Enterococcus faecalis infective endocarditis associated with colorectal cancer: A case report

Soheil Ebrahimpour[a], Mohammad Reza Hasanjani Roushan[a], Zeinab Mohseni Afshar[b], Arefeh Babazadeh[a]

[a] *Infectious Diseases and Tropical Medicine Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, I.R. Iran*

[b] *Clinical Research Development Center, Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran*

ARTICLE INFO

Article history:
Submitted: 17. 4. 2019
Revised: 7. 12. 2019
Accepted: 20. 12. 2019
Available online: 21. 10. 2020

Klíčová slova:
Infekční endokarditida způsobená bakteriemi kmene *Enterococcus faecalis*
Kolonoskopie
Kolorektální karcinom

Keywords:
Colonoscopy
Colorectal cancer
Enterococcus faecalis infective endocarditis

SOUHRN

Několik studií ukázalo, že infekční endokarditida způsobená bakteriemi kmene *Enterococcus faecalis* je třetím hlavním zdrojem infekční endokarditidy (IE). Kromě toho existuje několik důkazů, které svědčí o vztahu mezi enterokokální IE a kolorektálním karcinomem (CRC). Uvádíme kazuistiku pacienta s infekční endokarditidou způsobenou bakteriemi kmene *Enterococcus faecalis* spojenou s CRC. Jednasedmdesátiletý muž měl horečku, dyspnoe, ortopnoe, kašel, mírnou hemoptýzu, intermitentní rektoragii, bledé spojivky, „jemné praskání" a typický zvuk umělé chlopně. Byla mu diagnostikována bakteriemie vyvolaná *Enterococcus faecalis* a následně endokarditida. Kolonoskopie byla také provedena a uváděla, že má velký obstrukční maligní vřed v hepatické flexuře. Biopsie odhalila adenokarcinom. Kolorektální chirurgický tým provedl parciální kolektomii. Kromě toho byl pacient léčen s endokarditidou. Je zdůrazněn význam kolonoskopického screeningu u pacientů s infekcí *E. faecalis* a endokarditidou, jehož cílem je vyloučit diagnózu CRC.

ABSTRACT

Several studies have presented *Enterococcus faecalis* (E. faecalis) endocarditis is the third leading source of infective endocarditis (IE). Besides, there have been several evidence in favor of relation between enterococcal IE and colorectal cancer (CRC). We report a patient with *E. faecalis* endocarditis associated with CRC. A 71-year-old male known to have a fever, dyspnea, orthopnea, cough, mild hemoptysis, intermittent rectorrhagea, pale conjunctivae, fine crackle, and typical sound of the artificial valve. He was diagnosed to have *E. faecalis* bacteremia and subsequent endocarditis. Also, colonoscopy was performed for him that reported a large obstructive malignant ulcer at hepatic flexure. The biopsy result was adenocarcinoma. The colorectal surgery team did a partial colectomy. Besides, he was treated for endocarditis. The colonoscopy screening in the patients of *E. faecalis* infection and endocarditis for the rule out of the diagnosis of CRC is emphasized.

Introduction

There are certain documents for the relationship between *Streptococcus bovis* (*S. bovis*), *Enterococcus faecalis* (*E. faecalis*), and *Clostridium septicum* (*C. septicum*) and gastrointestinal (GI) cancers as colorectal cancer (CRC).[1,2] Generally, Enterococci are emerging as an increasingly important cause of infections in older people and malignancy is one of the most common co-morbidities.[3] The current medical practice recommends a colonoscopy to be performed in a patient with *S. bovis* , *E. faecalis,* and *C. septicum* bacteremia.[3,4]

E. faecalis is a Gram-positive opportunistic pathogen inhabiting the GI tract.[5] This commensal bacterium can dislocate through the gut and cause systemic infection. In other word, the bowel flora like *E. faecalis* can cause bacteremia due to barrier disintegration following any intestinal lesion.[6] Even though, *E. faecalis* bacteremia and endocarditis has no identifiable source in most of the cases, but some studies have shown that *E. faecalis* endocarditis is the third leading source of infective endocarditis (IE), which can be seen in more than 10% cases.[7,8] Besides, there have been several evidence in favor of the relation between enterococcal IE and CRC. Herein, we describe a case of *E. faecalis* endocarditis associated with CRC.

