

Hepatocellular Carcinoma with Acute Spinal Cord Compression as the Initial Presentation

Helen L. Po, Pei-Hao Chen, Sho-Jen Cheng¹, and I-Hung Hseuh

Abstract- Primary hepatocellular carcinoma (HCC) ranks as the most lethal malignancy in Taiwan. Its initial presentation as acute spinal cord compression from epidural metastasis is rare. Because of newer treatment modalities and better control of the primary tumor, the mean survival has increased, making early diagnosis and detection of distant metastases of utmost importance. The authors describe a 60-year-old man presented with a sudden onset of bilateral lower limb weakness and a sensory level at T8. Plain film of the thoracic spine was normal. Magnetic resonance imaging of the thoracic spine showed a large intraspinal epidural tumor at T6 level causing spinal cord compression. A diagnosis of HCC with epidural metastasis was made after surgical removal of the tumor mass.

Key Words: Hepatocellular carcinoma, Magnetic resonance imaging, Metastasis, Radiotherapy, Spinal cord compression

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INTRODUCTION

Spinal cord compression from epidural metastasis occurs in 5 percent of cancer patients⁽¹⁾. It is among the most dreaded complications of cancer. With the development of new chemotherapeutic agents and the progress in diagnostic procedures, the survival rate of cancer patients is increased; the occurrence of spinal metastases may be expected to increase⁽²⁾. Extrahepatic spreading is not uncommon in patients with hepatocellular carcinoma (HCC). The most common sites are lungs, lymph nodes, and the portal vein, whereas involvement of the spine is rare, with the incidence varying from

1.74% to 4.3%⁽³⁻⁵⁾. Moreover, epidural spinal cord compression as the presenting manifestation of HCC is exceedingly rare. The incidence of this metastatic type ranges in the literature from 0.03% to 1.52%⁽³⁻⁵⁾. In this article, we report a case whose clinical and radiological features of spinal cord compression led to the diagnosis of HCC.

CASE REPORT

A 60-year-old man presented with a sudden onset of bilateral lower limb weakness. He had low back pain with the character of constant dull ache, which aggravated

From the Departments of Neurology, and ¹Radiology, Mackay Memorial Hospital, Taipei, Taiwan.
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Reprint requests and correspondence to: Helen L. Po, MD, Department of Neurology, Mackay Memorial Hospital, No. 92, Sec. 2, Chung-Shan North Road, Taipei, Taiwan.
E-mail: wjfu1660@yahoo.com

ed with recumbency about one month prior to admission. His past medical history included cirrhosis of the liver and essential hypertension. He had a positive serology for hepatitis B surface antigen and hepatitis C antibody. Pertinent neurological findings on admission included impairment of sensations at T8 level, and sphincter disturbances. Muscle power was grade 2/5 on the Medical Research Council scale in the lower extremities; the deep tendon reflexes were areflexia with plantar extensor response bilaterally.

Abnormal laboratory parameters were as follows: platelets, $73 \times 10^3/\mu\text{L}$; fasting glucose, 132 mg/dL; albumin, 3.3 gm/dL; serum glutamic-oxaloacetic transaminase, 54 IU/L; serum glutamic pyruvic transaminase, 51 IU/L; total cholesterol, 325 mg/dL; BUN, 31 mg/dL; uric acid, 9.7 mg/dL.

Chest x-ray and plain radiograph of the thoracic spine were unremarkable (Fig. 1). Ultrasound of the abdomen revealed very coarse liver parenchyma suggesting liver cirrhosis. Intravenous corticosteroids in the form of dexamethasone was administered promptly to

the patient after spinal cord compression was strongly suspected on clinical grounds, pending confirmation by diagnostic imaging. Subsequently, magnetic resonance imaging (MRI) of the thoracic spine showed a tumor growth in the spinal epidural space at T6 level with spinal cord compression (Fig. 2). Progressive neurological deterioration occurs rapidly despite large doses of corticosteroids, and patient underwent decompression laminectomy with removal of intraspinal tumor on the following day. Pathologic examination revealed metastatic HCC (Fig. 3). Postoperatively, laboratory studies showed markedly elevated serum alpha-fetoprotein (>800 ng/mL). Computed tomography of the abdomen further confirmed the presence of diffuse type of HCC involving both lobes of the liver. Whole body bone scan showed multiple metastatic bony lesions involving T5, T6, left scapula, and left acetabulum. Palliative radiotherapy was given to the spine and the other bony lesions for pain control. His neurological symptoms did not improve. The general condition deteriorated, and he died one month later.

