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SUCCESSFUL ENDOVASCULAR MANAGEMENT OF A RUPTURED RIGHT GASTRIC ARTERY ANEURYSM IN AN ELDERLY PATIENT.

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ABSTRACT

Ruptured gastric artery aneurysm is a rare cause for upper gastrointestinal hemorrhage and should be considered if intraluminal causes are ruled out. We present a case of an 84 years old patient who presented with loss of consciousness following severe hematemesis. Oesophago-gastro-duodenoscopy reveals Forrest type 1A actively bleeding peptic ulcer at D1 of the duodenum. An urgent mesenteric computer tomography scan and conventional angiography revealed an actively bleeding right gastric artery aneurysm, which was successfully treated with embolization.

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ABSTRACT

Ruptured gastric artery aneurysm is a rare cause for upper gastrointestinal hemorrhage and should be considered if intraluminal causes are ruled out. We present a case of an 84 years old patient who presented with loss of consciousness following severe hematemesis. Oesophago-gastro-duodenoscopy reveals Forrest type 1A actively bleeding peptic ulcer at D1 of the duodenum. An urgent mesenteric computer tomography scan and conventional angiography revealed an actively bleeding right gastric artery aneurysm, which was successfully treated with embolization.

KEYWORDS: Aneurysm, Bio-glue, Duodenal ulcer, Gastro-duodenal endoscopy, Right Gastric artery, Ruptured aneurysm, Therapeutic embolization.

INTRODUCTION

Splanchnic artery aneurysm (SAA) includes any aneurysm which occurs in the celiac artery, superior mesenteric artery, inferior mesenteric arteries, and their respective branches.[1,2] It is defined as any vessel that has increased in size of more than 1.5 times compared to the native vessel size.[1,3] The estimated incidence of SAA is 0.1% - 2% in the adult populations.[1,2] There is an increase in the detection of asymptomatic aneurysms due to increased usage of thin slice cross-sectional abdominal imaging, especially the multiple detectors computed tomography (MDCT) for surveillance or diagnosis of other abdominal pathology.[1,4,5,6] More than 20% of all SAA tend to rupture at the initial presentation, and these patients present themselves at the emergency department with signs of hemodynamic instability.[1] Ruptured SAA is associated with a mortality rate as high as 8.5%.[1,3] Significantly higher risk of ruptured SAA is associated with pseudoaneurysms compared to true aneurysms due to lack of structural integrity in pseudoaneurysm.[2,6,7]

We report here a successful case of endovascular management of ruptured right gastric artery aneurysm (GAA) in a 84-years old man, who presented with massive hematemesis and hemodynamic instability. We dis-

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cussed the pathophysiology, imaging, and management of this vital condition to help the clinician to diagnose and manage this potentially fatal condition.

CASE REPORT

An 84-years old gentleman with a background history of hypertension was found unconscious at home by a family member. He, however, recovered consciousness spontaneously. The patient was brought to a nearby primary health clinic for further evaluation and management. Additional history revealed several episodes of hematemesis and melena at home before the loss of consciousness. The patient had another episode of hematemesis of approximately 500cc in the emergency department of the primary health clinic. His vital signs were stable prior to transfer to our tertiary institution for further management. Upon assessment after arrival to our institution, the patient was pale but fully conscious and alert. His initial blood pressure was 90/50mmHg, with a pulse rate of 135 beats per minute. Oxygen saturation was maintained at 97% on nasal prong with a rate of 3L/min. He was subsequently fluid resuscitated and hemodynamically stabilized prior to an emergencey esophageal-gastro-duodenoscopy (OGDS).

The emergency OGDS revealed a Forest 1A bleeding ulcer at D1 of the duodenum. Despite injection of 20cc diluted adrenaline with concentration of 1:10000 at the bleeding ulcer site during OGDS and concurrent intravenous infusion of propranolol and omeprazole, the patient continued to have intermittent hematemesis, and his hemoglobin continued to drop from 8.9g/dL at admission to 7g/dL. Biochemistry profile showed elevated urea and creatinine, reflecting an acute kidney injury secondary to the massive blood loss. An urgent computed tomography arteriogram (CTA) of the mesenteric artery was performed after discussion with nephrologist,

