

Trans-Arterial Embolization of a Giant Hepatic Hemangioma Prior To Surgical Resection – A Case Report and Review of the Literature

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Abstract

Hepatic hemangiomas are the most common benign tumors of the liver. The majority of them consist of small and asymptomatic hemangiomas that could be managed conservatively. However, giant hemangiomas with persistent symptoms, rapid growth in size, and risk of bleeding may require intervention. Trans-arterial embolization (TAE) has been proposed for the treatment for giant hemangiomas of the liver, either alone or as an adjunct prior to definitive surgery. The purpose of this report is to present a case of a female patient with a giant symptomatic liver hemangioma that was referred to our outpatient hepatobiliary/pancreas (HBP) clinic. The patient was initially treated by TAE of the feeding vessels, followed by open surgery in the form of a non-anatomic left lateral hepatectomy.

Keywords: Liver hemangioma; Arterial Embolization; Liver resection

Introduction

Hepatic hemangiomas are the most common benign tumors of the liver, occurring in the 0,4 - 20 % of the general population. They are usually found in females (female: male ratio 5:1) and are diagnosed between the third and fifth decade of life (1). Histologically, they are composed of clusters of blood-filled cavities, lined by a single layer of endothelial cells within a fibrous stroma fed by the hepatic artery. Approximately 80% are of the cavernous type, whereas the sclerosing, the capillary and the hemangioendothelioma are less common entities [1]. The pathogenesis is not well known, although a congenital anomaly has been proposed. Predisposing factors such as steroids, estrogen therapy, oral contraceptives and pregnancy have all been implicated [2]. At about 90% of the hemangiomas tend to be present as a single lesion. They are commonly found in the right liver lobe, with a diameter ranging from a few millimeters to tens of centimeters. Giant hepatic hemangiomas are defined as those with a diameter larger than 5 cm and account for about 20% of the cases [1,3]. Classic liver hemangiomas have a typical appearance on imaging studies. Typically are well-defined lesions with peripheral nodular enhancement on contrast enhancement ultrasound (CEUS) and/or on multiphase Computed tomography (CT) scan. The vast majority are small and asymptomatic. Symptoms are usually caused by mechanical compression of adjacent structures and distension of the Glisson's capsule. Upper abdominal pain, nausea, early satiety, jaundice, haemobilia and Budd Chiari syndrome are commonly seen in such cases [2,3]. Other symptoms might be caused by intra-tumoral infarction and bleeding, or less commonly by rupture and intraperitoneal hemorrhage. Mortality rates in case of spontaneous rupture have been reported as high as 60% [4]. More rarely, giant hemangiomas

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can be the cause of Kasabach- Merritt syndrome, resulting in thrombocytopenia and disseminated intravascular coagulation. Indications for treatment include rapid growth in size, persistent symptoms, as well as questionable diagnosis [1]. A variety of treatments have been proposed for the management of liver hemangiomas. Surgical options include enucleation, typical segmental resection, liver lobectomy or even transplantation. Transcatheter arterial embolization and radiofrequency ablation are nowadays developing as an alternative approach, used either alone or as an adjunct prior to surgical resection [5,6].

Case Report

A 69-year-old female was referred to our HBP outpatient clinic for a known giant liver hemangioma since 2016. The patient had a history of gastroesophageal reflux disease (GERD) and she was complaining for upper abdominal pain and indigestion symptoms for six months. Recent ultrasound and CT scan showed a left lobe giant liver hemangioma of approximately 10 cm with an increase in size, in direct contact with the stomach and the second part of the duodenum. An oesophago-gastro-duodenoscopy (OGD) was then carried out revealing gastritis but without any signs of external compression.

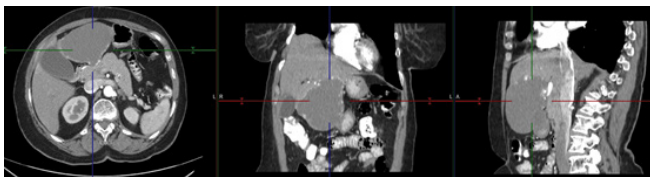


Figure A: Computer tomography showing the giant left liver hemangioma.

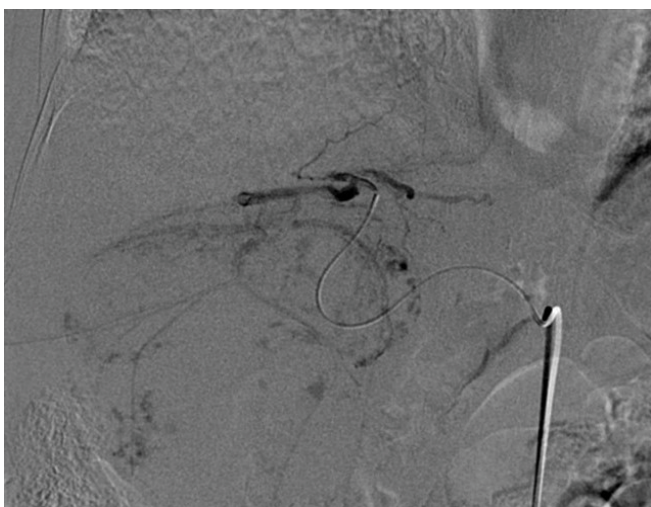


Figure B: Selective catheterization of the common hepatic artery and superselective catheterization of the feeding artery of the lesion, shows the classic snowy tree or cotton wool appearance of a liver hemangioma.

