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Case Report

Massive hepatic adenoma response to bland embolization: A case study

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ABSTRACT

Hepatic adenomas are rare, benign liver masses of rising incidence in the United States. We present a report of a 22-year-old asymptomatic female with a massive (14.2 × 11.4 cm), centrally located hepatic adenoma. The unique presentation of the adenoma in close proximity to the hepatic vasculature meant the patient was not a candidate for surgical resection. An arterial embolization was used as an alternative approach to initial treatment. Arterial branches supplying the adenoma were identified via computed tomography and embolized with embospheres and coils. The treatment resulted in a large reduction in size and density of the adenoma identified at a 1-month follow-up. The case supports further use of arterial embolization as an initial treatment for large adenomas to improve the outcome of subsequent surgical approaches.

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Introduction

Hepatic adenomas (HA) are benign liver masses with a yearly incidence of 1–4 per 100,000 adults [1–3]. HAs most commonly occur in female patients of reproductive age with a pertinent history of oral contraceptive use [2]. Established treatment strategies for HAs include conservative monitoring and surgical resections while new techniques such as arterial embolization and radiofrequency ablation provide alternative options for patients.

HAs are considered candidates for elective surgery once they exceed 5 cm in diameter while conservative measures are recommended for smaller lesions [4,5]. Resection of lesions larger than 5 cm is advised due to the risk of hemorrhage or malignant transformation [4,6]. Current case studies have shown that intra-arterial embolization (AE) provides a favorable option for perioperative management of HAs and is considered safe for elective management of HAs [7,8].

AE is commonly used to manage hemorrhagic hepatic adenomas and can also be used to induce tumor regression [5]. This treatment has been shown to reduce the need for

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surgical intervention and has caused complete disappearance of HAs in some patients [5].

The case presented is of a large, centrally located hepatic adenoma measuring 14.2 × 11.4 cm. The size and location of the adenoma prevented elective surgery due to the unique position of the tumor near the inferior vena cava, hepatic veins, and portal vein. We report the effects of AE on a large hepatic adenoma to guide treatments of similar adenomas in the future.

Case report

A 22-year-old asymptomatic female presented with an elevated alkaline phosphatase level identified during a routine annual physical. The patient had a 9-year history of oral contraceptive use.

An alkaline phosphatase isoenzyme test was performed and a hepatic origin was determined. Liver disease due to alpha-1 antitrypsin deficiency was ruled out. Magnetic resonance imaging of the abdomen identified a solid, centrally located liver mass in close proximity to the inferior vena cava, hepatic veins, and portal vein causing displacement of the healthy surrounding liver tissue. AFP tumor marker for liver cancer was negative. A computed tomography (CT) guided biopsy of the liver mass was performed to confirm the benign nature of the tumor. Four passes were made with an 18 g biopsy needle with a 3.3 cm throw and confirmed the diagnosis of a benign hepatic adenoma.

Although surgical resection would be recommended due to the size of the HA, the location of the mass dictated a bland embolization to be performed. A CT angiography was performed showing the adenoma was supplied from branches of the superior mesenteric artery, celiac axis, and right inferior phrenic artery (Fig. 1).

Digital subtraction angiography was used to observe the potential vascular supply originating from the celiac axis, superior mesenteric, left hepatic, gastroduodenal, right gastric, and right inferior phrenic arteries. This showed an accessory right hepatic artery originating from the SMA, an enlarged middle hepatic artery, and reversed flow in the gastroduodenal artery (Fig. 2).

Selective arterial embolization was performed on suspected arteries providing a vascular supply to the central hepatic tumor. The vessels were embolized with 300-500 micron embospheres.

The embolization was performed on 4 branches off the replaced right hepatic artery and an artery to segment 4 originating from the gastrohepatic trunk. A large communicating branch between the gastroduodenal artery and intrahepatic vessels was coil embolized to prevent nontarget embolization. Minimal vascular supply to the lesion was identified from the gastroduodenal and left hepatic artery and no supply was identified from the right gastric artery.

The embolization was assessed using postembolization angiography showing significantly reduced tumor vascularity.

The patient returned for a CT scan 1-month postprocedure to evaluate tumoral response. After receiving the bland embolization, the large central liver mass decreased from a

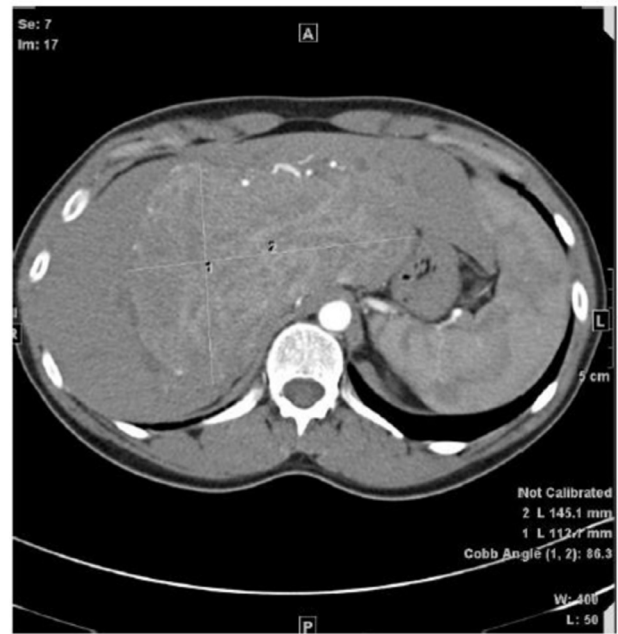


Fig. 1 – CTA of the abdomen in arterial phase post contrast identifies a centrally located heterogeneously enhancing central hepatic mass later identified as a proven hepatic adenoma by biopsy measuring 14.2 × 11.2 cm. CTA, computed tomography angiography.

density of 45 Hounsfield units to a smaller mass measuring 15 Hounsfield units with a core of necrosis. Enhancing tissue is identified along both the anterolateral and posterior aspect of the mass surrounding the necrotic remnant of the treated tumor (Fig. 3). The enhancement pattern is similar to the tumor pretreatment likely indicating the remnant viable tissue is adenomatous likely supplied by extrahepatic vessels. Overall the bland embolization of the HA was successful in reducing the mass to 10-15% of viable remnant tissue volume after treatment.

