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Colorectal carcinoma and endocarditis caused by Streptococcus gallolyticus: Case report

Carcinoma colorretal e endocardite por *Streptococcus gallolyticus*: Relato de caso

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ABSTRACT
Bacterial endocarditis is a recurrent pathology in health services around the world, and several etiological agents may be involved, which can modify the course of the disease according to the degree of infection and aggressiveness of the pathogen. However, a complex relationship is established when this condition is triggered by a specific bacterium, *Streptococcus gallolyticus* , popularly known as S. bovis, since observational studies have related the presence of this Gram-positive coccus to colorectal carcinomas1.

Keywords: Bacterial endocarditis, Streptococcus gallolyticus, Gastrointestinal pathologies.

INTRODUCTION

The association between S. bovis and gastrointestinal pathologies, such as diverticular disease, inflammatory bowel diseases and the like, began to be better documented in the late 70's, although there were already publications on the subject since the 50's; Since then, the scientific community has taken a closer look at these diseases and their association with the bacteria in question. Formally, there is no direct evidence of how the presence of this pathogen

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influences the occurrence of diseases of the gastrointestinal tract, however, the relationship between the presence of the bacterium in sick individuals is true and well documented2,3.

The connection between Streptococcus gallolyticus and colorectal carcinoma is not merely coincidental. Multiple pathogenic mechanisms have been proposed to explain this association. One theory suggests that chronic inflammation of the gastrointestinal tract, induced by this bacterium, may create an environment conducive to the development of preneoplastic and cancerous lesions. In addition, the bacterium can facilitate the translocation of bacteria or their products into the bloodstream, reaching the endocardium and triggering endocarditis3.

The adhesion of Streptococcus gallolyticus to colonic epithelial cells is mediated by specific bacterial adhesion factors. Molecularly targeted studies have revealed the presence of adhesion proteins, such as pilin, which facilitate the colonization of the intestinal mucosa. This persistent colonization can trigger a local immune response, contributing to chronic inflammation and eventually the development of malignant lesions. The role of *Streptococcus gallolyticus* in the pathogenesis of endocarditis is complex and multifactorial. The bacterium has the ability to adhere to cardiac surfaces and form biofilms, which are microbial agglomerates that are highly resistant to host defense mechanisms and antibiotics1,3.

This ability to adhere and biofilm formation contributes to the virulence of *Streptococcus gallolyticus*, making it a particularly efficient pathogen in causing endocarditis. Early detection and effective treatment of *Streptococcus gallolyticus-related* endocarditis is crucial, not only to address the cardiac condition but also to identify potential associated colorectal lesions. Imaging tests, such as magnetic resonance imaging and colonoscopy, play a fundamental role in the evaluation of patients with endocarditis caused by *Streptococcus gallolyticus*, allowing the early detection of colon lesions2,3.

The objective of this article is to report a clinical case of a 60-year-old male patient with bacterial endocarditis caused by *S. bovis*, who, given the prevalence of the relationship between the identified pathogen and the premalignant and malignant lesions of the gastrointestinal tract, had an investigation with videocolonoscopy performed, where a colorectal carcinoma was indeed identified. As there were no complaints related to the intestine, the early diagnosis thanks to suspicion due to the positive blood culture for this specific bacterium anticipated the diagnosis and also the appropriate treatment for endocarditis and carcinoma.

METHODS

The information was obtained after a search in the electronic medical record, where access was obtained to information about the patient's care, hospitalization, evolution and tests, both laboratory and imaging. To this end, all the regulations recommended by the National Council for Research Ethics (CONEP) were followed. To validate the information found and the conducts adopted, a literature review was carried out containing articles related to the theme published in the PubMed and Embase databases in the last 5 years.

CASE REPORT

A 60-year-old male patient arrives at the emergency room of the hospital, referred by the vacancy regulation system, complaining of pain in the left clavicular region that started about 4 days ago, radiating to the ipsilateral shoulder and worsening the elevation of the left limb. At the origin, laboratory tests were performed that showed a significant increase in CRP (C-reactive protein) and febrile episodes. Due to a myocardial bridge catheterization in the distal third of the anterior descending artery performed 2 months earlier, a probable endocarditis late to the procedure was questioned.

The patient was hospitalized and stabilized, who presented signs of bacteremia, and a blood culture was requested, the result of which showed growth of Streptococcus gallolyticus, which drew the attention of the attending team. Due to the relationship between this pathogen and the occurrence of diseases of the gastrointestinal tract (GIT), a more targeted investigation of it was initiated, in addition to the initiation of specific antibiotic therapy, guided by blood culture.

At the same time, imaging tests showed distant impairment by the emboli that the probable vegetation located in the heart was sending, with pulmonary thromboembolism on the left, splenic infarction, pulmonary infarction and pneumonia, identified through chest and abdominal CT scans. A transesophageal ultrasound was performed in sequence to better measure the infection: vegetation lodged in tricuspid and aortic valves was identified, with moderate insufficiency in both.

