

# Ruptured hepatic hematoma managed with a Sengstaken–Blakemore probe in severe preeclampsia with hemolysis, elevated liver enzymes, low platelets (HELLP) syndrome

*Hematoma hepático roto manejado con una sonda de Sengstaken–Blakemore en preeclampsia grave con síndrome hemólisis, enzimas hepáticas elevadas, baja cuenta plaquetaria (HELLP)*

Juan G. Vázquez-Rodríguez<sup>1\*</sup> and Juan G. Vázquez-Arredondo<sup>2</sup>

<sup>1</sup>Intensive Care Unit, Unidad Médica de Alta Especialidad Hospital de Ginecología y Obstetricia No. 3, Centro Médico “La Raza” Instituto Mexicano del Seguro Social; <sup>2</sup>School of Medicine, Universidad Nacional Autónoma de México. Mexico City, Mexico

## Abstract

We report the case of a 34-year-old woman with a 32-week pregnancy complicated by recurrent severe preeclampsia, HELLP Class I syndrome, and an intact hepatic hematoma of the right lobe detected by ultrasound. During the cesarean section, the rupture of the hematoma occurred and a gastroesophageal probe of the Sengstaken–Blakemore type was placed to occlude the bleeding cavity and the exit tunnel. The balloons were deflated gradually and the probe was removed on the 10<sup>th</sup> day without complications. The Sengstaken–Blakemore probe can be an effective remedy to control liver bleeding in selected cases.

**Key words:** Hepatic rupture. Ruptured hepatic hematoma. Severe preeclampsia. HELLP syndrome. Sengstaken–Blakemore probe.

## Resumen

Reportamos el caso de una mujer de 34 años con embarazo de 32 semanas complicado con preeclampsia grave recurrente, síndrome HELLP de clase I y hematoma hepático intacto del lóbulo derecho detectado por ultrasonido. Durante la operación cesárea se rompió el hematoma, por lo que se colocó una sonda gastroesofágica de tipo Sengstaken–Blakemore para ocluir la cavidad sangrante y el túnel de salida. Los balones fueron desinflados paulatinamente y la sonda se retiró el décimo día sin complicaciones. La sonda de Sengstaken–Blakemore puede ser un recurso efectivo para controlar el sangrado hepático en casos seleccionados.

**Palabras clave:** Rotura hepática. Hematoma hepático roto. Preeclampsia grave. Síndrome HELLP. Sonda de Sengstaken–Blakemore.

## Introduction

Hepatic hematoma is a serious complication of pre-eclamptic patients<sup>1</sup>. Its rupture is associated with massive hemorrhage, hypovolemic shock, and serious

complications including maternal death<sup>2</sup>. Incidence has been reported of one case for every 67,000 births and one case for every 20,000 pregnancies complicated with preeclampsia-eclampsia and HELLP syndrome<sup>3</sup>. The main clinical manifestation is the intense

### Correspondence:

\*Juan G. Vázquez-Rodríguez

Allende, 116, interior 13

Col. Centro

C.P. 56100, Texcoco, Edo. de México, México

E-mail: juangustavovazquez@hotmail.com

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pain located in the upper right quadrant of the abdomen, epigastrium, right shoulder, or throughout the abdomen. Symptoms such as pain and vomiting may present with intact laboratory results<sup>4,5</sup>. Hypotension and clinical manifestations of shock involve at least an estimated blood loss  $\geq 2000$  ml, so emergency surgery is necessary to stop bleeding and save the life of the patient. The surgical technique is varied according to the site of the rupture of the hepatic gland, the estimated bleeding, the technical resources available at the time, and the experience of the surgical team. Vascular surgery of the hepatic artery and its branches such as clamping and ligature, arterial embolism with various materials, diathermy with argon, and the packing of the bleeding hole with textile materials have been described in the medical literature. In exceptional cases, hemihepatectomy and liver transplantation have been performed with successful results<sup>4-7</sup>. Maternal mortality (39%) and perinatal mortality (42%) are high<sup>2,4,8,9</sup>. Fatal cases can occur despite timely and successful liver surgery and patient care in an intensive care unit (ICU)<sup>2-10</sup>. The aim of this study is to report the technique and results of the placement of a gastroesophageal probe of the Sengstaken–Blakemore type to control the bleeding of a ruptured hepatic hematoma in a preeclamptic patient with HELLP syndrome.

