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Spontaneous rupture of the liver in a patient admitted for subarachnoid hemorrhage

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ABSTRACT

INTRODUCTION: Spontaneous rupture of the liver is a rare event often associated with the presence of malignant liver disease or occurring in the context of a HELLP syndrome.

We present a case of spontaneous rupture of the liver in a patient admitted to our Intensive Care Department with hemoperitoneum in the aftermath of recent surgical clipping of a cerebral aneurysm.

PRESENTATION OF CASE: We report a 50-year-old woman who was transferred from the Bolzano Hospital Department of Neurosurgery to the Intensive Care Unit with anemia and the occurrence of major abdominal pain.

DISCUSSION: Spontaneous hepatic rupture remains a rare event, associated more often than not with pregnancy or traumatic events. The treatment of hemorrhage due to spontaneous rupture of the liver includes, in addition to serial monitoring of hemoglobin values, in cases of unstable patients, embolization, hepatic resection and packing.

CONCLUSION: The case described here shows that spontaneous rupture of the liver may be due to indefinable causes and that its treatment remains complex and multidisciplinary.

1. Introduction

Spontaneous rupture of the liver is a rare event often associated with the presence of malignant liver disease or occurring in the context of a HELLP syndrome.[1] The cases reported in the literature refer to hepatic rupture in pregnancy or cases in the context of the rupture of a hepatocellular adenoma, in idiopathic peliosis hepatis[2,3] and other more rare conditions such as coagulation disturbances[4] and connective tissue disease like amyloidosis.[5]

The clinical case described here is one of a female patient admitted to our Intensive Care Department for spontaneous rupture of the liver in the aftermath of recent surgical clipping of a cerebral aneurysm.

2. Presentation of case

A 50-year-old woman was transferred from the Bolzano Hospital Department of Neurosurgery to the Intensive Care Unit as a result of anemia (hemoglobin down to 8.2 g/dl) and the occurrence of major abdominal pain in the right hyperchondrium.

On examination, the patient was normotensive (blood pressure 125/70 mmHg, pulse rate 90/min) and had a firm, tender abdomen.

An ultrasound examination of the abdomen was performed, showing a fluid collection in the perihepatic region and in the pelvic area, partly with an echogenic appearance.

The patient had been admitted a week earlier to the Neurosurgery Department following a subarachnoid hemorrhage due to a bleeding aneurysm of the right pericallosal artery, treated with a right frontal craniotomy and clipping.

The postoperative course was described as uneventful.

The patient and her husband denied the possibility of a trauma related to the cerebral hemorrhage.

An abdominal CT scan was performed with contrast medium showing a voluminous fluid collection in a subcapsular site along the ventral margin of the liver. In the context of this collection, moreover, the presence of a circumscribed leakage of arterial contrast medium was observed at the level of the 4th segment. A diffuse fluid collection was also present in all the peritoneal recesses (Figs. 1 and 2).

The patient was then given a blood transfusion with 2 units of packed red blood cells with an increase in hemoglobin from 8.2 to 8.7 g/dl.

The patient was subjected to hepatic angiography which revealed no signs of arterial leakage of contrast medium, but showed multiple petechial images in the peripheral portions of the hepatic parenchyma. We then proceeded with reversible gelatin

