Histoplasmosis mimicking metastatic spinal tumour

Bing Liu, Liyan Qu, Jian Zhu, Zhengming Yang and Shigui Yan

Abstract
Histoplasmosis is an infection caused by a fungus called Histoplasma. Diagnosis of histoplasmosis is based on the culture of biological samples and detection of fungus in tissues. Histoplasmosis can mimic malignant lesions. We report a 65-year-old, immunocompetent, male patient with back pain. We describe the main clinical and radiological characteristics in our patient who had vertebral histoplasmosis that mimicked cancer. A computed tomography scan showed lytic lesions of the right side of T4, T5, and T6 vertebral bodies. Magnetic resonance imaging displayed abnormal marrow signals in T4, T5, and T6 vertebral bodies (low signal on T1, high on T2 and short time inversion recovery (STIR)). Which was mimicking malignancy, such as haematological malignancy and metastatic bone cancer. Therefore, thoracic spinal surgery using the anterior approach was performed. An intraoperative frozen section examination and routine postoperative pathology showed thoracic histoplasmosis infection. Treatment of histoplasmosis was performed with oral itraconazole. The lesions did not progress and the patient symptomatically improved at a follow-up of 26 months.

Keywords
Histoplasmosis, spine, infection, cancer

Introduction
Histoplasmosis is caused by reproductive spores of the fungus Histoplasma capsulatum. Primary pulmonary infection is most commonly transmitted when these spores become airborne, often during clean-up or demolition projects. Air currents can carry the spores, which float in the air and expose unsuspecting individuals to contaminated sites. Histoplasmosis is not contagious, and thus cannot be spread from person to person. Disseminated histoplasmosis usually

1Department of Orthopedics, Second Affiliated Hospital, School of Medicine, Zhejiang University, Hangzhou, Zhejiang, China
2Clinical Laboratory Centre, Second Affiliated Hospital, School of Medicine, Zhejiang University, Hangzhou, Zhejiang, China
3Clinical Laboratory Centre, Binjiang Hospital of Hangzhou, Hangzhou, Zhejiang, China

Corresponding authors:
Zhengming Yang and Shigui Yan, Department of Orthopedics, Second Affiliated Hospital, School of Medicine, Zhejiang University, #88 Jie Fang Road, Hangzhou, 310009, Zhejiang, China.
Emails: zhengmingyang_zrgk@163.com; shiguuiyan_zrgk@163.com
presents as a progressive disease, which can affect nearly any part of the body and is considered as infiltration of macrophages into infected tissues. Histoplasmosis is classically described as an endemic mycosis, which often occurs in patients with an immunocompromised condition. Chronic, progressive, disseminated infection of histoplasmosis rarely occurs in older adults who do not have compromised immune systems. Many cases of histoplasmosis mimic malignancy. We report a 65-year-old immunocompetent male patient with back pain. We describe the main clinical and radiological characteristics of our patient who had vertebral histoplasmosis that mimicked cancer.

**Case report**

A 65-year-old man visited our hospital because of his gradually worsening back pain for 2 months. He was administered Nonsteroidal Antiinflammatory Drugs (NSAIDs) and paracetamol for pain relief, but these did not relieve the pain. He denied any persistent fevers, night sweats, chills, and respiratory symptoms. His past medical history and review of systems were unremarkable. A physical examination showed that the patient had a clear consciousness, upper thoracic (over the T4 and T6 vertebrae) percussion pain of the spine, myodynia was V, and reflexes were all normal. The cervical and lumbosacral spine was clinically

**Figure 1.** (a) Anteroposterior and (b) lateral plain radiographs showing an osteolytic lesion with a pathological fracture in T5
normal. Laboratory tests showed a white blood cell (WBC) count of $7.1 \times 10^9/L$ and the percentage of neutrophilic granulocytes was 83.2%, the C-reactive protein (CRP) level was 63.0 mg/L, and a T-spot was negative. A bone marrow biopsy was normal.

