

Surgical Treatment of Liver Hemangioma – Case Report

Kolani Henri^{1*} Naço Majlinda² Taçi Stela³ Kananaj Ervin⁴ Haxhiu Asfloral⁵
Vila Frenki⁶ Osmënaj Renato⁷ Prendi Urana⁸ Qosja Entela⁹
Thomanasto Aleksandër¹⁰ Prendi Kristian¹¹ Sula Arentin¹²

1. Associate Professor, General Surgeon, “Mother Teresa” University Hospital, Tirana, Albania
 2. Associate Professor, Anesthesiologist, “Mother Teresa” University Hospital, Tirana, Albania
 3. Gastroenterologist, “Mother Teresa” University Hospital, Tirana, Albania
 4. General Surgeon, Berat Regional Hospital, Berat, Albania
 5. General Surgeon, Lushnje County Hospital, Lushnje, Albania
- * E-mail of the corresponding author: henri.kolani@yahoo.com

Abstract

Background

The increase of usage of imaging techniques, such as ultrasound, MRI and CT has also raised our awareness about benign liver tumors. A higher specificity of these methods reduces the need for percutaneous biopsy. A liver hemangioma must be differentiated from other benign solid tumors of the liver: hepatocellular adenoma, hepatocellular focal nodular hyperplasia, angiomyolipoma and leiomyoma. Liver hemangiomas have clear imaging features and are mostly asymptomatic.

Case presentation

Our 52 years old female patient had been following regularly her liver hemangioma for the last five years. Lately she was experiencing epigastric and RUQ pain after meals, and the dimensions of the hemangioma reached 10cm, with an involvement of the segments II-III and IV. Considering the dimensions and most importantly the clinical signs, the decision was made for the surgical treatment. A left resectomy was performed. The patient made a full recovery and was discharged.

Discussion

The overwhelming majority of liver hemangiomas are asymptomatic and are incidentally diagnosed in routine ultrasound examinations. They comprise about 70% of all benign hepatic lesions. Because of the clear imaging features of liver hemangiomas, the role of radiologic studies is emphasized. Despite the varying dimensions, asymptomatic hemangiomas have no recommended treatment. No lifestyle changes or medications contribute to improved outcomes. However, when hemangiomas become symptomatic, there are three therapeutic options. 1) Hepatic artery ligation; 2) Radiofrequency ablation 3) Surgical resection.

Conclusion

In conclusion, the management of liver hemangiomas may vary from watchful radiologic observation, to radiologic and major surgical interventions. The most common indication for a surgical approach is the presence of various symptoms (mostly abdominal pain) with the increase in size. Although more voluminous tumors are likely to cause more symptoms, size alone is not an indication. Prophylactic resection for giant hemangiomas (>10cm) is not recommended, as the risk for hemorrhage and complications is to be considered. In this specific case, the following arguments were considered for proposing a surgical treatment: a) the tumor has become symptomatic (abdominal pain), b) patients willingness and cooperation to remove the tumor, c) hemangioma size of 10cm, which has a higher risk of traumatic rupture.

Keywords: General Surgery, Hepatobiliary Surgery, Liver Hemangioma, Liver Resection, Left Hepatectomy.

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1. Introduction

The increase of usage of imaging techniques, such as ultrasound, MRI and CT has also raised our awareness about benign liver tumors. A higher specificity of these methods reduces the need for percutaneous biopsy. A liver hemangioma must be differentiated from other benign solid tumors of the liver: hepatocellular adenoma, hepatocellular focal nodular hyperplasia, angiomyolipoma and leiomyoma. Liver hemangiomas have clear imaging features and are mostly asymptomatic.

The prevalence of liver hemangioma in the general population ranges from 2 to 20%. The majority of hemangiomas are less than 5cm in diameter. They remain stable in size, although larger lesions tend to have a higher rate of growth also. Such tumors of more than 10 cm are considered giant hemangiomas.

