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Case Report

Streptococcus Gallolyticus endocarditis in patient with liver cirrhosis: a case report

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Abstract

Streptococcus gallolyticus (*S. gallolyticus*) bacteremia is commonly associated with endocarditis and diseases of gastrointestinal tract, especially with colorectal carcinoma. On the other side, it is rarely connected to liver disease, especially alcoholic liver disease. A 44-old patient with a history of one month fever, pre-existing heart murmur and previous alcohol abuse, was treated in Clinic for Infectious and tropical diseases, Clinical Centre of Serbia (CCS), Belgrade. The diagnose of infective endocarditis (IE) of the aortic valve caused by *S. gallolyticus* has been established. Despite the conducted antibiotic treatment based on antibiogram, pericardial effusion with paracardial aortic abscess was diagnosed on the 9th day of treatment. Pericardiocentesis was done and 800 mL of haemorrhagic fluid was evacuated in the Clinic for Cardiology, CCS. Unfortunately, 20th day of hospitalization the patient died. Clinical autopsy confirmed endocarditis, liver cirrhosis and chronic pericarditis. Prognosis of the outcome of treatment of patient with endocarditis caused *S. gallolyticus* and liver cirrhosis is not optimistic. Therefore, significant attention should be given to patients with liver cirrhosis and febrile of unknown origin.

Key words: *Streptococcus gallolyticus;* endocarditis; pericarditis; alcoholic liver cirrhosis; aortic valve disease.

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Introduction

Bacteremia caused by *Streptococcus gallolyticus* (*S. gallolyticus*), a group B beta-haemolytic *Streptococcus* (GBS), is commonly asociated, in published studies, with diseases of gastrointestinal tract, especially colorectal carcinoma and inflammatory bowel disease [1-5]. Its association with alcoholic liver cirrhosis is less frequently reported, although these patients are prone to it. *S. gallolyticus* infection of endocardium and pericardium was described in several cases. Due to its rare occurance, it can be overlooked, especially when symptoms and signs typically associated with pericarditis are missing. The fact that it can lead to a life-threatening condition despite advanced technologies and treatment modalities, means that it must be taken into consideration in everyday clinical practise.

We are presenting a case report of a patient with alcoholic liver cirrhosis and complete aortic blockage due to aortic stenosis, who was diagnosed with infective endocarditis (IE) of the aortic valve and chronic pericarditis after one month of fever caused by *S. gallolyticus*.

Case presentation

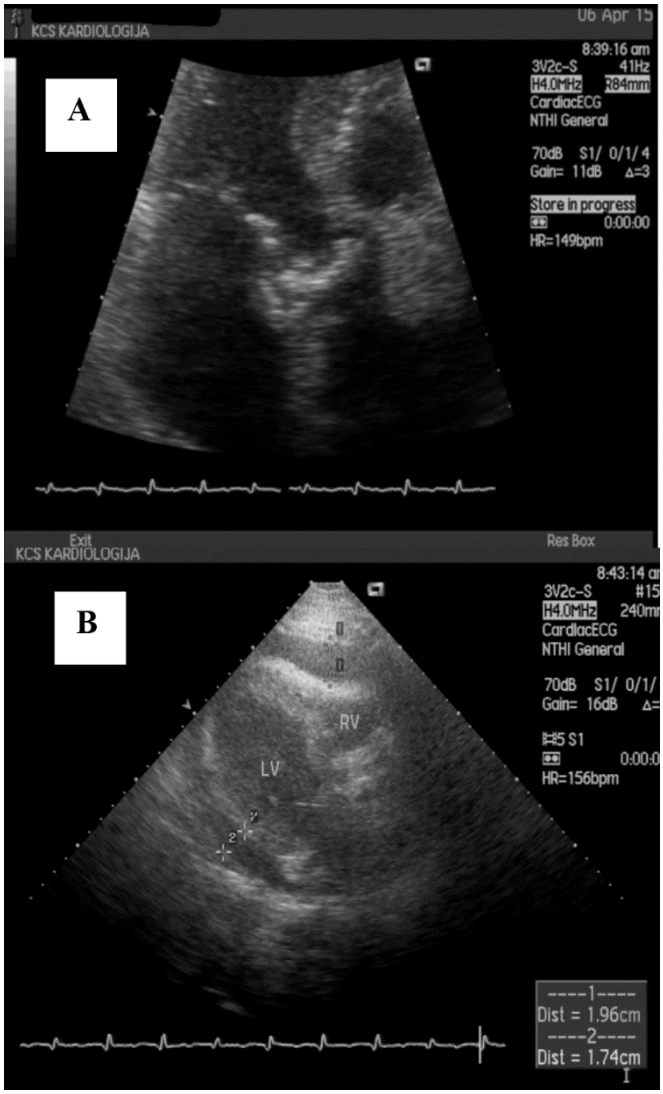
A 44-year-old male was admitted to the Clinic for Infection and tropical diseases, Clinical Centre of Serbia (CCS), in Belgrade, Serbia, complaining about a 1-month history of lower respiratory tract symptoms and fever (39°C), which was unsuccessfully treated by azithromycin administered orally. The patient's medical history included previous heavy alcohol consumption, a cerebrovascular accident that happened 13 years ago, and a pre-existing heart murmur diagnosed 6 years ago. The patient's therapy protocol included enalapril 20 mg/bid, amlodipine 5 mg/d and clopidogrel 75 mg/d.