Clinical case

A 71-year-old man presented with fever and weakness. He was a known case of type 2 diabetes mellitus (DM), hyperlipidemia, heart failure, and old cerebrovascular accident (CVA). He developed an extensive myocardial infarction (MI) and severe mitral regurgitation (MR) thirteen years

Address: Arefeh Babazadeh, Infectious Diseases and Tropical Medicine Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, I.R. Iran. Email: drbabazadeh.a@yahoo.com
DOI: 10.33678/cor.2019.089

Please cite this article as: Ebrahimpour S, Hasanjani Roushan MR, Mohseni Afshar Z, Babazadeh A. *Enterococcus faecalis* infective endocarditis associated with colorectal cancer: A case report. Cor Vasa 2020;62:517–519.

ago and underwent mitral valve replacement. Three years ago, he underwent the second valve surgery due to valvular leak and failure. One month ago, he gradually developed dyspnea and weakness that lead to evaluating and finally, blood cultures positive for *E. faecalis* result was obtained. He was treated with ampibactam and amikacin and discharged; however, his weakness and malaise were progressive despite continuing therapy. He was readmitted, due to he had a fever, dyspnea, orthopnea, cough, mild hemoptysis, and intermittent rectorrhagea. His physical examination was notable for low grade fever, pale conjunctivae, fine crackle, and typical sound of artificial valve. The patient's vital signs were stable at admission as follows: BP: 100/70 mm Hg, PR: 99, RR: 20, T: 38 °C. Lab data that was requested showed white blood cell (WBC): 7900 cells/mL^3; hemoglobin: 9.2 g/dL; platelet: 191 000 g/dL; creatinine (Cr): 1.4 mg/dL; blood urea nitrogen (BUN): 21 mg/dL; Na: 132 mmol/L; prothrombin time (PT): 24; partial thromboplastin time (PTT): 43; international normalised ratio (INR): 2/7; increased erythrocyte sedimentation rate (ESR): 70 mm/h; C-reactive protein (CRP): 48 mg/L, and negative blood culture.

Again, an echocardiography was performed that showed moderate paravalvular leak, bilateral mechanical prosthetic valves and a clot in antero-medial of sewing ring (Fig. 1).

So, treatment with ampi-sulbactam 12 g IV q24 h in four equally divided doses, and levofloxacin 750 mg orally every 24 hours was started and heart surgery consults requested. Due to his rectorrhagia, anemia, and his prior entrococcal bacteremia, colonoscopy was performed for him that reported a large obstructive malignant ulcer at hepatic flexure (Fig. 2). Biopsy result was adenocarcinoma. Computed tomography (CT) scan of abdomen and pelvis was performed multiple hypodense lesions in the liver compatible with metastasis and pleural effusion (Fig. 3). Also oncology and surgery consult was requested. The colorectal surgery team did a partial colectomy. He was treated for endocarditis with ampicillin 500 mg IV q12hg per day and gentamycin 80 mg IM every eight hours.

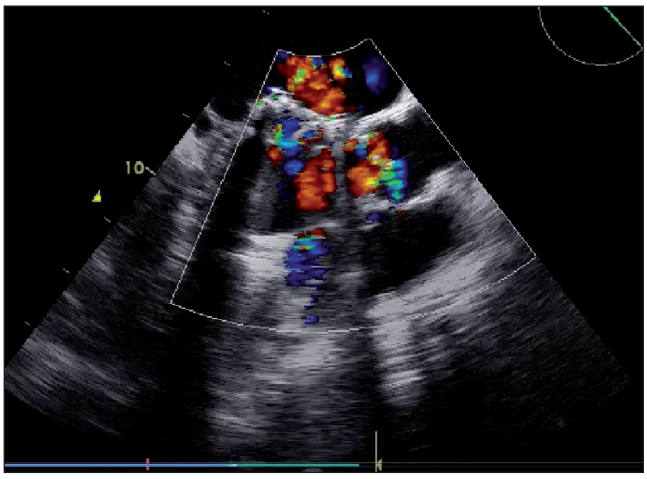

Fig. 1 – Echocardiography showed moderate paravalvular leak, bilateral mechanical prosthetic valves, and a clot in antero-medial of sewing ring.

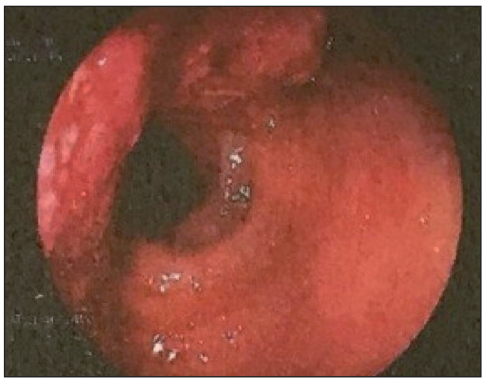

Fig. 2 – Large obstructive malignant ulcer at hepatic flexture.

Fig. 3 – Abdominal and pelvic CT showed multiple hypodense lesions in liver compatible with metastasis and pleural effusion.

Discussion

Bacteremia due to bacteria found in the GI tract is commonly caused by increased permeability of the damaged colonic mucosa.[9] Colonic mucosal damage is the result of infection, ischemic and inflammatory colitis or secondary bleeding in consequence of tumor mucosal invasion. Enterococci are Gram-positive pathogens, facultative anaerobes, non-spore-forming, that are observed under microscopy in pairs.[10] *E. faecalis* as a species of Enterococcus is usual commensals in the intestine of humans. This healthy gut flora is responsible for some diseases through translocation from intestinal wall and resulting in systemic infection.

