

# SKULL METASTASIS OF HEPATOCELLULAR CARCINOMA ASSOCIATED WITH ACUTE EPIDURAL HEMATOMA: A CASE REPORT

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Hayashi K, Matsuo T, Kurihara M, Daikoku M, Kitange G, Shibata S. Skull metastasis of hepatocellular carcinoma associated with acute epidural hematoma: a case report. *Surg Neurol* 2000;53:379–82.

## BACKGROUND

Although epidural hematoma is well documented in trauma patients, its association with other etiologies, such as neoplasms, is not widely known. Here the authors report a case of acute epidural hematoma that originated from a metastatic hepatocellular carcinoma (HCC) in the skull.

## CASE DESCRIPTION

A 70-year-old male was admitted to our hospital with left-sided hemiparesis. Preoperative computed tomography (CT) revealed a lenticular high-density area adjacent to the right parietal bone, consistent with an acute epidural hematoma. A subsequent magnetic resonance image (MRI) showed a skull tumor adjacent to the epidural hematoma. Removal of the tumor and evacuation of the hematoma were performed and the pathological diagnosis was metastatic HCC. Postoperatively, the patient gradually recovered but he died of pneumonia 2 months later.

## CONCLUSION

This report represents an additional example of a rare case of metastatic skull tumor associated with acute epidural hematoma. The authors suggest that metastatic skull tumors may be one of the important differential diagnoses in patients with acute epidural hematoma. © 2000 by Elsevier Science Inc.

## KEY WORDS

*Hepatocellular carcinoma, skull metastasis, acute epidural hematoma.*

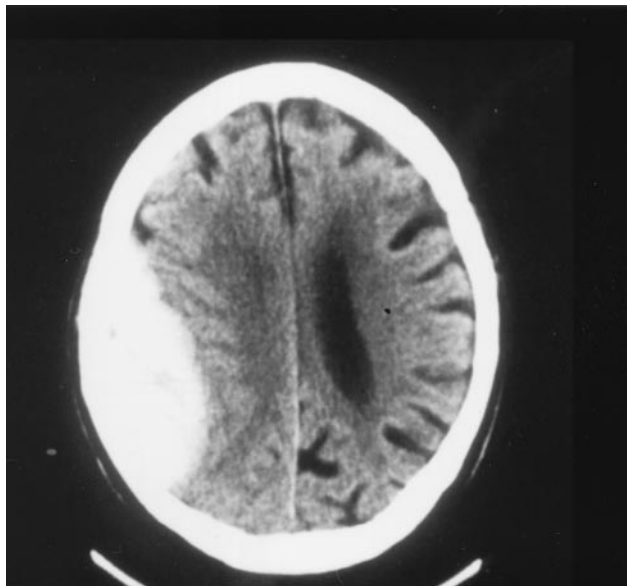
Skull metastases from hepatocellular carcinoma (HCC) have rarely been reported [6–8]. Commonly, patients with skull tumors present with headache or subcutaneous masses and rarely with features of acute epidural hematoma [6,10]. Here, we report a spontaneous epidural hematoma that originated from a metastatic HCC in the skull with interesting magnetic resonance imaging (MRI) findings, and review the associated literature.

## CASE REPORT

A 70-year-old man with a history of transcatheter embolization of the hepatic artery attributable to HCC and a progressively enlarging right parietal swelling presented to our hospital due to a sudden onset of headache and left-sided weakness. On examination, he was found to have left hemiparesis and a 3.0 × 3.0 × 1.5 cm elastic hard mass in the right parietal region. No scalp wound was found. Computed tomography (CT) showed a lenticular high-density area adjacent to the right parietal bone (Figure 1). Laboratory examination demonstrated liver dysfunction, coagulopathy, and severe anemia. We suspected a skull metastasis of HCC presenting with acute epidural hematoma. For this reason we performed an MRI examination, which demonstrated a skull tumor adjacent to the epidural hematoma. The tumor enhanced homogeneously with Gd-DTPA as shown in Figure 2. Cerebral angiograms showed a tumor stain in the right parietal bone, which was richly supplied by branches of the right external carotid artery (Figure 3). After the patient's general condition had im-

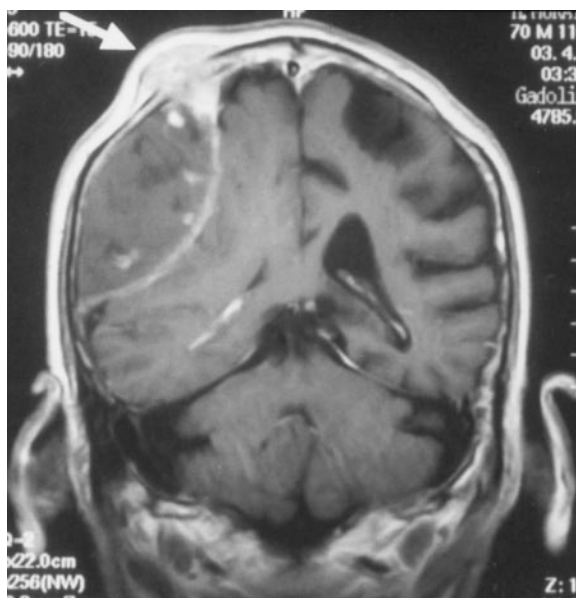
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**1** CT showed a large epidural hematoma in the right parietal region.