During physical examination at admission, the patient was afebrile (T max of 36,6°C), with a pulse rate of 84 beats per minute, blood pressure of 120/70 mmHg, and oxygen saturation of 98% in ambient air. There were no signs of skin rash or jaundice. Pulmonary auscultation revealed fine late-inspiratory crackles at

the basis of lungs. Heart auscultation showed harsh mid-systolic ejection murmur, predominantly over the basis of the heart and radiating to the neck. Abdomen examination revealed a pronounced hepatosplenomegaly, with the liver edge palpable up to 2 cm bellow the right rib cage and spleen up to 3 cm below the left rib cage. No signs of edema or ischemia of the extremities were present. Neurological examination was unremarkable.

Initial laboratory findings showed significant elevation of C-reactive protein (CRP) 59.8 IU/mL and erythrocyte sedimentation rate 100/hour, high level of serum gamma glutamyl transpherase 150 IU/mL, and leukocytosis of 12,200 per mm^3. The chest X-ray was normal, while the abdominal ultrasound showed enlarged liver 150 mm and spleen 197 mm.

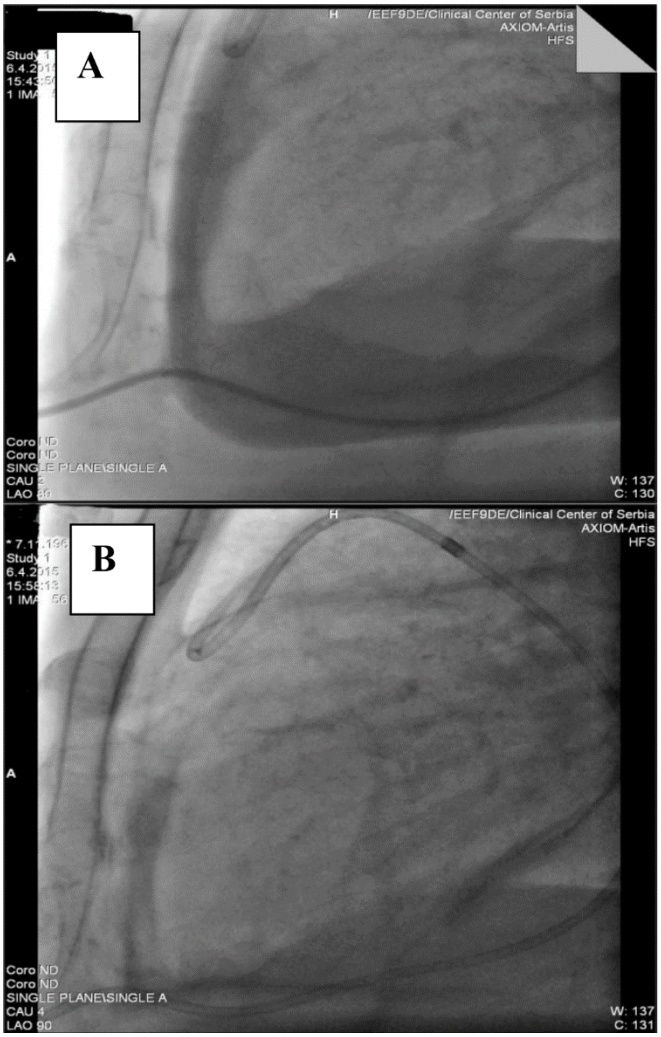
Figure 1. Echocardiography. A. The vegetation of the aortic valve, suspected paravalvular abscess; B. The pericardial effusion.



Echocardiography revealed a complete aortic valve blockage due to narrowing caused by calcified aortic stenosis.

