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Thoracic vertebrae spinal brucellosis with formation of epidural abscess

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Abstract: *Introduction:China is the largest developing country in the world, and the probability of Brucellosis is high in some areas. The incidence of spondylitis in brucellosis is 2% Mel 53%, and the most common site is the lumbar vertebrae. However, spinal cord compression caused by thoracic vertebrae brucellosis accompanied by epidural abscess is very rare. Methodology: We report a case a 59-year-old female with Brucella antibody test and serum agglutination test (SAT) for Brucella revealed brucella infection. Thoracic vertebrae magnetic resonance imaging (MRI) and computed tomography (CT) scan suggested T6, T7 vertebral destruction and at the same time, it is accompanied by spinal cord compression caused by epidural abscess. Based on preoperative clinical symptoms and auxiliary examination, Thoracic vertebrae spinal brucellosis with formation of epidural abscess suspected. Results: The preoperative symptoms of the patient decreased significantly after surgery. The patient Follow-up for 6 months showed that the pain was relieved, the nerve function recovered obviously, and the patients could walk independently. Conclusion: The formation of epidural abscess is a serious complication of spinal brucellosis, which can lead to permanent nerve damage. We have to make an early diagnosis, and when infection cannot be relieved by conservative treatment, or when neurological dysfunction continues to progress, priority should be given to surgical treatment.*

Keywords: *Brucella; Spondylitis; Spinal cord compression; Epidural abscess*

1. Introduction

Brucellosis is a worldwide zoonotic disease [1,2]. In China, sheep is the main source of infection, herdsmen or veterinarians pick up lambs as the main route of transmission, fur, meat processing, milking and so on can be infected through the skin and mucosa, and eating diseased animal meat, milk and dairy products can be transmitted through the digestive tract without lasting immunity. Reinfection is common after the disease. Brucellosis is a systemic infection caused by facultative intracellular bacteria of Brucella, which can affect various tissues and organs. Bone and joint involvement is the most common complication of brucellosis. Sacroiliac joints (up to 80%) and spinal joints (up to 54%) are the most common sites involved [3]. Spondylitis and discitis are the most common complications of spinal involvement in brucellosis. Brucellosis spondylitis is often difficult to diagnose because of its diverse and unspecific clinical manifestations [4]. The incidence of spondylitis in brucellosis is 2% Mel 53%. The most common site is the lumbar spine, followed by the cervical and thoracic vertebrae [5]. Clinically, it is most common that adult brucellosis infection causes adjacent or distant bone and joint involvement (spondylitis and discitis), while spinal cord compression caused by epidural abscess is very rare [6]. This article provides a related case and provides the treatment process.

2. Manuscript Preparation

2.1. Case report

The 59-year-old female patient was admitted to hospital mainly because of sensory disturbance below

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xiphoid process and sensorimotor disturbance of both lower limbs for 1 month, aggravated for 3 days. One month ago, there was no obvious inducement for chest and back pain, sensory disturbance under xiphoid process and sensorimotor disturbance of both lower limbs. There was a history of eating mutton and raising sheep in the past, and the above symptoms were obviously aggravated in recent 3 days and were hospitalized in Affiliated Heping Hospital of Changzhi Medical College. Admission physical examination: deep tenderness at the spinous process of thoracic vertebrae 6 and 7, obvious percussion pain, no radiation, normal sensation and motor reflex of both upper limbs, positive bilateral Hoffmann sign, normal skin sensation and loss of tactile sensation of trunk from xiphoid process, disappearance of abdominal wall reflex, loss of skin pain and tactile sensation of both lower limbs, bilateral hip flexion, knee extensor, ankle dorsal extensor and ankle metatarsal flexor muscle strength grade 2. Bilateral knee reflex, ankle reflex (++++), bilateral lower limb straight leg elevation test negative, bilateral Babinski sign positive, ankle clonus positive, perineal numbness, sphincter dysfunction.

Conduct auxiliary inspection. The blood routine: a white blood cell count (WBC) of 3.3×109 cells/L (reference range: 4×109 to 10×109 cells/L), neutrophil percentage (NE%) is 75.7% (reference range: 50%-70%), lymphocyte percentage (LY%) is 15.9% (reference range: 20%-40%), monocyte percentage is 8% (reference range: 3%-8%),erythrocyte sedimentation rate（ESR）of 77.0 mm/hour (reference range: < 15 mm/hour), C-reactive protein (CRP) level of 23.55 mg/L (reference range: < 8.2 mg/L). MRI of thoracic vertebrae at admission showed uneven enhancement of T6 and T7 vertebrae, pedicles and spinous processes, patchy necrotic cystic areas in vertebral bodies, multiple annular enhancement in para spinal soft tissue enhancement, involvement of bilateral intervertebral foramen in T6 and T7 vertebrae, compression of spinal cord at the same level, and no abnormal enhancement signal. Consideration: infection of T6 and T7 vertebrae with para spinal and intra spinal epidural abscess (Figure 1). CT of thoracic vertebrae showed slightly lower density of T6, gaseous low density shadow of T6-T7 vertebrae intervertebral space, thickening of para spinal soft tissue of T6 and T7 vertebrae, and "insect phagocytic" changes in thoracic vertebrae. Consideration: decreased local density of T6 vertebrae, bone destruction, and signs of intervertebral disc degeneration of T6-T7 vertebrae (Figure 2).

