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# Successful gelfoam angioembolisation in anastomotic pseudoaneurysm: A case report



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## ABSTRACT

**INTRODUCTION:** The use of angioembolisation in patients with lower gastrointestinal tract haemorrhage has become well established, especially in cases of diverticular bleeding, or in bleeding from arterio-venous malformations. Pseudoaneurysms are rare and the evaluation of selective gelfoam angioembolisation amongst patients with lower gastrointestinal tract bleeding secondary to this etiology has not been extensively studied. The friable nature of pseudoaneurysms may lead to a greater risk of rupture during an attempted angioembolisation procedure.

**PRESENTATION OF CASE:** We describe the successful treatment and outcome of a lady who initially presented with perforation of the colon at the rectosigmoid junction, for which she underwent resection and anastomosis. A few days later, she was noted to have persistent hematochezia, which was secondary to bleeding pseudoaneurysms at the rectosigmoid branches of the inferior mesenteric artery. She successfully underwent selective angioembolisation of these pseudoaneurysms with gelfoam. She did not suffer any complications from the procedure.

**DISCUSSION:** Although there have been significant advances in the armamentarium associated with percutaneous interventional radiology procedures for hemostasis in gastrointestinal bleeding, the use of selective angioembolisation for bleeding pseudoaneurysms have not been readily adopted due to the friable nature of the wall of the pseudoaneurysm, and its risk for rupture. Our case report illustrates that angioembolisation in such cases is feasible, and should be a consideration especially when the risk of surgical intervention is high.

**CONCLUSION:** Selective gelfoam angioembolisation should be considered in the management of patients with bleeding from the gastrointestinal tract secondary to pseudoaneurysms.

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## 1. Introduction

Pseudoaneurysms are false aneurysms which involve only the outermost layer of the vessel wall, in contrast to true aneurysms which involve all three vessel wall layers [1]. These aneurysms include infectious, inflammatory and iatrogenic causes. Pseudoaneurysms are often symptomatic. The commonest presentation for pseudoaneurysms is acute haemorrhage in up to 90% of patients [2].

The use of micro-catheters in super-selective angioembolisation for gastrointestinal bleeding has achieved success rates of between 82 and 100%, whilst having minimal peri-procedure morbidity [3]. The use of endovascular techniques in pseudoaneurysms is less established because there is a significant risk of rupture of the

pseudoaneurysm during angioembolisation in an emergent setting [4].

We describe the successful treatment and outcome of a lady who presented with persistent hematochezia secondary to anastomotic pseudoaneurysms at the rectosigmoid branches of the inferior mesenteric artery. This case report is presented in accordance to CARE criteria [5].

## 2. Case report

A 26 year old Chinese lady presented with a one week history of abdominal pain, diarrhoea and fever. She was a recipient of a cadaveric renal transplant for which she had been on oral mycophenolate. Physical examination revealed the presence of generalised abdominal tenderness, worst over the lower abdomen. Her blood pressure was 118/58, and heart rate was 108 bpm. She was febrile with a temperature of 39 °C.

She was suspected of having a perforated viscus secondary to chronic steroid and immunosuppression use and was brought to the operating theatre for an exploratory laparotomy. During the

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**Fig. 1.** Pseudoaneurysms seen at the rectosigmoid branches of the inferior mesenteric artery (circled).

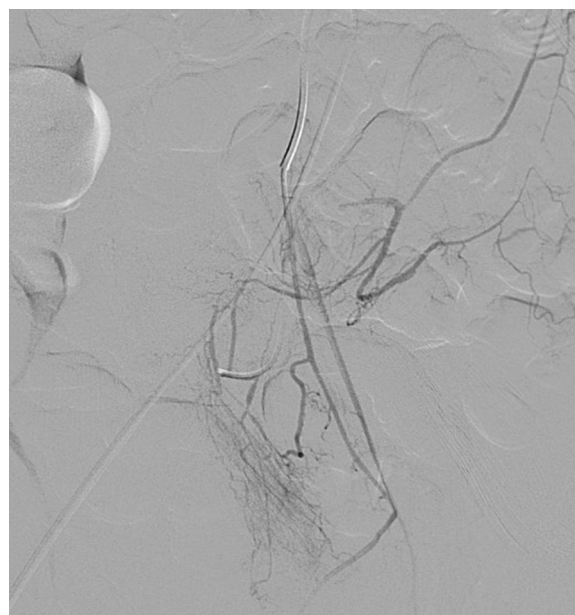
laparotomy, perforation at the rectosigmoid junction was noted. Bleeding was controlled with silk ties. The left colic artery was visualised and preserved. She underwent segmental large bowel resection, a functional end to end anastomosis with a stapler device, and closure of the abdomen.