Suspecting septic condition, an empiric intravenous antibiotic therapy was started, consisting of one daily dose of 2.0 g of ceftriaxone and 2.0 g of vancomycin every 12 hours. In the meantime, *Streptococcus gallolyticus subsp gallolyticus* was isolated from two consecutive blood cultures, and it was confirmed that the administered therapy matched the antibiogram. Despite the treatment, the patient remained febrile. Echocardiography showed a complete aortic valve disease due to a soft tissue shadow in the left ventricular outflow tract, which could correspond to vegetation. Concurrent laboratory findings showed elevated CRP 104.8 IU/mL, with leukocytosis and low platelet count. Skin tuberculine test was within boundaries, fecal occult blood test (FOBT) was negative, tumor markers (CEA, CA 19-9, CA 72-4, and αFP) were within normal

Figure 2. Pericardiocentesis. Before and after draining 800 mL of pericardial effusion.



range, and serology (anti-HCV, anti-HIV, HBsAg) was negative. Electrocardiogram (ECG) showed depression of ST segment and negative T wave from V2 to V6, light ST depression in D1 and aVL. Abdominal ultrasound showed enlarged liver (157 mm) and spleen (174 mm) with a minimal amount of ascites around the small bowel and in the pelvis.

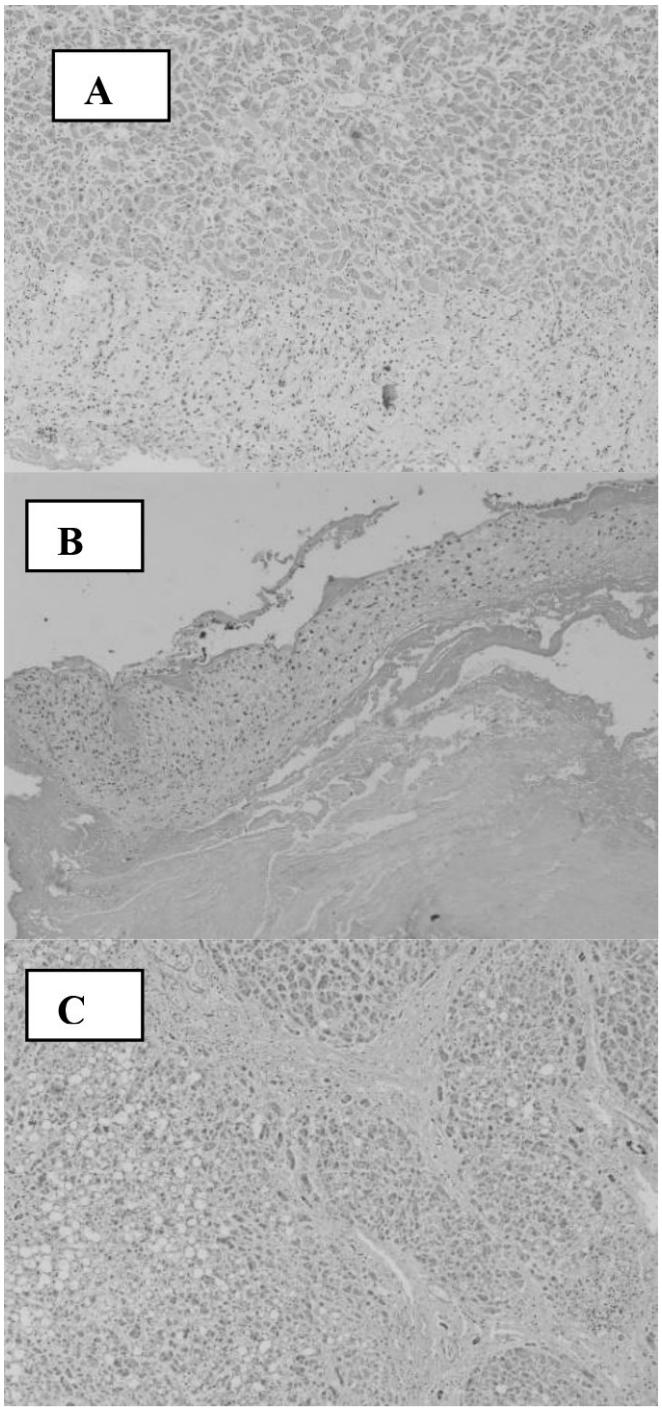
On the ninth day, patient's condition began to deteriorate, with manifestation of dyspnoea, tachycardia and normal arterial pressure (120/75 mmHg), and electrical alternans on ECG. Another echocardiography was performed and showed effusion in the pericardial cavity, along the front wall of the right ventricle 2.0 cm, with the lateral wall of the left ventricle 1.7 cm, subcostal with right ventricle 2.5-2.7 cm, the diastolic collapse of the right ventricle, enlargement of inferior vena cava with collaps in inspirium, thickening of the aortic valve with PG 50 mmHg and 3+ aortic regurgitation, and a suspected paravalvular aortic abscess (Figure 1). Chest X-rays showed pleural effusion on the left. Because of the threatening cardiac tamponade, the patient underwent pericardiocentesis, with evacuation of 800 mL of hemorrhagic fluid (Figure 2). Further treatment was continued at the Clinic for Cardiology CCS, where the patient died. Clinical autopsy was performed, confirming endocarditis, liver cirrhosis and chronic pericarditis (Figure 3). In addition to the standard hematoxylin/eosin (H&E) staining, the Ziehl-Neelsen staining was applied, and there was no evidence of *Mycobacterium tuberculosis*.

