
CASE REPORT

Embolisation of a Left Gastric Artery Pseudoaneurysm by Transcatheter Thrombin Injection Guided by Fluoroscopy and Doppler Ultrasound

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ABSTRACT

We present a case with a left gastric artery pseudoaneurysm in a 51-year-old female confirmed on computed tomography and angiography. These aneurysms are rare but are prone to rupture leading to death. Although many are discovered incidentally, early definitive treatment is advocated to prevent subsequent rupture. Successful embolisation was achieved by transcatheter intra-arterial thrombin injection guided by fluoroscopic and Doppler ultrasound imaging. Our case demonstrates an alternative way of treating these entities by recourse to interventional radiology.

Key Words: Aneurysm, false; Angiography; Embolization, therapeutic; Thrombin

中文摘要

透視和多普勒超聲引導下經導管注射凝血酶進行胃左動脈假性動脈瘤栓塞術

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本文報告一名51歲女性病例，經電腦斷層掃描和血管造影證實有胃左動脈假性動脈瘤。這些動脈瘤很罕見，但容易破裂而引致死亡。儘管許多病例為偶然發現，還是提倡盡早徹底治療以防止動脈瘤後期破裂。我們在透視和多普勒超聲引導下使用經導管注射凝血酶，替病人成功進行了胃左動脈假性動脈瘤栓塞術。該病例演示了依賴介入放射治療的這類病變的一種替代療法。

CASE REPORT

A 51-year-old woman presented to our emergency department with a 6-week history of increasing epigastric tenderness and a palpable expansile mass on a background of *Helicobacter pylori*-positive

recurrent gastric ulcerations. She was afebrile and haemodynamically stable, and had a haemoglobin level of 112 g/l. Screening for pancreatic enzyme levels and vasculitis yielded unremarkable results. Treatment with a proton pump inhibitor was started

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and computed tomography (CT) of the abdomen showed a 6-cm contrast-filled structure adjacent to the stomach (Figure 1).

An urgent coeliac axis angiogram obtained using a microcatheter revealed a left gastric artery (LGA)

aneurysmal sac (Figure 2). Following this, 400 IU of recombinant thrombin (King Pharmaceuticals, Bristol [TN], USA) diluted in 0.4 ml of normal saline was slowly injected under ultrasound guidance until near absence of any Doppler signal (Figure 3). There was no contrast filling of the sac in the completion angiogram