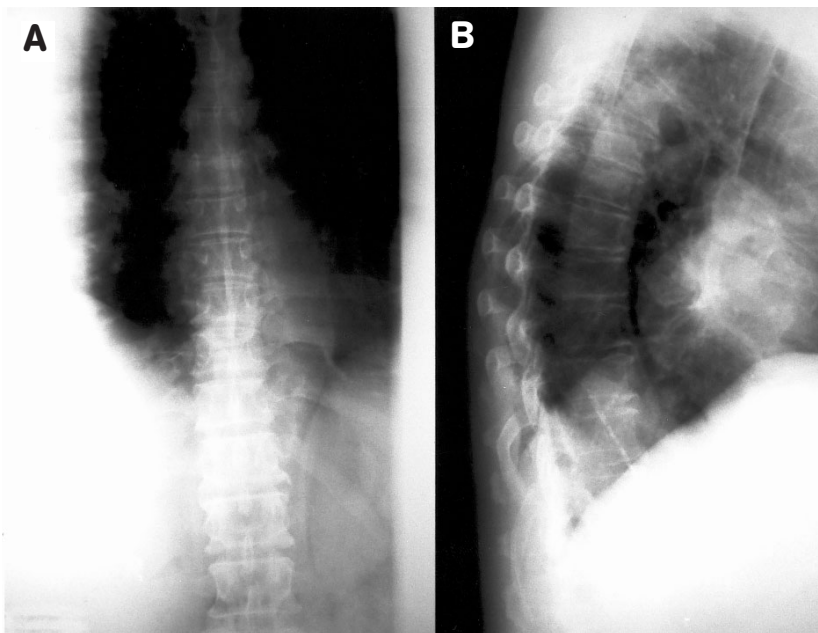


Figure 1. Thoracic spine x-ray shows normal bony structures. (A) Anteroposterior view. (B) Lateral view.



Figure 2. Sagittal T2-weighted non-contrast MRI of the thoracic spine showing abnormal infiltration of the T6 vertebral body associated with a large intraspinal extradural mass causing cord compression. The tumor has signal intensity of soft tissues.

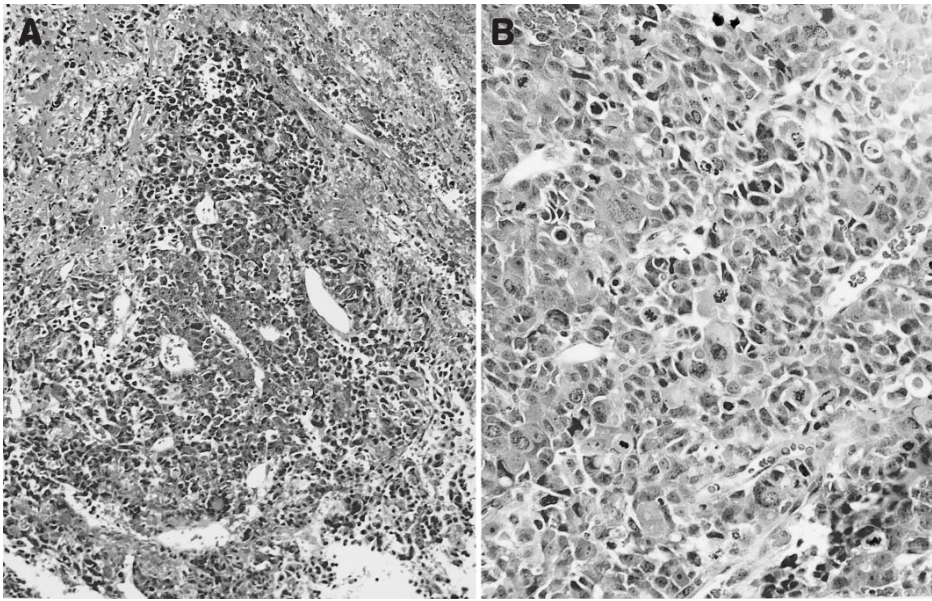


Figure 3. Biopsy specimen of the spinal cord lesion shows typical histologic features of hepatocellular carcinoma with trabecular pattern. (A) H&E $\times 100$. (B) H&E $\times 200$.

