

## Giant ruptured hepatic hemangioma in pregnancy managed with a mixed approach: case report

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### Abstract

**Background:** Hemangiomas are benign vascular tumors that can develop from the skin and even in intra-abdominal organs. **Objective:** The study aimed to describe the clinical case of a patient with ruptured hepatic hemangioma in the third trimester of pregnancy and its management. **Clinical case:** A 31-year-old female admitted with acute abdomen and fetal distress, cesarean section was performed with finding of hemoperitoneum, packing was performed with subsequent mixed approach with embolization and hepatectomy. **Discussion:** Its diagnosis during pregnancy is incidental and an association in its pathogenesis with growth and the elevated presence of sex hormones has been demonstrated. The management of this type of tumor is expectant when there is no presence of pain, growth, or rupture. Hemodynamic embolization will be useful before surgical management. **Conclusion:** Hemangioma is the most common benign liver tumor. In the case of this patient, it presented a severe complication that led to hypovolemic shock, which required intensive medical management and subsequent resection of the tumor with adequate evolution.

**Keywords:** Hepatic hemangioma. Ruptured hepatic hemangioma. Hypovolemic shock. Embolization. Partial hepatectomy.

### Introduction

Hemangiomas are benign vascular tumors that can develop both in the skin and in the intra-abdominal organs, including the liver, being the most common benign tumor in this organ<sup>1</sup>. They consist of groups of cavities filled with blood. Four types of hemangiomas can be classified: cavernous, sclerosing, capillary, and hemangioendothelioma, of which cavernous hemangioma correspond to up to 70% of all benign liver tumors<sup>2</sup>. Hepatic hemangiomas commonly present silently, being detected only as findings by ultrasonography or tomography; however, when they present as a rupture

it is the most catastrophic form. We present the case of a fractured hepatic hemangioma, as a cause of hypovolemic shock in a patient with pregnancy in the third trimester.

### Case presentation

A 31-year-old female patient, with a history of two previous cesarean sections, presents with a pregnancy of 35 weeks' gestation for evaluation at the emergency department with abdominal pain, signs of shock, and fetal distress, on examination with vital signs and blood pressure of 80/40 mmHg, obstetric ultrasound identifies

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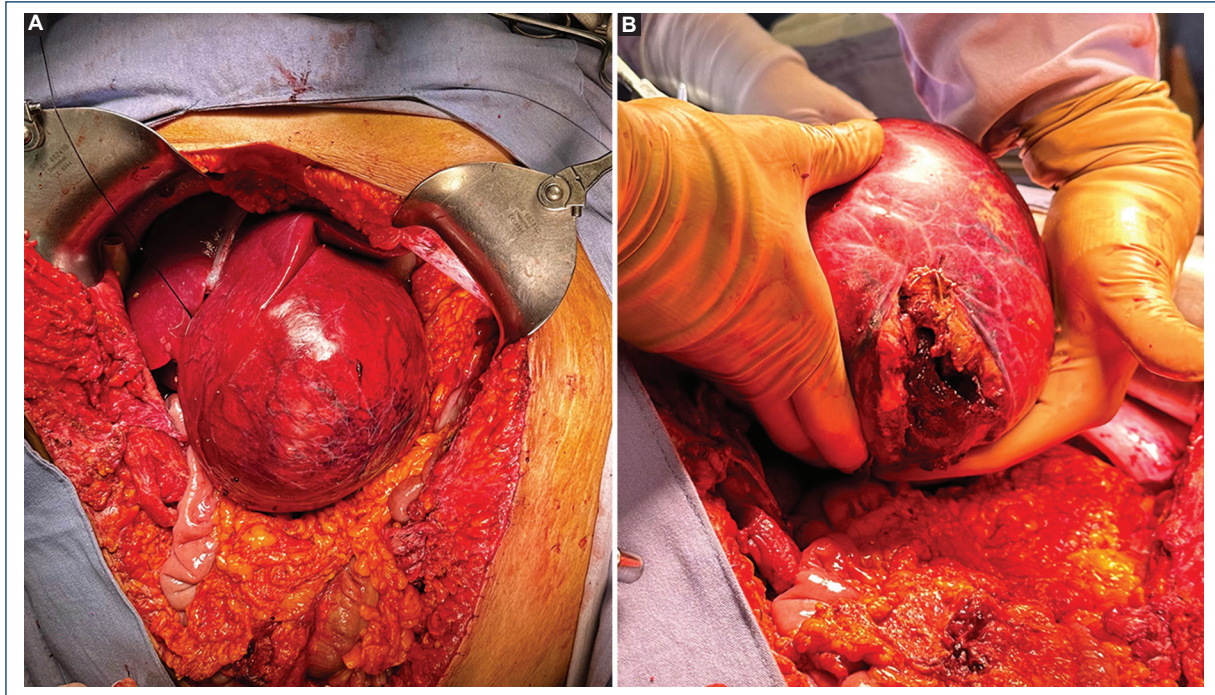
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**Figure 1. A:** partial segment II-III hepatectomy with complete resection of giant hepatic hemangioma. **B:** anterior face of the hemangioma fractured.

