



Case report

Multifocal extracranial mycotic aneurysms in a patient with endocarditis



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ABSTRACT

This report describes the case of a 44-year-old man with *Streptococcus gallolyticus* (formerly *S. bovis*) endocarditis requiring surgical mitral valve replacement who developed multifocal extracranial mycotic aneurysms after the resolution of infection.

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Introduction

Mycotic aneurysms are a complication in patients with infective endocarditis. Aneurysms arising both intra- and extra-cranially have been documented with numerous infectious etiologies [1]. However, the presentation of multifocal intra-abdominal mycotic aneurysms has not yet been reported in the literature. We describe a case in which a patient with *Streptococcus gallolyticus* (formerly *S. bovis*) endocarditis requiring surgical mitral valve replacement was found to have mycotic aneurysms of the tibial peroneal trunk, hepatic artery, and a jejunal branch of the superior mesenteric artery on routine postoperative follow-up.

Case presentation

A 44-year-old man with a history of diet-controlled diabetes mellitus type 2 and recently diagnosed rheumatoid arthritis presented with one-day of fever in the setting of hematuria, lower extremity petechial rash, generalized fatigue, and arthralgias. The patient had no history of intravenous drug use, recent dental procedures, or prior cardiac valvular history. Upon admission, he was found to be tachycardic to 118 with a fever of 39.4C. Physical

examination was significant for a holosystolic murmur at the right upper sternal border. His white blood cell count was 9.64 K/uL, and he was anemic with a hemoglobin of 6.5 g/dL. Other significant laboratory findings included erythrocyte sedimentation rate of >140 mm/hr, C-reactive protein of 84.8 mg/L, C3 complement of 45.9 mg/dL, and creatinine of 1.80 mg/dL. The patient was started on IV vancomycin and ceftriaxone empirically. Blood cultures grew *Streptococcus gallolyticus* within 13 h, after which vancomycin was discontinued. The patient responded well to antimicrobials, was afebrile by hospital day 2, and had negative blood cultures by hospital day 3. Gentamicin was added on hospital day 5 following return of culture sensitivities.

The patient underwent transesophageal echocardiogram and was found to have a 22 mm × 17 mm vegetation on the anterior leaflet of the mitral valve, and severe mitral regurgitation secondary to a flail posterior leaflet. In light of the patient's arthralgias and new-onset posterior right knee pain, he underwent an ultrasound study of the right popliteal fossa, which was unremarkable. CT of the head without contrast was unremarkable. The patient also underwent upper and lower endoscopy on hospital day 6 for workup of possible gastrointestinal malignancy, which identified a single 10 mm colonic tubular adenoma.

On hospital day 8, the patient underwent uncomplicated mitral valve replacement with a 31 mm bovine pericardial valve (Edwards Lifesciences, Irvine, CA). Inspection of the mitral valve intra-operatively revealed that both the anterior and posterior leaflets were encased with vegetation, which extended to the primary and

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secondary cordae. The postoperative course was unremarkable, and the patient was discharged home 6 days postoperatively on warfarin and 6 weeks of IV ceftriaxone and gentamicin via PICC.

Ten days after discharge, the patient was seen for routine postoperative check. He was complaining of one week of worsening, throbbing right lower extremity pain. Physical examination demonstrated tenderness and pitting edema of the extremity. The patient underwent Doppler ultrasonography of the right lower extremity which showed a 2.7 cm proximal peroneal artery pseudoaneurysm with no evidence of deep venous thrombosis. He was readmitted for further workup. CTA of the abdomen, pelvis, and lower extremities revealed a 2.5 cm right hepatic artery pseudoaneurysm, a 6 mm aneurysm of a distal superior mesenteric artery branch supplying the jejunum, and a $3.3 \times 3.7 \times 3.6$ cm aneurysm arising from the right tibial peroneal trunk. A CTA of the head was unremarkable.

