Le Infezioni in Medicina, n. 3, 220-223, 2013

Caso clinico

Case report

Paediatric tubercular spinal abscess involving the dorsal, lumbar and sacral regions and causing spinal cord compression

Ascesso spinale di natura tubercolare in sede dorsale, lombare e sacrale, responsabile di compressione midollare in un paziente pediatrico

Elena Bozzola[1], Mauro Bozzola[2], Andrea Magistrelli[3], Valeria Calcaterra[2], Daniela Larizza[2], Laura Lancella[1], Alberto Villani[1]

[1]Department of Pediatric, Pediatric and Infectious Diseases Unit, Bambino Gesù Children's Hospital, IRCCS, Rome, Italy;
[2]Department of Internal Medicine, University of Pavia, Pavia, Italy;
[3]Department of Radiology, Bambino Gesù Children's Hospital, IRCCS, Rome, Italy

INTRODUCTION

Tuberculosis (TB) remains the leading infectious cause of death world-wide. Children carry 10-20% of the global burden of TB disease, and yet they have been chronically neglected. This neglect is at least partly because of consequences of the difficulties in making the diagnosis in them. In fact, TB can mimic a wide variety of diseases, ranging from benign common illnesses to malignancy. Under diagnosis leads to under-reporting and consequently to an underestimation of the situation of childhood TB in the respective community [1].
In children TB most frequently affects the pulmonary system (47%), while spinal localization is very rare (5%) [2]. Spinal tuberculosis mostly affects the lower thoracic and upper lumbar areas [2, 3]. Spinal abscess represents a severe, generally pyogenic, infection of the epidural space which may compress neural elements and require urgent surgical intervention to avoid permanent neurological deficit [4]. Early diagnosis and decompression remain the two important predictors of successful neurological outcome in acute cauda equina syndrome.

Corresponding author
Elena Bozzola
E-mail: elenabozzola@libero.it

CASE REPORT

We present a rare case of paediatric cord compression caused by abscess of tubercular origin involving the thoracic-lumbar-sacral spinal regions.
A 13-year-old Philippine boy was referred to our hospital with a 3 week latero-cervical lymphadenitis. There was a history of Bacillus-Calmette-Guérin (BCG) vaccination at birth. The patient underwent blood cultures as well as bacterial and viral isolation by polymerase chain reaction and serology identification, with negative results. The tuberculin skin test was performed, with a positive result. The patient underwent a chest radiography, negative for pneumonia, a QUANTIferon test, which was positive, and two gastric aspirates positive for *Mycobacterium tuberculosis* (MT). He was started on three-drug antituberculous treatment (rifampin, isoniazid, pyrazinamide). Twenty day after, the patient referred cervical and dorsal backache. At physical examination, patellar tendons were moderately hyperactive and both Achilles tendons had beats of clonus. Percussion of either patellar tendon elicited no extension at the knee or contraction of the quadriceps. Urgent magnetic resonance imaging (MRI) showed mass lesions at D1-D4, at L1 and at S1 vertebral levels, compressing and displacing the spinal cord antero-laterally within the

spinal canal, causing spinal cord compression. Moreover, a remodeling of D2 and D3 vertebral bodies and of the intervertebral space was observed (Figure 1). Urgent surgical decompression was performed: laminectomy was done at D3-D5 levels and the higher abscess was then flushed using a catheter, decompressing the cauda equina. The pus, sent for culture, was positive for MT. Despite the rapid and severe disease progression on an appropriate drug regimen, the final cultures showed no evidence of an atypical drug-resistant TB strain.

Figure 1 - Magnetic resonance imaging showing spinal abscesses and spinal cord compression.

DISCUSSION

TB infections are increasing in both developing and developed countries [2, 5]. TB must be considered in patients even if a referred BCG vaccination at birth. In fact, BCG immunization is frequently scarce effective in children vaccinated at birth [6]. In literature it has been reported that patients vaccinated at birth who have a positive tuberculin skin test at 12-year-old are at a 5 to 48 times greater risk of developing tuberculosis [7]. In children TB rarely affects the extrapulmonary system [1, 2]. Moreover, as reported in literature, spinal TB is frequently seen in less developed countries, especially in adults [2]. It is considered as the most dangerous form of skeletal tuberculosis as it can cause bone destruction, deformity and paraplegia; the reported incidence of neurological complications varies from 23 to 76% [8].