Discussion

The article presented illustrates the elected management of an asymptomatic, massive HA. AE was selected as an initial treatment strategy due to the central location of the mass in close proximity to important vasculature. This location meant surgical resection would not be an initial option. The embolization was successful on follow up CT, both reducing the size and density of the HA.

Due to the increasing use of diagnostic imaging and use of birth control by females of reproductive age, more benign liver masses, including HAs, are being diagnosed in the United States [9]. Surgical resection is not an option for many of these lesions due to the complex anatomy of the liver. This makes the evaluation of other treatment options such as AE of absolute importance. Additionally, while the low morbidity (9%) and minimal mortality of a minor liver resection seem favorable, individual patient presentations including comorbid

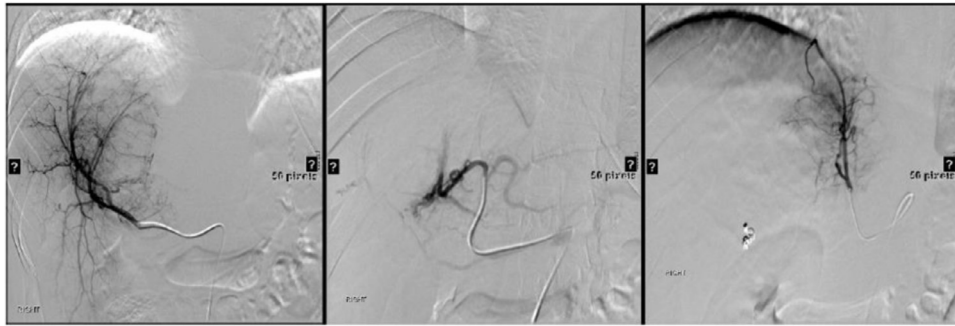


Fig. 2 – Digital subtraction angiography of the replaced right hepatic artery (A), left hepatic artery (B), and right inferior phrenic artery (C) was used to identify the vascular supply to the HA. The phrenic artery shows a significant vascular supply to the lesion. HA, Hepatic adenomas.

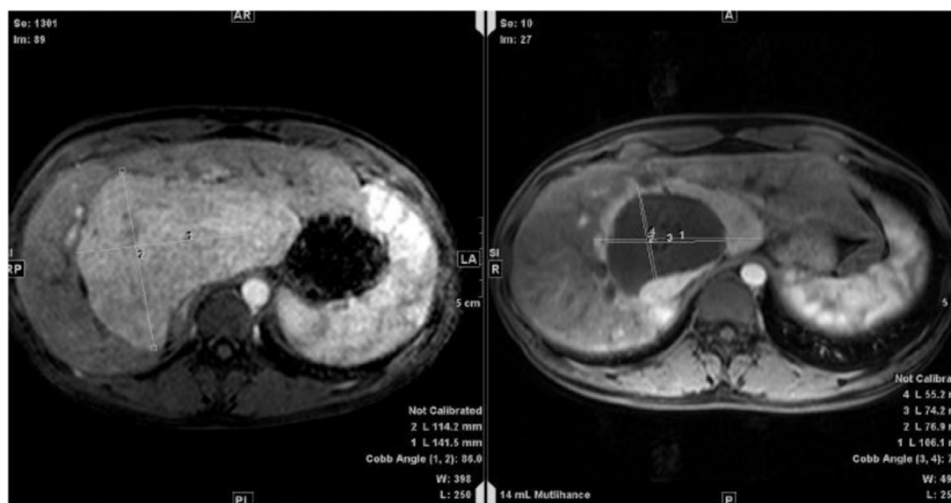


Fig. 3 – Magnetic imaging before treatment via embolization (A) and 1 month after treatment (B). Compared to the initial MRI, the post-treatment shows an overall reduction in size of the lesion in addition to a central necrotic core.

conditions and surgical complications such as prolonged surgery time and incomplete resections can increase unfavorable outcomes [10]. Using AE as an approach to minimize surgical complications by making the tumor more approachable would be a useful tool for physicians when providing initial evaluation of an HA. Complications associated with AE are reported at 8% and include postembolization syndrome and temporary renal failure [5]. A major liver resection has an associated complication rate up to 43%, mostly due to postoperative hepatic dysfunction [11]. This discrepancy in complication rates makes the consideration of AE crucial since the AE approach to small lesions can lead to complete resolution and the avoidance of liver surgery in entirety [5]. As a result of the reduction in size due to the AE performed in this case study, the patient underwent a successful resection 9 months following the initial treatment.

In conclusion, AE is an indicated initial treatment for large adenomas in cases where surgical resection is not an option or as a perioperative tool to improve the surgical approach. In this case, the treatment resulted in a reduction in density and size of the HA. This case presents support for a conservative

initial approach in the management of large hepatic adenomas that are not initial candidates for resection. The treatment has been shown to reduce the size of HA which could provide the patient the option of having a surgical resection in the future. The conclusions provided by the study should be validated with a larger, comparative study.

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