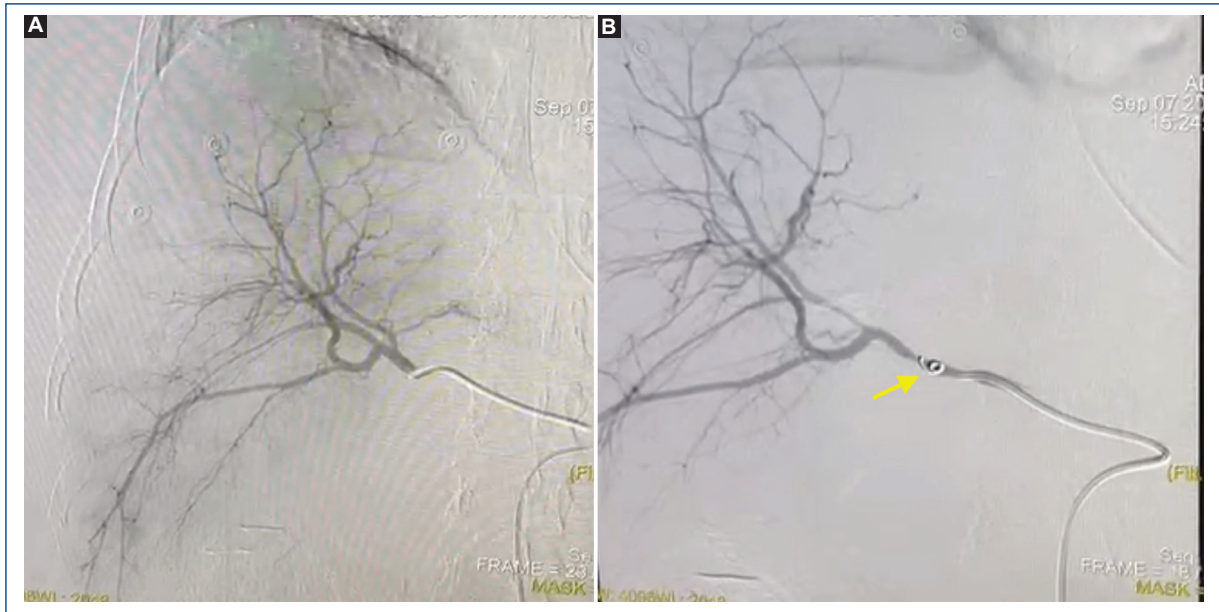
the presence of oligohydramnios, so urgent surgical exploration is indicated by the gynecology service, finding hemoperitoneum of 2000cc. The pregnancy was resolved by cesarean section without complications, obtaining a single live male product that did not require advanced resuscitation maneuvers. Subsequently, the rest of the abdominal cavity was explored, presenting as a finding a liver tumor in segment II-III measuring 15 × 15 × 10 cm with a 10cm linear fracture on its anterior surface (Fig. 1), with data of active bleeding. An evaluation is requested by the general surgery service and packaging and hemorrhage control are performed. During the operation, a transfusion of four red blood cell concentrates is performed and subsequently, the patient is transferred to the intensive care unit service, where he is maintained with invasive mechanical ventilation and medication support and vasopressors. During the immediate post-surgical period, laboratories are requested to report leukocytes of 27.72/uL, hemoglobin 7.40g/dL, erythrocytes 2.8uL, and platelets 372/uL. After 3 days of medical management, abdominal panangiography is indicated to identify the bleeding site and in this way, selective embolization of the right hepatic artery is performed with the placement of a 035 coil (Fig. 2). A new surgical exploration is indicated by the hepatopancreatobiliary service, in which hemangioma is

identified without signs of active bleeding. However, due to its fracture and the risk of rebleeding, it was decided to perform partial hepatectomy (segment II-III) with complete resection of the tumor (Fig. 3), a procedure performed without complications. The patient progressed satisfactorily. She was discharged from the intensive care unit 24 h after surgery, discharged home 5 days later, and followed up by outpatient clinic without complications.