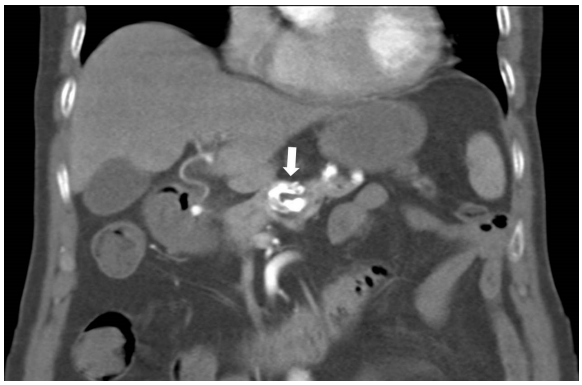

Figure 1: Coronal CT angiogram of mesentery showing saccular aneurysm of the right gastric artery at D1/D2 duodenum junction (whitw arrow) with background scattered wall calcification of celiac trunk and its' branches. (click to enlarge image)

regarding the abnormal renal profile and the possibility of further renal injury requiring dialysis from contrast nephropathy. Pre-CTA hydration was given to the patient. The CTA revealed a saccular aneurysm arising from the right gastric artery measuring 0.5mmx0.5mm (Figure 1). No active contrast extravasation or contrast pooling was noted at this junction.

Following multidisciplinary discussion between the surgeons, anaesthetists, nephrologist and intervention radiologist, endovascular management of the gastric artery aneurysm (GAA) was deemed the treatment of choice in view of the symptomatic presentation and ongoing hematemesis. Conventional angiography confirms the CT findings (Figure 2). Unfortunately, the patient developed a spontaneous rupture of the aneurysm, which leads to transient hypovolemia while undergoing angiography. Superselective cannulation of the aneurysm was done using 2.4Fr Renegrade microcatheter. Embolization was performed successfully using 50% concentration hydrocryl glue. The aneurysmal sac and a small portion of the proximal and distal artery supplying the aneurysm were embolized successfully (Figure 3).

The patient's condition improved after the embolization with the cessation of hema-

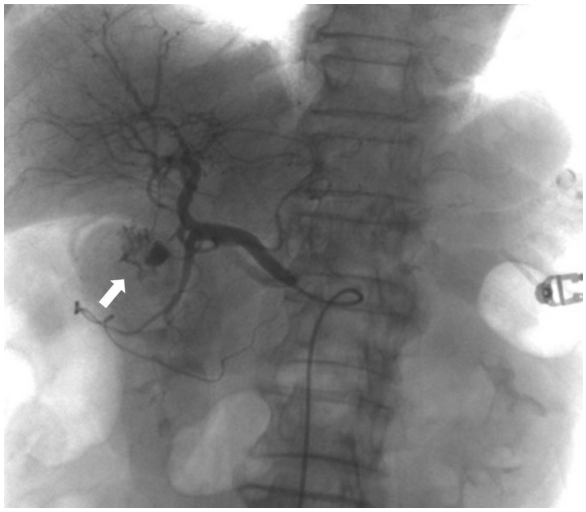

Figure 2: Conventional angiogram of common hepatic artery shows a saccular right gastric artery aneurysm with active contrast extravasation (white asterix). (Click to enlarge image)

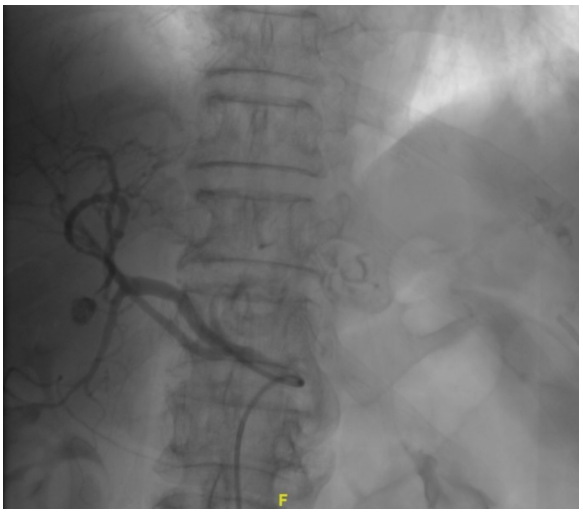

Figure 3: Post embolization angiogram shows glue embolization of the aneurysmal sac and proximal and distal arteries. (Click to enlarge image)

temesis post-procedure. The vital signs and hemodynamics markedly improved. His renal function started to show improvement after 2nd day of embolization and was given a nephrology clinic review appointment upon discharge to follow-up on his previous renal derangement. The patient was discharged well from our center on day three post-procedure with oral pantoprazole. The patient was reviewed in a combined surgical and nephrology clinic 1 week after discharge and was noted to be doing well with no further episodes of hematemesis with normalizing of his renal function.

