



## minimally invasive techniques

# Video-Assisted Thoracic Surgery Diagnosis of Thoracic Spinal Tuberculosis\*

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**Tuberculous spondylitis is rare in economically well-developed countries. MRI is the most sensitive radiologic method of diagnosis. CT-guided fine needle aspiration can be an appropriate method for obtaining samples for culture, with positive cultures in 25 to 89% of cases. However, it can take >6 weeks for specimens to grow, and it is essential to have adequate culture and sensitivity studies for the diagnosis and treatment of mycobacterial diseases. We propose a minimally invasive diagnostic approach that ensures that adequate surgical specimens are obtained prior to initiating treatment.** (CHEST 1999; 116:1471-1472)

**Key words:** spondylitis; tuberculosis; video-assisted thoracic surgery

**Abbreviation:** VATS = video-assisted thoracic surgery

The patient was a 33-year-old man from the Ivory Coast who had been in Switzerland for the previous 6 months. He presented with a 1-month history of progressive chest and back pain, no fever, and a weight loss of 10 kg. A chest CT showed bilateral paravertebral swelling, which was more pronounced on the right side, at the level of the aortic arch. There was also a lytic lesion of the fourth thoracic vertebra. These findings were confirmed by an MRI scan (Fig 1). The patient underwent right video-assisted thoracic surgery (VATS). After double lumen intubation and right lung collapse, the camera was introduced through the sixth intercostal space in the midaxillary line. Two 5-mm ports were introduced in the second interspace anteriorly and the sixth interspace posteriorly. The paravertebral abscess was drained using a long trocar needle through the anterior port. Then, under both visual and fluoroscopic guidance, surgical biopsies were taken of the wall of the abscess, the involved vertebra, and the involved disk. Ziehl-Neelsen stains of the biopsy

specimens demonstrated acid-fast bacilli. Subsequent cultures confirmed the clinical diagnosis of tuberculosis. Thus, appropriate therapy could be started within 12 h of the procedure, while being certain that sensitivity studies would subsequently be available.

### DISCUSSION

The diagnosis of tuberculous spondylitis is often difficult. Clinically, there is usually a history of back pain with local tenderness and limitation of movement. Other symptoms, such as low-grade fever, night sweats, and weight loss, can be present. Symptoms are commonly present for several months prior to diagnosis.<sup>1</sup> Initially, plain radiographs of the spine are normal. MRI and radionuclide bone imaging are the studies that first show pathologic changes.<sup>2,3</sup> MRI can examine the whole spine, which is important because tuberculous spondylitis can be multifocal.<sup>1</sup> Furthermore, MRI demonstrates changes both in the bone and disk space and in the surrounding soft tissues, and it shows cord or nerve compression.<sup>2,3</sup> If MRI cannot be performed, spiral CT is the best option.<sup>2,3</sup>

Prior to initiating therapy, it is important to obtain adequate samples for culture and sensitivity studies. Spondylitis can be caused by aerobic or anaerobic

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FIGURE 1. This T1 weighted image of an MRI scan shows a paravertebral abscess with partial destruction of four vertebrae as well as the intervertebral disks.

bacteria, fungi, or mycobacteria. Successful treatment depends on precise identification of the infecting agent.<sup>4,5</sup> CT-guided fine needle biopsy can yield adequate samples in 25 to 89% of cases.<sup>1,6,7</sup>

The treatment of spinal tuberculosis is medical and surgical. The results of this combined approach are excellent.<sup>1,5,8</sup> With cervical and lumbar lesions, anterior decompression and spinal fusion can be advisable.<sup>1,8</sup> When the dorsal spine is involved, kyphosis is uncommon and surgical stabilization is not usually required. Surgery is reserved for cases with

massive bone loss or kyphosis and is essential in cases with neurologic symptoms, vertebral instability, an abscess or septic complications, or failure of medical treatment.<sup>1,8</sup>

The VATS procedure allowed for both complete drainage of the abscess as well the retrieval of adequate diagnostic specimens. We believe that this minimally invasive technique should allow a precise microbiological diagnosis of spondylitis to be made in the majority of cases because surgical biopsies can be taken from the involved vertebra and disk.

## CONCLUSION

In cases of suspected tuberculous spondylitis, radiologic examination with standard posteroanterior and lateral spine films and MRI scans are essential for the diagnosis and localization of lesions. Confirmation of the diagnosis with culture and sensitivity studies are required for adequate treatment. CT-guided fine needle aspiration has a diagnostic yield of 25 to 89%. Therefore, surgical biopsies are often required. A VATS procedure is an expeditious, minimally invasive technique that allows adequate specimens to be obtained.

## REFERENCES

- 1 Boachie-Adjei O, Squillante RG. Tuberculosis of the spine. *Orthop Clin North Am* 1996; 27:95-103
- 2 Rothman SLG. The diagnosis of infections of the spine by modern imaging techniques. *Orthop Clin North Am* 1996; 27:15-31
- 3 Sharif HS, Morgan JL, Al Shahed MS, et al. Role of CT and MR imaging in the management of tuberculous spondylitis. *Radiol Clin North Am* 1995; 33:787-804
- 4 Bloom BR. Back to a frightening future. *Nature* 1992; 358:538-539
- 5 Sapico FL. Microbiology and antimicrobial therapy of spinal infections. *Orthop Clin North Am* 1996; 27:9-13
- 6 Rieneck K, Hansen SE, Karle A, et al. Microbiologically verified diagnosis of infectious spondylitis using CT-guided fine needle biopsy. *APMIS* 1996; 104:755-762
- 7 Mondal A. Cytological diagnosis of vertebral tuberculosis with fine-needle aspiration biopsy. *J Bone Joint Surg Am* 1994; 76:181-184
- 8 Loembe PM. Traitement médico-chirurgical du mal de Pott de l'adulte: notre attitude au Gabon. *Can J Neurol Sci* 1994; 21:339-345