Spontaneous rupture of hepatocellular carcinoma in children

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ABSTRACT

Spontaneous rupture of hepatocellular carcinoma (HCC) with intraperitoneal haemorrhage is a life-threatening complication with a high mortality rate. The mechanism of spontaneous rupture of HCC is unknown. It may be related to venous congestion, haemorrhage, central necrosis, or trauma. Patients with ruptured tumours confirmed on computerised tomography (CT) scan underwent immediate cardiovascular resuscitation. Depending on the stage of the tumour as seen on the CT scan and the condition of the patient, stoppage of bleeding was accomplished by transcutaneous hepatic artery embolisation, selective hepatic artery ligation, or hepatic resection. Only clinically stable, small tumours were resected as an emergency procedure. We report the case of a 12-year-old child admitted with acute right upper quadrant abdominal pain and signs of hypovolaemia. Ultrasonography revealed free peritoneal fluid and left liver haematoma was suspected. CT scan showed a tumour on the left side of the liver and free peritoneal fluid. Emergency laparotomy revealed haemoperitoneum and a 5-cm diameter left liver tumour which was ulcerated and haemorrhagic. The tumour was completely resected. Histopathological examination confirmed a diagnosis of rupture of differentiated HCC.

Key words: Haemoperitoneum, hepatectomy, hepatocellular carcinoma, rupture

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INTRODUCTION

Primary neoplasms of the liver constitute 0.5–2.0% of paediatric tumours in a large series, and malignant epithelial neoplasms constitute two-thirds of the primary hepatic tumours in infancy and childhood.[1] Hepatoblastoma (HB) and hepatocellular carcinoma (HCC) are the most common primary epithelial liver tumours in children.[1] Haemoperitoneum, secondary to neoplastic liver rupture, is a rare but potentially fatal condition.

Spontaneous rupture of HCC with intraperitoneal haemorrhage is a life-threatening complication with a high mortality rate. Prognosis is associated with poor liver reserve, advanced disease and severity of haemorrhage.

CASE REPORT

A 12-year-old child was admitted with acute right upper quadrant abdominal pain and signs of hypovolaemia. On examination, he was pale, dehydrated, with a tense and distended abdomen, but no signs of external bleeding; blood pressure was 90/60 mmHg and heart rate 110 bpm. Routine laboratory test results were as follows: haematocrit (Ht) 25% and haemoglobin (Hb) 7.8 g/dl. There was no history of trauma. He was admitted to the surgery department and submitted to abdominal ultrasonography, which revealed free peritoneal fluid and left liver haematoma was suspected. Computerised tomography (CT) scan showed a tumour on the left side of the liver and free peritoneal fluid [Figure 1]. After transfusion of two units of red cell concentrate and haemodynamic stabilisation, emergency laparotomy was performed. It revealed a 1-l haemoperitoneum and a 5-cm diameter left liver tumour which was ulcerated and haemorrhagic. The tumour occupied segments II and III. No similar lesions were found on the right side of the liver. The liver was not cirrhotic. The tumour was completely resected (bisegmentectomy of segments II and III) [Figure 2]. Histopathological examination confirmed a diagnosis of differentiated HCC. Laboratory tests showed no elevated transaminase and HBsAg was negative. Our patient had no peritoneal recurrence until December 2008 and is now regularly followed up.

DISCUSSION

HCC is the second most common malignancy of the

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Figure 1: Arterial phase CT shows a well-enhancing mass with protruding contour in the left side of the liver and free peritoneal fluid



Figure 2: Section of left side of the liver showing an ulcerated tumour with haemorrhagic areas

liver in children. Most cases of HCC are diagnosed after 10 years of age.[1] HCC is the most common hepatic malignancy of adolescents. Often, HCC is associated with known hepatic viral infection or cirrhosis, and while it can take decades for malignancy to develop, occasionally cases are seen in very young children.[1]

The prognosis for paediatric patients with HCC appears poor. The resection rate is 45%, and the median survival time is only 5 months. Hepatitis B surface antigen tests are positive in 64%. Haemoperitoneum due to spontaneous rupture of HCC is a rare event.[2-4] Over 10% of HCC patients present as acute abdominal catastrophes due to rupture of the tumour.[5] Massive abdominal bleeding has also been associated with other liver tumours. The most common symptom is sudden onset of abdominal pain (66–100%).[6,7] CT can help to identify the source of intra-abdominal bleeding. The sensitivity of CT is higher than that of US fo r most intra-abdominal injuries. CT depicts solid organ injuries and has been used to classify injuries to the liver and eliminate patients with pathological liver, who are excluded from the conservative treatment.[3,8,9] These occult malignancies are usually diagnosed during operation or at autopsy.[10] The mechanism of spontaneous rupture of liver tumour is unknown. It may be related to venous congestion, haemorrhage, trauma, or central necrosis[10] and therefore prone to intraperitoneal rupture. Factors that contribute to bleeding may include increased intravascular pressure secondary to tumour embolus,[10] causing intra-hepatic venous obstruction with shunting of blood,[11] and a hyperaemic liver circulation[11] caused by proximity of vessels to metastatic nodules or primary tumours. However, direct pressure of the tumour against the capsular surface of the liver seems the most plausible explanation. A sudden increase in intra-abdominal pressure resulting from sneezing, coughing or vomiting may cause rupture of tumours that are necrotic or hypervascular.[11] Minor trauma or liver palpation should be ruled out before the rupture and haemoperitoneum is classified as spontaneous. Large tumour size, peripheral location and protruding contour are all associated with an increased risk for rupture of HCC.[12,13] There is some controversy regarding the treatment of choice in this situation. Bleeding is often difficult to control, and the mortality rate is high.[10] Treatment of ruptured HCC is primarily aimed at controlling haemorrhage and preserving the functional liver parenchyma as much as possible. Open surgical method is the mainstay of treatment. It was reported that various surgical procedures, including perihepatic packing, suture plication of bleeding tumours, injection of alcohol, hepatic artery ligation, and hepatic wedge resection or lobectomy are effective against haemostasis.[14,15] Besides transarterial embolisation and transarterial chemoembolisation for palliative treatment in patients with unresectable HCC, transarterial embolisation is also gradually used for haemostasis in spontaneous rupture of HCC.

Several authors advocate an aggressive surgical intervention[2,5] with resection of the affected liver lobe, whenever possible. Unfortunately, only a few patients are suited for this procedure, owing to the presence of cirrhosis or extensive replacement of liver tissue by tumour.[15] Rupture has not been included as a prognostic variable in the SIOP staging system for paediatric hepatic tumours. Peritoneal metastasis after spontaneous rupture of HCC is rare. Few cases of peritoneal metastasis after ruptured HCC have been reported.[2]

CONCLUSION

The prognosis for patients with haemoperitoneum secondary to HCC rupture is generally poor. The outcome is determined by the stage of both the neoplastic and the underlying liver disease, the rapidity of diagnosis, the degree of haemorrhage and the type of therapy. The present experience shows that emergency laparotomy can be life saving.

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