ONE-STAGE EMERGENCY RIGHT HEMIHEPATECTOMY DUE TO SPONTANEOUS RUPTURE OF HEPATOCELLULAR CARCINOMA – CASE REPORT

JERZY WSOŁEK, ALEKSANDER BURENOK

Department of General and Oncological Surgery, Ludwik Rydygier Specialist Hospital in Cracow
Ordynator: dr n. med. H. Łabza

Hepatocellular carcinoma (HCC) develops in 80% of patients diagnosed with liver cirrhosis. Spontaneous rupture of HCC is a life-threatening complication observed in 3-15% of cases. Hemorrhagic shock after a sudden episode of abdominal pain is a typical symptom of the above-mentioned complication. The abdominal ultrasound and CT examinations show the presence of peritoneal cavity fluid and hepatic tumor. The Authors presented a case of a 66-year old female patient subject to emergency hemihepatectomy, due to spontaneous rupture of a 9cm right hepatic lobe tumor.

Key words: hepatocellular carcinoma, spontaneous rupture, one-stage emergency liver resection

Hepatocellular carcinoma (HCC) is the most common malignant neoplasm of the liver, and the fifth most common neoplasm considering the general population (1, 2). 80% of cases of HCC develop in patients with liver cirrhosis connected with hepatitis B or C virus infections. Other predisposing factors of HCC development include alcoholic cirrhosis, hemochromatosis, alpha-1-antitrypsin insufficiency, autoimmune hepatitis, non-alcoholic liver steatosis, aflatoxins, and estrogen and androgen therapy (3, 4, 5). In connection with the high probability of hepatic cancer development, patients with diagnosed liver cirrhosis should perform abdominal ultrasound and AFP level examinations every 6 months (6). Other specific markers of HCC include Glipican 3 (GPT 3), Gamma-glutamyltranspeptidase (GGTP forms I, II, III), Alpha-L-fucosidase (AFU), Des-gamma carboxyprothrombin (DCP) or mRNA by means of the PCR method (7). The typical contrast CT or MR image presents abundant vascularization of the hepatic tumor during the arterial phase and rapid contrast outflow during the venous phase (washout phenomenon). The principle and most effective method of therapy considering patients with HCC is surgery, and liver transplantation is the method of choice (8). The already existing Milan criteria (tumor <5 cm or 3 lesions no greater than 3 cm, without vascular infiltration) were extended on the basis of multicenter trial results published by Mazzaferro in 2009, considering more than 1000 liver transplantations due to HCC. These investigations showed that the five-year survival at a level of 70% is possible when qualifying patients to liver transplantations on the basis of the “up-to-seven rule (the sum of all lesions does not exceed 7, and the total diameter <7 cm) (9). In case of single HCC lesions in patients without cirrhosis, liver resection is the method of choice. Perioperative mortality does not exceed 3% and the five-year survival amounted to 50% (10, 11). Other therapeutic methods include tumor ablation (thermoablation, alcohol ablation), chemoembolization (embolization of the artery supplying the tumor with simultaneous administration of cisplatin or doxorubicin), radiotherapy- targeted radiotherapy on a limited surface of the liver or highly specific internal
radiotherapy with the use of the Y90 radioactive isotope or lipiodol labeled with $^{131}$I administered to the tumor by means of the hepatic artery (12). Clinical trials confirmed the efficacy of Sorafenib — an oral kinase inhibitor which inhibits angiogenesis and neoplastic cell proliferation. The above-mentioned prolongs the progression of the tumor and the overall survival in patients with HCC (13).

**CASE REPORT**

A 66-year old female patient was admitted to the department, due to abdominal pain and general weakness. The patient had a history of hypertension, asthma, hypothyroidism, obesity, and myocarditis. The patient was on oral anticoagulation, due to history of deep venous thrombophlebitis. On admission, the patient was conscious with symptoms of hemorrhagic shock (CTK 70/50 mm Hg, morphology $E - 2.31$; $Hb - 6.9$; $Ht - 20.1$; $P - 221$; $L - 22.3$), and coagulation disorders ($INR - 2.4$).

Liver function tests (AspAT, AlAT, GGTP, ALP), bilirubin, and urea were within normal values. Antigen HBs and anti-HCV were negative. The physical examination of the abdomen showed peritoneal cavity symptoms. Abdominal CT (fig. 1) revealed a hypodense lesion, 7.5x6.5x5.5 cm in size, located in the 6-th liver segment. Additionally, fluid surrounding the liver, spleen, and pelvis was also observed. Anti-shock therapy was initiated — the patient received 4 units of blood, 2 units of FFP, and intravenous vitamin K. An increasing amount of peritoneal cavity fluid was observed.