proved, a right parietal craniotomy was performed. Elevation of the skin flap revealed a reddish-brown, smooth, and elastic hard swelling of the skull. Removal of the bone flap revealed the epidural hematoma. The tumor was removed en bloc, carefully separating it from the dura mater, and this was followed by evacuation of the hematoma. The surgical specimen showed sinusoidally arranged tumor cells with eosinophilic cytoplasm and hyper-



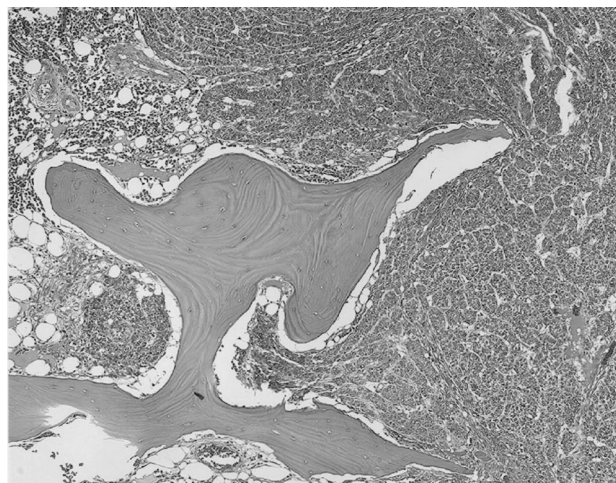
**2** T1-weighted MRI with Gd-DTPA shows the skull tumor (arrow) adjacent to the epidural hematoma. The tumor is enhanced well with Gd-DTPA.



**3** Cerebral angiograms showed a tumor stain (arrow) in the right parietal bone, which was richly supplied by branches of the right external carotid arterial system (A-P view).

chromatic nuclei within the skull bone structure. Several intratumoral hemorrhages were also found. Pathological diagnosis was a metastatic skull tumor from HCC (Figure 4).

Postoperatively, the patient gradually recovered, but 1 month later his condition deteriorated because of liver failure. He died of pneumonia 2 months later.



**4** Photomicrograph of the operative specimen shows tumor cells with eosinophilic cytoplasm and hyperchromatic nuclei in a sinusoidal arrangement within the bone structure ( $\times 50$ , H&E).

## DISCUSSION

Although skull metastases may arise from primary sites in various organs and tissues, they are frequently seen with bronchogenic, breast, and prostate cancers. Unlike these tumors, HCC commonly metastasizes to the lung, regional lymph nodes, peritoneum, and adrenal glands, but rarely to the skull. For example, Yanase et al reviewed 4140 autopsy reports on Japanese patients with HCC and found only 17 skull metastases among 278 cases of bone involvement [12], which further supports the view that skull metastasis from HCC is a rare event.

Several authors have reported skull metastases associated with chronic epidural hematomas [7,8], but their association with acute epidural hematomas is rarely seen. To the best of our knowledge, only one case of skull metastasis from HCC associated with acute epidural hematoma has been reported [6]. In contrast, several primary skull tumors, such as Ewing's sarcoma [11], epidermoid [1], and hemangioendothelioma [5] have frequently been found to be associated with epidural hematoma, especially in young patients. Moreover, dural metastases from several malignancies have presented as epidural hematomas [2,3]. Our report, therefore, represents the second case of a very rare skull metastasis from HCC presenting with acute epidural hematoma.

Generally, tumor hemorrhage occurs from thin, fragile tumor vessels. The present tumor had many sinusoid-like blood vessels, which probably led to hemorrhage and formation of epidural hematoma. Indeed, some intratumoral hemorrhages were found in the operative specimen. Kuga et al reported that eight of nine patients with brain metastasis from HCC developed intracranial hemorrhage, suggesting that bleeding from such tumors is not unusual [4]. Bleeding from the middle meningeal artery, emissary vein, or venous sinus could be a possible source of the epidural hematoma in our case. However, this possibility was not supported by our cerebral angiograms, which demonstrated an intact superior sagittal sinus. In addition, no evidence of active vessel bleeding was seen intraoperatively. Although the patient denied a history of bleeding tendencies, a hemorrhage caused by liver dysfunction and coagulopathy was suspected in this case.

This is the first case presenting the MRI findings of a case of epidural hematoma originating from a skull tumor. Skull tumors usually expand the middle table of the skull bone, resulting in displacement of the inner and outer tables in the opposite direction [9]. It is therefore difficult to differentiate the skull

tumor from the epidural hematoma with CT alone. In our case, MRI demonstrated a skull tumor adjacent to the hematoma, which suggested that the epidural hematoma originated from the skull tumor. Furthermore, MRI showed dural invasion by the tumor, a finding which was very useful for the diagnosis and the subsequent surgical management. Thus, although the CT findings are usually diagnostic for intracranial hemorrhages we propose that MRI should be performed on patients with a history of malignancies who present with acute intracranial hemorrhage.

## CONCLUSIONS

Epidural hematoma usually stems from trauma, yet it may be caused by other rare etiologies, such as metastatic skull tumors from HCC. We emphasize the possibility of brain or skull metastasis from HCC in patients with acute intracranial hemorrhage.

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#### COMMENTARY

This is an interesting and rare case of metastatic hepatocellular carcinoma to the skull as the source of an epidural hematoma at the tumor site. The patient's initial complaint was associated with the epidural hematoma (left hemiparesis) and obvious

soft tissue mass in the scalp with bone involvement. CT, MRI, and angiography show the tumor stain with involvement of the underlying dura as the source of the epidural hematoma.

The rarity of this type of case gives the clinician the suspicion of such associations when confronted with a patient with liver dysfunction and a soft mass arising from the skull.

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**I**f opportunity doesn't knock, build a door.