Discussion

S. gallolyticus is a common gut commensal in various animals and humans. Faecal load of *S.gallolyticus* in normal colon ranges from 2.3% to 13.0% [6]. *S. gallolyticus* is the second most common streptococcal pathogen causing endocarditis, responsible for 5-25% of all cases of bacterial endocarditis [6-8]. Reported mortality rates vary from 7% to 37%, with an average of 14% [9-12].

IE caused by *S. gallolyticus* is more common in elderly patients and in patients with immunosuppressive condition, such as alcoholism, diabetes mellitus, liver disease, neoplasms [13,14]. In published studies, *S gallolyticus* is known as a cause of bacteremia in patients with colon cancer , but there are also a number of reports of *S. gallolyticus* bacteremia in patients with liver disease and cirrhosis [10,15,16]. The association of *S. gallolyticus*-caused bacteremia and/or endocarditis with chronic liver disease has been previously described in some case reports or

Figure 3. Clinical autopsy finding, pathohistology.



A. Vegetation of aortic valve. 10X magnification. The vegetation is composed of fibrin and mixed inflammatory infiltrates (mononuclear and polymorphonuclear). Dystrophic calcifications and necrosis areas are noticeable; B. Epicard and pericard. 10X magnification. Fibrovascular granulation tissue with predominantly lymphocytic inflammatory infiltrate is observed. Findings indicative of chronic pericarditis; C. Liver. Zoom 4X. The presence of parenchymal fibrosis and formation of regenerative nodules are observed. Lobuli were damaged during processing. Within the connective tissue septa, mildly multiplied ducts are observed, indicating regenerative changes. In hepatocytes, lipid vacuoles are present. Overall findings correspond to cirrhosis and macro- and micro-vesicular fatty liver changes.

retrospective studies, showing the presence of liver disease in up to 50% of affected patients [11,15,16]. A possible explanation for this association may be high levels of cytokines, such as TNF-alpha, in patients with chronic liver disease, which create favourable environment for proliferation of anaerobic bacteria such as *S. gallolyticus* [17].

A role of alcoholism in predisposition to *S. gallolyticus*-caused bacteremia should also be taken into account, knowing that alcohol abuse is one of the most common causes of chronic liver disease [18,19]. In addition, the prevalence of adenomatous polyps as precancerous lesions is higher in alcoholic than in non-alcoholic patients (58% *vs* 13%) [20]. We have excluded other causes of liver disease by serological tests for hepatitis C and B virus markers. It should be noted that the patient's autopsy results revealed histopathological markers specific for alcoholic liver cirrhosis. The patient was likely immunocompromised due to alcoholic liver disease, which lead to the life-threatening infection and fatal outcome.

Purulent pericarditis as a complication of *S. gallolyticus*-caused bacteremia was only described in a small number cases [21-24]. Infection of the pericardium can occur via direct extension of infectious endocarditis, by haematogenous spread from a distant source or by injury of the chest wall [25]. Clinical presentation with atypical electrocardiogram and detection of pericardial fluid on echocardiography can facilitate the diagnosis. Definitive diagnosis is established by evacuation of purulent pericardial fluid and subsequent microbiological analysis positive to *S.gallolyticus* [26,27]. In these cases, no further diagnostic associations of *S.gallolyticus*-caused bacteremia and other gastrointestinal diseases were made. Unregulated diabetes mellitus and a previous history of cerebrovascular stroke are defined as immunocompromised conditions in these studies [25].

So far, there are no reported cases of chronic pericarditis associated with liver disease as a condition predisposing to *S.gallolyticus*-caused bacteremia and acute endocarditis.

Conclusion

The prognosis of endocarditis caused by *S. gallolyticus* in patients with liver cirrhosis is poor, which was confirmed in our patient. Knowing that patients who are immunocompromised due to liver cirrhosis are prone to life-threatening spontaneus bacteremia and endocarditis, *S.gallolyticus* should be considered as one of the major possible causes. Therefore, in every case of prolonged febrile condition of unknown origin in patients with liver cirrhosis, this opportunistic pathogen should be taken into consideration.

Authors' Contributions

ARS wrote the article, organized the data and prepared the manuscript. IG and DO organized the data and prepared the manuscript. OP and OS revised the manuscript. IM and AR supervised this study. All authors contributed to analysis and interpretation of the data, read and approved the final version of the manuscript

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