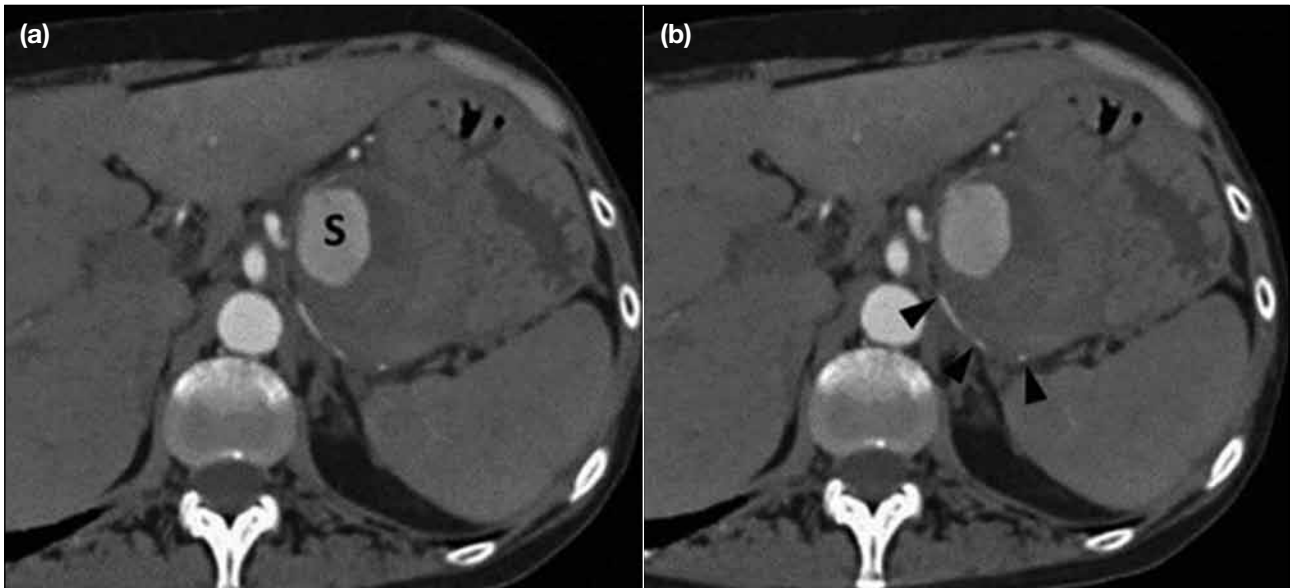


Figure 1. (a) An arterial phase contrast-enhanced axial computed tomography image at the level of the coeliac axis shows an aneurysm in close relation to the lesser curve of the stomach. Note the eccentric contrast-filling of aneurysmal sac (S) and hypodense crescentic thrombus more peripherally. (b) An image at a more caudal level reveals a posteriorly displaced splenic artery (arrowheads).

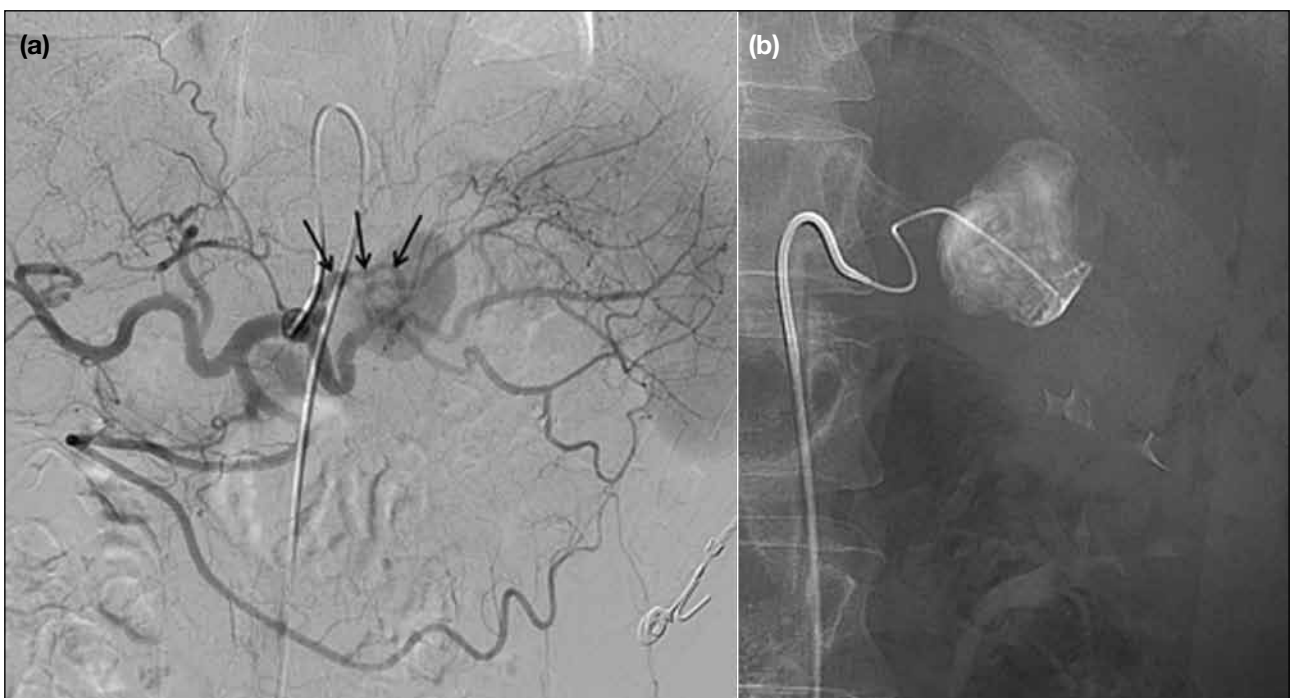


Figure 2. (a) A digital subtraction angiographic image after selective cannulation of the coeliac axis shows the aneurysmal sac arising from the terminal end of left gastric artery (arrows). (b) Super-selective catheterization with a microcatheter better delineates this sac.