Diagnosis is often difficult as the clinical onset may be insidious and aspecific. Tubercular spinal localization in children is very rare (5%) [2]. The incidence of tubercular spinal disease with cord compression has not been reported for the paediatric age.

To estimate the clinical characteristic of children with both spinal TB and cord compression, a MEDLINE search was performed using the keywords "Tuberculosis, Spinal" AND "Spinal Cord Compression" as MESH terms. The results were limited to publications written in English, and relevant to paediatric age (0-18 years). We also limited the results to articles published in the time period between 2003 and January 2012. We examined a total of 13 manuscripts resulting from our MEDLINE search. Out of them, just 3 studies were eligible for inclusion in the meta-analysis [2, 6, 9] (Table 1). We excluded 9 articles for the following reasons:

1) they reported data on both adults and children, not analyzable separately;
2) they did not report the age of the patients included in the study [1, 8].

The child with spinal TB usually presents with pain and stiffness but the signs and symptoms vary according to the position and number of vertebrae involved. There is alteration of gait or posture secondary to muscle spasm [2, 6, 9]. For this reason, skeletal TB should be considered in any child infected with TB and in whom skeletal symptoms or signs not otherwise explained develop [5]. Plain radiography of the spine may show disc space narrowing or variable degrees of bone destruction. Modern imaging tech-

niques such as MRI have changed the prognosis of patients, because the pathological entity in the spinal cord can be discovered at an earlier stage, even when the clinical suspicion is low [2, 6, 8, 9]. In fact, MRI in vertebral TB gives a more precise picture of bony destruction as it can assess the extent of soft-tissue involvement and delineate vertebral bodies, discs and paraspinal tissues. It can also reveal paraspinal abscess and cord compression at a very early stage. For a definite diagnosis the bacilli should be cultured and isolated from the biopsy material [2]. Open biopsy, fine needle aspiration of bone, synovial fluid aspiration or synovial biopsy provide specimens for histology and culture [5].

As for therapy, in earlier cases reported in the literature, spinal tuberculosis has been managed by drainage and medical therapy [2, 6, 9]. In our case report as well, the patient developed spinal TB with cord compression, nevertheless an appropriate antitubercular therapy had been started nearly 3 weeks before.

Awareness of the clinical characteristics of tubercular spinal cord compression and providing rapidly initiated treatment are critical for preventing long-term morbidity and mortality. Early TB spondylitis without neural compression can be treated conservatively with a drug regimen [8, 10]. On the contrary, spinal cord compression is an acute surgical emergency that necessitate early diagnosis and urgent surgical decompression to achieve a successful

Table 1 - Children with both spinal tuberculosis and cord compression reported in literature from 2003 till 2012.

Pediatric spinal tuberculosis with cord compression				
	Author (reference)			
	Kapoor (9)	*Kiymaz (2)*	*Lee (6)*	*Bozzola (present article)*
No. of patients	1	1	1	1
Age of patient	9 months	1 year	13 months	13 years
Site	Craniovertebral junction	Thoracic vertebra bodies	Cervical and thoracic vertebra bodies	Dorsal, lumbar and sacral region
Spinal cord compression	Yes	Yes	yes	yes
Symptoms	Cessation of movements	Back and weakness in the feet, kyphotic deformity at the lower level	Weakness in his right arm and leg	Cervical and dorsal backache
MRI	Destruction of atlas, occiput and axis	Destruction of T8-9 vertebra bodies	Destructive bony lesions from the fourth cervical vertebra to the first thoracic vertebra	Mass lesions at D1-D4, at L1 and at S1 vertebral levels
Surgery	Surgical debridement	Anterior T8-9 corpectomy	Surgical decompression with a laminectomy and abscess drainage	Surgical decompression with a laminectomy and abscess drainage
Antitubercular drug	yes	yes	yes	yes
Mycobacterium tuberculosis	Not found	Found in the biopsy material	Found in the biopsy material	Found in the biopsy material

outcome [2, 9]. In details, a decompression within 48 hours is vital for neurological recovery of such patients. The goals of the surgery are to relieve pain, to decompress the spinal cord in an attempt to restore neurological function, to reconstruct the spine to prevent a late deformity, and to decrease the overall disease burden by wide debridement of infected tissue. In our case as well, we decompressed the cauda equina by performing laminectomy D3-D5 to relieve the clinically evident compression, with a good clinical outcome.