From the clinical perspective, liver hemangiomas do not manifest with direct symptoms, rather other accompanying conditions such as gallstones, peptic ulcer or hiatal hernia may present abdominal pain, nausea, vomiting. However, giant lesions of the left liver lobe may cause mild symptoms from the compression of adjacent structures and jaundice. Laboratory tests are generally normal, but in rare occasions inflammatory

processes with coagulopathy may be observed.

Under abdominal ultrasound, liver hemangiomas have an aspect of a homogenous hyperechoic mass with clear margins and no Doppler enhancement. On a CT scan, the lesions show a slow contrast enhancement, starting with the central portion. A characteristic, more specific appearance of liver hemangiomas is observed in contrast MRI.

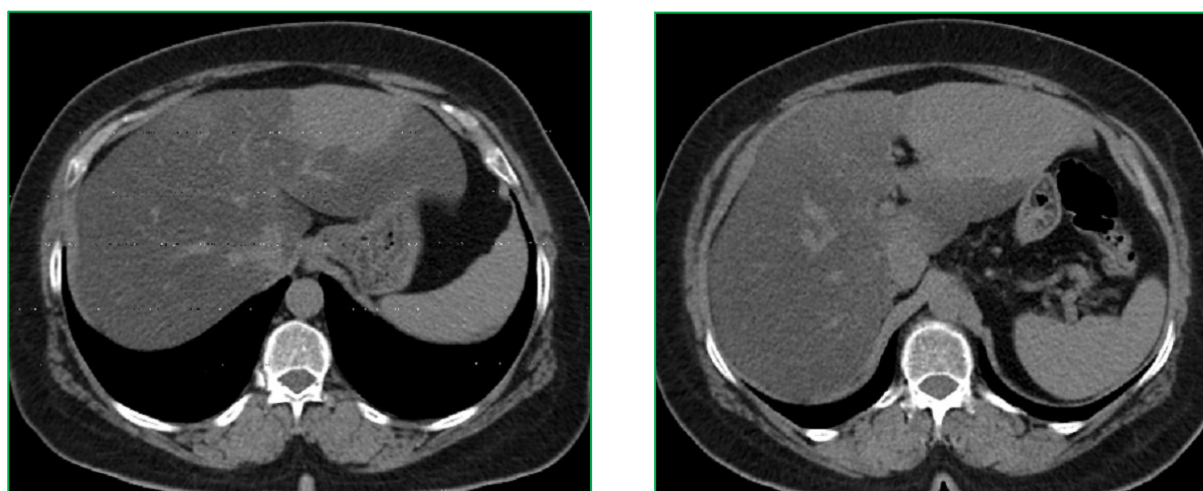
Among treatment options for symptomatic or complicated liver hemangiomas the most acceptable techniques remain enucleation or liver resection either via open or laparoscopic route.

2. Case presentation

2.1 History of present illness

Our patient is a 52 years old woman diagnosed 5 years ago on a routine check-up with a liver hemangioma. Initially the dimensions were about 6-8cm, and the patient had no symptoms. On the last 2 years an increase in the dimensions of hemangioma was noted, and in the last 4 months she experienced abdominal pain in the epigastric and right upper quadrant regions, especially after a meal. The size of the hemangioma, now reaching 10cm, also most importantly the fact that the patient experiences pain and discomfort after meals indicated a surgical treatment. Patient consent was obtained and she was prepared for surgery.

The patient was evaluated with an ASA score of 2, due to the accompanying conditions of type II Diabetes Mellitus, class-3 obesity (BMI 36), varicose veins of lower extremities and arterial hypertension.



Figures 1 & 2. CT sequences showing a contrast enhanced liver mass involving segments II-III-IV.

2.2 Details of the surgical procedure

The surgery begins with an extended bicostal incision and access to the peritoneal cavity. We encounter an intraparenchymal liver hemangioma involving segments II-III and partially IV, with maximal diameter 10cm. The falciform ligament is divided and cut. We continue with the division of the triangular ligament on both sides, left and right. The suprahepatic vena cava is identified and the left suprahepatic vein is prepared. It is then cut and suture-ligated.

