

Case Report

Splenic and hepatic artery aneurysm: a case report

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ABSTRACT

Visceral artery aneurysms (VAA) have an incidence of 0.01-2% and are mainly diagnosed as an incidental finding in imaging studies done for other reasons. Their mortality when ruptured can be as high as 75%. We present a rare case of multiple visceral artery aneurysms that presented as dull abdominal pain and were managed with open surgery in accordance to specific treatment criteria.

Keywords: VAA, Hepatic artery aneurysms, Splenic artery aneurysms, Endovascular surgery

INTRODUCTION

Intra-abdominal aneurysms have an incidence of 0.01-2%, which are generally asymptomatic and incidentally diagnosed by imaging studies performed for another apparent reason.¹ VAA have a 75% mortality when ruptured; for this reason, they have specific treatment indication even in asymptomatic cases.

CASE REPORT

A 59-year-old female seeks attention for a 3-year duration abdominal pain, intermittent, of moderate intensity, located in right hypochondrium without irradiation. Her past medical history includes a tubal sterilization done 30 years before presentation. Patient has no chronic diseases, allergies or history of trauma. Due to suspicion of biliary pathology, an abdominal ultrasound is done with findings of a hepatic artery aneurysm. In order to complete the diagnosis, a CT angiography is done where three intraabdominal aneurysms are documented. The first one is a right hepatic artery aneurysm, saccular type of 23×23×20 mm dimensions with tortuosity proximal to the aneurysmatic

lesion. The second one is 13×12.6×10 mm with a 4 mm neck located in the splenic artery and a third splenic artery aneurysm of 11×11×9 mm with a 4 mm neck located in the splenic hilum in close contact to the pancreas tail. Both splenic artery aneurysms are saccular type (Figures 1 and 2).

The vascular surgery and angiology department is not able to perform an endovascular technique to address the hepatic and splenic aneurysms due to the tortuosity found proximal to the lesions.

A second preoperative CT angiography is done finding a 2 mm enlargement in the splenic hilum aneurysm. An open surgical approach is done in collaboration with the vascular surgery and angiology department which included a total cholecystectomy, aneurysmectomy of the right hepatic and splenic aneurysm and a total splenectomy including the aneurysm located in the splenic hilum. Surgery was done without any complication with the subsequent findings: a right hepatic artery fusiform aneurysm of 3×2.5×2.5 cm in size, with two entry vessels and one outlet vessel (Figures 3A and B); splenic artery aneurysm located in the splenic hilum

in close contact with pancreas tail of approximately 9 mm in size; splenic aneurysm located 6 cm distal to the splenic hilum of approximately 10 mm in diameter. All the aneurysms were obtained without any mayor complication, with minimal bleeding and adequate hepatic irrigation was confirmed.

Patient had a good post operatory evolution with oral intake at 24 hours post-op, ambulation at 48 hours and hospital discharge at 72 hours postop. Patient had good evolution without pain or any other symptom in the 5, 10 and 30 post-operatory days.

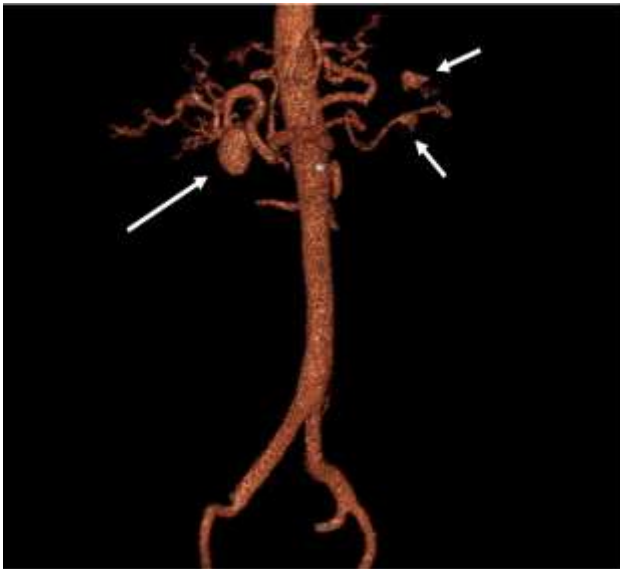


Figure 1: Tridimensional vascular reconstruction CTA of 3 aneurysms, in the right hepatic artery, in the splenic artery and in the splenic hilum.

