

## LETTER TO THE EDITOR

### An adolescent with cervical spine injuries Adolescente con lesiones en columna cervical

To the Editor:

We report on the case of a 12-year-old girl presenting with a pain in her ribs lasting for two months following an accidental fall; the chest X-ray was normal. She subsequently came to the Emergency Department complaining of progressive retrocervical pain, both at rest and on movement, with right xz antialgic lateralization and functional impotence in the right arm. She did not mention any fever or other associated symptoms.

In her personal history, the only noteworthy fact was her country of origin, Equatorial Guinea, but with residence in Spain for the previous 7 years, albeit with prolonged visits to Guinea, the last one sixteen months previously. Her medical history includes several bouts of malaria since the age of 8 months, treated in her country of origin, with the last outbreak 6 years previously. She has been vaccinated against BCG, DTP, Polio, measles, cholera and yellow fever.

On physical examination, she presented pale mucosae, a right axillary adenopathy measuring 0.5x0.5 cm, limitation of cervical mobility with pain on palpation. The joints in her upper and lower limbs are free-moving, symmetrical, without oedemas or limitations. Osteotendinous reflexes are normal. Strength and sensitivity are retained. The rest of the physical examination, blood analysis and biochemistry are normal. globular sedimentation velocity (GSV) was 88 mm in the 1st hour and C reactive protein was 4.9 mg/dL.

### Evolution

In view of the patient's condition, a lateral cervical X-ray was requested (fig. 1), and it revealed a lytic bone image with expansive destruction of the cortex affecting the posterior elements and transverse apophysis of C7.

On suspicion of a bone tumour, a computerized axial tomography (CAT) was requested (fig. 2), which revealed lytic lesions in C7-D1 with compression of the medullary canal and a paravertebral abscess; on the thoracic-lumbar spine (fig. 3) it was possible to observe an osteolytic image at D12; and in the pelvic area (fig. 4), osteolysis of the right iliac wing with an accumulation of liquid in the iliac muscle

(fig. 5). The chest X-ray and the chest CAT were normal, without any alteration being found in the lung parenchyma nor any adenopathies in the mediastinum.

An NMR was performed on the cervical spine and revealed the findings described, with clear observation of the involvement of the adjacent soft tissues at the cervical level.

A bone gammagraphy was performed and showed uptake of the tracer at C7, D12, L3 and the right iliac crest compatible with multifocal inflammatory process.

The Mantoux test after 24 hours was 20 mm. Sputum bacilloscopy was negative.

A puncture was performed on the cervical abscess under echographic control and a bone biopsy of the iliac wing. In view of the suspicion of bone tuberculosis, following the collection of the samples described above, treatment with quadruple therapy (isoniacide [INH], rifampicin [RIF], pyrazinamide [PZM] and etambutol [ETB]) and her cervical spine was fixed with a Philadelphia-type neck brace.

The abscess bacilloscopy was negative. The biopsy revealed chronic granulomatous inflammation without signs of malignancy. *Mycobacterium tuberculosis* was isolated in the cultures, giving a diagnosis of multifocal bone tuberculosis.

The patient's evolution was favourable after starting treatment with quadruple therapy for the first two months (INH+RIF+PZM+ETB) and dual therapy (INH+RIF) to complete twelve months, with total recovery.

### Discussion

The incidence of tuberculosis (TB) has increased in recent years both in developed and emerging countries, particularly due to the increase in the population over the same period. Although the overall incidence of TB in the European Union is less than 5% in the paediatric population, most of the cases are diagnosed among the immigrant population.<sup>1</sup> According to the World Health Organization (WHO), 13 of the 15 countries with the greatest incidence are in Africa and it is related to co-infection by HIV.<sup>2</sup>

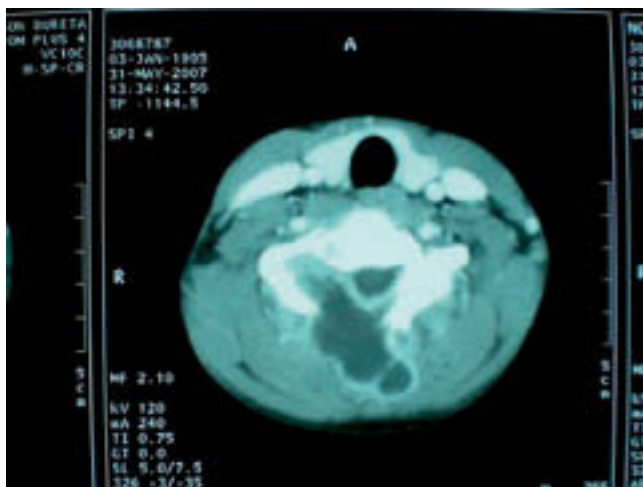
Bone tuberculosis (BTB) represents approximately 20% of extrapulmonary tuberculosis.<sup>3</sup> It is disseminated through the blood from a primary focus that is often unknown as pulmonary tuberculosis is discovered in less than half. The mycobacteria are deposited on the anterior portion of the vertebra through vertebral arterial circulation and spread posteriorly towards the intervertebral discs, common anterior



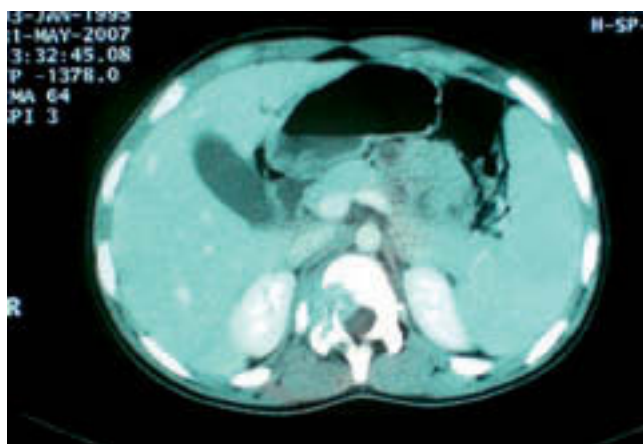
**Figure 1** Lateral cervical X-ray.