After the normalization of the coagulation parameters ($E - 3.2$; $Hb - 9.6$; $Ht - 27.4$; $P - 222$; $INR - 1$) the patient was qualified for emergency surgery. The abdominal cavity was opened by means of the transverse incision. After suction of one liter of blood the Authors visualized a ruptured and bleeding tumor, located in the 6-th segment of the right hepatic lobe. The remaining hepatic parenchyma was normal. The patient was subject to liver resection. The right triangular, round, and falciform hepatic ligaments, as well as peritoneum were severed, exposing the right hepatic lobe. After gall-bladder excision and the identification of the structures of the hepatic hilum, the right hepatic duct, right hepatic artery, and right branch of the portal vein were ligated. After separation of the liver from the anterior and lateral surface of the inferior caval vein, the right hepatic vein was ligated. Thus, the demarcation line on the surface of the liver indicated by the electrocoagulation knife. Afterwards, the hepatoduodenal ligament was constricted and right hemihepatectomy was performed by means of the electrocoagulation knife. The hepatic ischemia time was 20 minutes.

Bleeding was supplied by means of ligation, argon coagulation, and the use of a collagen-fibrin sponge. Two drains were left at the sight of the removed hepatic lobe and the abdominal cavity was closed. During the four-hour procedure the patient was hemodynamically stable, and received 4 units of blood and 3 units of FFP (freshly frozen plasma). During the postoperative period (initial six days) the patient was intubated and on mechanical ventilation, requiring small doses of dopamine.

On the second postoperative day nutrition was initiated by means of the gastric tube. Abdominal cavity drainage amounted to values ranging between 150-300 ml daily. During hospitalization the patient received a total of 10 units of blood and 7 units of FFP. Infectious complications, bleeding, and bile outflow from the sight of the removed lesion were not observed. The wound healed per primam, and the patient was discharged from the hospital 17 days after the operation. Liver function tests and bilirubin values were within normal values. Antigen HBs and anti-HCV were negative.
One-stage emergency right hemihepatectomy due to spontaneous rupture of hepatocellular carcinoma

limits. The histopathological examination of the lesion (19x16 cm) showed the presence of a 9 cm hepatocellular carcinoma (HCC), infiltrating the fibrous capsule of the liver.

DISCUSSION

The presented case is an example of a life-threatening complication of HCC-spontaneous rupture. Eric C. Lai and W.Y.Lau (14) analysed publications elaborated between 1970 and 2004 demonstrating 1500 cases of spontaneous HCC rupture. The above-mentioned complication is observed in 3% of the western population, and in 14% of the Asian population. Mortality ranged between 25 and 75% (14, 15).

The mechanism of spontaneous rupture remains unclear. However, the following hypotheses are considered: rapid tumor growth with vascular injury of the unchanged hepatic parenchyma; increased pressure within the tumor, due to hepatic vein closure by means of a thrombus or infiltration; elastin degeneration and type IV collagen breakdown (14).

The above-mentioned patient presented with sudden abdominal pain and symptoms of shock, as well as presence of a tumor and peritoneal cavity fluid observed in the abdominal ultrasound and CT examinations, which were typical features of HCC complication. Transarterial embolization (TAE) as a palliative therapeutic method in case of non-resection HCC may also be used as an initial attempt to obtain hemostasis in these patients. In case of ineffective TAE, surgical attempts to stop bleeding are initiated during laparotomy, such as the implantation of sutures. However, due to the consistency of the tumor the above-mentioned method might prove ineffective. Perihepatic packing enables the surgeon to stabilize the patient’s general condition, as well as organize a more experienced team of physicians or transfer the patient to a referral center. The above-mentioned method is connected with the need of reoperation, risk of recurrent bleeding, and increased amount of infectious complications.

Other intraoperative methods of bleeding control include tumor alcoholization, and hepatic artery ligation (HAL). Tumor blood supply comes mainly from the hepatic artery and the efficacy of HAL is estimated at 68-100%, with mortality amounting to 77% (14). Due to the risk of liver damage selective HAL is preferred. One-stage emergency liver resection is the method that simultaneously stops bleeding and definitely treats HCC. The resection index in patients with a ruptured HCC ranges between 12.5 and 31%, and these procedures are connected with a high mortality, due to the incomplete knowledge of the functional hepatic reserve (hemorrhagic shock condition). Mortality ranged between 16.5 and 100%, depending on the center (14). Many Authors prefer staged liver resection, after initial bleeding control. The resection index considering the above-mentioned ranged between 21 and 56%, while postoperative morality between 0 and 9%. Therefore, one-staged liver resections in case of ruptured HCC should only be performed in easily accessible tumors, and patients without liver cirrhosis (14).

The uneventful course of treatment considering our patient should be associated with the properly performed surgical procedure, proper postoperative care, and good functioning of the remaining liver parenchyma.

REFERENCES


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Adress correspondence: 31-826 Kraków, Os. Złotej Jesieni 1