CASE REPORT

Tuberculosis of bilateral first costovertebral joints

Mayank Gupta, Vijay Kumar Jain, Ananta Kumar Naik, Rajendera Kumar Arya

Department of Orthopaedics
PGIMER, Dr Ram Manohar
Lohia Hospital, New Delhi,
India

Correspondence to
Dr Vijay Kumar Jain,
drvijayortho@gmail.com

SUMMARY

Involvement of posterior spine constitutes to 1–6% of the cases of spinal tuberculosis (TB). To the best of our knowledge, TB of costovertebral joints has only been reported once in the literature. The purpose of this study is to describe a case of TB arthritis of costovertebral joints. A 22-year-old immunocompetent patient presented with a 3-month history of pain in the neck and upper back along with a swelling on the left side of the base of the neck. On performing an MRI of the cervicodorsal spine, there was evidence of destructive collections at the bilateral first and right-sided second costovertebral joints. The patient was diagnosed as a case of tubercular pathology and was managed successfully with antitubercular chemotherapy.

BACKGROUND

The spine is the most common site for osteoarticular tuberculosis (TB) accounting for nearly 50% of all the cases.¹ Isolated posterior vertebral element involvement is uncommon in the tubercular disease, seen in less than 1–6% of the cases.² Posterior vertebral TB may involve the lamina, the spinous process, the transverse process, the articular process, the apophyseal joint or the pedicle.² The involvement of costovertebral joint in isolation is extremely rare and only one such case has been reported in the literature.³ We report a very rare presentation of the TB in a 22-year-old man with the involvement of the bilateral first costovertebral joints and concomitant right second costovertebral joints.

CASE PRESENTATION

A 22-year-old man presented with a 3-month history of pain in the neck and upper back along with a swelling on the left side of the base of the neck which was slowly progressive in size. This was associated with low grade evening rise fever along with other constitutional symptoms like anorexia and significant weight loss. There was no history of any other swelling elsewhere in the body. The patient had no history or family history of TB. On physical examination, a diffuse swelling was found on the left side of the cervicodorsal junction of the spine whose margins were ill-defined and it showed no signs of inflammation. There was no deformity, but only mild tenderness elicited over the transverse processes bilaterally at the D1 and D2 vertebral levels. There was no neurological deficit.

INVESTIGATIONS

Haematological investigations revealed a raised erythrocyte sedimentation rate of 29 mm in first hour (Wintrobe) and elevated C reactive protein.

The serology for the HIV and hepatitis B were negative. Radiograph of the chest was normal. On performing MRI of the cervicodorsal spine, there was an evidence of destructive collections at the bilateral first and right-sided second costovertebral joints. The right-sided collections were seen to extend posteriorly and compress the right exiting first dorsal nerve root. Right hemicord compression was also seen at the same level. The left-sided collection was seen to extend laterally and into the posterior triangle of the neck (figure 1A–F).

Considering the possibility of an infectious pathology, an aspiration of the swelling was performed from its most prominent aspect. The pus aspirate was sent for the microbiological and cytopathological investigations. On Ziehl-Nelson staining, acid-fast bacilli were seen. However, culture reports from the same specimen were negative. The PCR was positive for *Mycobacterium tuberculosis*.

TREATMENT

Based on the clinicoradiological and microbiological findings, a diagnosis of TB of the bilateral first and right second costovertebral joints was made and the patient was started on a standard DOTS 1 (directly observed treatment, short-course) regimen of antitubercular treatment (ATT) (2 months of intensive phase and 6 months of continuation phase) consisting of alternate day dosage (thrice weekly) of the following drugs: in intensive phase Rifampicin, Isoniazid, Pyrazinamide and Ethambutol for the first 2 months followed by Rifampicin and Isoniazid for the next 6 months in continuation phase. The patient was evaluated clinically, haematologically and radiologically at the end of 8 months of ATT with partial signs of healing and ATT was extended with Isoniazid and Rifampicin for the next 12 months. He was advised to take bed rest for the initial 2–3 months.

OUTCOME AND FOLLOW-UP

The patient was kept on regular follow-up during which the swelling was found to progressively decreasing in size, and was completely disappeared clinically at 10 months after starting therapy. The fever was subsided and the pain was relieved gradually. Other constitutional symptoms also showed improvement. At 18 months after starting the therapy, the patient was free from all symptoms.

