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### Accurate Intervention in Visceral Aneurysms

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# Accurate Intervention in Visceral Aneurysms

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## Introduction

A 30 year old male presented to the ED with a one week history of fever, abdominal pain, and poor PO intake due to nausea and emesis. He was given a GI cocktail and sent home for a presumed diagnosis of gastritis. After having persistent pain the patient returned to the ER the following day and was admitted for further testing. The patient died 3 days later. This is an interesting case presentation, and was in no way straightforward.

## Presentation of case

Further testing was initiated and A CT scan showed 4.9 X 7.2 cm. vascular lesions with arterial inflow. He was diagnosed with hepatic arterial aneurysm secondary to an arteriovenous malformation (AVM). Peripheral Vascular, Interventional Radiology, and Transplant Surgery teams were consulted on the case. Transplant surgery determined there was nothing they could do for the patient, because the patient had an elevated WBC count and an active fever which made him not a candidate for a transplant. Interventional Radiology attempted to embolize the hepatic artery aneurysm. Complications arose during the procedure when the device used to embolize the aneurysm migrated into the aneurysm sac. Due to the large size of the aneurysm and the surrounding vessels, a standard covered stent typically used to treat visceral aneurysms were unfortunately contraindicated. After much discussion the team felt that there was a high risk of the aneurysm rupturing if they continued and decided to stop the procedure until a new plan had been discussed. While discussing a new plan, the aneurysm ruptured and after unsuccessful attempts to stabilize, the patient expired.

## Signs & Symptoms

- Abdominal pain
- Unrelieved nausea & vomiting.
- Fever
- Laboratory tests:
  - Increase in Total Bilirubin (3.9 mg/dL)
  - Increase in White Blood Cell Count (13K/uL)

## Underlying Pathophysiology

Aneurysms are the result of weakening and thinning of the artery wall. When a portion of the arterial wall stretches and grows to more than 50 percent of the original diameter, this is called an aneurysm (Sanchez, 2010, p. 296). Visceral artery aneurysms (VAAs) are relatively rare pathological conditions. Most VAAs are asymptomatic and are often diagnosed incidentally; however they are associated with a high incidence of rupture (Bovens & Wang, 2014 p.14). The prevalence of VAAs is 0.1-2%, and only a few may cause abdominal pain, which indicates a higher risk of impending rupture (Bercelli, 2005, p. 197). Surgery has always been considered to be the treatment of choice for VAAs. However, endovascular management has become a valid therapeutic option in recent years, especially in patients who are not suitable for open repair (Balderi, Antonietti, Pedrazzini, Ferro, Leotta, Peano, & Grosso, 2010, p. 1256). Risk factors associated with visceral aneurysms include aging, smoking, hypertension, hypercholesterolemia, hyperlipidemia, male gender, and family history. Other causes of visceral aneurysms include inherited or developmental diseases, infections, vasculitis, and trauma (Fournier & Zanoff, 2012, p. 27).

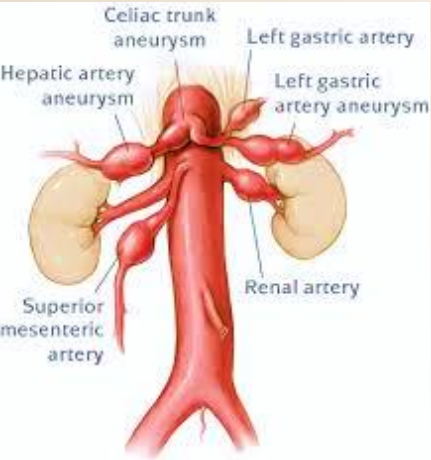


Figure 1

Visceral artery aneurysms (Figure 1) are exceedingly rare, with a reported incidence of between 0.02% and 0.1%, 16 most commonly in the splenic artery or hepatic artery, with celiac aneurysms accounting for only 4% to 6% of visceral aneurysms (Gehlen, Heeren, Verhagen, & Peppelenbosch, 2011, pg 685).

## Significance of Pathophysiology

According to literature, embolization of the artery is the accepted treatment of choice for intrahepatic aneurysms (Ferrero, Gaggiano, Ferri, Viazzi, Berardi, Piazza, Cumbo, Lamorgese, & Nessi, 2010, p. 31-32). Although, relating to this specific case, literature states that open surgery is recommended when the aneurysm diameter is greater than 5.5 cm and also in a symptomatic aneurysm of any size (Elefteriades & Farkas, 2010, p. 843). Large aneurysms are contraindicated for endovascular repair because the risk of coil migration with occlusion of vital branches is high (Balderi, et al., 2010, p. 1285).

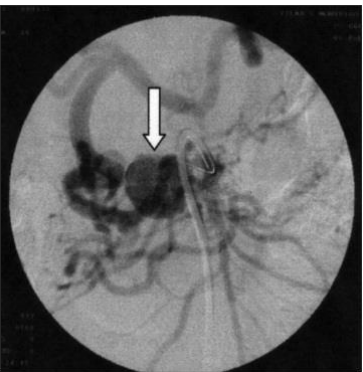


Figure 2

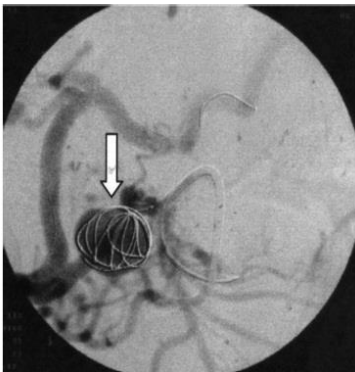


Figure 3

Figure 2: CT scan showing common hepatic arterial aneurysm

Figure 3: CT scan showing common hepatic arterial aneurysm after coiling procedure

## Implications for Nursing Care

Since VAAs are of such low incidence, it would be easy to overlook this disease. Despite their low incidence, when encountered, VAAs pose a significant risk. Therefore it could be a deadly mistake to assume a different diagnosis. When an APN is confronted with a patient complaining of abdominal pain, the provider must first rule out catastrophic causes of pain, such as dissecting aortic aneurysm (Yamada, 2013). This was missed on the patient's first visit to the ER. A full set of labs may have prompted further investigation into the reasons for the abdominal pain (elevated bilirubin & elevated WBC).

Table 1

Aneurysm location	Rate	Rupture Rate	Mortality
Splenic Artery	60%	2%	25% non-pregnant 70% mother 75% fetus
Hepatic Artery	20%	20%	35%
SMA	5.5%	rare	50%
Gastric	4%	90%	50%
Pancreaticoduodenal	2%	75%	50%

Table 1: Visceral Arterial Aneurysms, frequency rate, rupture rate, and mortality rate (Gehlen, Heeren, Verhagen, & Peppelenbosch, 2011, pg 682.)

## Conclusion

Relative contraindications to interventional radiology treatment include an anatomic issue such as occlusion of the feeding vessels, limited access, and challenging local vascular anatomy which may make trans-catheter treatment too difficult to perform. Although classically treated by open surgery, modern treatment strategies generally place interventional radiology techniques at the top of the treatment algorithm. Therefore, vascular interventional radiologist must become familiar with the indications for the treatment of VAA, become experienced in the different techniques, and know when to recommend treatment of VAA by interventional radiology techniques or when to advocate open surgical repair. (Belli, Markose, & Morgan, 2012, p. 234). In this particular case, the aneurysm was much to be large to be stabilized interventional. Looking back, the correct treatment would have been to resect the effected portion of the liver to give the patient time until he was a candidate for a Liver Transplant.

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