He underwent ultrasound-guided thrombin injection of the peroneal artery pseudoaneurysm on hospital day 3, coiling of the peroneal artery (Fig. 1) and hepatic artery aneurysm (Fig. 2) on hospital day 4, and embolization of the jejunal artery aneurysm (Fig. 3) on hospital day 8. His post-embolization course was uncomplicated, and he was later discharged with routine follow up. At six week follow up the patient underwent CTA of the head,

which was unremarkable. At six month follow up he underwent CTA of the abdominal aorta with run-off, which showed no recurrence of the aneurysms.

Discussion

This case report highlights the presentation and management of a patient with *S. gallolyticus* endocarditis who developed multiple late-onset mycotic aneurysms both intra- and extra-abdominally.

Mycotic aneurysms are a rare complication of endocarditis, often classified as central (i.e., intracranial) or peripheral (i.e., extracranial). Peripheral mycotic aneurysms have been reported with less frequency than centrally located aneurysms [2]. In their retrospective study of 922 patients with a definite infective endocarditis episode, Gonzalez and colleagues identified only 18 patients with a symptomatic peripheral mycotic aneurysm. Further, only one of these patients had an intra-abdominal aneurysm [1]. This highlights the low prevalence of intra-abdominal mycotic aneurysms in patients with endocarditis. A further review of the literature revealed only individual case reports documenting single aneurysms of intra-abdominal vessels, including the SMA, hepatic artery and splenic artery [3–5]. There

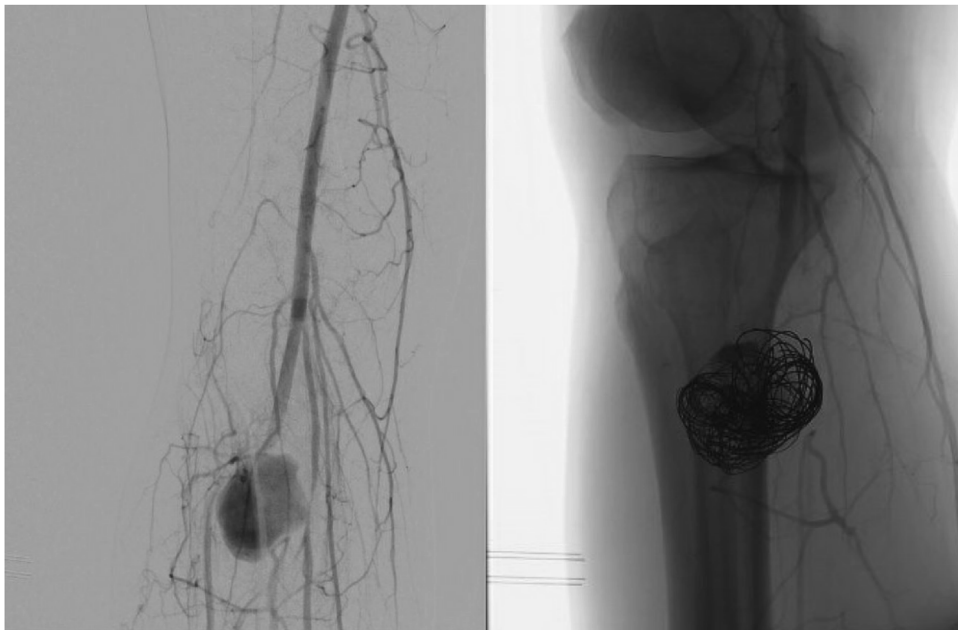


Fig. 1. Right peroneal artery pseudoaneurysm angiograph, before and after and coiling.