An X-ray of the thoracic spine showed slight compression of the body of T6 (Figure 1). Ultrasonic examination of the pelvis and abdomen was normal. A computed tomography (CT) scan showed lytic lesions of the right side of the T4, T5, and T6 vertebral bodies (Figure 2). Magnetic resonance imaging (MRI) displayed abnormal marrow signals in T4, T5, and T6 vertebral bodies (low signal on T1, high signal on T2 and short time inversion recovery), with some compressed fracture of the T5 body and the lesions partly extended into the right pedicle (Figure 3). Which is mimicking malignancy, such as haematological malignancy and metastatic bone cancer. The spinal cord was normal. There was no intra-spinal or extra-osseous component. A Positron Emission Computed Tomography

Figure 2. T5 (a) and T6 (b), and spinal sagittal plane (c) and coronal plane (d) CT scans show lytic lesions of the right side of T4, T5, and T6 vertebral bodies
PET-CT scan demonstrated increased uptake in T4, T5, and T6 vertebrae on late films. A CT-guided transpedicular biopsy of T6 showed a lesion (Figure 4). A histopathological examination showed granulomatous inflammation with necrosis, which was highly suggestive of tuberculosis. Therefore, the patient was administered isoniazid, rifampicin, pyrazinamide, and ethambutol for 2 weeks. The CRP level was 5.6 mg/L. Thoracic spinal surgery using the anterior approach was performed (Figure 5). An intraoperative frozen section examination showed thoracic histoplasmosis infection (Figure 6). Routine MRI shows abnormal marrow signals (low signal on T1, high on T2 and STIR) in T4, T5, and T6 vertebral bodies. There is some compression of the T5 body and extension into the right pedicle, which mimics malignancy.

Figure 3. T1-weighted (a) and T2-weighted (b) MRI findings

Figure 4. CT-guided transpedicular biopsy of T6
Figure 5. (a) Anteroposterior and (b) lateral radiographs 26 months after surgery. The lesions have not progressed and the patient was asymptomatic.

Figure 6. (a) Histopathology from CT-guided transpedicular biopsy showing granulomatous inflammation with necrosis, tuberculosis. (b) An intraoperative frozen section examination and routine postoperative pathology show thoracic histoplasmosis infection.
postoperative pathology, and specific myco-
logical stains, such as Giemsa, PAS, and
periodic acid-silver methenamine, also con-
firmed thoracic histoplasmosis infection
(Figure 7). The patient’s back pain was
relieved. He was treated with itraconazole
for 12 months. At a 26-month follow-up, the
lesions had not progressed. The patient was
pain-free and asymptomatic, and was able
to return to his active lifestyle.

Discussion
Histoplasmosis is caused by the reproductive
spores of the fungus *Histoplasma capsulatum*,
which is global, but is mainly concentrated
in Central and North America. Immunocompetent infection with histoplas-
mosis is asymptomatic. Acute pulmonary
histoplasmosis results in symptoms 8. Pulmonary infection is the main presentation
of histoplasmosis 9. However, our case was a
65-year-old man who was immunocompe-
tent and presented with no pulmonary dis-
ease. He had no symptoms of productive
cough, weight loss, fever, or night sweats,
but had spinal presentation of histoplasmo-
sis mimicking a malignant tumour. His
WBC count was normal, the CRP level
was 63.0 mg/L, and a T-spot was negative.
He was administered isoniazid, rifampicin,
pyrazinamide, and ethambutol for 2 weeks,
and then his CRP level was 5.6 mg/L.

Patients with histoplasmosis have been
misdiagnosed as having a malignant tumour
10. On CT scans, as well as MRI or PET-CT,
histoplasmosis can mimic malignant lesions.
Our case appeared to have haematological
malignancy, but a bone marrow biopsy was
normal. We performed thoracic spinal
surgery using the anterior approach because lesions appeared to be malignant. An intraoperative frozen section examination and routine postoperative pathology showed thoracic histoplasmosis infection. The infection did not progress and he had symptomatically improved at a follow-up of 26 months. Histoplasmosis was found to mimic tuberculosis spondylodiscitis in a patient with rheumatoid arthritis, which can still simulate tuberculous spondylitis. Therefore, histoplasmosis with tuberculosis and malignant lesions should be identified.

Diagnosis of histoplasmosis is based on culture of biological samples and detection of the fungus in lesions. Treatment of patients with histoplasmosis and severe acute/chronic respiratory or localized forms can be performed with intravenous or oral itraconazole.

In brief, histoplasmosis in the spine should be considered as a differential diagnosis of haematological malignancy and metastatic malignancy. Delaying treatment of this condition can result in severe manifestations.

**Patient consent**

The patient provided verbal consent.

**Declaration of conflicting interest**

The Authors declare that there is no conflict of interest.

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