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ABSTRACT

Splenic artery aneurysms are the most common visceral aneurysm. They are usually asymptomatic, but may present rarely as abdominal pain, or with symptoms and signs of acute rupture. This is a case report of a 42 years old female patient who presented with mild abdominal pain and was found to have a splenic artery aneurysm with a challenging anatomy of the prominent splenic artery. The patient refused the surgical option of treatment, and was treated by endovascular embolization, using a double catheter technique.

Introduction

Of all visceral arterial aneurysms, splenic artery aneurysm (SAA) is the most common, accounting for 60% of these aneurysms. As for the intra-abdominal aneurysms, the splenic artery is the third most common site for aneurysm formation after the aorta, and the iliac arteries. The majority of these aneurysms are asymptomatic, and are discovered incidentally on imaging. Other presentations include chronic abdominal pain or hemorrhagic shock presenting with hypotension following acute rupture in the peritoneal cavity. Other atypical presentations include massive gastrointestinal bleed due to rupture of aneurysm into the stomach or the colon. Treatment options include both surgery and endovascular intervention.

Case Report

A 42 years old female presented to the Internal Medicine Department, at King Hussein Medical Center complaining of vague epigastric abdominal pain. The physical examination was unremarkable. The laboratory workup, including CBC, full Chemistry Test, PT, PTT and INR were within normal limits. Patient’s haemoglobin was 11.8 mg.

Abdominal ultrasound was done and demonstrated an aneurysm in the splenic artery, which was confirmed by abdominal Computed Topographic Angiography (CTA). The aneurysm appeared to be arising from the anterior wall of an acutely angled kink at the middle third of the splenic artery, measuring 22x16 mm. The splenic artery itself was tortuous, and patent distal to the aneurysm. (Fig. 1)

The findings were explained to the patient, and the possible treatment options including both endovascular and surgical interventions were discussed. The patient refused the surgical treatment option because she did not want to lose her spleen, and she chose the endovascular option.

Via a right common femoral artery access, using a 4 Fr introducing sheath, the celiac artery was catheterized, and an attempt to pass a 4 Fr RDC catheter (Cook) to the splenic artery distal to the
Fig. 1: CTA and reconstructed CTA images showing the splenic artery aneurysm and demonstrating the tortuosity of the splenic artery

Fig. 2: Angiogram demonstrates the 4 Fr catheter in the splenic artery proximal to the aneurysm, and the microcatheter in the splenic artery distal to the aneurysm

Fig. 3: Angiography images demonstrating a coil in the splenic artery proximal to the aneurysm, and glue in the splenic artery distal to the aneurysm.

The aneurysm was not successful due to the severe tortuosity of the splenic artery, and the anatomical location of the aneurysm at the convex aspect of the mid splenic artery kink.

The 4Fr catheter was placed in the splenic artery proximal to the aneurysm. A renegade microcatheter (Boston Scientific) was manipulated across the base of the aneurysm, and passed to the splenic artery distal to the aneurysm.

A six mm peripheral coil was deployed via the 4Fr catheter, in the splenic artery proximal to the aneurysm to occlude it. The angiogram demonstrated cessation of the proximal flow, however there was retrograde filling of the aneurysm. The splenic artery distal to the aneurysm was embolized using glubran glue (GEM) given through the microcatheter (Fig. 2).

The catheters were pulled out and a final angiogram was done and showed complete occlusion of the aneurysm with perfusion of the spleen (Fig. 3).

Follow up by Doppler ultrasound was done after one, three, and six months, and all studies
demonstrated a viable spleen, with thrombosed aneurysm.

Discussion

The splenic artery aneurysm is more common in female\(^1\) due to the increased blood flow to the splenic artery, and the elevated level of hormones (oestrogen, progesterone, relaxin) during pregnancy.\(^1,5\) The majority of these aneurysms are single, ≤ 2cm in size, and located in the mid to distal third of the splenic artery.\(^5,9\)

The most commonly encountered complication for these aneurysms is rupture, mostly into the peritoneal cavity, and less likely into the stomach, colon, or pancreas.\(^1,8\) The risk of rupture varies from 2-9.6%\(^6\). The mortality rate following rupture is high, reaching up to 25%.\(^1\)

Treatment should be offered to patients with symptomatic aneurysms, large aneurysms (>2cm), growing aneurysms on follow-up, and women of childbearing age.\(^10\) In our case, the indication for treatment was the size of the aneurysm, and the presence of symptoms.

Treatment options for these aneurysms include surgery (arterial occlusion, aneurysm resection, or arterial bypass), with the possibility of splenectomy. Another treatment option is by endovascular intervention, and embolization of the splenic artery aneurysm.\(^1,5,10\)

The choice of the treatment modality is governed by the patient’s general condition, anatomical considerations, availability of an experienced interventionalist, and the patient’s preference.\(^10\)

In our case, the anatomical site of the aneurysm, increased size and tortuosity of the splenic artery, and the patient’s desire were in favor of the endovascular option. The anatomical findings on the CTA and angiogram, affected our technique, and two catheters were used to occlude the splenic artery both proximal and distal to the aneurysm, with preserved blood flow to spleen via collaterals.

This double catheter technique, using catheter and microcatheter, is advantageous over the standard double microcatheter technique as it gives more stability for the proximal catheter through the tortuous splenic artery. It allows a deployment of a larger size coils rather than microcoils which have higher chance of distal dislodgment due to the blood flow in the splenic artery. This technique might be limited by severe tortuosity and stenosis of the celiac trunk, a case where it is impossible to catheterize the splenic artery using a 4Fr catheter.

This double catheter technique; using coils and glue, was successful in our case. It can be used in cases of splenic artery aneurysms with tortuosity and anatomical limitations of the mid and distal splenic artery but accessible proximal part for catheterization using a 4Fr or larger size catheters.

References