



Case Report

Lactococcus endocarditis after Bentall procedure presenting with intracranial hemorrhage

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ABSTRACT

Background: Endocarditis is more common in patients with cardiac prostheses. A Bentall procedure entails surgical replacement of the aortic valve, aortic root, and ascending aorta with re-implantation of coronary arteries into the graft.

Case: 65-year-old male with history of atrial fibrillation on rivaroxaban, bicuspid aortic valve, and ascending aortic aneurysm with a history of a Bentall procedure two years prior, presented with headache and dysarthria for one day. National Institutes of Health Stroke Scale was 3 and CT head showed 2.7 cm left frontal hematoma with extension into the subarachnoid space. Andexanet alfa was given for rivaroxaban reversal followed by cerebral angiogram which showed 5 mm intracranial inferior MCA aneurysm and embolization and coil placement was done. Blood cultures grew *Lactococcus garvieae* and transesophageal echocardiogram revealed aortic valve thickening and vegetation on the non-coronary cusp. He was subsequently treated with six weeks of IV ceftriaxone and Gentamycin.

Conclusion: With increasing use of bioprosthetic valves, the possibility of infective endocarditis with uncommon pathogens should be kept in mind. *Lactococcus* commonly affects native valves, however it can affect bioprosthetic valves and can present with mycotic aneurysms.

Introduction

Infective endocarditis (IE) is the term used to describe an infection affecting the heart, the endocardium, and/or cardiac prosthesis. This infection can be caused by different organisms, most commonly bacterial [1]. Risk factors for IE include chronic comorbidities (such as diabetes mellitus, hypertension, end stage renal disease), older age, implantable cardiac devices, prosthetic valves and increased vascular access, seen in those with prolonged intravenous access or intravenous drug users [2,3].

The most common presentation of IE is fever, but patients can develop a wide variety of vague, non-specific symptoms making the Modified Duke Criteria the main diagnostic scoring criteria for IE [2,4]. Blood cultures are important in guiding the diagnosis of IE. A state of transient bacteremia is almost always the prerequisite to developing infective endocarditis, especially in the presence of cardiac prosthesis [5].

A Bentall procedure has been the standard surgical approach for the repair of ascending aortic aneurysm with aortic valvulopathy. In 1968 Bentall & De Bono proposed the Bentall procedure consisting of replacement of the aortic valve, aortic root, and ascending aorta with re-implantation of coronary arteries into the graft [6]. There have been reports of infectious complications of the Bentall procedure, however these are uncommon.

Lactococcus garvieae is a gram-positive coccus formerly considered to be part of genus *Streptococcus*. The first human infection with *L. garvieae* was not identified until 1991, however it is still often misidentified as *enterococci* in laboratories around the world [7,8]. It is extremely unusual for *L. garvieae* to be the causal bacteria of IE, with only 27 reported cases to this date [9]. In this case report, we explore an isolated case of *Lactococcus garvieae* IE in a male patient with a history of Bentall procedure, who presented with intracranial bleeding due to mycotic aneurysms.

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Case

65-year-old male presenting to the emergency department for headache and dysarthria. History of present illness was significant for severe headache starting one day prior to presentation associated with one episode of non-bilious non-bloody vomiting. Patient's headache was persistent when he endorsed new onset dysarthria which commenced 6 h prior to presentation. He had denied any chills, fever, peripheral weakness, numbness, abnormal vision or imbalance. His past medical history was significant for hypertension, hyperlipidemia, atrial fibrillation on rivaroxaban, bicuspid aortic valve, and ascending aortic aneurysm with a history of a Bentall procedure two years prior. Vital signs were pertinent for bradycardia to 48 beats per minute, normotensive with a blood pressure of 126/61 mmHg and saturating well on room air. Physical examination was significant for slurred speech and decreased sensation in right lower face. Stroke alert was called with a National Institute of Health Stroke Scale of 3 and CT head showed 2.7 cm left frontal hematoma with extension into the subarachnoid space (Fig. 1). Patient had been taking rivaroxaban, for which he received andexanet alfa as a reversal agent. This was followed by a cerebral angiogram, with embolization of a distal M2/M3 segment of the left middle cerebral artery aneurysm, and coil placement. On the cerebral angiogram, there was evidence of a 5 mm intracranial aneurysm (Fig. 2) arising from a bifurcation point along the inferior middle cerebral artery; embolization and coil placement was done. Given the history of an aortic valve replacement and findings of an aneurysm on cerebral angiography, further endocarditis workup was done.

Patient was admitted to neuro-intensive critical unit. Two peripheral venous blood cultures grew *Lactococcus garviae* by PCR panel. A transthoracic cardiac echocardiogram showed bioprosthetic aortic valve thickening. This finding was consistent in the transesophageal echocardiography which confirmed a vegetation on the non-coronary cusp of the valve (Figs. 3 and 4). After confirmation of a diagnosis of endocarditis using the modified duke's criteria, patient was started on intravenous antibiotics, ceftriaxone and gentamycin. No cardiothoracic intervention was offered given the patient's perioperative cardiac risk and the presence of intracranial hemorrhage. Patient's stay was



Fig. 1. CT Head showing left frontal hematoma with extension into subarachnoid space.



Fig. 2. CT angiogram showing Inferior middle cerebral artery aneurysm. MCA = Middle Cerebral Artery.

