

Enterococcus Faecalis Infective Endocarditis and Colorectal Carcinoma: Case of New Association Gaining Ground

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Abstract

Mostly *Streptococcus bovis* (*S. bovis*) bacteremia and endocarditis (60%) has been found to be associated with underlying colorectal cancer (CRC). *Enterococcus faecalis* (*E. faecalis*) bacteremia and endocarditis has no identifiable source in most of the cases. *E. faecalis* is part of normal gut flora that can translocate through the intestine and cause the systemic infection. With any intestinal lesion or tumor, the barrier is breached and the gut flora like *E. faecalis* can translocate and cause infection. A 55-years-old male known to have non-ischemic cardiomyopathy with implantation of automated implantable cardioverter defibrillator (AICD) and atrial fibrillation presented with weight loss, fever and back pain. He was diagnosed to have *E. faecalis* bacteremia and subsequent endocarditis and osteomyelitis of T7 - T8 and L4 - L5 vertebrae. He underwent colonoscopy for screening of malignancy because of his age and presenting symptoms suggestive of one. The colonoscopy found pedunculated polyp in sigmoid colon, and after biopsy the histology revealed an invasive well differentiated mucinous adenocarcinoma, with focal squamous differentiation. He underwent removal of AICD and antibiotic treatment for infective endocarditis and osteomyelitis. He underwent sigmoid colectomy with pathology of removed specimen showing adenocarcinoma with negative margins and lymph nodes. In many of the patients with *E. faecalis* endocarditis, if identifiable the source is genitourinary tract. But in most of the cases the source of *E. faecalis* bacteremia is unidentified. There is some evidence to suggest that in patients with unidentified source, colonoscopy may reveal a hidden early stage CRC or adenoma. We conclude that in cases of *E. faecalis* bacteremia and endocarditis with unidentified source, colonoscopy should be considered if feasible to rule out the diagnosis of CRC.

Keywords: Infective endocarditis; Colorectal cancer; *E. faecalis* bacteremia; *E. faecalis* infective endocarditis

Manuscript submitted February 28, 2018, accepted March 26, 2018

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doi: <https://doi.org/10.14740/gr996w>

Introduction

There is a strong evidence of association between *Streptococcus gallolyticus*, formerly *Streptococcus bovis* (*S. bovis*) bacteremia and colorectal cancer (CRC) [1]. The prevalence of CRC in patients with *S. Bovis* undergoing colonoscopy is approximately 60%, [2] and both American [3] and European [4] guidelines recommend systematic colonoscopy in these patients. *Enterococcus faecalis* (*E. faecalis*) formerly classified as part of the group D Streptococcus system is a Gram-positive, commensal bacterium inhabiting the gastrointestinal tracts of humans and other mammals. Enterococci are becoming one of the most common causes of infection in elderly population [5]. *E. faecalis* is the most common among enterococci responsible for 63-81% of cases [6], and malignancy is the most common comorbidity [7]. *E. faecalis* endocarditis is the third leading cause of infective endocarditis, being responsible for 5% to 15% of cases. The source of bacteremia in majority of these cases is undetermined and if identifiable, it is mostly genitourinary tract. There has been some evidence in favor of association between enterococcal endocarditis and hidden CRC [8]. Here we report a case of *E. faecalis* endocarditis associated with CRC.

Case Report

A 55-year-old gentleman known to have non-ischemic cardiomyopathy with automated implantable cardioverter defibrillator (AICD) implantation and atrial fibrillation presented with the complaint of low grade fever, productive cough, back pain, fatigue and weight loss. His labs revealed normocytic anemia (Hb 11.4 g/dL), the hepatitis C antibody (anti-HCV) positive, blood cultures positive for *E. faecalis*. Chest X-ray showed right lower lobe pneumonia. Trans-esophageal echocardiography for workup of bacteremia revealed aortic valve vegetation. His computerized tomography (CT) abdomen and pelvis was negative. His social history was positive for being active smoker and 20 pack years of smoking history. He was treated for pneumonia with oral ciprofloxacin at the dose of 500 mg PO q12h for 14 days. Further workup done for the back pain revealed osteomyelitis of T7 - T8 vertebrae and L4 - L5 vertebrae.

His history of unintentional weight loss of 30 lb in 2 months with normocytic anemia prompted the workup for hid-

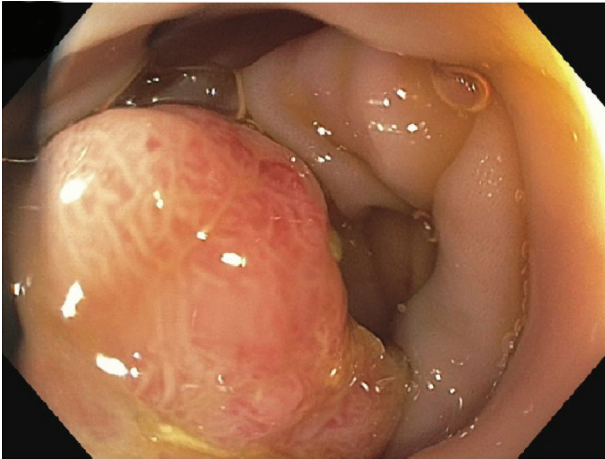


Figure 1. Large pedunculated polyp.