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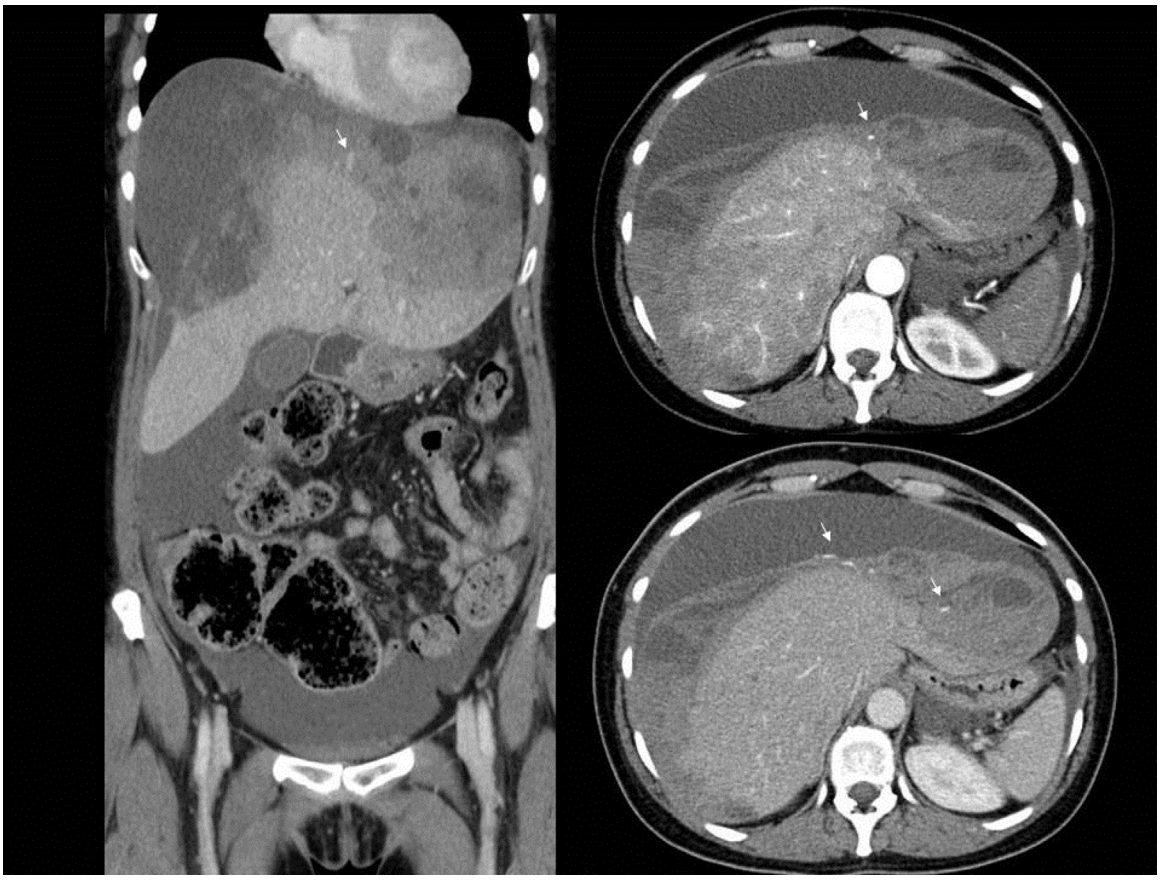

Fig. 1. Coronal portal-venous phase (left) and axial arterial and portal-venous phase (right) CT images show a large subcapsular hematoma displacing liver parenchyma downward and backward. Spotty contrast extravasation is present (white arrows).