## Clinical case

We present the case of a 34-year-old woman with a history of two cesarean operations with a current pregnancy of 32 weeks. Her prenatal check-up included four revisions and three obstetric ultrasound studies with a reported evolution without complications. In the 32<sup>nd</sup> week of gestation, she presented weight gain, edema of the legs, headache, blood pressure 160/100 mmHg, intense epigastric pain, hyperreflexia of the pelvic and thoracic limbs, and infrequent uterine contractions without changes of the cervix. She was sent to the emergency department and immediately moved to the ICU. The blood pressure was 160/100 mmHg and the initial laboratory showed hemoglobin 12 g/dL, thrombocytopenia 34,000 platelets/ $\mu$ L, uric acid 7.2 mg/dL, creatinine 1.2 mg/dL, lactic dehydrogenase 640 U/L, aspartate aminotransferase 110 U/L, alanine aminotransferase 95 U/L, total bilirubin 0.9 mg/dL, and fibrinogen 600 mg/dL. Clotting times were normal and proteinuria 300 mg/dL in a urine sample. The diagnosis of severe preeclampsia with the HELLP Class I syndrome was

made. Abdominal ultrasonography showed a unique, live, intrauterine product in the longitudinal situation, cephalic presentation, dorsum on the right side, fundus placenta normoinserta without hematoma with Grade III maturation (Bonilla classification), and scarce amniotic fluid. At the hepatic level, an intact hematoma measuring 14  $\times$  6  $\times$  10 cm in the right lobe and discrete hepatomegaly was found.

The treatment consisted of absolute rest, nasal oxygen supply, crystalloid liquids (ringer-lactate type), omeprazole, dexamethasone, magnesium sulfate, buprenorphine, oral antihypertensive drugs (methyldopa, hydralazine, and metoprolol), and par-enteral hydralazine and the transfusion of seven platelet concentrate units. Two hours later, the cesarean section was performed under the effects of general intravenous and inhalation anesthesia with orotracheal intubation and mechanical ventilation. A Kerr-type incision was made and a newborn of the female sex with Apgar score 8 and 9 at min 1 and 5 of birth, weight 2300 g, and size 48 cm was obtained. Placental removal and uterine involution occurred without problems. During the surgery, massive bleeding of hepatic origin appeared, a rupture of the hepatic hematoma was found that had previously been identified. The cavity communicated to the surface by a tunnel with an exit hole 2 cm in diameter. The contents of the hematoma were aspirated and a gastroesophageal probe of the Sengstaken–Blakemore type was placed with the gastric balloon insufflated with 300 cc of air and the esophageal balloon insufflated with air at a pressure of 40 mmHg. This successfully occluded the bleeding cavity and its outflow tract. The absence of hemorrhage was corroborated and the proximal segment of the probe was exteriorized by means of an incision from the soft tissues to the surface of the skin. A Penrose drainage was placed near the bleeding bed, another in the right parietocolic slide, and one more in the pelvic cavity. Hepatic bleeding was quantified as 2500 ml and placental 800 ml. She received erythrocyte concentrates, fresh frozen plasma, and platelet concentrates, a nasogastric tube was installed and she moved back to the ICU. Radiological image and abdominal computed tomography (CT) scan showed the position of the balloons of the probe in the affected parenchyma (Figs. 1 and 2).

The patient remained in the ICU with improvement of their general conditions, the amount of fluid from the drains was scarce, and mechanical ventilation and the orotracheal tube could be removed 24 h after the

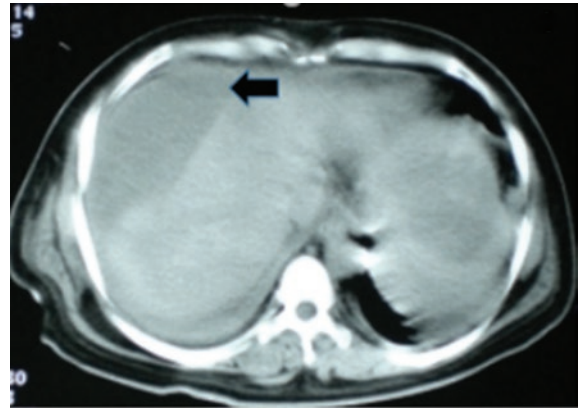


**Figure 1.** Radiological image of the position of the balloons of the Sengstaken-Blakemore probe in the ruptured hepatic hematoma.