DISCUSSION

Neurological deficits resulting from spinal cord compression cause serious morbidity and markedly compromise the quality of life in cancer patients^(6,7). The daunting clinical challenge is to diagnose the condition and start treatment before neurological injury occurs because pre-treatment level of neurological function is by far the most important predictor of post-treatment functions⁽⁸⁾. The understanding of pathogenesis, early symptoms, clinical course, diagnostic imaging, and treatment options is crucial in the prevention and minimization of neurological deficits⁽⁶⁻⁸⁾.

Epidural spinal cord compression typically arises from metastasis to one of three locations: the spinal column (in most cases), outgrowth of metastasis which eventually invades the epidural space; the paraspinal region through the neural foramen of vertebral bones, or rarely directly to the epidural space^(6,8). Metastatic spread to the spinal column usually occurs through the pulmonary circulation or the valveless vertebral venous system known as Batson's plexus⁽⁹⁾. More recently, experimental models have emphasized the role of arterial seeding⁽¹⁰⁾. Because spine metastasis of HCC is seen frequently in patients without lung metastasis⁽¹¹⁾, as in our patient, the vertebral venous plexus may be a route by

which tumor cells of HCC spread to the bones and eventually to the epidural space. The pattern of metastases in HCC with cirrhosis is different from that in HCC without cirrhosis, i.e., HCC that arise in cirrhotic liver has few bony metastases^(12,13). Our patient, who suffered from liver cirrhosis and HCC, not only had extrahepatic metastases at an unusual site, but also had spinal cord compression as the initial manifestation of HCC.

Pain, as in our patient, is the initial symptom in approximately 95 percent of adults, and has been present for a median of weeks to months⁽⁸⁾. It may be worse with recumbency, a feature that can distinguish it from the pain of degenerative joint disease.

Conventional radiographic examination is usually the initial imaging modality^(6,14). It is relatively insensitive for early bone metastases, because cortical bone is responsible for most of the bone density depicted in the plain x-rays and the fact that cancellous bone is usually the first site of skeletal metastases^(14,15). Plain films were falsely negative in 10-17 percent of cases⁽⁶⁾; this is in agreement with our experience in this patient. A recent large prospective study also found that plain x-rays did not have adequate predictive value to warrant their routine use⁽¹⁶⁾. Radionuclide bone scanning, though highly sensitive in localizing skeletal abnormalities, is nonspecific as to the causes of increased radionuclide uptake⁽¹⁴⁾.

Bone scans cannot identify whether epidural tumor is present. It is not commonly utilized at present in the assessment of epidural spinal cord compression⁽¹⁷⁾. Because the majority of bony metastases involve the bone marrow, MRI is the most sensitive imaging modality that depicts bone marrow involvement, and can show the components of vertebrae infiltrated by the tumor, e.g. body, pedicle, lamina, spinous process. It also provides the most detailed information regarding the location and extent of intraspinal epidural masses compressing the cord^(6,14,18). More recently, Colletti and colleagues demonstrated that MRI altered planned treatment in more than 40 percent of patients because MRI can delineate exactly the craniocaudal extent of the tumor^(18,19).

Corticosteroids and radiation therapy are the mainstays of treatment. Clinical and laboratory studies demonstrate that corticosteroids improve clinical outcome and have salutary effects on pain⁽⁸⁾. More recently, radiation therapy has become the primary definitive treatment for most patients with metastatic epidural spinal cord compression. Aside from providing adequate pain control, it effectively prevents further tumor growth and neurological damage⁽⁶⁾. In addition to pre-treatment neurological status, tumor type is also important in determining the treatment outcome of radiation therapy because some tumors are simply more sensitive to radiation than others^(5,8).

The role of surgery in the treatment of spinal metastasis is often a subject of debate. The main purpose was to decompress the spinal cord and nerve roots but not to attempt radical cure of the lesion. Therefore this must be performed as early as possible. Once neurological damage is complete and stable, surgery is useless unless it is intended for some other purpose⁽⁷⁾. Surgery can be considered in the following circumstances: in patients when the diagnosis of the spinal lesion is in doubt, in those with progressive neurological deterioration despite large doses of corticosteroids, in patients with radioresistant primary tumors and intractable pain, in those with spinal instability, and in those with deterioration during radiotherapy or with recurrence following radiotherapy^(6,8). At present, no definitive guidelines is available regarding the merits of the two approaches.

In conclusion, it is worth stressing that HCC should

be included in the differential diagnosis of metastatic epidural spinal cord compression, particularly in Taiwan, because it may be the initial manifestation, with or without overt signs of liver disease.

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