The procedure continues with the hepatic hilum. At the hepato-duodenal ligament a rubber loop is passed in case a Pringle manoeuvre is needed. Cholecystectomy is performed. The common bile duct is prepared in order to visualize the left and right hepatic ducts. The left hepatic duct is indexed with a rubber loop.

The left hepatic artery is also identified and a loop is passed around it. At the bifurcation level, the left and right hepatic parts of portal vein are identified. Near the left branch of the portal vein the hepatic artery which irrigates the IV-th segment is identified. The aforementioned biliary and vascular elements pertaining to the left side of the liver are selectively cut and ligated.

We begin the resection of liver parenchyma, performing careful hemostasis control and suturing biliary ducts and vessels. During the surgery, a drop in the oxygen saturation (80%) and blood pressure (90/65 mmHg) was encountered. Having no active bleeding sites in the abdomen, it was concluded that a right-side pneumothorax had occurred (possibly after a right jugular IV line insertion). A chest tube is inserted and parameters normalize. The procedure ends with lavage and the positioning of abdominal drains and closure of the wound.

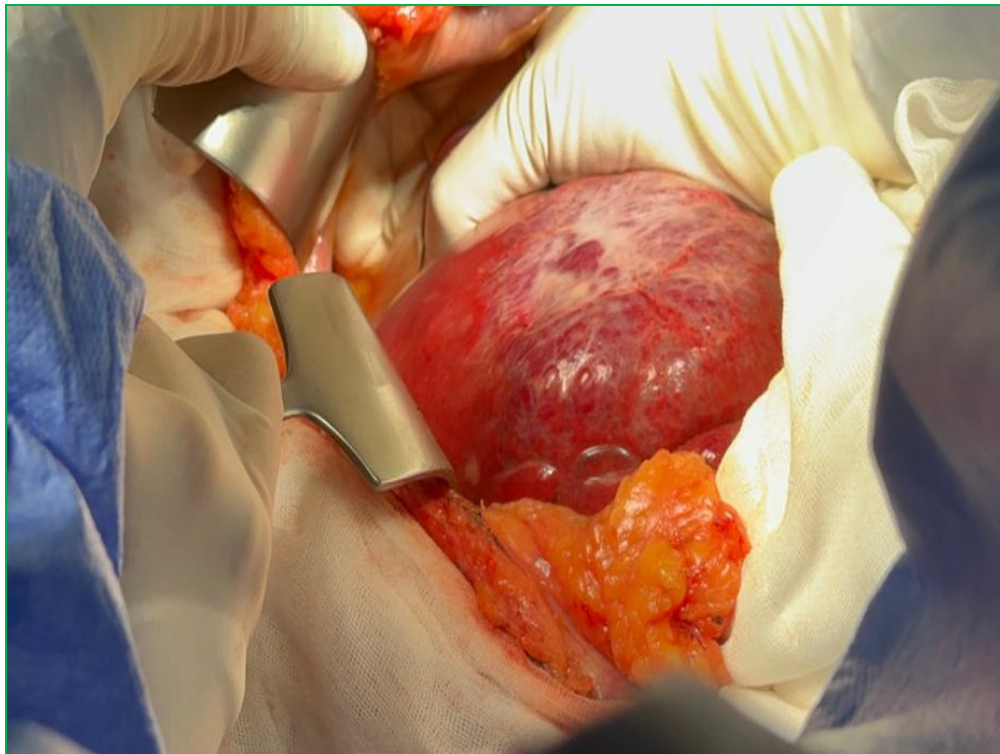


Figure 3. Liver hemangioma visible on the left liver lobe, segments II-III.