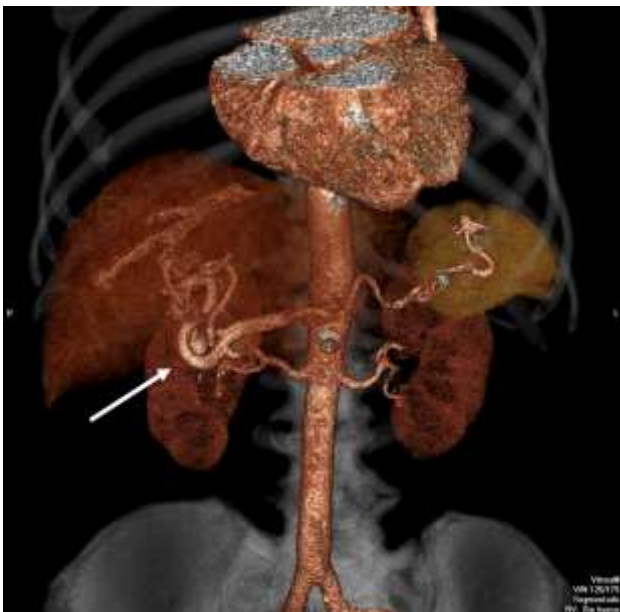


Figure 2: Tridimensional vascular reconstruction CTA where a vascular tortuosity proximal to the hepatic artery aneurysm can be appreciated.

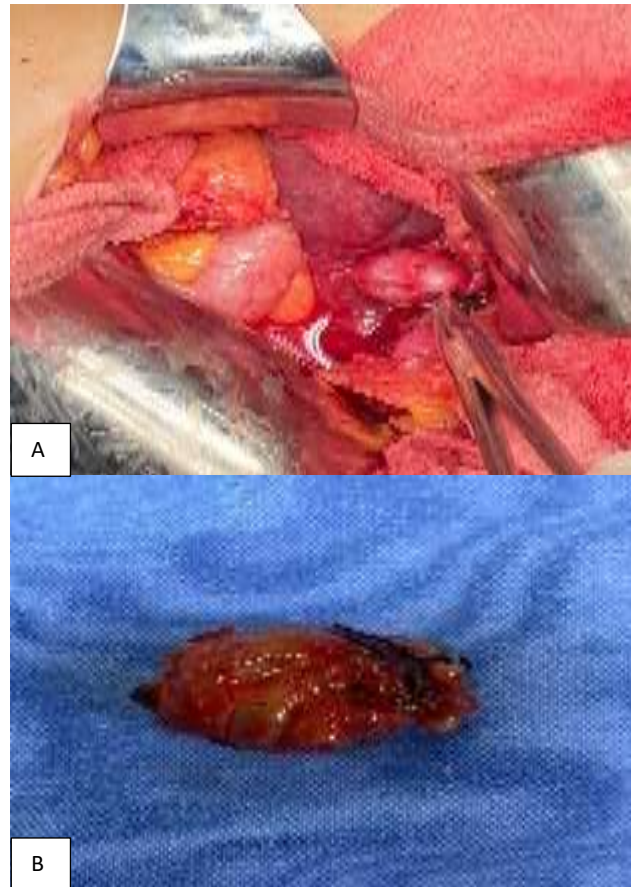


Figure 3 (A and B): Right hepatic artery aneurysm.

DISCUSSION

Visceral artery aneurysms (VAA) are those who involve the main arterial trunks which irrigate the intraabdominal organs. These are the celiac trunk, superior mesenteric artery and inferior mesenteric artery.² The most prevalent intraabdominal aneurysms are aortic and renal aneurysms which are present in 95% of times;¹ these are excluded in the VAA classification because they have different epidemiologic profile, clinical characteristics and treatment. In recent studies, VAA incidence varies from 0.01 to 2%, and rises within the years due mainly to incidental diagnose of VAA in imaging studies done for another cause.² The most common VAA are the splenic artery aneurysms with a reported incidence of 20-70% in the different case series.^{1,3}

VAA are divided in true aneurysms and pseudoaneurysms. The former includes all layers of the arterial wall and their main etiology is atherosclerosis.⁴ Pseudoaneurysms arise due to an alteration in vessel wall structure generally secondary to trauma, infection, vasculitis or inflammation.⁴ Morphologically, aneurysms are classified between fusiform or saccular.

