INFECTIOUS ENDOCARDITIS FROM *Streptococcus bovis* ASSOCIATED WITH COLONIC CARCINOMA: case report and literature review

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ABSTRACT - ***Background*** - Many studies in the literature have warned of the need for investigation of colonic lesions among patients, especially elderly ones, who have bacteremia and/or endocarditis from *Streptococcus bovis*. Bacteremia and infectious endocarditis from *Streptococcus bovis* may be related to the presence of neoplastic lesions in the large intestine and hepatic disease. ***Aim*** - This report describes a patient who presented infectious endocarditis from *Streptococcus bovis* associated with colonic carcinoma and tubular-villous adenomas. ***Conclusions*** - The finding of this bacterium among patients with septicemia and/or endocarditis is also related to the presence of villous or tubular-villous adenomas in the large intestine. For this reason, complete and detailed investigation of the large intestine must be performed in patients with infectious endocarditis, even in the absence of intestinal symptoms. An increased incidence of this condition or hepatic dysfunction has been reported among patients with infectious endocarditis from *Streptococcus bovis*. Patients with infectious endocarditis from *Streptococcus bovis* and normal colonoscopy may be included in the group at risk for developing colonic cancer. The knowledge that there is an association between endocarditis from *Streptococcus bovis* and carcinoma of the colon has important clinical implications. If the lesion can be discovered at an early stage, curative resection may become possible.

HEADINGS - Endocarditis, bacterial. *Streptococcus bovis*. Colonic neoplasms. Carcinoma.

INTRODUCTION

Although McCOY and MASON[20] suggested a relationship between colonic carcinoma and the presence of infectious endocarditis in 1951, it was only in 1974 that the association of *Streptococcus bovis* (*S. bovis*) and colorectal neoplasia was recognized[16, 24]. *S. bovis* accounts for approximately 14% of the cases of infectious endocarditis and 13% of all cases of infectious endocarditis are caused by bacteria that have gastrointestinal origin[4].

The knowledge that there is an association between endocarditis from *S. bovis* and carcinoma of the colon has important clinical implications.

The objective of this study was to present a report on a case of bacterial endocarditis from *S. bovis* associated with colonic carcinoma and adenomatous polyps in the large intestine, making comments about aspects of the disease, especially in relation to its incidence, pathogenesis and diagnosis.

CASE REPORT

A 67-year-old white man presented in the Department of Cardiology of the "Hospital do Servidor Público Estadual", São Paulo, Brazil, with dyspnea when making small exertions, orthopnea and diurnal fever. He also presented changes in intestinal habits, complaining of constipation and evacuation of pasty feces with the presence of fresh blood. Upon physical examination, he was seen to be in regular general condition, dyspneic, pallid and febrile (38 ºC). From the clinical examination of the lungs, the presence of stertorous noises

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was noted in the right and left hemithorax. The cardiac beats were arrhythmic and had normal sounds. No masses or enlarged viscera were palpated. The hemoglobin measurement was 11.2 g% and hematocrit 33.2%. Radiography of the thorax revealed an increase in the cardiac area and diffuse interstitial infiltrate in both lungs. The electrocardiogram showed supraventricular extrasystoles.

The patient underwent transthoracic echocardiography, which revealed vegetation of the aortic valve mechanism, with dimensions of 14 x 6 mm, adhering to the coronary and non-coronary cusps. Significant aortic insufficiency was also shown. The left ventricle was slightly increased in size and there were signs of pulmonary hypertension. The clinical diagnosis was infectious endocarditis and grade II congestive cardiac insufficiency.

To investigate the presence of intestinal hemorrhage, colonoscopy was performed, which showed a vegetative and infiltrative lesion in the left flexure. Histopathological examination revealed adenocarcinoma, as well as tubular-villous adenomatous polyps in the ascending, transverse and sigmoid colon, which were partially removed in the endoscopic examination. The carcino-embryonic antigen (CEA) level in serum was 6.8 ng/mL (up to 5.0 ng/mL is normal). Hemoculture showed a rise in negative coagulase *S. bovis*, which was sensitive to vancomycin and ceftriaxone. Hepatic function tests showed normal results. Abdominal tomography did not reveal any alterations except for thickening of the colon wall, at the level of the left flexure.

The patient was treated with digoxin, oral replacement of potassium, corticoids and vancomycin. After the cardiac insufficiency was ameliorated and the fever disappeared, the patient was transferred to the Department of Gastrointestinal Surgery, where he underwent laparotomy. This revealed a stenosing concentric lesion at the left flexure of the colon and polyps in the regions described by the colonoscopy, without other abnormalities. Total colectomy was performed with ileal-rectum anastomosis.

Macroscopic examination of the operative specimen revealed an ulcerous vegetative lesion located at the splenic flexure, with a diameter of 4.0 cm. Microscopic analysis showed tubule and papillae-forming mucoid adenocarcinoma that was well-differentiated and mucus-secreting, with nerve infiltration and vessel invasion, even reaching the serosa of the organ. The surgical margins were free. Among the 17 lymph nodes dissected, there were 2 at the level of the lesion that had neoplasia involvement. The lesion was classified as Astler-Coller C2 and T3N2M0.

There were no intercurrences during the course of the postoperative period and the patient was discharged on the 8th postoperative day. Two years after the operation, the patient was found to be asymptomatic, while still under treatment with medications for the cardiac insufficiency, awaiting surgical correction of the aortic valve disease.