Figure 1: MRI of thoracic vertebrae spine: sagittal images showed enhancement of T6 and T7 vertebrae and formation of epidural abscess.

Figure 2: CT of thoracic vertebrae spine: At T6 and T7 vertebrae, there were air hypo dense opacities in the intervertebral space, thickening of the para spinal soft tissue in the T6 and T7 vertebrae, and "moth eaten" changes in the thoracic vertebral bodies.

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The results of Brucella antibody test and Serum agglutination test (SAT) were all positive. Diagnosis of brucellosis spondylitis (T6, T7), thoracic abscess C-arm guided percutaneous catheter drainage, but no pus and other tissue outflow was found in this operation. The corresponding symptomatic and antibacterial treatments were given: oral 600mg/ of rifampicin capsule, once a day; doxycycline hydrochloride tablets, 100mg/, twice a day; and local injection of streptomycin sulfate for injection 1g/, once a day. Levofloxacin hydrochloride injection was given 0.4g/ intravenously once a day. When the pain is severe, analgesic drugs such as pareoxib sodium are given. At the same time, patients are advised to stay in bed appropriately. After 3 weeks of treatment, the symptoms of the patients were slightly relieved. Re-examination of thoracic vertebra MRI showed that the necrotic area of vertebral body and spinal canal lesions in MRI was less than that before admission, and the spinal cord was compressed at the same level and no abnormal enhancement signal was found, which was lighter than that before. Consideration: T6, T7 vertebral body infection with para spinal and intra spinal epidural abscess formation, after treatment, the lesion was slightly alleviated (Figure 3). Due to the persistence of neurological symptoms, there was no obvious relief after conservative treatment. Posterior thoracic lamina decompression, transcostal transverse process spinal cord resection and decompression, focus debridement, pedicle screw internal fixation and percutaneous catheterization were performed under general anesthesia (Figure 4).

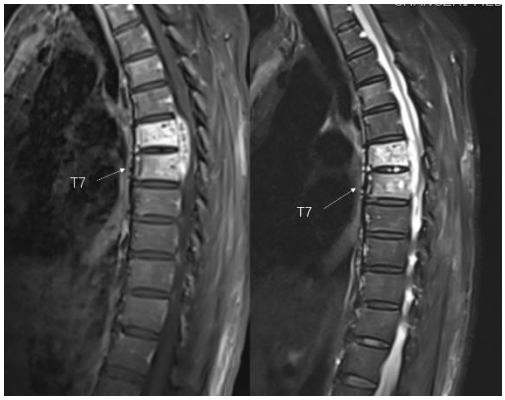

Figure 3: MRI of thoracic vertebrae spine: Compared with the previous Figure 1, the necrotic area of vertebral body and spinal canal was slightly reduced.

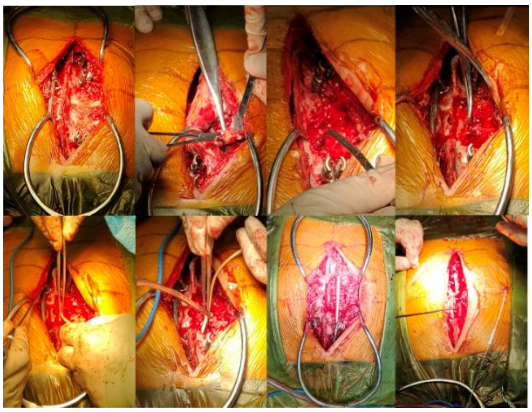

Figure 4: Posterior decompression of thoracic lamina, lateral anterior resection and decompression of trans costal transverse process of spinal cord, focus debridement, pedicle screw fixation and percutaneous catheterization.

The symptoms of the patients were obviously relieved after operation, rifampicin capsules were taken orally 600mg/ once a day, and doxycycline hydrochloride tablets were taken orally 100mg/ twice a day. Postoperative MRI of thoracic vertebrae showed that the sequence of thoracic vertebrae was neat and curvature existed, internal fixation shadow was seen in chest 4, 5, 8 and 9, the left accessory part was absent, and uneven long T2 signal was seen in the left side of the vertebra. Consideration: postoperative changes of thoracic 6 and 7 vertebral body infection (Figure 5). Follow-up for 6 months showed that the pain was relieved, the nerve function recovered obviously, and the patients could walk independently.

