

# Infective endocarditis and infected aneurysm of splenic artery post colonoscopy

Yeng Kwang Tay<sup>a</sup>, Jia Yin Tay<sup>b</sup>, Niyaz Naqash<sup>a</sup>, Paul Cashin<sup>a</sup>

Monash Medical Centre, Southern Health; Dentistry and Health Sciences, University of Melbourne, Victoria, Australia

## Abstract

Colonoscopy, a relatively non-invasive procedure, has been associated with several complications including perforation, hemorrhage and abdominal pain. Post-colonoscopy bacteremia can occur up to 4.4% of the time but is almost always transient without significant clinical sequelae. Post-colonoscopy infective endocarditis, on the other hand, is a rare occurrence associated with high rates of mortality and morbidity, and may be further complicated by aneurysm of splenic artery. Current definitive treatment of infected aneurysm is surgical ligation and excision with or without vascular anastomosis. If surgery is contraindicated, endovascular graft and transcatheter embolization may be the preferred treatment options. This is a case report of infective endocarditis and infected aneurysm of splenic artery presenting two weeks after elective colonoscopy.

**Keywords** sepsis post colonoscopy, infective endocarditis, infected aneurysm of splenic artery, mycotic splenic aneurysm

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## Introduction

Colonoscopy is a relatively non-invasive procedure. Apart from common complications such as perforation, hemorrhage and abdominal pain, rare cases of bacteremia and infective endocarditis (IE) have been reported. We report a rare case of IE complicated by splenic abscess and infected aneurysm of splenic artery, presented two weeks after elective colonoscopy and rectal polypectomy.

## Case report

A 68-year-old male presented a two-week history of malaise, left-sided abdominal pain and intermittent fever. The only apparent incident of significance prior to presentation was a colonoscopy performed two weeks ago for investigation into his recent change in bowel habit. The colonoscopy was

performed with adequate bowel preparation and revealed a 10 mm pedunculated rectal polyp. Apart from a rectal polypectomy with snare diathermy, 3 mm-diameter biopsies were taken randomly from the terminal ileum, ascending colon and descending colon. Hemostatic clips and adrenaline injection were not required as there was no significant bleeding. There was no significant past medical, surgical or dental histories. He does not take any regular medications and has no known allergies. There was no recent travel, sick or animal contacts. He does not smoke and only drinks alcohol socially. He denies any form of illicit drug use.

Histological examination confirmed the rectal polyp as a tubular adenoma. He was well the next day following polypectomy but presented four days later with left upper quadrant pain radiating to the back and minor rectal bleeding. Six days following colonoscopy and polypectomy he developed sepsis, supported by leukocytosis of 18.1 (range 4-11), CRP of 234 (normal range <5) and ESR of 55 mm/h (normal 2-14). He was immediately commenced on amoxicillin/clavulanic acid and treated as colitis by his general practitioner. Due to a lack of clinical improvement despite oral antibiotic, a contrast CT scan of his abdomen and pelvis was performed. There were CT evidence of distal splenic artery aneurysm with complete obliteration distally as well as splenomegaly with most of the spleen occupied by multiple cystic lesions (Fig. 1).

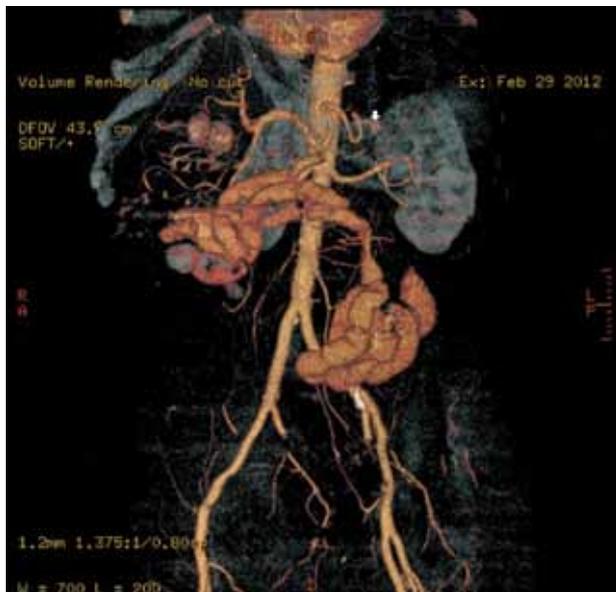
Blood cultures and CT-guided splenic abscess aspiration were collected immediately, followed by administration of intravenous antibiotics (ceftriaxone and metronidazole). Multiple sets of blood cultures and splenic aspirate cultures were positive for *Enterococcus faecalis* on day one, sensitive to amoxicillin and vancomycin. Transthoracic echocardiogram

<sup>a</sup>Department of Upper Gastrointestinal Surgery, Southern Health (Yeng Kwang Tay, Niyaz Naqash, Paul Cashin); <sup>b</sup>Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne (Jia Yin Tay), Victoria, Australia

Conflict of Interest: None

Correspondence to: Mr. Paul Cashin, Upper Gastrointestinal Surgery Unit, Monash Medical Centre, 246 Clayton Road, Clayton, 3168 Victoria, Australia, Tel.: +61 3 9594 6666, Fax: +61 3 9594 6053, e-mail: cashin.csg@hotmail.com

