

## A Rare Case of *Serratia marcescens* Causing Infective Endocarditis Complicated by Aortic Root Abscess

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### Abstract

The most common causative organisms of Infective Endocarditis in otherwise healthy patients are coagulase-negative staphylococci and streptococci, to name a few. A rarer, lesser known, etiology of Infective Endocarditis is *Serratia marcescens*. Historically, *S. marcescens* has been associated with intravenous drug use. However, its occurrence in clinical practice has shifted to an association with healthcare related infections. This case brings to light *Serratia marcescens* as a cause of aortic root abscess and infective endocarditis. It seeks to establish *Serratia* as a source of infective endocarditis and outline its ability to demonstrate persistent bacteremia and rapid antibiotic resistance thereby preventing *Serratia* from being overlooked and averting the overuse of antibiotics.

**Keywords:** *Serratia marcescens*; Endocarditis; Aortic Root Abscess

### Introduction

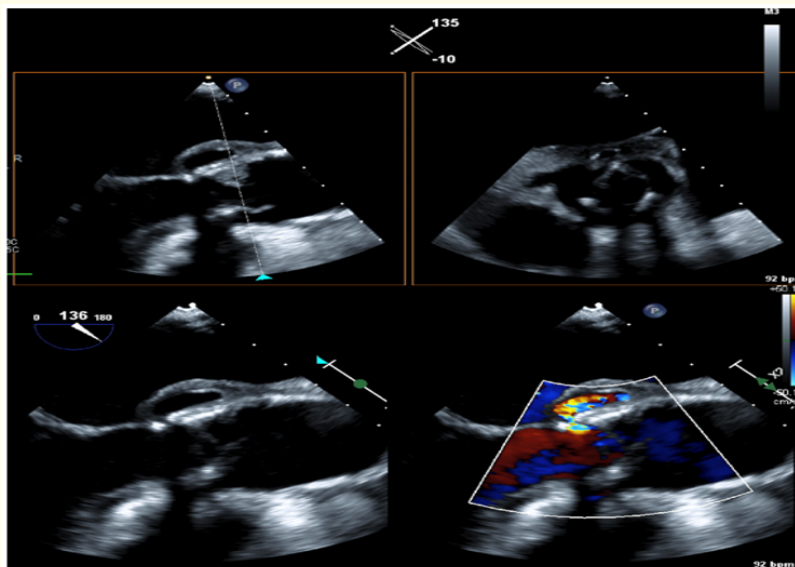
The most common causative organisms of Infective Endocarditis in otherwise healthy patients are coagulase-negative staphylococci and streptococci, to name a few. A rarer, lesser known, etiology of Infective Endocarditis is *Serratia marcescens*.

### Case Presentation

We present a case of a 78-year-old male with a past medical history of ascending aortic aneurysm repair and aortic valve repair secondary to aortic stenosis, presented to the hospital with fever, chills, and fatigue. He had a temperature of 39.4°C and a blood pressure of 94/70mmHg. He was admitted and a thorough investigative workup was conducted. Oral examination showed normal dentition without evidence of periodontal disease. No history of intravenous drug abuse, immunosuppressive therapy or chronic disease. Patient's EKG revealed a first-degree heart block. A computed tomography (CT) angiography of the chest with and without contrast was negative for any acute process. During the course of his admission, the patient underwent a transesophageal echo (TEE) which showed evidence of a 1.4 x 0.9 cm prosthetic valve vegetation and an aortic root abscess. Based upon this finding, a blood culture was ordered and was found to be positive for *Serratia marcescens*. A detailed review of his medical history revealed a post-operative *Serratia marcescens* bacteremia after his initial aortic aneurysm repair 9 months ago. Taking this into consideration, a 6-week course of ertapenem with long term oral suppression with ciprofloxacin was ordered. A month later, blood cultures grew carbapenem resistant *Serratia marcescens*. Patient then underwent debridement

of the aortic root abscess and this was followed by treatment with ceftazidime, avibactam, and ceftriaxone which resolved the infection. We present this case to highlight an aortic root abscess and infective endocarditis secondary to *Serratia marcescens*.

**Echo Report**



**Figure 1:** This is a transesophageal echocardiography image showing evidence of a vegetation on one of the prosthetic aortic valve leaflets. There is extension of the infection involving the aortic root which is consistent with aortic root abscess. Doppler flow is seen communicating with the aortic area.

**Discussion**

We believe this case should be reported to the literature because of the rare complication of an aortic root abscess and infective endocarditis caused by *Serratia marcescens*. Infective endocarditis with concurrent involvement of the aortic valve is known to occur with a consequential formation of an aortic root abscess [1,2], with a higher frequency of occurrence in prosthetic valves than native valves [3]. A study by Kirali, *et al.* found the mortality rate to be 40.7% in individuals with a prosthetic valve [4]. The most common organisms involved in this disease process are coagulase-negative staphylococci, streptococci, and rarely fungi. Though *S. marcescens* is not uncommon, it seldom results in infective endocarditis, and rarely, in the formation of an aortic root abscess.

*S. marcescens* is an anaerobic, gram-negative bacillus that belongs to the Enterobacteriaceae family. Although it can be frequently found in soil, animals, and water; it is not considered to be commensal flora of a human. *S. marcescens* is commonly known to cause infections of the lungs, urinary tract, surgical sites, skin, and soft tissues [5]. Regardless of its knowledge of causing such a wide range of infections, it rarely results in infective endocarditis. In fact, a study by Morpeth, *et al.* found that approximately 0.14% of infective endocarditis cases are the result of the entire *Serratia* species [6]. The trend of *S. marcescens* has shifted from being associated with intravenous drug use to nosocomial and healthcare related infections [7, 8].

Transesophageal echocardiography (TEE) is the imaging modality of choice for infective endocarditis, particularly due to its advantage in identifying complications in the region of the aortic root [9]. TEE also provides information regarding the presence of associated veg-

etations and valvular defects [10,11]. This microorganism is known to be resistant to many of the first generation and second generation cephalosporins as well as penicillins [12]. Because of this resistance, the Infectious Diseases Society of America recommends a combined regimen of aminoglycoside or fluoroquinolone with a  $\beta$ -lactam medication for 6 weeks [13]. Moreover, the role of surgery to debride the abscess is the mainstay treatment for an aortic root abscess [14] and is critical to prevent the abscess from progressing to a pseudoaneurysm, an arrhythmia, or a fatal rupture into a nearby cardiac chamber.

### Conclusion

Infective endocarditis with concurrent aortic root abscess can be a life-threatening complication of *S. marcescens*. It requires a close workup by the clinician as well as the microbiologist to prevent *S. marcescens* from being overlooked as the management and treatment of this organisms differs from the routine culprits commonly encountered in clinical practice.

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