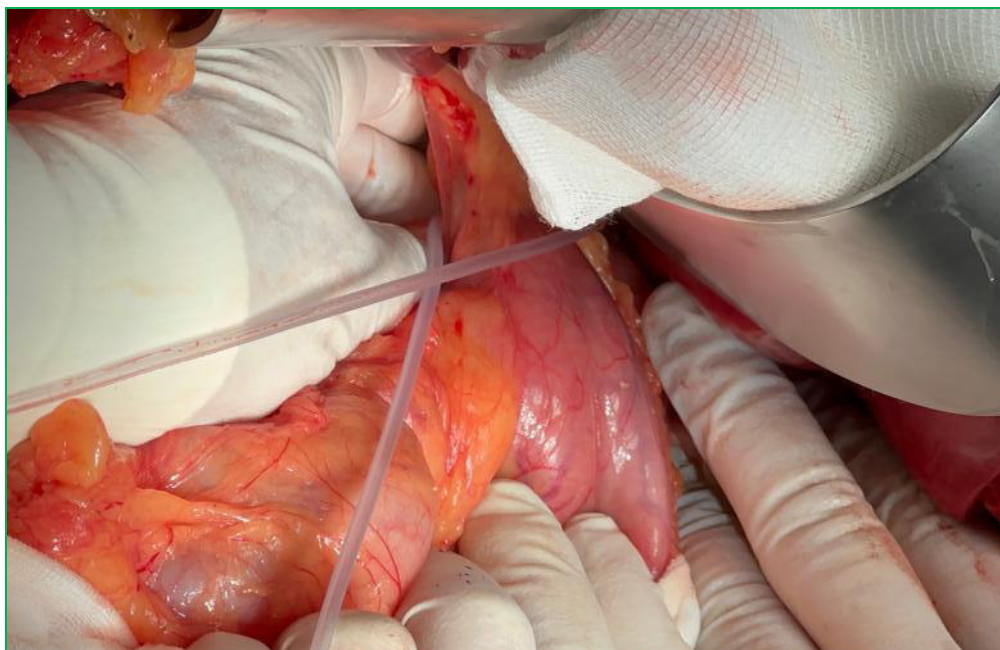


Figure 4. Rubber loop around the hepatoduodenal ligament, in case a Pringle manoeuvre is needed.