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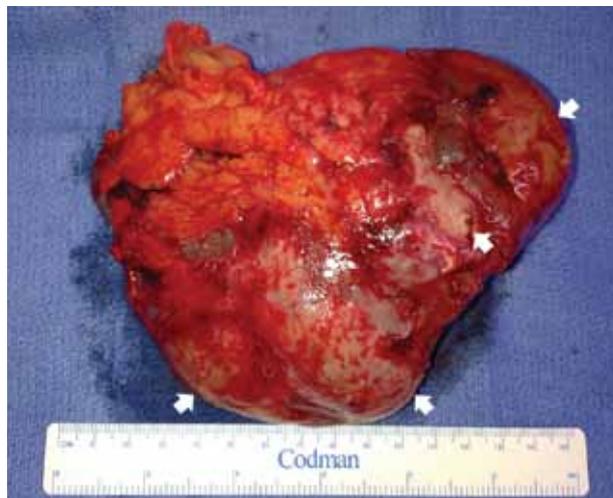
**Figure 1** CT showing infected aneurysm of the splenic artery (arrow) with complete distal obliteration

showed moderately severe aortic regurgitation and an aortic valve vegetation (1.4 x 0.9 cm) situated at the right coronary cusp with localized leaflet prolapse and perforation. Apart from that, no other valvular lesion was detected and both ventricular systolic functions were well-preserved. These findings were confirmed on a subsequent transesophageal echocardiogram.

Open splenectomy was performed via a roof-top incision. Macroscopically, the spleen was grossly enlarged with multiple loculations of abscess (Fig. 2). The infected aneurysm of splenic artery was densely adherent to the retroperitoneum and pancreas, rendering its excision challenging. A decision was then made to suture-ligate it proximally. Post-splenectomy recovery was uneventful. Bioprosthetic aortic valve replacement was performed one week after splenectomy. Culture of the native aortic valve was positive for *Enterococcus faecalis*. Recovery post-cardiac surgery was uncomplicated. He was then discharged on ampicillin 2 g every four hours for a total of six weeks. He remained well and asymptomatic at his follow up eight weeks after discharge.

## Discussion

*Enterococcus* is part of the normal flora in human colon [1]. After *staphylococcus* and *streptococcus*, *enterococcus* is the third most common leading cause of IE, having been isolated in 5-18% of the cases [2,3]. However, IE precipitated by colonoscopy is rare. Recent evidence showing the incidence of post-colonoscopy bacteremia is estimated to be 4.4%, with the vast majority of cases asymptomatic, transient, and absent of significant clinical consequences [4]. In addition,



**Figure 2** The spleen showing multiple large purulent loculations (arrows)

current evidence has not found significant association between colonoscopy and bacteremia [5]. Prophylactic antibiotics against IE have been relatively ineffective and carry multiple adverse effects [5]. As a result, the American Heart Association does not recommend routine use of prophylactic antibiotics to prevent IE [5,6]. However, in patients with high-risk cardiac conditions, for example, the presence of prosthetic cardiac material; previous IE; specific types of congenital cardiac disease (unrepaired cyanotic congenital cardiac disease, within six months of repaired congenital cardiac disease with prosthetic device, repaired congenital cardiac disease with residual defects); and cardiac valvulopathy in cardiac transplantation recipients, should receive prophylaxis [5].

Infected aneurysm was previously termed as “mycotic aneurysm” by Sir William Osler to describe infected aneurysm associated with IE in 1885 [7]. Four different pathogenetic mechanisms of infected aneurysm have been described: 1) septic embolisation, 2) direct extension from adjacent septic focus, 3) hematogenous bacterial seeding, and 4) direct traumatic bacterial inoculation to arterial wall [3]. Infected aneurysm can rapidly expand in size, rupture and cause multiple complications depending on its location [7]. CT angiography is the recommended imaging modality to investigate infected aneurysm which can appear saccular, eccentric or multilobulated [8]. Peri-aneurysmal soft tissue stranding and fluid collections demonstrated on CT are also suggestive of infection [8]. If gas-forming organisms are causing the infection, CT may also reveal intramural or peri-aneurysmal air [8]. If an infected aneurysm is strongly suspected, yet found to have none of the above CT findings, a rapidly enlarging aneurysm detected by a repeat CT is also suggestive of infected aneurysm [8]. In cases where CT angiography is contraindicated, MR angiography may be a useful substitute. As infected aneurysm could be asymptomatic and multifocal, the threshold required to image and investigate the integrity of the vasculature of head, neck, thorax, abdomen

and pelvis should be lower than usual [7]. Splenic abscess and infarction are not uncommon complications of IE but infected aneurysm of the splenic artery is rare [3,7]. Apart from antibiotic therapy, treatment options of infected splenic artery aneurysm include surgical ligation and excision (open or laparoscopic), transcatheter embolization or endovascular stent grafts [9]. The current preferred treatment method is surgical ligation and excision of the infected splenic artery with or without splenectomy [7]. Transcatheter embolization and endovascular stent grafts are appropriate palliative treatments in patients with high risk of peri-operative mortality. Despite prolonged antibiotic treatment, patients treated with endovascular techniques still have septic foci *in situ* and frequently suffer from recurrent sepsis [10]. In conclusion, IE is a rare complication of colonoscopy. Although current evidence does not recommend routine antibiotic prophylaxis to prevent IE at the moment, increasing reports of endoscopic-related sepsis might lead to revision of the current recommendation. As recommended by the American Heart Association, patients with previous IE should receive prophylactic antibiotics to prevent recurrent IE, as documented by Sekino *et al* [11].

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