**Figure 4** Image of the pelvic area.



**Figure 2** Computerized axial tomography (CAT).



**Figure 3** Osteolytic image of D12.



**Figure 5** Accumulation of liquid in the iliac muscle.

vertebral ligament and adjacent soft tissues. The involvement of the sub-ligamentous area may lead it to spread into adjacent areas or to pass over to other vertebral bodies, occasionally forming epidural or paravertebral masses. If infection continues, it can cause medullary compression.<sup>4</sup>

Vertebral BTB represents 50% of all bone and joint tuberculoses, with 30% in the hip or knee and 20% in the rest of the body (pubis, wrist, shoulder and sacroiliac bone).<sup>5</sup> The dorsal spine is the area most frequently affected in children, whereas cervical involvement occurs in less than 5%.<sup>6</sup> Multifocal presentation as in our case is rare, with few cases described in the paediatric literature and greater prevalence among young children in areas with a high endemic presence of tuberculosis during the first year whereas in industrialized countries it happens in adults after late reactivation.

Its clinical manifestations are usually insidious at first, with local pain as the first symptom, subsequently associated

with rigidity and muscular spasm. Diagnosis is based on the epidemiological situation and compatible clinical signs, a positive Mantoux and imaging tests.<sup>7</sup> medullary involvement is the most important complication.

The Mantoux test is positive in 90% of cases although it may be a confounding factor in patients coming from endemic areas or vaccinated with BCG. In our case it was clearly positive according to the criteria of the American Academy of Pediatrics (AAP). The new detection techniques using gamma interferon might be useful in these cases.<sup>7</sup> Differential diagnosis must consider other infections by such germs as *S aureus*, brucellosis, actinomycosis or histoplasmosis, as well as both benign and malignant tumoral processes: osteoma osteoid, osteoblastoma, histiocytosis, aneurysmatic bone cyst, osteosarcoma, Ewing's sarcoma, lymphoma or metastasis.<sup>8</sup>

Chest X-rays are usually normal; an X-ray of the spine may show alterations in 50% of cases. CAT scans are useful for lytic lesions and sclerosis and to guide the biopsy but NMR is better for revealing paravertebral masses and involvement of the discs or the medulla.<sup>4</sup>

Treatment is medical with triple or quadruple therapy in the light of suspected resistances and with a recommended duration of between 6 and 12 months.<sup>9,10</sup> Philadelphia or Minerva type neck braces are used to stabilize the cervical column and surgery is reserved for debridement when there is medullary involvement or to prevent cervical fusion in children that develops into ciphosis following growth.<sup>11</sup>

## References

1. Walls T, Shingadia D. The epidemiology of tuberculosis in Europe. *Arch Dis Child*. 2007;92:726-9.
2. Global tuberculosis control: a short update to the 2009 report. World Health Organization (2009). Disponible en: [http://www.who.int/tb/publications/global\\_report/2009/update](http://www.who.int/tb/publications/global_report/2009/update).
3. Marudanayagan A, Marudanayagam A, Gnanadoss. Multifocal skeletal tuberculosis: a report of three cases. *Iowa Orthop J*. 2006;26:151-3.
4. Teo HEL, Peh WCG. Skeletal tuberculosis in children. *Pediatr Radiol*. 2004;34:853-60.
5. Gelal F, Sabah D, Doğ an R, Avcı A. Multifocal skeletal tuberculosis involving the lumbar spine and a sacroiliac joint: MR imaging findings. *Diagn Inter Radiol*. 2006;12:139-41.
6. Govender S, Ramnarain A, Dip Ortho H, Danaviah S. *Clin Orthop Relat Res*. 2007;460:78-85.
7. Starke JR. New concepts in childhood tuberculosis. *Curr Opin Pediatr*. 2007;19:306-13.
8. Lemme SD, Kevin Raymond A, Cannon CP, Normand AN, Smith KC, Hughes DP. Primary tuberculosis of bone mimicking a lytic bone tumor. *J Pediatr Hematol Oncol*. 2007;29:198-202.
9. Treatment of extrapulmonary tuberculosis and complicated forms of pulmonary tuberculosis. Grupo de Trabajo de Tuberculosis de la SEIP. *An Pediatr (Barc)*. 2008;69:271-8.
10. Garcia-Mauricio AA, Aristegui Fernandez J, Alvez Gonzalez F, del Castillo Martin F, Corretger Pauet JM, Hernandez-Sampelayo Matos T, et al. Documento de consenso sobre el tratamiento de la tuberculosis pulmonar en niños. *An Pediatr (Barc)*. 2007;66:597-602.
11. Moon MS, Moon JL, Kim SS, Moon YW. Treatment of tuberculosis of the cervical spine: operative versus nonoperative. *Clin Orthop Relat Res*. 2007;460:67-77.

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