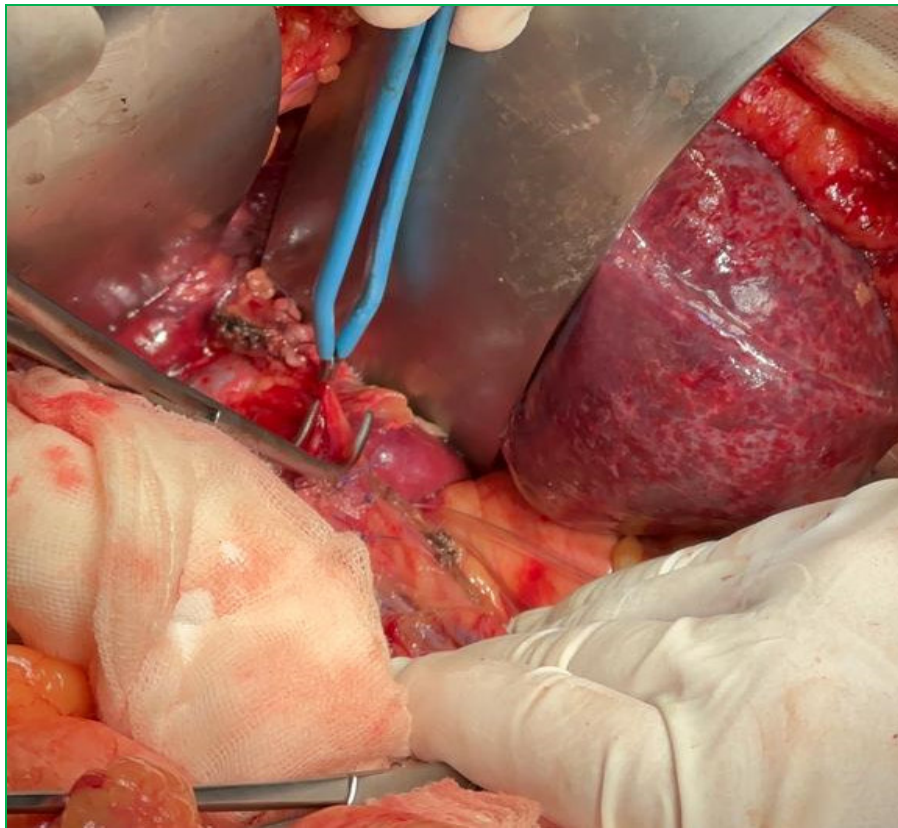


Figure 5. Dissection of the hilum. Identification of the left