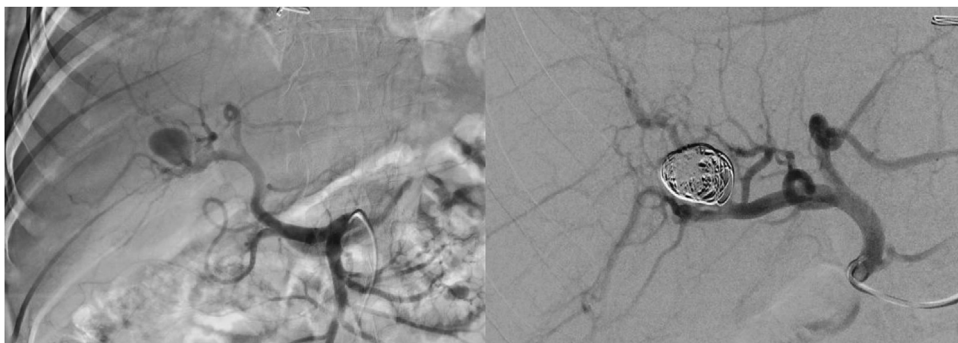


Fig. 2. Hepatic artery aneurysm angiograph, before and after and coiling.

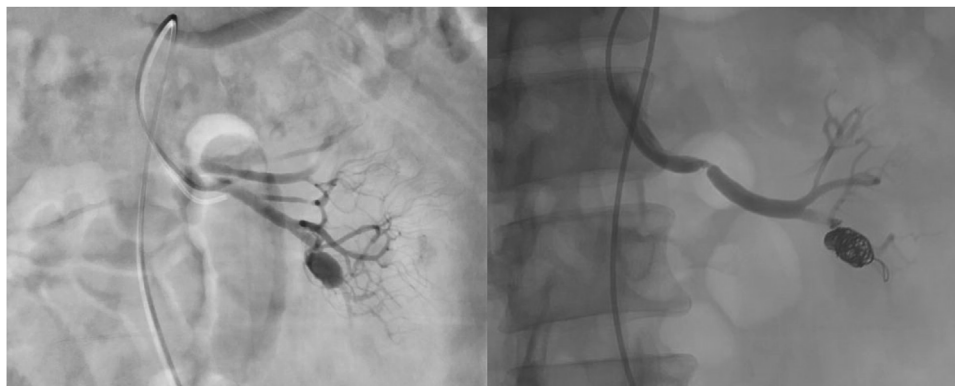


Fig. 3. Jejunal artery aneurysm angiograph, before and after and coiling.

are no reported cases of multifocal intraabdominal mycotic aneurysms, nor concomitant intra- and extraabdominal mycotic aneurysms as seen in our patient.

The temporal association between mycotic aneurysms and infective endocarditis also has not been well-elucidated. Much of the literature describes mycotic aneurysms as the presenting symptom of infective endocarditis [2]. It has also been documented that the diagnosis of mycotic aneurysms may not be established until after the completion of antimicrobial therapy [6]. However, there are no documented cases supported with pre- and post-treatment imaging in which a mycotic aneurysm was confirmed to have developed after initial presentation and treatment of infective endocarditis. In our case, the comparison of the pre- and postoperative ultrasounds of the right popliteal fossa showed a definitive mycotic aneurysm developing after the initial presentation and management of endocarditis.

Not only is the pattern of mycotic aneurysm development seen in our patient a rare presentation of endocarditis, the development of any mycotic aneurysms in cases of *S. gallolyticus* endocarditis has seldom been documented. In the same retrospective study by Gonzalez, *S. gallolyticus* was not deemed the causative organism in any patient with a mycotic aneurysm [1]. Further review of the literature revealed only two individual case reports in which mycotic aneurysms were discovered in a patient with *S. gallolyticus* endocarditis [7,8]. The more commonly reported association with *S. gallolyticus* endocarditis is its relation to colonic malignancy.

It should be noted that the mechanism of these mycotic aneurysms is not clear. There was never any evidence of ongoing infection at the time they were diagnosed. The patient was on antimicrobials, and all follow up blood culture were negative. This suggests that there was an immunologic cause of the aneurysms, perhaps related to deposition of immune complexes in the wall of

the arteries in response to the underlying infection. This has previously been described as a possible mechanism in other mycotic aneurysms.

Our case highlights the rare but clinically significant incidence of multiple intra- and extra-abdominal mycotic aneurysms in patients with infective endocarditis secondary to *S. gallolyticus*.

Author contributions

AMS, MAC, PJY were involved in the drafting of the manuscript. BFF, KVK, PJY were involved in the proofing and revision of the manuscript.

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