Clinical presentation in patients with aneurysms varies from asymptomatic to severe hemorrhages that can lead to death. Abdominal pain is the main symptom in patients

with VAA followed by compressive symptoms like nausea or vomiting.⁴ In ruptured VAA the most common symptom is gastrointestinal bleeding that varies in presentation depending on the location of the lesion.⁴ Pain is only reported in one third of patients with a ruptured aneurysm, it is more common that patients present with hypotension and hemorrhagic shock.⁵

In many cases a VAA is diagnosed as an incidental finding in an imaging study done for another cause.⁶ There are many imaging modalities that can be used in the diagnostic workup of both aneurysms and pseudoaneurysms.⁶ Ultrasound is mainly used as an initial imaging study and is useful to differentiate between true aneurysms and pseudoaneurysms. However, it has low sensitivity, around 50% due to the deep location of VAA.⁵ Computed tomography angiography (CTA) is the most commonly used imaging modality to assess aneurysms because it provides multiphase imaging that allows a detailed assessment of the lesion with a sensitivity of 67%.⁵ The gold standard in the diagnosis of VAA is the angiography which allows detailed imaging of vascular anatomy with 100% sensitivity and the advantage of being therapeutic in specific cases.⁵ CTA provides all the anatomic landmarks and information required prior to intervention and avoids the invasiveness of angiography.⁷ This makes CTA an essential imaging modality in VAA.

Treatment options varies depending on the VAA location. In general terms, this lesion can be treated by either endovascular or open repair which can be laparoscopic or open surgery. Depending on the location of the aneurysm, open surgery can be done by different techniques like simple vessel ligation, aneurysmectomy with end-to-end ligation, vascular graft interposition or even organ resection.⁵ Endovascular approach has a lower morbidity and mortality compared to open repair but is not necessarily feasible due to tortuous vessel anatomy.⁴

Splenic artery aneurysm

Splenic artery aneurysms are the most common VAA with an incidence that varies between 20 and 80% in different case series and with an incidence of less than 1% in general population.³ About 78% of splenic artery aneurysms occur in pregnant women with a described mortality of 25%, nonetheless it can reach up to 75% during pregnancy in case of rupture with fetal mortality reaching 95%.^{3,7} Due to high rupture risk, splenic artery aneurysms should be treated in asymptomatic patients with aneurysms >3 cm, pregnant women, portal hypertension, patients who may require an hepatic transplant in the future or in cases where there's aneurysm growth in follow up imaging modalities.⁷

In asymptomatic patients the recommended treatment is endovascular but if the vascular anatomy is tortuous, open approach should be considered. When approaching splenic artery aneurysm, the surgical technique does not

routinely require revascularization or artery preservation, mainly because the spleen has abundant collateral flow through short gastric arteries. Final decision of revascularization should be done evaluating every case and residual ischemia of the spleen following aneurysm ligation.⁷ In splenic artery aneurysms located in the hilum, open approach is recommended and splenectomy sometimes considered due to splenic infarction risk and pancreatitis.⁷

Hepatic artery aneurysm

Hepatic artery aneurysms are the second most common type of VAA and their main etiology is atherosclerosis. They are more common in men and commonly observed in the sixth decade of life with an incidence of 0.002% in general population.⁸ The rupture rate of hepatic artery aneurysms is 14% and mortality is up to 14%.⁹ Based on case series, it is considered that the risk of rupture increases in aneurysms greater than 2 cm even if they are asymptomatic. The clinical practice guidelines of the vascular surgery society recommend repairing any hepatic artery aneurysm greater than 2 cm in diameter, with a grade of recommendation 1B.⁷

Treatment varies depending on the anatomical site of the aneurysms. Intrahepatic aneurysms are best treated by endovascular methods. In large hepatic artery aneurysms where hepatic irrigation might be compromised, anatomic liver resections should be considered.⁷ In patients with extrahepatic artery aneurysms, the endovascular approach is preferred and in cases where tortuous anatomy limits this approach, aneurysmectomy should be done to preserve hepatic circulation. In cases where hepatic circulation might be compromised, vascular reconstructive techniques should be attempted prior to considering anatomic liver resections.⁷

CONCLUSION

Asymptomatic patients with VAA should be considered for aneurysm repair if specific criteria are met. Open surgical technique is an appropriate approach for visceral artery aneurysms and in some cases might be the only feasible approach.

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