DISCUSSION

S. bovis is a normal inhabitant of the human gastrointestinal tract. It is a non-enterococcal streptococcus in Lancefield's group D that can cause bacteremia and endocarditis, as well as urinary infection[2]. Infectious endocarditis from *S. bovis* is the second greatest cause of endocarditis from streptococci[1, 8, 24]

The normal human colon is a significant reservoir for *S. bovis* in 2.5% to 15% of individuals[5, 21]. S. *bovis* colonizes the thrombin of platelets and fibrin, where its colonies become developed with protection from new layers of platelets and fibrin that are formed by stimulation from thromboplastin[22]. The microorganisms may penetrate into the bloodstream through epithelial, oropharyngeal, dermal, respiratory, gastrointestinal or urogenital lesions. It is believed that ulceration of the neoplastic lesion forms a pathway for the microorganism to enter the bloodstream[22], although this does not explain the cases of patients with infectious endocarditis and non-ulcerated colonic polyps[6].

Infectious endocarditis from *S. bovis* habitually affects patients aged over 60 years[25], as occurred in this case. Its most important complication is cardiac insufficiency, occurring mainly in the aortic valve[12, 19], which was also present in the patient described.

S. bovis is found in 7% to 14% of sub-acute infectious endocarditis cases[4]. It is frequently associated with gastrointestinal lesions, especially carcinoma of the colon[1, 3]. The incidence of the association of colonic neoplasia with *S. bovis* has been determined as 18% to 62%[17, 21, 23, 26, 27]. Colonic neoplasia may arise years after the presentation of the condition of bacteremia or infectious endocarditis[9, 10, 27]. In addition to the bacteremia and infectious endocarditis from *S. bovis*, endocarditis caused by other streptococci like *S. faecalis*[18] and *S. equines*[11, 17] and the bacteremia introduced by *S. sanguis, S. equinus* and *S. salivaris* have also been related to colonic neoplasias[24].

The diagnosis of infectious endocarditis is normally done in the laboratory via hemoculture, as was done in the present case, for which the positivity rate is 95%. Nevertheless, previous antibiotic therapy reduces the isolation rate for the microorganism to 64%[7].

An increased incidence of this disease or hepatic dysfunction has been reported among patients with infectious endocarditis from *S. bovis*[9, 22, 27]. It has been speculated that *S. bovis* affects portal circulation through bacterial translocation, thereby determining hepatic alterations[3, 14, 15]. Modifications in the hepatic secretion of bile salts and the production of immunoglobulins contribute towards increasing the participation of *S. bovis* in the bacterial flora of the colonic lumen[3, 14, 15]. In two studies, hepatic cirrhosis was present in around 11% to 19%[4] of the patients. In the present report, the tests of hepatic function were normal.

Case-control studies have shown that the relative risk of developing infectious endocarditis from *S. bovis* in the presence of carcinoma of the colon is between 3% and 6%[4]. In addition, around 60% to 75% of patients with endocarditis from *S. bovis* simultaneously present malignant gastrointestinal disease that was not previously diagnosed[13]. It has been suggested that higher serum levels of *S. bovis* antibodies could constitute a marker for carcinoma of the colon[3,7].

The finding of the bacteria among patients with septicemia and/or endocarditis is also related to the presence of villous or tubular-villous adenomas in the large intestine[6, 9, 18], as occurred in the present case.

It is prudent to provide antibiotic prophylaxis for cardiopathic patients at an elevated risk for infectious endocarditis who undergo colonoscopy. It is also recommended that the investigation of postoperative fever after extirpation of the colonic carcinoma should include searching for infectious endocarditis[2].

The possible relationship between these two clinical entities reinforces the importance of complete and detailed investigation of the large intestine in patients with infectious endocarditis from *S. bovis*[13]. Patients with infectious endocarditis and normal colonoscopy may be included in the group who present risk for developing colonic cancer, because of the late appearance of such lesions, which are seen around 2 to 4 years after the infectious episode[4, 9].

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RESUMO – ***Racional*** - Diferentes estudos na literatura têm alertado para a necessidade de investigação de lesões cólicas entre doentes, especialmente nos mais idosos, que apresentem bacteremia e/ou endocardite por *Streptococcus bovis*. A bacteremia e a endocardite infecciosa por *S. bovis* pode estar relacionada à presença de lesões neoplásicas do intestino grosso e a doença hepática. ***Objetivo*** - Descrição do caso de doente com endocardite infecciosa por *S. bovis* associada a carcinoma cólico e adenomas túbulo-vilosos. ***Conclusões*** - A detecção da bactéria nos pacientes com bacteremia e/ou endocardite também está relacionada com a presença de adenomas vilosos ou túbulo-vilosos no intestino grosso. A investigação minuciosa e completa do intestino grosso em doentes com endocardite infecciosa, mesmo na ausência de sintomas intestinais, deve ser realizada. O aumento da incidência da doença ou de disfunção hepática está sendo notado entre os pacientes com endocardite infecciosa por *S. bovis*. Doentes com endocardite infecciosa por *S. bovis* e colonoscopia normal podem ser incluídos em grupo de risco para o desenvolvimento de câncer cólico. O conhecimento desta associação entre endocardite por *S. bovis* e carcinoma de cólon tem aplicações clínicas importantes, pois se a lesão for descoberta num estádio inicial, a extirpação curativa pode ser possível.

DESCRITORES – Endocardite bacteriana. *Streptococcus bovis*. Neoplasias do cólon. Carcinoma.

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