The most common clinical manifestations of entrococcal endocarditis are fever and malaise like our patient.[11] Entrococcal endocarditis may also be presented as heart failure, which was also present in our patient. Our patient had intermittent episodes of rectal bleeding. When colonoscopy was performed, the source of his rectorrhagea was discovered to be an adenocarcinoma of colon. His fever was due to his entrococcal bacteremia probably as a result of translocation of colonic bacteria.

CRC as common cancer in both sexes and the three leading cause of cancer death among adults globally. Some critical risk factors of CRC comprise old age, sex, and a family history of illness.[12] The relationship between some infectious endocarditis as *S. bovis* infective endocarditis and

CRC is documented, although this association about *E. faecalis* endocarditis is not yet fully elucidated.[13] Even though, in a study; half of cases with *E. faecalis* infective endocarditis with unidentifiable source were found to have colorectal cancer.[6] Although, the usual distinguishable source of *E. faecalis* bacteremia is related to urinary tract infection (UTI), in the current case, there is no evidence for this link. Also, the patients with *E. faecalis* IE most commonly have no detectable source of bacteremia.[7] In our case, the relationship between CRC and enterococcal bacteremia is well established, but the colonoscopy was done because of anemia and rectal bleeding to look for malignancy, and it was not intended to find the source of bacteremia. Moreover, our patient's age that was above 50 years necessitated colonoscopy as a screening procedure.

Conclusion

It is recommended to perform endoscopy in the cases with unknown source of *E. faecalis* bacteremia and endocarditis irrespective of age conditions. As soon as the cancer is diagnosed, surgical and oncotherapy is performed earlier.

Acknowledgements
All authors thank to the Department of Infectious Diseases of Babol University of Medical Sciences, Iran; and Marzieh Nnourollahzadeh for her guidance as a translator of this article.

Conflict of interest
The authors report no conflict of interest.

Funding body
None.

Ethical statement
Authors state that the research was conducted according to ethical standards.

Informed consent
Patient's informed consent was obtained.

References

1. de Almeida CV, Taddei A, Amedei A. The controversial role of Enterococcus faecalis in colorectal cancer. Therap Adv Gastroenterol 2018;11:1756284818783606.
2. Abdulamir AS, Hafidh RR, Abu Bakar F. The association of *Streptococcus bovis/gallolyticus* with colorectal tumors: the nature and the underlying mechanisms of its etiological role. J Exp Clin Cancer Res 2011;30:11.
3. Amarnani R, Rapose A. Colon cancer and enterococcus bacteremia co-affection: A dangerous alliance. J Infect Public Health 2017;10:681–684.
4. Mirza NN, McCloud JM, Cheetham MJ. Clostridium septicum sepsis and colorectal cancer – a reminder. World J Surg Oncol 2009;7:73.
5. Goh HMS, Yong MHA, Chong KKL, Kline KA. Model systems for the study of Enterococcal colonization and infection. Virulence 2017;8:1525–1562.
6. Khan Z, Siddiqui N, Saif MW. Enterococcus Faecalis Infective Endocarditis and Colorectal Carcinoma: Case of New Association Gaining Ground. Gastroenterology Res 2018;11:238–240.
7. Pericàs JM, Corredoira J, Moreno A, et al.; Hospital Clínic and Hospital Lucus Augusti Infective Endocarditis Investigators. Relationship Between *Enterococcus faecalis* Infective Endocarditis and Colorectal Neoplasm: Preliminary Results From a Cohort of 154 Patients. Rev Esp Cardiol (Engl Ed) 2017;70:451–458. English, Spanish.
8. Dahl A, Bruun NE. *Enterococcus faecalis* infective endocarditis: focus on clinical aspects. Expert Rev Cardiovasc Ther 2013;11:1247–1257.
9. Bischoff SC, Barbara G, Buurman W, et al. Intestinal permeability – a new target for disease prevention and therapy. BMC Gastroenterol 2014;14:189.
10. Fisher K, Phillips C. The ecology, epidemiology and virulence of Enterococcus Microbiology (Reading, England) 2009;155:1749–1757.
11. Male KR, Mathews A, Mower J. An unusual presentation of an unusual disease: infective endocarditis: a case report and review of the literature. Cases J 2008;1:292.
12. Jasperson KW, Tuohy TM, Neklason DW, Burt RW. Hereditary and familial colon cancer. Gastroenterology 2010;138:2044–2058.
13. Beganovic M, Luther MK, Rice LB, et al. A Review of Combination Antimicrobial Therapy for *Enterococcus faecalis* Bloodstream Infections and Infective Endocarditis. Clin Infect Dis 2018;67:303–309.