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Case Report

Surgical salvage for sudden quadriplegia due to recurrent hepatocellular carcinoma with spinal metastasis

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ABSTRACT

The occurrence of spinal cord compression together with quadriplegia due to metastasis from hepatocellular carcinoma (HCC) is rare. There is a dilemma over whether to use aggressive treatment when metastases occur in multiple organs but death is not imminent. Herein, we report the case of a 45-year-old man who had sudden quadriplegia 22 months after undergoing a right hemihepatectomy for HCC. Both intrahepatic recurrence and extrahepatic spinal metastasis were found at that time. After an aggressive surgery for cervical spinal metastasis, he resumed walking and daily activities quickly. His postoperative ambulation time was at least 4.4 months. The patient could feed himself until the last 2 weeks of life. His survival was 6.8 months, even though he did not receive sorafenib.

1. Introduction

Extrahepatic recurrence of hepatocellular carcinoma (HCC) is infrequent after treatment of the primary tumor [1]. Aggressive treatment for extrahepatic recurrence may be unnecessary because it is usually not the cause of death [2]. However, it may lead to severe disability before death. In this case report, we describe a patient who experienced quadriplegia from a recurrent tumor in the cervical spine 22 months after liver resection for HCC.

2. Case report

A 45-year-old man with a history of hepatitis B and C virus co-infection and liver cirrhosis was diagnosed with a 3.5-cm HCC in the posterior sector of the liver with right hepatic duct invasion. He had a right hemihepatectomy without perioperative complications. Focal microvascular portal invasion by the tumor was also found after the surgery. His disease was then under surveillance with serum alpha-fetoprotein and four-phase liver computed tomography (CT) every 3 months.

Twenty-two months after the resection, he experienced sudden weakness of all four extremities when he was standing and cooking at home. He was weak but still able to take few steps before he was brought by ambulance to the emergency department. Upon arrival, he could no longer walk. Physical examination showed quadriplegia with preservation of the bilateral deltoid muscle and right biceps muscle. Sensation in both arms was impaired below the C5 level on the left side and below the C6 level on the right. His liver function was classified as Child–Pugh A. He had thrombocytopenia (platelets 35,000/μL), similar to that reported before and after liver resection over the previous 2 years. An emergency magnetic resonance imaging showed a tumor involving the transverse processes, lamina, and spinous processes of the C5, C6, and C7 vertebrae. C6 spinal cord compression was also found (Fig. 1). A dynamic liver CT revealed a single 3-cm recurrent HCC in segment IV of the liver. The patient's serum alpha-fetoprotein level was 60.4 ng/mL.

The patient received high dose of corticosteroids in the emergency department. Palliative radiotherapy alone was initially considered. However, severe pain in his neck and shoulders became worse and then voluntary flexion of his right elbow was completely lost within 3 days. A total laminectomy of the C5, C6, and C7 vertebrae, and excision of the spinal bone tumor was done. The pathologic diagnosis was metastatic HCC and immunohistochemical staining for glypican-3 was positive. The surgical margin was not free but contained cancer cells.

The patient resumed walking within 10 days after the surgery. The power of the muscles innervated by the C7 to T1 nerve roots did not completely recover, but motor function in both upper limbs was good enough to perform daily activities. He was able to urinate and defecate independently. The intrahepatic recurrence was treated by

Conflicts of interest: none.

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Fig. 1. T2 MRI showing C6 spinal cord compression from a metastatic bone tumor.

transarterial chemoembolization soon after the spinal surgery. He also tolerated subsequent radiotherapy of 40 Gy in 20 fractions to his spine. However, the patient could not afford sorafenib.

The pain in the posterior aspect of the patient's neck and bilateral shoulders was mild and he handled daily life independently in the first 3 months after treatment. Transarterial chemoembolization was repeated for the same intrahepatic tumor. However, progressive numbness and greater pain in the bilateral shoulders to forearms began 4.4 months after spinal decompression. Magnetic resonance imaging showed focal recurrence of HCC (Fig. 2). Multiple asymptomatic subcentimeter lung metastases were also revealed. Intrahepatic disease appeared stable on a dynamic CT. Comfort care without invasive treatments was chosen at that time. The patient died in a hospice at the hospital 6.8 months after the spinal surgery. He had lived outside the hospital for a total of 84 days postoperatively. In the patient's last 4 weeks of life, standing and walking became very difficult because of whole-body pain and weakness in the bilateral lower extremities. Muscle power and coordination of both hands and fingers worsened. However, the patient still fed himself until the last 2 weeks of his life. Serum bilirubin and albumin levels were normal and there was no jaundice, symptomatic ascites, or gastrointestinal bleeding before death. Signs of respiratory distress were not obvious until the last moments of life. Although neurogenic respiratory failure due to tumor compression or invasion into spinal cord was suspected, the direct cause of death was not confirmed by autopsy reports.

