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CASE REPORT | ENDOSCOPY

Bacterial Endocarditis Following Deep Enteroscopy: Is Prophylaxis Warranted?

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ABSTRACT

The development of bacterial endocarditis as a result of endoscopic interventions within the gastrointestinal tract is exceedingly rare. Antibiotic prophylaxis for endoscopic procedures is generally not warranted, except for certain high-risk patients. Double-balloon enteroscopy (DBE) is a common endoscopic procedure for evaluation of the small bowel. Bacterial endocarditis secondary to DBE has not been previously described. We describe the first case of enterococcal endocarditis attributed to DBE in a patient with a history of stage 1 primary biliary cholangitis.

INTRODUCTION

Endocarditis as a result of endoscopic interventions of the gastrointestinal tract is exceedingly rare.[1] The pathogenesis occurs through mucosal damage with subsequent bacteremia and colonization of abnormal or mechanic cardiac valves. Esophageal balloon dilation and endoscopic variceal sclerotherapy are the most commonly implicated procedures; however endoscopic retrograde cholangiopancreatography (ERCP), endoscopic ultrasound with fine-needle aspiration, and percutaneous gastrostomy and jejunostomy tube placement have also been described in the literature.[2,3] Double-balloon enteroscopy (DBE) is a common endoscopic procedure for evaluation of the small bowel. To our knowledge, bacterial endocarditis secondary to DBE has not been previously described. We report a case of enterococcal endocarditis that was attributed to DBE in a patient with a history of stage 1 primary biliary cholangitis.

CASE REPORT

An 86-year-old man with a medical history of aortic stenosis, chronic kidney disease (stage IV) primary biliary cholangitis (with stage 1 fibrosis), diabetes mellitus, chronic anemia, hypertension, and hyperlipidemia presented to our institution for evaluation of chronic anemia. The patient had a history of occult bleeding requiring blood transfusions every 6 weeks. His baseline hemoglobin was 10.3 g/dL, with a platelet count of 120×10^9/L and international normalized ratio of 1.3. Previous endoscopic evaluation included negative esophagogastroduodenoscopy (EGD) and colonoscopy. Capsule endoscopy, however, identified active bleeding in the mid to distal jejunum. He was then referred to our institution for anterograde deep enteroscopy, which was performed with a Fuji double-balloon endoscopy system (Fujinon Corp, Saitama, Japan). The examination revealed a small nonbleeding angioectasia and an actively bleeding angioectasia within the mid-jejunum. Multiple applications of 10-W bipolar cautery were applied, which successfully obliterated the angioectasia with cessation of all bleeding (Figure 1). Two Boston Scientific hemostatic clips (Boston Scientific Corp, Natick, MA) were then applied.

Four days after the procedure, the patient presented to an outside hospital with lethargy and chills and was found to have a fever to 101.6°F. Urinalysis and chest x-ray were negative. Three of 4 blood cultures grew Gram-positive clusters and chains. He was started on piperacillin/tazobactam and doxycycline. When the blood cultures speciated to *Enterococcus faecalis*, he underwent

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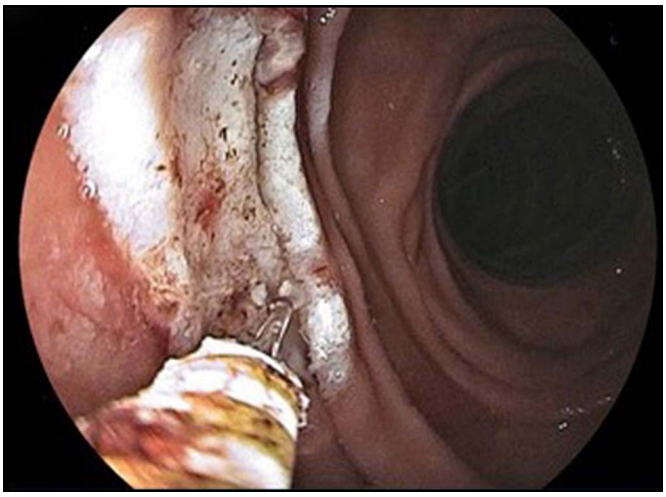

Figure 1. Bipolar cautery of angioectasia within the mid-jejunum.

transthoracic echocardiogram to rule out endocarditis, which revealed scleral degenerative thickening of the aortic valve without evidence of vegetation. A transesophageal echocardiogram was then performed due to persistent fevers and showed a nodular lesion present on the aortic valve measuring 0.8 × 0.6 cm attached to the noncoronary cusp with a mobile component consistent with a vegetation.

After the patient was diagnosed with enterococcal endocarditis, his antibiotic regimen was changed to ampicillin and ceftriaxone. He stabilized and was discharged to a rehabilitation center where he completed a 6-week course of antibiotics. Repeat blood cultures were negative, and his symptoms resolved.

DISCUSSION

According to guidelines published in 2015, antibiotic prophylaxis for routine endoscopic procedures, including colonoscopy, EGD, and device-assisted enteroscopy, is not recommended because of the low risk of bacteremia associated with these procedures.[1] Prophylaxis is recommended, however, for procedures that carry a high risk of bacteremia including esophageal stricture dilation, esophageal variceal sclerotherapy, and endoscopic retrograde cholangiopancreatography with biliary obstruction.[1] High-risk patients, including those with cirrhosis and ascites, immunocompromised patients, or those who underwent synthetic vascular graft placement within the past 6 months are also candidates for prophylaxis.[1,4]

Although rare, infectious endocarditis occurs when mucosal injury or trauma during a procedure allows for transmural migration of microorganisms into the bloodstream. In 1 recent study involving murine models, prolonged balloon distension of the colon during DBE was associated with increased tissue hypoxia and intestinal permeability and may lead to bacteremia.[5] Common causative pathogens include strep viridans, staphylococci, pneumococci, hemolytic streptococci, and enterococci.[6] In a recent comprehensive review of the literature, 25 cases of endocarditis secondary to endoscopy were identified, but none were secondary to deep enteroscopy.[7–9] Similarly, in a case series by Nelson et al, 7 cases of endocarditis in the setting of EGD and 1 case secondary to colonoscopy were described.[3]

This case is the first reported incidence of bacterial endocarditis secondary to deep enteroscopy and specifically DBE. The development of endocarditis may have been caused by mucosal damage from inflation of the scope and overtube balloons while passing through the small bowel allowing for transmigration of bacteria. Not uncommonly, abrasions and mucosal disruption are visible on scope withdrawal. Alternatively, ablation of the angioectasia with bipolar cautery could have led to transient bacteremia. The duration of the procedure (92 minutes) was within the usual average time range for DBE; therefore, prolonged distention of any segment is unlikely.[10] The contribution of the patient's mild baseline liver disease to the development of endocarditis remains unclear; however, liver cirrhosis has been attributed to bacterial complications of endoscopy likely due to impaired immune function.[3]

Our case illustrates that patients with valvular heart disease in conjunction with underlying liver disease undergoing deep enteroscopy may be at a higher risk of infectious endocarditis. Further studies may help define the appropriate role of prophylactic antibiotics in this patient population.

DISCLOSURES

Author contributions: S. Ferm, MK Siu, and M. Rubin wrote and edited the manuscript. M. Chhetry, IM Jacobson, and S. Tay edited this manuscript. S. Ferm is the article guarantor.

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