DISCUSSION

Gastric artery aneurysm is a very rare type of splanchnic artery aneurysm (SAA), within a larger group of aneurysms called visceral arterial aneurysm (VAA) with a reported incidence of 2-4%. Such aneurysm tends to affect elderly males in the sixth or seventh decade of life.[4,5,9,10] GAA could be either a true aneurysm, which is thought to be degenerative in origin or pseudoaneurysms, which is caused by various other causes such as trauma, infection, or inflammatory conditions (such as pancreatitis).[1,2,4] A true aneurysm will have all three vessel wall layers involved, while pseudoaneurysm usually only involves the outermost layer.[2,3,11] Pseudoaneurysms have a higher rupture rate compared to a true aneurysm due to a lack of structural integrity in pseudoaneurysm.[2] An increase in endoluminal biliary interventions and percutaneous interventions have also contributed to the increasing incidence of pseudoaneurysm.[4] GAA is usually an acquired lesions secondary to medial degeneration or as a consequence of periarterial inflammation and commonly associated with secondary atherosclerosis changes.[9,10] They tend to be solitary lesions, as in our patient.[9]

GAA often presents as vascular emergencies without any preceding symptoms. More than 90% of these lesions are ruptured at the time of diagnosis, and about 70% of them present with severe gastrointestinal bleeding.[9,10,12] Confirmatory diagnosis is made based on contrast MDCT angiogram or conventional angiogram images, which shows either saccular or fusiform dilatation of the artery. MDCT angiography is useful as it can be used for the diagnosis of GAA as well as for planning the suitable treatment approach. It is also useful for the follow-up of these pa-

tients post-intervention.[3]

Due to the rarity of GAA, mortality rates due to ruptured GAA is still uncertain. However, adapting from the mortality rates of ruptured VAA which ranges between 25% - 100%, all symptomatic or enlarging VAA should be repaired.[1,2,4,5,6,12] All pseudoaneurysms, regardless of size or location, should also be repaired as there is an associated high rupture rate.[2,4] *Covey et al.,* noted an intervention rate of 5.8% among SAA patients, who were on surveillance based on the surgeon's preference with no rupture recorded within the 24-months surveillance period.[1] The common indications for the intervention of VAA are aneurysmal rupture, large aneurysmal size, symptomatic aneurysm, pseudoaneurysm, and arteries involved.[4,6,8,12,13]

The traditional definitive treatment of SAA repair is open surgery. The first reported successful open repair was done by DeBakey and Cooley in 1949.[1] The recommended surgery for GAA is open surgical ligation of the aneurysmal extragastric GAA vessels, while excision of the aneurysm with the involved portion of the stomach for intramural lesion.[9] Surgical repair is advocated in cases of ruptured GAA with hemodynamic instability or the presence of other concomitant aneurysms, and in patients with anatomy not suitable for endovascular interventions.[13,14] Less invasive endovascular management is increasing preferred with excellent outcome, lower morbidity and mortality rate as well as early hospital discharges.[2,4,7,11,12] The common endovascular technique available is selective embolization using coils, vascular plugs, or liquid embolic materials such as bioglue.[2,4,7,11] Our patient was successfully treated with hydrocryl glue embolization. Alternatively, a covered stent could be placed in an accessible aneurysm with good proximal and distal landing zones. Percutaneous thrombin or glue injection is useful in an aneurysm with a long and narrow neck.[2,4,11] Newer endovascular techniques using balloon-assisted coiling, usage of flow diverter and multilayer intra-arterial stents have reported promising results.[6] The exception is for gastroduodenal, and pancreaticoduodenal arteries aneurysms as these aneurysms tend to rupture early even in a smaller size. Therefore, all of these aneurysms needed to be repaired early.[1] The decision for suitable treatment has to be individualized based on size, location, operator experience, equipment availability, and the need to maintain end-organ blood flow.[4,11] Follow-up imaging is advocated in most literature review to look for aneurysm reperfusion, sac enlargements, endoleaks, late rebleeding events, or stent migration and occlusion. The follow-up could be done using MDCT or magnetic resonance imaging.[2,3,7]

CONCLUSION

Ruptured GAA is a rare cause for massive upper gastrointestinal hemorrhage and is a surgical emergency, with significantly morbidity and mortality if not treated urgently. MDCT angiography is useful as it can be used for confirmatory diagnosis of GAA as well as for planning the suitable treatment approach. The treatment of choice is endovascular embolization of the aneurysm, which is safe, less invasive and with good outcomes.

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CONSENT

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

CONFLICT OF INTERESTS

The authors declared that there is no conflict of interest.

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