DISCUSSION

Overall, the skeletal system is involved in only 1–3% of all the cases of TB.⁴ Out of these, nearly 50% have the involvement of the spine.⁴ Spinal TB affects most commonly the lower dorsal and the dorsolumbar junction. The involvement of

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Figure 1 Axial MRI of the cervicodorsal spine at the D1 level showing abscesses involving bilateral first costovertebral joints. The abscesses are hypointense on T1-weighted images (A) and hyperintense on T2 (B) weighted images. There is no evidence of involvement of the vertebral body or the other posterior elements at this level; axial T1 (C) and T2 (D) weighted images of the cervicodorsal spine at the D2 level showing a large abscess involving the right second costovertebral joint and extending posteriorly. Right hemicord compression is also seen at the same level. Signal changes suggestive of marrow oedema is noted in the vertebral body and destruction of the right lamina is evident; Sagittal T2-weighted image of the cervicodorsal spine showing a posterior vertebral abscess compressing the cord at the D2 level (E); coronal section of cervicodorsal spine showing the right and left abscesses from the bilateral first and right second costovertebral joints with involvement of the posterior elements on the right side. The left-sided abscess is seen to extend into the posterior triangle of the neck (F).

cervicodorsal junction is uncommon with an incidence of only 5%.⁵ TB most commonly affects the anterior column, and posterior vertebral element involvement is relatively rare. Among the posterior elements, the disease mostly involves the lamina, the spinous process, the transverse process, the articular process, the apophyseal joint or the pedicle.² The involvement of the costovertebral joint in isolation is extremely uncommon with only one such case reported in the literature.³ Since then and also for more than half a century, no case of primary involvement of costovertebral joints by TB has been reported. Levine *et al*³ found TB of costovertebral joints of right D11 and left-sided D9 vertebrae on radiological investigations. The involvement of D11 in their case is plausible with the common occurrence of TB in the dorsolumbar junction. The present case had the involvement of bilateral first costovertebral joints and concomitant right second costovertebral joint, which was quite unexpected. Furthermore, the involvement of the same joints was at the cervicodorsal junction where the affliction of the disease is uncommon. The involvement of bilateral costovertebral joints may be explained by means of haematogenous spread via anastomosis of posterior external venous plexuses of vertebral veins around them.⁶ Patients with posterior spinal disease usually present with back pain and palpable soft tissue mass on the back due to pyomyositis as seen in our case. Kyphosis is very rare in these cases due to

sparing of vertebral bodies. The neurological symptoms are common especially early sensory loss due to posterior cord involvement by intraspinal soft tissue mass. Neurological symptoms were absent in the indexed case despite hemicord compression which might be due to slow progression of the disease.

Chest and spine radiographs usually appear normal in the cervicodorsal region due to difficulty in interpretation and overlapping of lung shadows leading to delay in diagnosis. Special coned-down penetrating views may be needed to localise posterior lesions especially in these areas.^{2 6 7} MRI is an important investigation to diagnose such atypical presentation for early diagnosis and management, as seen in our case.⁷ MRI can diagnose such cases in a very early stage of reactive bone marrow oedema, before any osseous destruction has occurred.⁷ Treatment with antitubercular drugs should be started as soon as the diagnosis is made. Surgery should be reserved in cases with neurological deficit.

In conclusion, costovertebral joint TB is rare and can occur in the absence of disease elsewhere. Diagnosis of these cases is usually delayed. Appropriate diagnostic studies need to be obtained as early as possible to avoid neurological complications. Knowledge of this condition among surgeons and physicians is imperative because early diagnosis and treatment generally give good outcome.

Learning points

- ▶ Posterior spinal tuberculosis is rare and even rarer is to get involvement of costotransverse joints which is only once described in literature.
- ▶ MRI is the investigation of choice for such atypical presentation.
- ▶ One should keep a high index of suspicion for such a curable disease in a patient with back swelling.

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REFERENCES

- 1 Jain AK, Dhammi IK. Tuberculosis of the spine: a review. *Clin Orthop Relat Res* 2007;460:39–49.
- 2 Arora S, Sabat D, Maini L, *et al*. Isolated involvement of the posterior elements in spinal tuberculosis: a review of twenty-four cases. *J Bone Joint Surg Am* 2012;94: e1511–18.
- 3 Levine SM, Marianacci EB, Kattapuram SV. Tuberculosis of contralateral costotransverse joints. *Skeletal Radiol* 1997;26:741–3.
- 4 Tuli SM. Tuberculosis of the spine: a historical review. *Clin Orthop Relat Res* 2007;460:29–38.
- 5 Tuli SM. Tuberculosis of the spine. In: Tuli SM, ed. *Tuberculosis of the skeletal system (bones, joints, spine and bursal sheaths)*. 4th edn. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd, 2010:196–8.
- 6 Kumar K. A clinical study and classification of posterior spinal tuberculosis. *Int Orthop* 1985;9:147–52.
- 7 Narlawar RS, Shah JR, Pimple MK, *et al*. Isolated tuberculosis of posterior elements of spine: magnetic resonance imaging findings in 33 patients. *Spine (Phila Pa 1976)*. 2002;27:275–81.

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