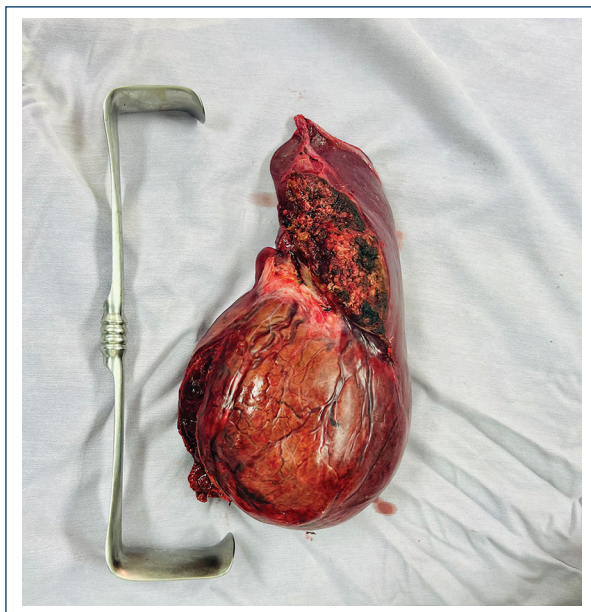
## Discussion

Hepatic hemangiomas are tumors that form when there is a cavity in the liver parenchyma surrounded by epithelial cells and with blood supply through a branch of the hepatic artery<sup>3</sup>. The exact etiology is unknown, although there is a probable genetic and hormonal relationship, with the overexpression of angiogenic factors. Its incidence ranges from 0.4 to 20% of the population, being more common in women in a 5:1 ratio and with an average age of 30-50 years<sup>4</sup>. It usually presents as a single lesion and due to its size, it can be classified as small, those measuring from millimeters to 3 cm, medium, from 3 cm to 10 cm, and giant, those measuring more than 10cm, which corresponds to < 10% of this type. of tumors and represent a risk





**Figure 2.** A: panangiography with bleeding in segment II. B: selective embolization with the right hepatic artery.



**Figure 3.** Pathology piece of giant hepatic hemangioma.

factor for complications<sup>5</sup>. They are most frequently located in the right lobe in 58%, followed by the left lobe in 35% and their bilateral presentation is exceptional (7%). Clinically, up to 70% of hepatic hemangiomas do not present signs or symptoms and occur as an incidental finding. The most common finding is pain in the right upper quadrant and there may be the presence of anorexia, early satiety, nausea, and vomiting.

They rarely present with obstructive jaundice. There may be complications such as the case of the patient who presented rupture and hemorrhage, which only occurs in 5% of cases. Some cases present degeneration with thrombosis and fibrosis of the tumor<sup>6</sup>. The diagnosis is usually incidental when evaluating pathologies of abdominal origin. The protocol includes conventional ultrasound, computed tomography, and magnetic resonance imaging, the latter being the study with the greatest certainty for this type of tumor, which has a sensitivity of 100%, with a specificity of 85%<sup>7</sup>. Its diagnosis during pregnancy is incidental and an increase in size during pregnancy has been reported, this is due to a probable hormonal association with estrogens in its pathogenesis, promoting cell proliferation, migration, and capillary organization, which promotes an increase in angiogenesis<sup>8</sup>. Its malignant transformation is exceptional. It has been described that, in the event of rupture, it has a mortality of 75%. The treatment in most cases in which the lesion is single, small, and asymptomatic, is follow-up and surveillance with imaging studies every 6 months. According to the current literature, there is no pharmacological therapy capable of reducing the size of hepatic hemangioma. Therapeutic options include radiofrequency ablation, monoclonal antibody therapy, transarterial embolization, and surgical management<sup>9</sup>. Management is controversial; however, surgery is indicated in cases of rapid growth and pain despite the use of analgesics, with absolute indications being those that

derive from the dimensions, location, and risk of intramural thrombosis and rupture<sup>10</sup>. The use of transcatheter arterial embolization has proven useful in inducing a reduction in the size of giant hemangiomas, both as a pre-surgical protocol or in patients who are not candidates for surgical treatment due to size, multifocality, location, or patient conditions<sup>11</sup>. In the case of this patient, the rupture and hemorrhage conferred hemorrhagic shock, which required management of complications to subsequently perform definitive management with selective embolization of the right hepatic artery followed by non-anatomical resection.

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## Conflicts of Interest

The authors declare no conflicts of interest.

## Ethical disclosures

**Protection of human and animal subjects.** The authors declare that no experiments were performed on humans or animals for this study.

**Confidentiality of data.** The authors declare that they have followed the protocols of their work center on the publication of patient data.

**Right to privacy and informed consent.** The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

**Use of artificial intelligence for generating text.** The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript or for the creation of images, graphics, tables, or their corresponding captions.

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