hepatic artery.

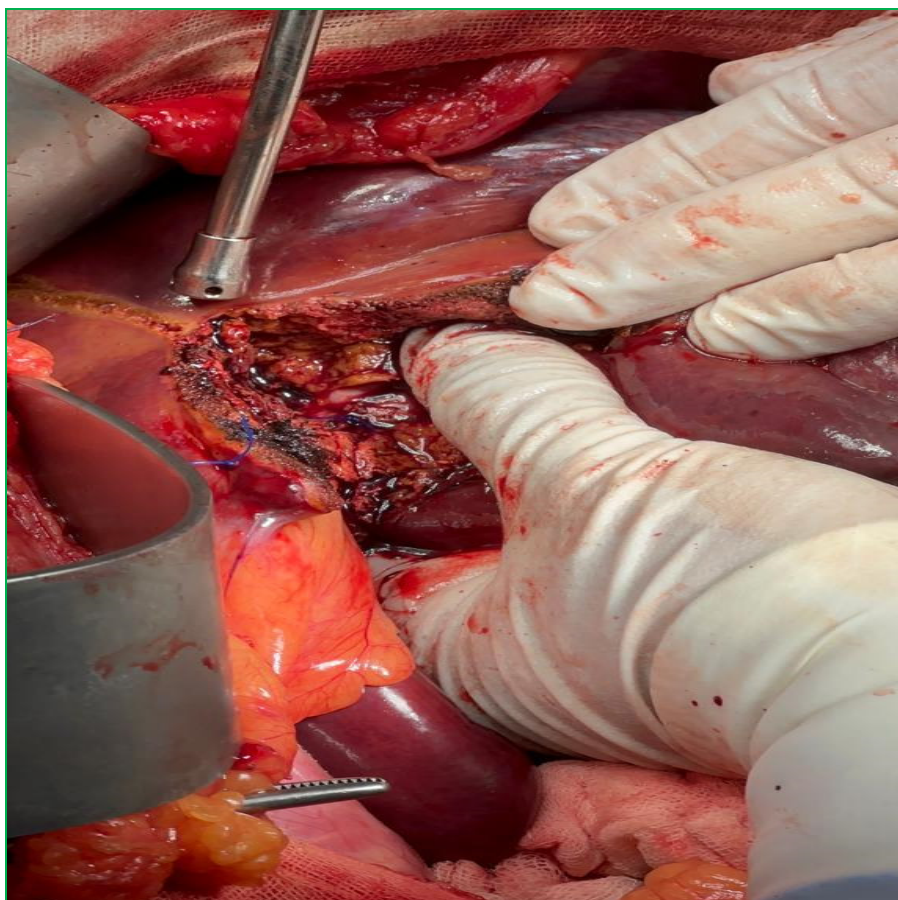
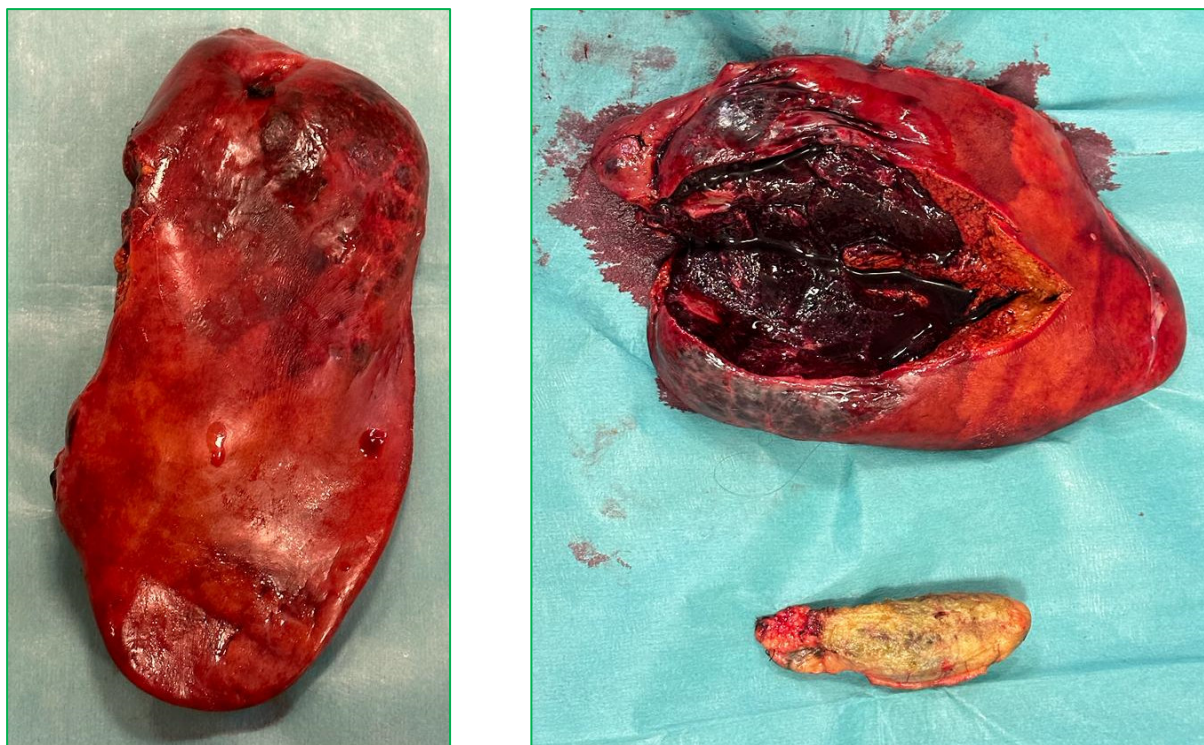