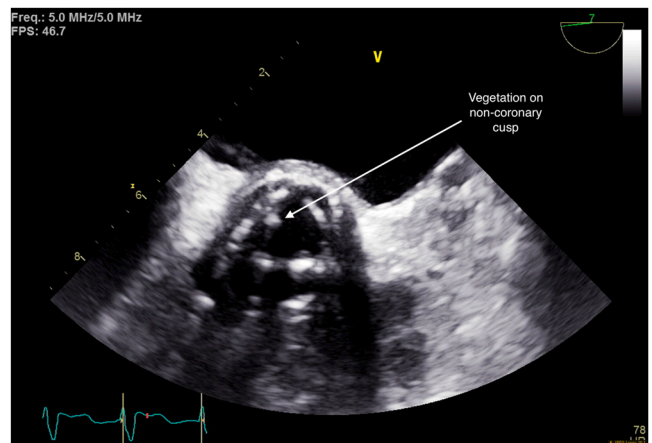


Fig. 3. Midesophageal short axis view showing aortic valve with vegetation on non-coronary cusp and thickening of right coronary cusp.

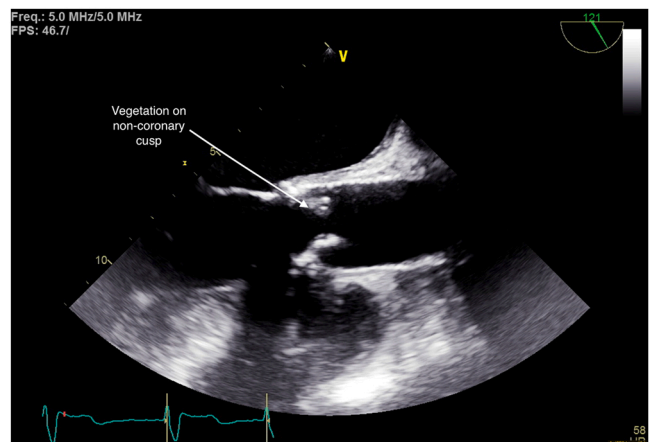


Fig. 4. Midesophageal long axis view showing aortic valve with vegetation on non-coronary cusp and thickening of right coronary cusp.

complicated by wide-complex tachycardia and cerebral vasospasms that resolved. Patient was discharged home from the hospital on the same intravenous antibiotics for a total of 6 weeks for treatment of *Lactococcus*

garviae infective endocarditis.

Discussion

Infective endocarditis is an infection commonly encountered in the presence of cardiac implantable devices and often seen in the presence of prosthetic valves. The most common organisms involved in cardiac prostheses IE are *Staphylococcus group* and streptococcus viridians; whereas in the general population, the most common organisms are *Staphylococcus* and *Enterococcus group* [9]. IE has wide variety of symptoms that include fever, fatigue and even immunologic sequelae. Despite this, the mainstay of diagnosis includes positive blood cultures as well as evidence of valvular vegetations, either on transthoracic or transesophageal echocardiography [2]. Pathogenesis of IE involves the formation of a biofilm on a cardiac valve; when bacteria have access to the bloodstream, they attach to platelet aggregates around the valve and thus form a biofilm which causes damage to the valve and ultimately, a systemic spread of septic emboli around the body [10].

Among the various cardiac prosthesis, bioprosthetic valves compromise the primary site for the development of IE. The Bentall procedure has rarely been associated with infectious complications (estimated at < 2 %), nonetheless a few reported cases of infected Bentall graft with Methicillin resistant *Staphylococcus aureus* and *Staphylococcus epidermitis* have been described in the literature [11,12].

Lactococcus garviae is an opportunistic pathogen that in rare cases causes infections in humans. Up until now, there have been around 27 reported cases worldwide of *L. garviae* IE [9]. It is hypothesized that the main mode of transmission to humans is through the ingestion of raw fish or milk products, with higher incidence of infection during summertime [13]. Around 53 % of cases have been associated with abnormal gastrointestinal mucosa, such as the presence of ulcerations or diverticula, and almost 26 % of cases involve infection of a bioprosthetic valve [9,13]. A previously reported case of *Lactococcus garviae* IE in a Japanese patient also showed associated mycotic aneurysms, findings similar to our patient [14].

The above report describes the case of a patient with a past medical history significant for a Bentall procedure presenting with intracranial hemorrhage secondary to a mycotic aneurysms. Thorough workup yielded positive blood cultures for *Lactococcus garviae* with possible evidence of vegetations on the aortic valve. The presence of this bacteria is very unusual and there is almost no literature of *Lactococcus garviae* after undergoing a Bentall procedure. In 2019 Malek et al. described one case of *Lactococcus garviae* subacute IE having intracranial hemorrhage as the initial presentation [15]. However, this previous case presented was in the setting of a prosthetic mitral valve replacement and not a Bentall procedure. Despite the current literature findings, it is not known whether our patient had a risk factor of raw fish intake at home. The presence of aortic grafts and different surgical techniques increases the risk of all kinds of IE, regardless of the organism.

The importance of this case resides in highlighting the emergence of *Lactococcus garviae* IE in people who had previously undergone a Bentall procedure. The increased prevalence of cardiac prosthetics in our society should raise concern of the increased chances of infections with uncommon opportunistic pathogens, especially with risk factors such as surgical graft placements.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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CRediT authorship contribution statement

Gennifer Wahbah Makhoul: Conceptualization, Resources, Writing – original draft. **Ahmad Mustafa:** Conceptualization, Resources, Writing – review & editing. **Joanne Ling:** Conceptualization, Resources, Writing – original draft. **Nnedindu Asogwa:** Writing – original draft. **Sherif Elhosseiny:** Resources, Writing – review & editing. **Fasih Sami Siddiqui:** Resources, Writing – review & editing. **Shahkar Khan:** Writing – original draft, Resources. **James Lafferty:** Resources, Supervision. **Allison Glaser:** Conceptualization, Resources, Writing – review & editing, Supervision.

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Disclosures

The authors have nothing to disclose.

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