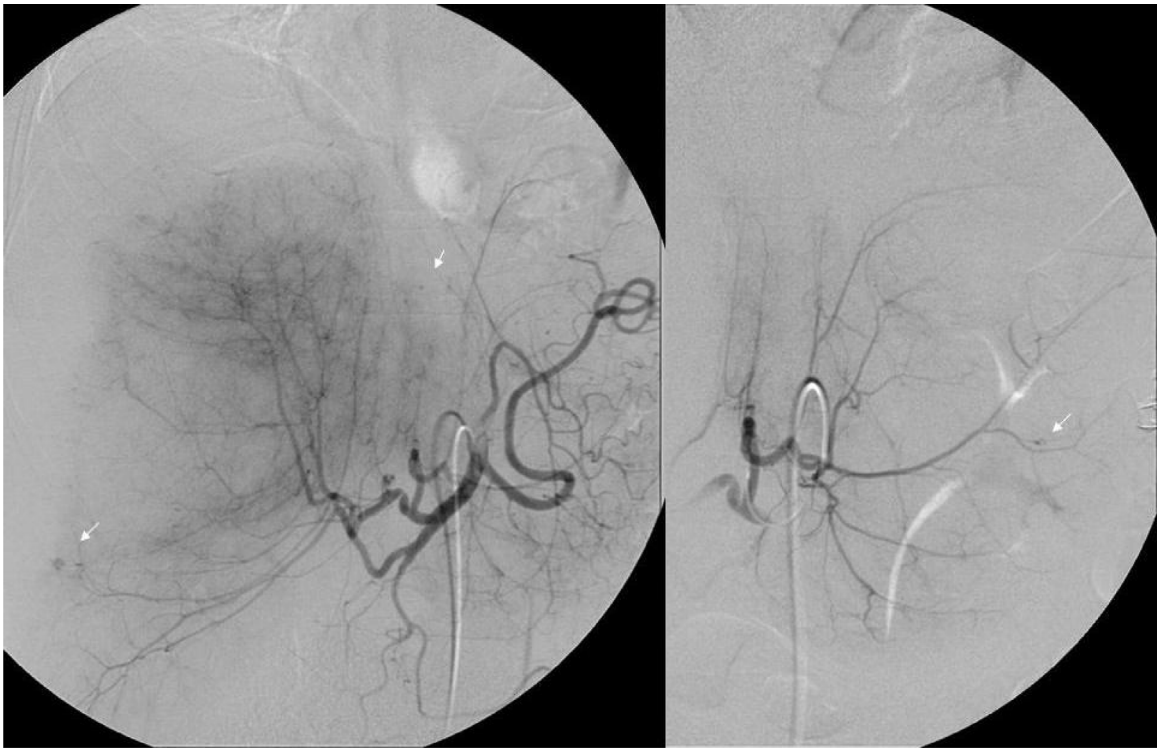

Fig. 2. Common hepatic artery (left) and selective left hepatic artery angiograms show diffuse petechial images and two pseudoaneurysm-like images in the peripheral liver parenchyma. No clear contrast medium extravasation is evident. A double right hepatic artery is seen on the left angiogram (variant).

sponge embolization of the branches for the central hepatic segments and the left lobe.

The patient was stable from the hemodynamic point of view (blood pressure 140/70 mmHg, pulse rate 95/min), with increased lactates (64 mg/dl), and tended to be oliguric.

As regard laboratory tests, there was a marked increase in liver function indices (AST 4092 U/L, ALT 6086 U/L and alkaline phosphatase 200 U/L), with normal value of bilirubin and coagulation profile.

In the hours following embolization, the patient presented a new reduction in hemoglobin to 6.9 g/dl and an increase in lactates above 80 mg/dl. She received 6 units of packed red blood cells.

The surgeons indicated an urgent exploratory laparotomy. A massive subcapsular bleeding was observed intraoperatively with tearing of the capsule. Resection of the 7th and 8th hepatic segments and packing of the liver were performed.

During the operation the patient was given massive blood transfusions with 11 units of packed red blood cells, 1800 ml of fresh frozen plasma, 1 platelet concentrate and 4 g of fibrinogen.

The patient's clinical condition was stable during the 72 h after the operation with hemoglobin values of 9 g/dl, and without any need for blood transfusions.

The patient's liver function parameters showed a 50% decrease. However, the patient was subjected to renal replacement therapy in CVVHDF due to the presence of oligoanuria and a tendency to develop metabolic acidosis.

On postoperative day 3, the patient was taken once again to the operating theater where she underwent a depacking operation. No difficulties were encountered during the operation.

On the following days the patient was weaned off the ventilator and successfully extubated.

Twelve days after admission to the Intensive Care Department the patient was transferred to the Surgery Department, awake and contactable, and stable from the hemodynamic and respiratory points of view. The patient's hemoglobin values remained stable at 9.5 g/dl, her liver parameters reverted to normal and she resumed urinating spontaneously.