The patient was offered treatment due to the increasing size. Prior to surgery, we decided to refer the patient for TAE in order to reduce the intraoperative risk of bleeding. Trans-arterial super-selective catheterization of the feeding artery of the lesion was performed (figure. A) and subsequent embolization with particles was followed until complete stasis of the blood flow was achieved. The patient was operated seven days later, by an open non-anatomical liver resection of segments II and III.

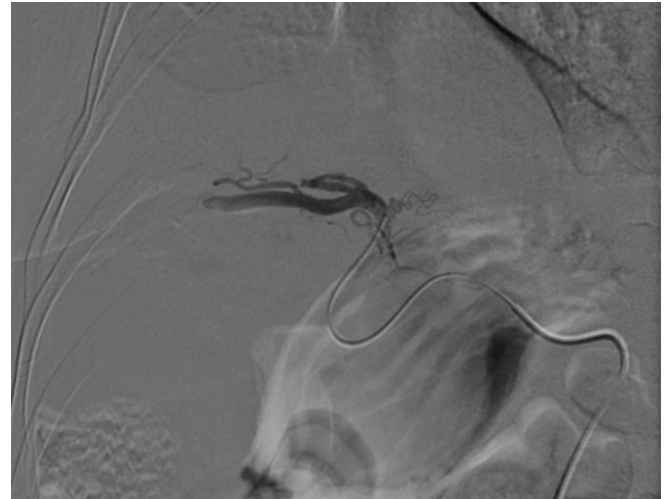


Figure C: Image from post-embolization angiography show no significant flow within the lesion.

Intraoperatively, we noticed a reduction in size as well as a clear demarcation of the surrounding parenchyma due to the TAE. The technique of parenchymal transection was the same as our usual technique, using a cavitron ultrasound aspirator device for parenchymal transection and a bipolar sealer to achieve hemostasis.

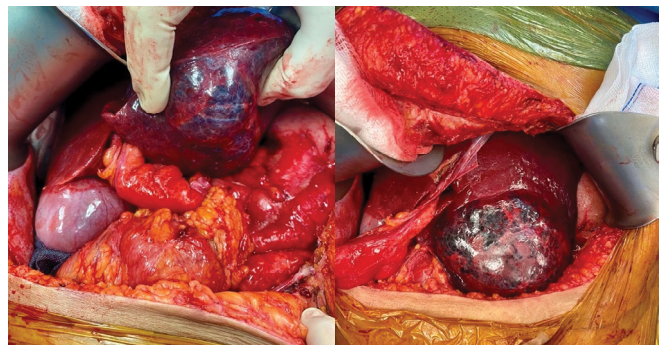


Figure D: Intraoperative picture of the hemangioma, showing compression of the stomach and second part of duodenum.

The patient had an uneventful postoperative course. A CT scan was requested on the 3rd post-operative day due to elevated inflammatory markers, without any significant findings. She was finally discharged two days later. She was

reviewed at the outpatient clinic 2 weeks later recovering reasonably well from surgery.

Discussion

Most hemangiomas are small, benign liver lesions that do not usually require any treatment. Follow up with imaging every 6 months or annually is usually sufficient [1,2]. The decision for intervention is individualized and based on the lesion size, location, severity of symptoms and the risk of bleeding. Appropriate treatment has been controversial. Although surgery has been considered as the gold standard in most centers, minimally invasive methods have shown efficacy either as a bridge prior to surgery or as an alternative method of definitive treatment. The main surgical procedures include enucleation, liver resection and liver transplantation [3]. Enucleation is a safe option for peripheral lesions and lesions proximal to hepatic portal vascular structures [1]. Comparing to resection, enucleation preserves more hepatic parenchyma and reduces postoperative complications such as postoperative bleeding, bile leak and hepatic insufficiency [3,7]. Larger anatomical resection remains an option for bigger lesions that cannot be managed with enucleation, or when the border between cavernous tissue and normal liver remains unclear. Liver transplantation is preserved for extreme cases of extensive hemangiomas or hemangiomas complicated with the Kasabach- Merritt syndrome [1]. Image guided surgery as an alternative approach, includes trans-arterial embolization, radiofrequency and microwave ablation, percutaneous sclerotherapy and percutaneous argon-helium cryotherapy [1]. Trans-arterial embolization with a combination of Lipiodol with bleomycin, pingyangmycin or ethanol is the most common preferred options for multiple or giant lesions [5,8]. The advantage is the potential significant reduction of the size of lesions up to 6cm [5,9]. Therefore, less extensive hepatectomies are required with potentially lower morbidity [6,8]. In addition, up to 98% of the patients may have partial or complete relief of their symptoms, whereas after surgery this percentage varies from 44 to 87% [10,11]. The complications of radiological intervention described are biloma, hepatic abscess, hydrothorax and the post-embolization syndrome (40%) [1]. Furthermore, 30% of patients that were treated with TAE alone, will eventually need surgery due to regrowth of the lesion [12].

In summary, data from several studies suggest that the majority of patients with giant hemangiomas benefit from surgical intervention. Trans-arterial embolization can be used as an alternative treatment or as a bridge prior to surgery. As far as we know, there is yet no guideline to follow as per the recommended treatment of giant hemangiomas. However, there could be a benefit from embolization prior to liver resection. There may be a reduction of the risk of intra-operative bleeding as well as a chance for preservation of more of the liver parenchyma.

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