**Figure 2.** Tomographic image. Position of the balloons of the Sengstaken-Blakemore probe in the cavity of the ruptured hepatic hematoma.

surgery. As of the third post-operative day, 50 cc of the gastric balloon and 10 mmHg of the esophageal balloon were reduced daily. The probe was removed with gentle maneuvers on the 10<sup>th</sup> day of stay in the ICU. A day later, the drains were removed. An abdominal CT scan at 12 days after the intervention showed parenchymal infiltration and the area of the hole adequately sealed (Fig. 3). The patient was discharged from the ICU on the 13<sup>th</sup> day of her surgery with severe preeclampsia and HELLP syndrome resolved and without technical complications due to the use of the probe.



**Figure 3.** Tomographic image of the liver once the Sengstaken-Blakemore probe is removed. The arrow indicates the site of the hepatic rupture.

## Discussion

The rupture of a hepatic hematoma is a complication of preeclampsia and HELLP syndrome described in the literature as potentially fatal unless emergency surgery stops bleeding immediately<sup>1-6</sup>. Vigil-De Gracia et al. published the results of a systematic analysis of 180 cases of preeclampsia-eclampsia complicated with a hepatic hematoma that was reported in the literature in the English, French, Spanish, and Portuguese languages between 1990 and 2010 and found 90% (162 cases) with rupture of the capsule. The most commonly used procedures in the literature reviewed were surgical exploration without additional maneuvers, supportive therapy, liver transplantation, embolization of the hepatic artery with or without surgical exploration, and ligation of the hepatic artery<sup>4</sup>. The 116 publications consulted did not refer to the use of a gastroesophageal balloon probe of the Sengstaken-Blakemore type as an alternative to the surgical technique for the control of hepatic bleeding.

The demographic data of the patient reported in the present study were similar to the cases described in the review of Vigil-De Gracia et al. (maternal age, parity, gestational age, presence of severe preeclampsia with the HELLP Class I syndrome, and the detection of the intact hematoma by ultrasound with location in the right lobe) and the cesarean section for the gestational interruption with the obtaining of a living fetus<sup>4</sup>.

The present case was complicated by the noticeable rupture of the hepatic hematoma during surgery with massive bleeding, which put the medical team on alert. It was decided to place a gastroesophageal

probe of the Sengstaken–Blakemore type on the initiative of the obstetric surgeon considering the dimensions of the bleeding cavity and the exit path. The insufflation of the gastric balloon in the hollow and the esophageal balloon in the exit tunnel and subsequent management was performed according to the technical recommendation in the case of patients with bleeding due to gastroesophageal varices, a common situation in patients with cirrhosis with portal hypertension. There was no bleeding with the abdomen closed. The tomographic studies documented the proper position of the balloons and the evolution of the injured liver parenchyma. Intensive care was decisive in the comprehensive management of the patient which has been recommended in recent literature to reduce maternal morbidity and mortality<sup>2,4,8-11</sup>.

The technique used in the present case has not been described in the previous reports and provides one more option to inhibit the hemorrhage of the liver from the rupture of a hematoma in the setting of severe preeclampsia with the HELLP syndrome.

## Conclusion

The placement of a Sengstaken–Blakemore probe can be used for the control of hepatic rupture in selected cases with successful results. The morphological characteristics of the site of the hepatic rupture, the experience of the management of the probe, and the skill of the surgeon are the most important factors to achieve satisfactory results and avoid a complication.

## Conflicts of interest

The author declares that they have no conflicts of interest.

## Ethical disclosures

**Protection of human and animal subjects.** The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

**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.

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