One week after surgery, the patient developed symptoms of per rectal bleeding. Her hemoglobin count was measured to be 7.1 g/dl and required 4 units of packed cell transfusion over 48 h. She was also noted to be in hemorrhagic shock, with tachycardia of 130–140. Anastomotic dehiscence was suspected as the cause of bleeding, but this was found to be negative on contrast enhanced computed tomography scans. The patient continued to have hematochezia, and required large volume transfusions of packed red blood cells. Mesenteric angiogram was then organised for her. Arterial access was established via the right common femoral artery using a 4Fr sheath. Two pseudoaneurysms were noted within the territory of the sigmoidorectal branches of the inferior mesenteric artery (Fig. 1). Selective angioembolisation of these aneurysms were performed using a 2.7Fr microcatheter, and gelfoam embolization was performed. Pseudoaneurysms were suspected to be arising from the marginal artery of the colon. Post-embolisation angiogram showed complete occlusion of the pseudo-aneurysm and perfusion beyond the point of gelfoam administration was noted to be well preserved and perfused (Fig. 2).

Following successful angioembolisation, the patient did not have any repeated episodes of per rectal bleeding. She remained hemodynamically stable without any episodes of hypotension or tachycardia. No repeated endoscopy or radiologic imaging for performed as the patient did not show any features to suggest recurrent bleeding. The patient was eventually discharged well twelve days after angioembolisation.

### 3. Discussion

The modern day armamentarium of superselective angioembolisation and numerous embolic agents such as microcoils, microparticles, glues and gelfoams [6,7], has been shown to be safe with a high technical success rate of up to 80% of patients achieving technical success [8]. In patients who have had failed



**Fig. 2.** The pseudoaneurysms are no longer visualised on the post angioembolisation angiogram.

endoscopic therapy in the management of lower gastrointestinal bleeding, both surgery and selective angioembolisation are equivalent rescue strategies. No large scale randomised controlled trials have been performed evaluating one over the other. A seminal study of Eriksson et al. [9], however, showed a trend to lower 30-day mortality in the use of angioembolisation as compared to surgery (3% vs 14%), although this was not statistically significant with a p value of <0.07. Rebleeding rates with selective angioembolisation have also been low, with the literature quoting a rebleeding rate of about 15% [10].

Our patient is a renal transplant recipient, who recently had surgery for a perforation in the colon close to the rectosigmoid junction. In view of her long term immunosuppression, there are concerns regarding the integrity of any bowel anastomoses performed on her. In retrospect, creating an ileostomy or colostomy may have been more appropriate for her. In this case, at presentation of hematochezia, although endoscopic treatment is recommended for postoperative haemorrhage [11,12], this was avoided for fear of intraluminal pressure disrupting an already vulnerable anastomosis in light of chronic immunosuppression, resulting in an anastomotic leak. She would have been a poor surgical candidate, in view of her comorbid condition, recent surgery, as well as the likely invasiveness of any surgical intervention. Selective angioembolisation is readily available at our institution and was deemed the most appropriate approach to arresting lower gastrointestinal bleeding in this scenario.

Pseudoaneurysms arise due to a disruption of the arterial wall, leading to communication of blood between the artery and a sac around the artery [13]. The etiology of pseudoaneurysms includes traumatic, iatrogenic, inflammatory and infective causes [14]. The incidence of anastomotic haemorrhage following colorectal anastomoses is rare at 0.4–4% [15,16]. Pseudoaneurysms arising at the site of a recent anastomosis is a rare cause of postoperative bleeding. As such, the evaluation of selective gelfoam angioembolisation amongst patients with lower gastrointestinal tract bleeding secondary to this etiology has not been extensively studied. The friable nature of the pseudoaneurysm wall may limit the efficacy of angioembolisation amongst this subgroup of patients. Angioembolisation is also known to cause infarction and necrosis of the bowel wall, however the use of superselective angioembolisation

limits the extent of disruption of blood supply to the bowel wall, thereby minimising the potential for ischemic complications [17].

However, the risks of rupture of the pseudoaneurysms during emergency angioembolisation needs to be weighed against the risks of surgical intervention. In patients in whom the risks of surgery are high, angioembolisation may be considered as a reasonable alternative. Successful angioembolisation avoids the morbidity and mortality risks of emergency surgery.

We propose that the use of angioembolisation can be attempted with success in patients with pseudoaneurysms, especially in patients whereby surgery or endoscopy may not be the optimal approach, or carries significant risks.

### Conflicts of interest

The authors disclose no conflicts.

All authors have obtained no support from any organisation for the submitted work.

### Funding

No financial relationships with any organisations that might have an interest in the submitted work, and no other relationships or activities that could appear to have influenced the submitted work.

### Ethical approval

In accordance with local guidelines, ethics approval is not required for case reports. All identifiers have been left out, and there are no recognisable pictures of the patient.

### Consent

There are no identifying details at all in this paper. Verbal consent has been obtained from the patient.

### Author contribution

Dedrick Kok-Hong Chan contributed to the management of the patient, the drafting of the case report and final editing of the case report.

Ker-Kan Tan contributed to the management of the patient, and the final editing of the case report.

### Guarantor

Dr. Tan Ker-Kan accepts full responsibility for the work.

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