CONCLUSION

This unusual case underscores the need for physicians to consider the diagnosis of TB even if an anamnestic BCG vaccination at birth and to rapidly provide surgical treatment in case of spinal cord compression to avoid devasting sequelae, such as bone destruction, deformity and paraplegia.

Keywords: tuberculosis, spinal abscess, spinal cord compression.

SUMMARY

Tubercular spinal localization is very rare (5%) in paediatric age. We report the unusual case of a child with a history of bacillus Calmette-Guérin vaccination who presented with lymphadenitis in the absence of pulmonary involvement. Despite appropriate anti-tubercular therapy, the patient developed spinal tuberculosis with cord compression. Urgent surgical decompression was performed: laminectomy was done at D3-D5 levels and the higher abscess was then flushed using a catheter, decompressing the cauda equina. Our findings suggest that diagnosis of tuberculosis should be considered even in light of anamnestic vaccination at birth, and that surgical treatment should be rapidly provided in the event of spinal cord compression to avoid devastating sequelae.

RIASSUNTO

La tubercolosi spinale è rara (5%) in età pediatrica. Riportiamo il caso clinico inusuale di un bambino vaccinato per tubercolosi che è giunto alla nostra attenzione per linfoadenite in assenza di coinvolgimento polmonare e che, nonostante un'appropriata terapia specifica, ha sviluppato una compressione midollare. Una decompressione chirurgica urgente è stata effettuata. In dettaglio, è stata praticata una laminectomia D3-D5 con rimozione dell'ascesso più alto tramite catetere e decompressione. La diagnosi di tubercolosi va considerata anche in presenza di un'anamnesi di avvenuta vaccinazione alla nascita; inoltre il trattamento chirurgico deve essere effettuato rapidamente in caso di compressione midollare, al fine di evitare devastanti sequele.

REFERENCES

[1] Perez-Velex C.M. Pediatric tuberculosis: new guidelines and recommendations. *Curr. Opin. Pediatr.* 24, 319-328, 2012.

[2] Kiymaz N., Yilmaz N., Demir O. Spinal cord compression from spinal tuberculosis in a child. *Pediatr. Neurosurg*. 42(3), 180-182, 2006.

[3] Ndiaye M., Sene-Diouf F., Diop A.G., Sakho Y., Ndiaye M.M., Ndiaye I.P. Pott's spinal cord compression in the child. *Dakar Med.* 44, 49-53, 1999.

[4] Reihsaus E., Waldbaur H., Seeling W. Spinal epidural abscess: a meta-analysis of 915 patients. *Neurosurg. Rev.* 232, 175-204, 2002.

[5] Carrol E.D., Clark J.E., Cant A.J. Non-pulmonary tuberculosis. *Paediatr. Respir. Rev.* 2, 113-119, 2001.

[6] Lee I.C., Quek Y.W., Tsao S.M., Chang I.C., Sheu J.N., Chen J.Y. Unusual spinal tuberculosis with cord compression in an infant. *J. Child Neurol.* 25(10), 1284-1287, 2010.

[7] Feja K., Saiman L. Tuberculosis in children. *Clin. Chest Med.* 26, 295-312, 2005.

[8] Kotil K., Alan M.S., Bilge T.Medical management of Pott disease in the thoracic and lumbar spine: a prospective clinical study. *J. Neurosurg. Spine* 6(3), 222-228, 2007.

[9] Kapoor S.K., Tiwari A., Chaudhry A. An unusual case of craniovertebral junction tuberculosis in an infant. *Spine* (Phila Pa 1976). 32(23), E678-E6781, 2007.

[10] Kumar R. Spinal tuberculosis: with reference to the children of northern India. *Childs Nerv Syst.* 21(1), 19-26, 2005.