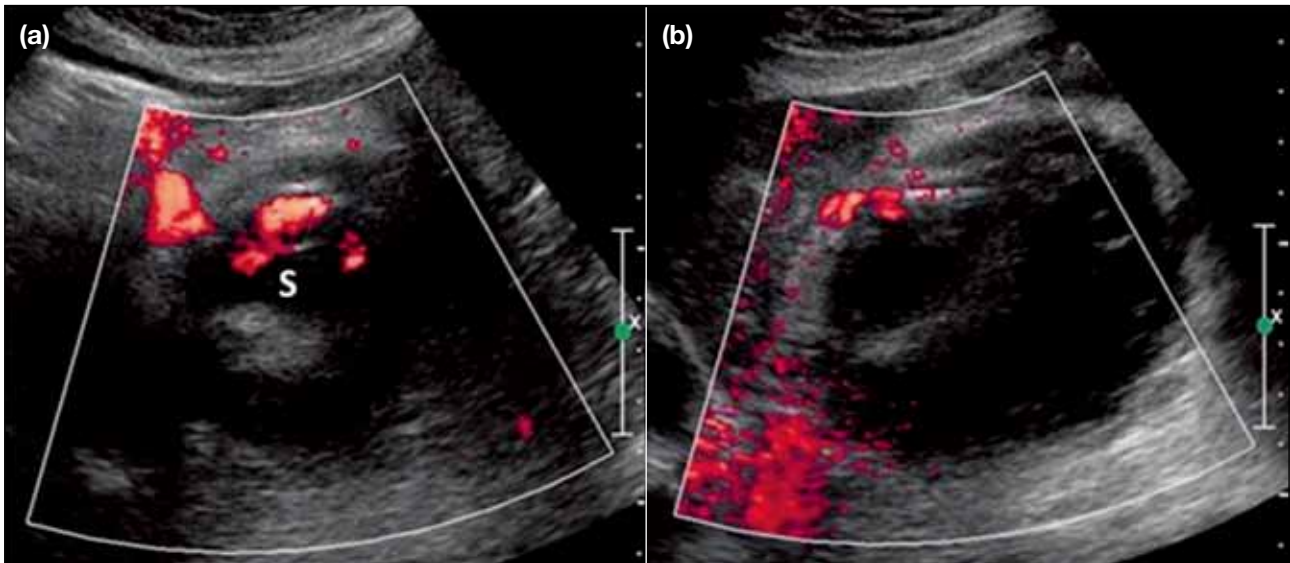


Figure 3. A power Doppler ultrasound image before infusion of thrombin shows (a) Doppler signal leading into the aneurysm sac (S), and (b) near absence of Doppler signal within the sac upon completion.

(Figure 4). The patient had an uncomplicated recovery and was discharged 2 days later.



Figure 4. Post-procedural digital subtraction angiography shows satisfactory embolisation of the aneurysmal sac.

At follow-up approximately 3 weeks later, an abdominal CT revealed a sectorial splenic infarct (Figure 5), whilst upper gastrointestinal tract endoscopy demonstrated chronic active gastritis without active ulceration. She was advised to continue long-term treatment with the proton pump inhibitor.

DISCUSSION

Aneurysms of the LGA are rare and account for less than 4% of all visceral artery aneurysms.¹⁻⁴ Many patients are asymptomatic (discovered incidentally, particularly due to the greater utilisation of imaging) or minimally symptomatic.^{3,5} These aneurysms or pseudoaneurysms are often secondary to inflammation (peptic ulcer disease, pancreatitis) or infection (mycotic processes), with resultant periarterial inflammation or degeneration of the media.^{1,2} Trauma and vasculitis are other causes.⁵ Given the history of *H. pylori* infection, our patient likely had a pseudoaneurysm of the LGA.