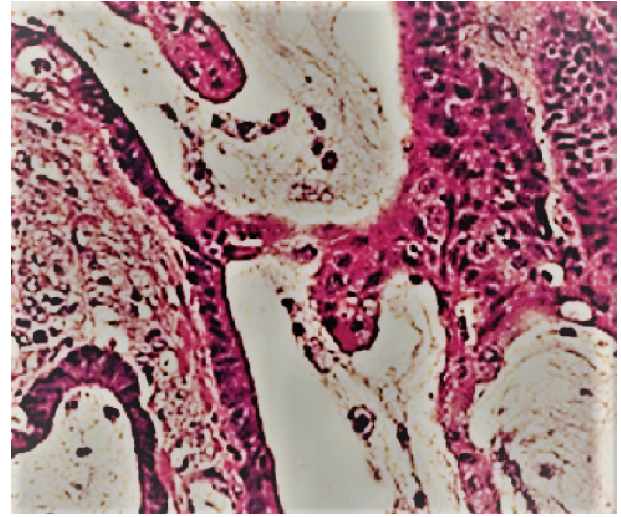


Figure 2. Histology showing mucinous adenocarcinoma.

den malignancy. His AICD was also removed because of the high suspicion of seeding during bacteremia. He subsequently underwent colonoscopy that showed the large 2 cm × 2 cm pedunculated polyp with 5 cm stalk found in sigmoid colon at 30 cm (Fig. 1). The pathology showed well differentiated invasive mucinous adenocarcinoma, with focal squamous differentiation (Fig. 2). The colorectal surgery team did a left hemicolectomy. The pathology from that surgery showed minimal residual adenocarcinoma, no metastasis in 18 retrieved lymph nodes (0/18), and negative margins with tumor classification of T1N0M0. He was treated for endocarditis and osteomyelitis meanwhile with IV antibiotics and started treatment for HCV after surgery for stage 1 CRC. The stage 1 CRC was thus the source of *E. faecalis* bacteremia and the resultant complications of endocarditis and osteomyelitis.

Discussion

Enterococci are Gram-positive, catalase-negative, facultative anaerobes that are seen under direct microscopy as diplococci in short chains. *E. faecalis* is part of normal gut flora and is responsible for human disease via translocation from gut wall and leading to systemic infection [9].

CRC is the third most common cancer in men and women in the United States of America. The most common etiology is sporadic, with genetic and environmental factors playing an important role. Other established risk factors include male gender, older age, inflammatory bowel disease and positive family history. The US Preventive Services Task Force (USPSTF) currently recommends routine screening for colorectal cancer between the ages of 50 and 75 using fecal occult blood testing, sigmoidoscopy or colonoscopy.

The relationship between *S. bovis* infective endocarditis and CRC is well established [10]; the association between *E. faecalis* endocarditis and CRC is yet to be established. Some data even suggest that the *E. faecalis* may be responsible for mutagenesis of colonic cells and resultant malignancy and intestinal lesions that then lead to translocation of *E. faecalis* into blood stream [11]. The most frequent identifiable source

of *E. faecalis* bacteremia is urogenital tract, but in our case the patient had no evidence of urinary tract infection, and no suspicion of acute cholecystitis and acute appendicitis

The patients with *E. faecalis* infective endocarditis most frequently have no identifiable source of bacteremia. The half of patients with *E. faecalis* infective endocarditis with unidentifiable source were found to have CRC, when underwent colonoscopy in a study by Pericas et al [12]. In our case the colonoscopy was done because of the weight loss and anemia to look for malignancy, it was not intended to find the source of bacteremia.

Our patient was having AICD, and the presence of AICD and other implantable cardiac devices increase the risk of infective endocarditis. There is no evidence to suggest that the risk of *E. faecalis* endocarditis increases with having an implantable cardiac device. The previous population based studies have shown that staphylococci (*S. aureus* and *S. epidermidis*) were the most common bacteria cultured in patients with implantable cardiac devices and infective endocarditis [13].

The patient was also above age of 50, so needed colonoscopy for CRC screening anyways. But not all the cases of endocarditis with unidentified source can undergo colonoscopy, as some of these patients are sick and cannot withstand the fluid overload with valve regurgitation needed for colonoscopy preparation. So the generalization of colonoscopy for all the patients with *E. faecalis* endocarditis with unidentifiable source though seem reasonable may not be practical in some patients. Also, it seems *E. faecalis* infective endocarditis like *S. bovis* infective endocarditis has no impact on the prognosis and outcomes of CRC and most of the cases of CRC associated with infective endocarditis are at early stage. This goes with our case as well, which was diagnosed at T1N0M0 stage.

Conclusions

In conclusion, we here present a case of *E. faecalis* endocarditis with unidentifiable source with subsequent finding and as-

sociation of stage 1 CRC with the endocarditis, which was the source of *E. faecalis* bacteremia as well. We recommend that the patients with unidentified source of *E. faecalis* bacteremia and endocarditis regardless of age should undergo colonoscopy if feasible to identify underlying CRC at an early stage and timely treatment of it.

Author Contributions

Zubair Khan contributed in writing the case report and major parts of discussion. Nauman Siddiqui assisted in writing the manuscript. Wasif M. Saif supervised and reviewed the entire article.

Disclosure

I hereby confirm on behalf of all my co-authors and myself as well that we don't have any competing interest and we don't have any financial interest to disclose.

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