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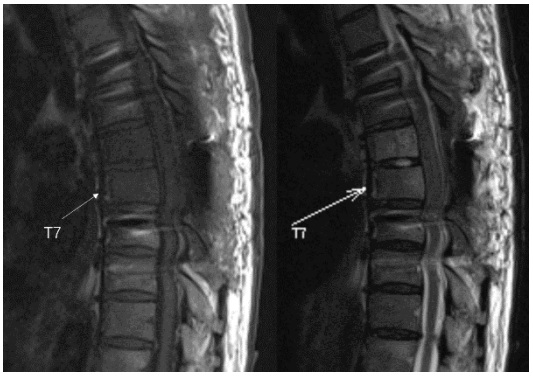

Figure 5: MRI of thoracic vertebrae spine: Partial absence of left accessory, clearance of intra spinal abscess and postoperative changes of T6 and T7 vertebral body infection.

2.2. Discussion

The Brucellosis spondylitis usually begins in the upper endplate, an area with a rich blood supply, but sometimes the lower endplate may be involved. The further progression of the infection depends on the virulence of the organism and the immunity of the host, so the infection may subside, but it may also involve the entire vertebral body and intervertebral disc space, and then involve the adjacent vertebral body or abscess to form compression of the dura and cause neurological symptoms. [7,13].

Magnetic resonance imaging (MR) is very important in the diagnosis, evaluation and treatment of patients with spondylitis. There are two known forms of brucellosis spondylitis, focal and diffuse [3]. 1 focal brucellosis spondylitis is defined as abnormal signal in the focus area, usually located in the anterior part of the vertebral endplate at the junction of the intervertebral disc. (2) diffuse brucellosis spondylitis refers to the diffuse abnormal signal intensity of the adjacent vertebral body and intervertebral disc. In our case, we found that the upper and lower endplates of T6 and T7 vertebrae were involved, and there was an abscess near the vertebrae, which was diffuse brucellosis spondylitis [8].

Epidural abscesses associated with brucellosis are rare and can cause spinal cord and nerve root compression due to the formation of epidural granulomas or abscesses in spondylitis. Usually manifested as paravertebral tenderness, nerve root symptoms, followed by abdominal distension, defecation dysfunction, and even progression to paraplegia [9]. Among them, nerve root compression mainly occurs in the lumbar region, while spinal cord compression caused by cervical and thoracic epidural abscess is more common. In our case, epidural abscess formation may be continuous with spondylitis, the main symptom of the patient is chest and back pain, through serological examination and magnetic resonance imaging, diagnosed as thoracic brucellosis spondylitis with epidural abscess formation [10]. Therefore, it is considered that regular imaging evaluation should be performed in patients with brucellosis spondylitis with intractable localized pain or para spinal tenderness, which is necessary for early diagnosis of epidural abscess and monitoring progress.

Drug therapy and surgical treatment are two options to cure brucellosis spondylitis [3]. Conservative treatment: Brucella colonized in the host cell, so the effective antimicrobial agents with high intracellular concentration should be selected. Because of the high recurrence rate of single drug treatment, rifampicin 600-900mg/d combined with doxycycline 200mg/d should be used for 6 weeks [11]. This patient had obvious signs of nerve compression, and there was no obvious relief after conservative treatment, so he was treated by operation [6,7,12,13]. Related literature studies have found that percutaneous intervertebral foramen endoscopic focus debridement and double lumen tube irrigation and drainage is effective, so we first use a more convenient C-arm-guided percutaneous drainage of thoracic abscess [14], but there is no outflow of necrotic tissue such as pus in this operation. it is speculated that the abscess is not pure liquid and spinal cord compression has not been relieved, so we improve the treatment plan. The surgical methods were as follows: posterior thoracic lamina decompression under general anesthesia, lateral anterior resection and decompression of trans costal transverse process of spinal cord, focus debridement, pedicle screw fixation, percutaneous catheterization (Figure 4), complete debridement of the focus under direct vision and implantation of drainage tube. the postoperative neurological symptoms were significantly relieved and the curative effect was significant.

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3. Conclusions

In short, the formation of epidural abscess is a serious complication of Spinal brucellosis [14], which can lead to permanent nerve damage. Early diagnosis is particularly important, and special attention should be paid to patients with fever, Para spinal muscle spasm, lower back pain and chest and back pain. Treatment must be continuously improved according to the severity of the disease, patients' clinical manifestations and treatment responses. When infection cannot be relieved by conservative treatment, or when neurological dysfunction continues to progress, priority should be given to surgical treatment [15].

Acknowledgements

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