Due to the risk of new emboli detachments and ischemia, an emergency surgical procedure was chosen to remove the vegetation; the same occurred without intercurrences, with good resolution; The surgery also included aortic valve replacement with a biological valve and tricuspid valve repair. The patient was referred to the ward again after anesthetic recovery and, following the investigations, a videocolonoscopy was scheduled.

After the early postoperative period, the examination was performed, and an ulcero-infiltrative lesion was identified in the ascending colon, of which a biopsy was performed, friable and very bleeding to the touch of the device, with approximate dimensions of 5 to 7 cm in its longest axis, occupying up to 40% of the organ's lumen, classified by the operator as Paris III. A sessile polyp was detected, which was promptly removed without intercurrences.

With the imaging findings and the positive biopsy result, the surgical schedule was made for the treatment of the colon tumor detected in the patient; The team responsible for the second surgery was in contact with the cardiology team and, in view of the extensive procedure that the patient had recently undergone, they agreed to wait a few more weeks to perform a new invasive procedure of such magnitude. During this period, an outpatient segment of the patient's oncology part was performed.

After 5 months of cardiac surgery, the patient was in clinical and laboratory conditions to perform a right hemicolectomy with ileocolon anastomosis. The procedure was uneventful and 13 days after surgery, he was discharged and started the outpatient segment with oncology and general surgery.

DISCUSSION

Colorectal carcinoma is the third most prevalent type of malignant neoplasm worldwide, and in Brazil, it is the third most common among men and the second in women. Given its prevalence, mechanisms that assist in early diagnosis become important allies in clinical practice, in order to accelerate hidden cases, in which typical signs and symptoms of this disease have not yet become very exuberant4.

The complex interaction between endocarditis, colorectal carcinoma, and Streptococcus gallolyticus is an expanding field of research, with emerging evidence indicating an intriguing association between these conditions. Understanding this triad is crucial for effective clinical management, the development of preventive strategies, and the conduct of more in-depth studies[2].

Bacterial endocarditis is an infection that affects the heart valves, and Streptococcus gallolyticus, formerly known as Streptococcus bovis, is recognized as a significant causal agent. Epidemiological studies suggest a specific association between the presence of Streptococcus gallolyticus in the gastrointestinal tract and the increased risk of endocarditis, especially in patients with abnormal heart valves, as in the case presented above[5].

The most notable aspect of this triad is the concomitant discovery of colorectal carcinoma in patients diagnosed with Streptococcus gallolyticus endocarditis. Substantial evidence from observational studies and systematic reviews supports this association. The bacterium has been identified as a risk marker for the subsequent development of colonic lesions, including adenomas and carcinomas[3,4].

The mechanisms underlying this complex connection involve the ability of Streptococcus gallolyticus to adhere to colonic cells, triggering a chronic inflammatory response in the colonic environment. Persistent inflammation, in turn, is a known risk factor for carcinogenesis, creating a favorable microenvironment for the malignant transformation of colonic cells[5].

Molecular studies have also contributed to the understanding of this association. The presence of the bacterium was detected in samples of colorectal tumors, and genomic analyses revealed specific genetic characteristics associated with strains isolated from colorectal cancer patients. These findings suggest a possible direct contribution of Streptococcus gallolyticus to the development and progression of colorectal cancer[5,6.]

The clinical relevance of this association is remarkable, requiring an integrated approach by health professionals. Patients diagnosed with Streptococcus gallolyticus endocarditis should undergo a comprehensive gastrointestinal evaluation to identify colonic lesions early and initiate appropriate interventions such as treatment or constant monitoring of colorectal cancer. In addition, close collaboration between cardiologists, gastroenterologists, and oncologists is vital for the effective management of these patients, ensuring a holistic approach to treatment and follow-up[3-5].

This multidisciplinary approach is essential not only for optimizing clinical outcomes but also for providing valuable insights that can guide future research. In addition, the identification of this association reinforces the need for preventive strategies. Antibiotic prophylaxis prior to dental and gastrointestinal procedures in patients with abnormal heart valves may be considered to reduce the risk of endocarditis2.

Raising awareness about the association between Streptococcus gallolyticus and colorectal cancer can inform screening strategies in high-risk populations, allowing for early detection and effective intervention[1-4].

In conclusion, current evidence supports a complex and interconnected relationship between endocarditis, colorectal carcinoma, and Streptococcus gallolyticus. However, it is crucial to recognize that the full understanding of these relationships is still evolving, and continued research is essential to unravel the underlying mechanisms and enhance clinical

management strategies. Collaboration between diverse medical specialties and the integration of preventive approaches are key to effectively address this complex clinical challenge and ensure efficient therapeutic outcomes, as in the case reported above.

Conflicts of interest
The authors declare that there is no potential conflict of interest that could interfere with the impartiality of this scientific work.

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