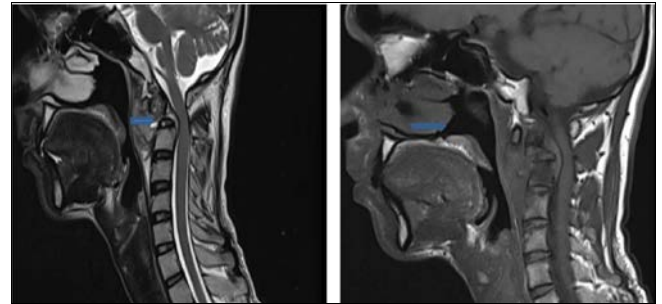
**Fig 1:** Pain Radiograph of Cervical Spine - Anteroposterior and Lateral Views showing fracture of odontoid process with its anterior displacement and anterolisthesis of C1 vertebrae over C2 vertebrae with widening prevertebral soft tissue shadow



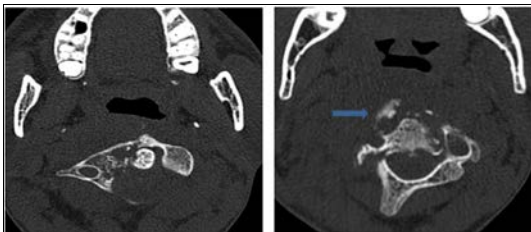
**Fig 5:** MR T2W Myelogram coronal (a) and sagittal (b) views showing spinal cord compression and edema at C1-C2-C3 vertebral levels



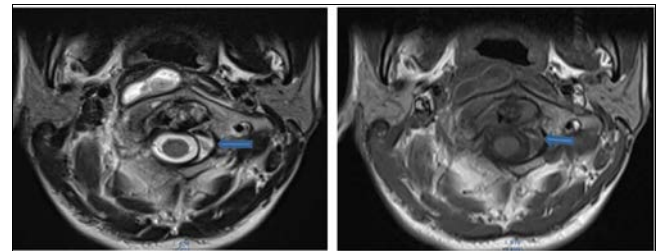
**Fig 2:** CT Cervical Spine - Bone Window Sagittal plane showing lytic destruction involving base of odontoid process with anterior displacement of the fractured fragment



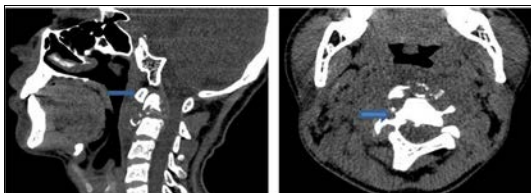
**Fig 6:** MRI Cervical Spine sagittal plane showing fracture of os odontoideum with displacement of odontoid process anteriorly (grade 2). Also, retroflexion of C2 vertebral body noted causing spinal canal stenosis, effacement of anterior subarachnoid space and compression of spinal cord



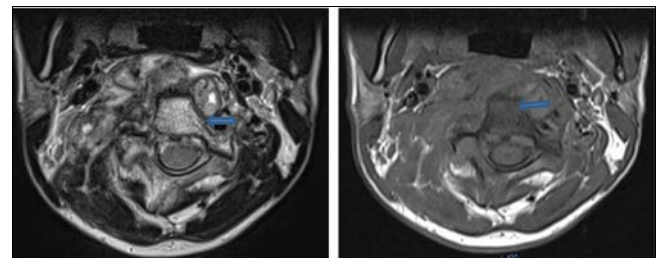
**Fig 3:** CT Cervical Spine - Bone Window Axial Plane showing lytic destruction involving superior arch of and superior facet of C1 vertebra. Similar lytic changes noted involving body, right transverse process, right lamina and right transverse foramina of C2 vertebra.



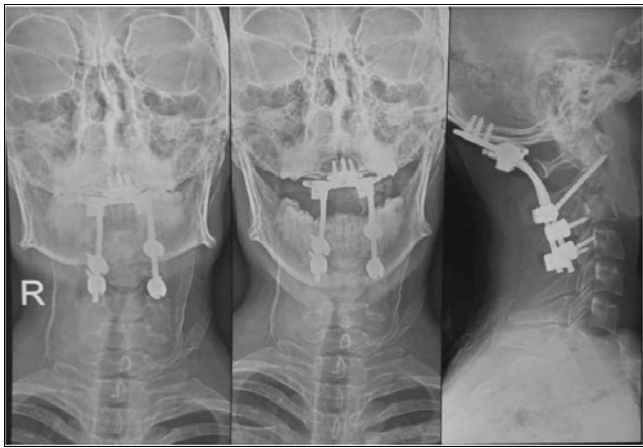
**Fig 7:** Hyperintense T2 signal in prevertebral and epidural regions with compression of the thecal sac and spinal cord extending along C1 to C3 vertebra which appears hypointense on T1WI- suggestive of prevertebral and epidural abscesses.



**Fig 4:** CT Soft Tissue Window sagittal (a) and axial (b) planes showing iso to hypoattenuating soft tissue with internal calcification/bony fragments noted in prevertebral and epidural region along C1 to C3 vertebra with resultant compression of the spinal cord.



**Fig 8:** MRI Cervical Spine Axial plane showing hyperintense marrow signal on T2WI and hypointense marrow signal on T1WI involving C2 vertebrae - suggestive of changes of spondylitis



**Fig 9:** Post operative plain radiograph of cervical spine - Anteroposterior, odontoid and lateral views showing cervical and occipital screws with occipital plate and rod fixation noted in situ

### Discussion

The commonest extra-pulmonary skeletal manifestation of TB is within the spine, with a predilection to the thoracic and lumbar regions of the vertebral column. In 2–3% of cases, the cervical spine may be affected with resultant lesions giving rise to instability and neurological deficits<sup>[1, 2]</sup>. The duration between onset of symptoms and presentation is 11–15 months<sup>[4, 5]</sup>. The patients are typically young with a mean age of 38 years (range 29–52)<sup>[4, 5]</sup>. The delay in presentation is secondary to the low intensity of the initial symptoms and incorrect attribution to musculoskeletal pain. Neurological deficits are the most serious complication of spinal TB with patients presenting with para- or tetraplegia, hemiplegia or monoplegia<sup>[3]</sup>. When the cervical spine is involved the commonest presenting symptom is neck pain, as seen in our patient, and can precede the diagnosis by 24 months<sup>[4]</sup>. Over 50% of patients will have muscular weakness<sup>[4]</sup>. TB of the cervical spine complicated by worsening neurological deficit and or progressive deformity should be treated early<sup>[6]</sup>. The gold standard treatment, following decompression, is anterior spinal instrumentation to support the collapsed anterior weight-bearing column of the cervical spine<sup>[3-5]</sup>. Our patient underwent occipito-cervical fusion and stabilization, with significant improvement in symptoms. In the absence of gross deformity or neurological deficit TB of the spine is a medical disease and should be treated with antituberculous medication, rest and mobilization with suitable orthosis<sup>[3]</sup>.

### Conclusion

Cervical spine tuberculosis is considered a catastrophic disease due to the associated probability of spinal cord compression and quadriplegia. To reduce the morbidity it is crucial is to prevent the development of neural complications. This can only be achieved by approaching patients with worsening neck pain with caution and spotting TB early before it represents with concomitant neurological deficits with clinico-pathological and radiological correlation.

### Financial Support

No funding sources

### Conflicts of Interest

None to declare

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### How to Cite This Article

Wadhvani U, Savaliya D, Desai P, Chaudhari H. Imaging review in case of cervical spine tuberculosis. *International Journal of Orthopaedics Sciences*. 2022;8(4):178-180

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