Figure 6. Hepatic resection and hemostasis control with sutures in the liver remnant.



Figures 7 & 8. The resected specimen of left hepatectomy (liver segment II-III, part. IV and gallbladder).

2.3 Post-operative period

The patient was monitored in the intensive care unit for the first 2 days. Liver enzymes were elevated up to 1100U/L and bilirubin up to 3mg/dL. After the fourth day the biochemical lab reports began to normalize. On the 6th postoperative day, the patient is discharged in good health.

3. Discussion

The overwhelming majority of liver hemangiomas are asymptomatic and are incidentally diagnosed in routine ultrasound examinations. They comprise about 70% of all benign hepatic lesions. Because of the clear imaging features of liver hemangiomas, the role of radiologic studies is emphasized.

Despite the varying dimensions, asymptomatic hemangiomas have no recommended treatment. No lifestyle changes or medications contribute to improved outcomes.

However, when hemangiomas become symptomatic, there are three therapeutic options. 1) Hepatic artery ligation; 2) Radiofrequency ablation 3) Surgical resection. The first two methods are not definitive, but may be considered in select cases. Surgical resection via enucleation, for peripheral tumors or standard segmental resection is the recommended definitive treatment.

4. Conclusion

In conclusion, the management of liver hemangiomas may vary from watchful radiologic observation, to radiologic and major surgical interventions. The most common indication for a surgical approach is the presence of various symptoms (mostly abdominal pain) with the increase in size. Although more voluminous tumors are likely to cause more symptoms, size alone is not an indication. Prophylactic resection for giant hemangiomas (>10cm) is not recommended, as the risk for hemorrhage and complications is to be considered.

As of today the two surgical strategies, enucleation and resection offer similar outcomes in giant hemangiomas of size >10cm. No medical therapy capable of reducing the size of hepatic hemangiomas has been described.

In this specific case, the following arguments were considered for proposing a surgical treatment: a) the tumor has become symptomatic (abdominal pain), b) patients willingness and cooperation to remove the tumor, c) hemangioma size of 10cm, which has a higher risk of traumatic rupture.

Conflict of interest

The author(s) declare(s) that there is no conflict of interest. The authors alone are responsible for the content and writing of the paper.

Financial disclosure

There is no financial support to this study.

Ethical aspect

Informed consent was obtained from all participants in the study and all procedures were conducted in accordance with the Declaration of Helsinki.

References

1. Jia K, Gao Z, Li M, Yu C. Interventional treatments for hepatic hemangioma: A state-of-the-art review. *J Interv Med.* 2022 Feb 26;5(1):6-9. doi: 10.1016/j.jimed.2021.12.009. PMID: 35586280; PMCID: PMC8947984.
2. Choi BY, Nguyen MH. The diagnosis and management of benign hepatic tumors. *J Clin Gastroenterol.* 2005 May-Jun;39(5):401-12. doi: 10.1097/01.mcg.0000159226.63037.a2. PMID: 15815209.
3. Brouwers MA, Peeters PM, de Jong KP, Haagsma EB, Klompmaker IJ, Bijleveld CM, Zwaveling JH, Slooff MJ. Surgical treatment of giant haemangioma of the liver. *Br J Surg.* 1997 Mar;84(3):314-6. PMID: 9117293.
4. Terkivatan T, Vrijland WW, Den Hoed PT, De Man RA, Hussain SM, Tilanus HW, IJzermans JN. Size of lesion is not a criterion for resection during management of giant liver haemangioma. *Br J Surg.* 2002 Oct;89(10):1240-4. doi: 10.1046/j.1365-2168.2002.02219.x. PMID: 12296890.
5. Duxbury MS, Garden OJ. Giant haemangioma of the liver: observation or resection? *Dig Surg.* 2010;27(1):7-11. doi: 10.1159/000268108. Epub 2010 Apr 1. PMID: 20357445.
6. Liu X, Yang Z, Tan H, Xu L, Sun Y, Si S, Liu L, Zhou W, Huang J. Giant liver hemangioma with adult Kasabach-Merritt syndrome: Case report and literature review. *Medicine (Baltimore).* 2017 Aug;96(31):e7688. doi: 10.1097/MD.0000000000007688. PMID: 28767598; PMCID: PMC5626152.
7. Xia ZH. Treatment of Hepatic Haemangioma with Hepatic Artery Embolism. *昆明医科大学学报.* 2011;32(01).
8. Moctezuma-Velázquez C, López-Arce G, Martínez-Rodríguez LA, Escalona-Huerta C, Chapa-Ibargüengoitia M, Torre A. Giant hepatic hemangioma versus conventional hepatic hemangioma: clinical findings, risk factors, and management. *Rev Gastroenterol Mex.* 2014 Oct-Dec;79(4):229-37. English, Spanish. doi: 10.1016/j.rgmx.2014.08.007. Epub 2014 Nov 29. PMID: 25438870.
9. Hoekstra LT, Bieze M, Erdogan D, Roelofs JJ, Beuers UH, van Gulik TM. Management of giant liver hemangiomas: an update. *Expert Rev Gastroenterol Hepatol.* 2013 Mar;7(3):263-8. doi: 10.1586/egh.13.10. PMID: 23445235.