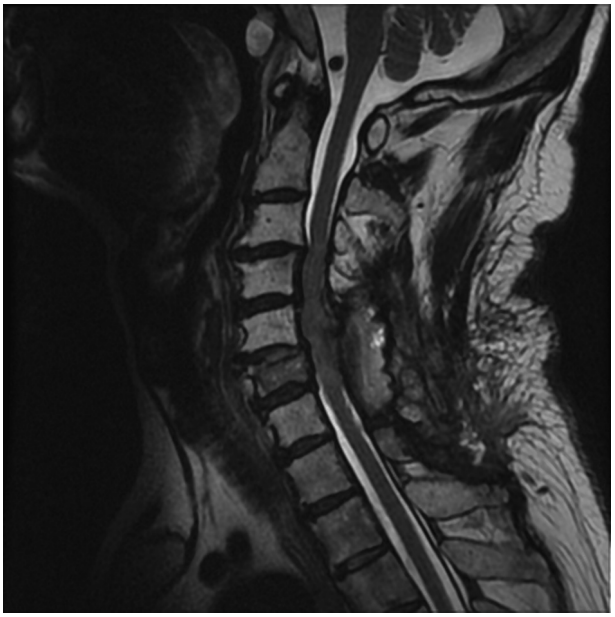

Fig. 2. T2 MRI showing the cervical spinal cord surrounded by focal recurrence in the epidural soft tissue behind and the body of C6 vertebral bone in front.

3. Discussion

The incidence of extrahepatic bone metastasis of HCC was low in an HCC pandemic area [1]. Routine examination for bone metastasis was not included in surveillance of patients with HCC. For patients with concurrent intrahepatic HCC and extrahepatic metastases, and also with good performance status and preserved liver function, sorafenib is the recommended treatment worldwide [3–5]. Survival of these patients may also benefit from transarterial chemoembolization for liver tumors [6]. In highly selected patients, surgical resection of HCC lung metastases may prolong survival [7,8]. However, surgical resection versus nonsurgical treatment has not been well studied for HCC vertebral metastases. With metastatic spinal cord compression and quadriplegia, as in our patient, the situation can become an oncologic emergency and sorafenib administration alone would not be enough. Aggressive, rapid treatment is required to improve the patient's quality of life. A combination of high-dose dexamethasone and radiotherapy is the established first-line therapy for metastatic spinal cord compression [9]. However, HCC has an unfavorable histology for radiotherapy [10]. When radiation dose escalation is not tolerated by patients, surgical decompression can be used for salvage treatment [11]. Such salvage surgery should be done early, because postoperative ambulation time was much longer in patients who were not nonambulatory yet before spinal surgery [12]. Our patient recovered soon after the surgery. His walking ability was Nurick Grade 3 or better for at least 4.4 months [13]. His performance was good enough for activities with his family in the last several months of his life. This performance was very important for him to prepare for the end of his life as he could take videos of himself as last gifts to his child. This experience has encouraged us to consider surgical treatment for similar patients in the future.

The purpose of surgery and radiation for our patient was preservation of neurologic function but not survival. Although sorafenib may prolong his survival, he cannot afford it. In the Asia-Pacific trial of sorafenib, the median overall survival was 4.2 months [95% confidence interval (CI): 3.75–5.46] in the placebo group and 6.5 months (95% CI: 5.56–7.56) in the sorafenib group [14]. Although our patient did not have sorafenib, his survival time after spinal surgery was 6.83 months. His outcome was not inferior to that of most patients with advanced HCC who did not receive sorafenib, and was comparable with patients who did receive sorafenib. The direct cause of death of this patient was not the intrahepatic recurrent tumor or liver failure. This was an unusual case because approximately 95% of patients with HCC extrahepatic metastasis die of primary liver disease or liver failure rather than extrahepatic disease [2]. It is possible that aggressive treatment of extrahepatic tumors can prolong survival if such extrahepatic tumor is expected to be the direct cause of death in the future. However, prediction of direct cause of death is still very difficult when concurrent intrahepatic and extrahepatic recurrences are found.

In conclusion, when patients without liver failure or imminent death develop quadriplegia, spinal surgery to restore neurologic function is worthwhile. It can improve quality of life, even if it does not really prolong life.

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