The pathology report relating to the liver resection slice on the day of the first operation described a capsular–parenchymal laceration with subcapsular blood extravasations, together with diffuse ectasia and vascular congestion, and multiple, partly confluent areas of hemorrhagic necrosis.

The pathologist suggest to exclude the posttraumatic origin of the lesion and to evaluate the possibility of a recent stroke or an acute heart failure.

The material examined presented no signs of malignancy.

3. Discussion

Spontaneous hepatic rupture remains a rare event, associated more often than not with pregnancy or traumatic events.[6]

The treatment of hemorrhage due to spontaneous rupture of the liver includes, in addition to serial monitoring of hemoglobin values, in cases of unstable patients, embolization, hepatic resection and packing.[7–9]

In the case described, the recent history of bleeding from a cerebral aneurysm led us to believe that initially an abdominal trauma had gone unrecognized. The patient and her husband consistently denied any such trauma, inasmuch as the patient had presented acute cerebral symptoms, headache and vomiting while seated at table.

Furthermore the cerebral bleeding was not correlated with an evidence of vasculitis or others connective diseases in the pathology findings.

The therapeutic approach adopted was characterized by two phases: the first consisted in angiography, revealing no active site of bleeding, while the second, the liver resection and packing surgery, achieved definitive hemostasis.

Though the angiographic study did not show a significant blush of contrast medium, there was multiple petechial images in the peripheral portions of the hepatic parenchyma. The embolization was performed with reversible gelatin sponge following the CT scan that showed a spotty extravasation of the branches for the central hepatic segments and the left lobe.

Transarterial embolization was chosen as the first option, in that the procedure is less invasive compared to exploratory laparotomy and surgical treatment and less risky for the patient, but in our case it failed to resolve the problem of controlling the bleeding.

Surgical treatment was postponed because the patient presented stable vital parameters, considering from the outset the possibility of the rupture of a hepatic angioma, the bleeding of which is often self-limiting.

The intraoperative macroscopic appearances and the pathology findings relating to the liver resection slice excluded the possibility of this cause, in that a capsular–parenchymal laceration was described with subcapsular hemorrhagic extravasations, vascular congestion and multiple areas of hemorrhagic necrosis without any evidence of malignancy.

A clinical–pathological correlation between cerebral and liver bleeding should be confirmed from the presence of an inflammatory process, microaneurysms, vasculitis or hepatic failure.

The laboratory tests, the CT scans and the pathology findings did not evidence these diseases.

4. Conclusions

Spontaneous hepatic rupture not associated with pregnancy or with the presence of a liver tumor remains a rare event, requiring combined treatment consisting in close clinical monitoring, transarterial angiography and possibly surgical intervention. Diagnosis of liver rupture is not easy and can be made on the basis of clinical examination, laboratory tests and abdominal imaging.

However, the etiology of liver rupture remains difficult almost in some cases in then the right succession of events is not clear.

A thorough history taking of the patient must rule out abdominal trauma and the presence of pathological conditions including rare diseases such as idiopathic peliosis hepatis or amyloidosis.

In our case, we were unable to uncover the real cause of liver bleeding.

Subclinical trauma remains a remote possibility since the husband denied a history of fall or blunt injury. At the time of onset of the first symptoms the patient was seated on the table. She suffered from hard headache and vomiting. The vomiting could have caused the rupture of the liver, in accordance with the location of the laceration, the ventral surface that is in strictly contact with the costal margin.

The case described here shows that spontaneous rupture of the liver may be due to indefinable causes and that its treatment remains complex and multidisciplinary.

Conflict of interest

There are no conflicts of interest.

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Ethical approval

Authors obtained written and signed consent to publish the case report from the patient.

Author contributions

Marianna Zatelli contributed in writing and data collection, and Alessio Comai contributed in figure collection.

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