For LGA aneurysms in patients presenting with epigastric pain and / or hypovolaemic shock, early reports quote a rupture rate of 90%.² Intramural lesions are more common (70%) and present with haematemesis when they rupture into the gastric lumen, whilst when extramural (30%) they result in intraperitoneal haemorrhage; mortality can be as high as 70% to 80%, so early treatment is advocated to prevent such complications.^{1,2}

Surgery was previously the standard of care. In

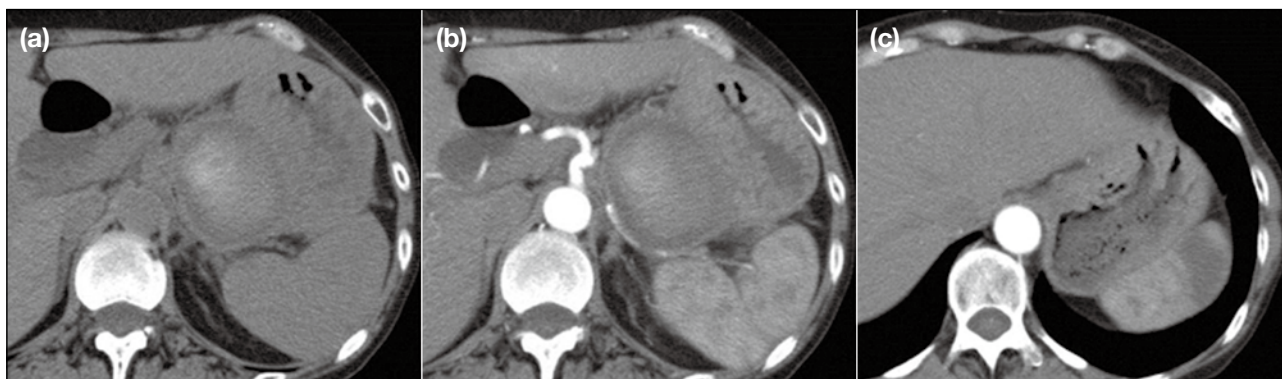


Figure 5. (a) Non-contrast and (b) arterially enhanced computed tomography images show diffuse but stable hyperdensity within central portion of aneurysmal sac, likely due to inspissated residual contrast within the thrombin. No active hyperdense contrast filling of this sac is evident. (c) An axial image cranial to slice (b) reveals a band hypodensity in the spleen due to an infarct.

recent years, LGA aneurysms have been successfully treated endovascularly with microcoils,¹ glue as well as ethylene vinyl alcohol copolymer (Onyx).³ There have been a limited number of reports on the use of thrombin in visceral artery aneurysms, mostly by the percutaneous route.^{2,4,6} We opted to use thrombin owing to our familiarity and previous success in treating pseudoaneurysms with this agent, and because glue or Onyx were not available in our institution. Furthermore, the large size of the lesion would have entailed multiple coils. We complemented transcatheter intra-arterial thrombin injection with ultrasound to observe its thrombotic effect in real time, until there was cessation of blood flow within the sac. Given that thrombin is non-opaque, it is adequate to observe the therapeutic effect of thrombin using ultrasound rather than fluoroscopy.⁶

The partial splenic infarct was possibly secondary to anastomoses between the LGA and short gastric arteries rather than reflux of thrombin, given the terminal location and narrow neck of the aneurysm. Nevertheless, reflux is a risk associated with the use of thrombin, as the embolic agent can be difficult to control.⁶ Possible thrombin reflux may be minimised by gentle infusion of small aliquots, placement of a protective balloon at the aneurysmal neck, or if feasible, even embolising communicating vessels.

CONCLUSION

The choice of embolic agent may depend on the specific case as well as institutional preference and experience. Our complementary utilisation of fluoroscopic and Doppler ultrasound imaging guided our intra-arterial administration of thrombin. This method of treatment adds to the armamentarium of the interventional radiologist.

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