Case Reports

Septic Coronary Artery Embolism Treated with Aspiration Thrombectomy:

Case Report and Review of Literature

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Coronary embolization is a potentially fatal sequela of endocarditis. We report a case of Candida *endocarditis with septic embolism to the left anterior descending coronary artery. This embolism was successfully treated with aspiration thrombectomy followed by balloon angioplasty. The treatment of acute coronary syndrome in the presence of septic embolism is controversial. Aspiration thrombectomy has been performed in this situation before, and it appears to be safer and more feasible than is thrombolysis or percutaneous transluminal angioplasty.* ***(Tex Heart Inst J 2014;41(4):437-9)***

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Systemic embolization is a severe complication of infective endocarditis (IE). Cardiac complications are seen in one third to one half of all patients with IE, and common problems include heart failure[1] and perivalvular abscess.[2] Systemic embolization is reported in 45% of cases of fungal endocarditis; the most common sites are the cerebral vasculature, the gastrointestinal tract, and the femoral arteries. To the best of our knowledge, ST-elevation myocardial infarction (STEMI) secondary to septic embolism has not been described in cases of *Candida* endocarditis. Treatment of acute coronary syndrome (ACS) secondary to coronary septic embolism is controversial. We report a case of aortic valve endocarditis from *Candida albicans* with septic embolism to the left anterior descending coronary artery (LAD). This embolism was successfully treated with aspiration thrombectomy.

Case Report

A 40-year-old man with a history of intravenous drug use, aortic valve replacement with a St. Jude bileaflet mechanical valve for endocarditis (2008), prosthetic valve endocarditis with *Rothia* and *Stomatococcus* species (2010), hemorrhagic stroke, and hypertension presented at our institution in February 2013 with fever in the context of active intravenous drug use. The patient's initial echocardiogram showed a normal left ventricular ejection fraction (LVEF) and a 10-mm vegetation on the prosthetic aortic valve that was possibly indicative of prosthetic valve endocarditis. After our collaboration with infectious disease specialists, we started the patient on vancomycin, gentamicin, and cefepime; his initial cultures were negative. We also conferred with cardiothoracic surgeons, who saw the patient and deemed him a poor surgical candidate because of his comorbidities and continued active drug use. In order to obtain a second opinion, we transferred the patient to another institution, where he was again declared to be an unsuitable candidate for repeat aortic valve surgery, because of his comorbidities. After a set of blood cultures grew *C. albicans* at the other institution, the antibacterial agents were suspended in favor of micafungin.

Upon transfer back to our institution, the patient developed central chest pain radiating to the neck. On examination, he was diaphoretic and febrile at 101.8 °F with a heart rate of 105 beats/min and a blood pressure of 173/63 mmHg. His electrocardiogram showed left bundle branch block (old) with ST-segment elevation in the anterior leads indicative of STEMI (Fig. 1). His troponin I level was elevated at 0.15 ng/mL, so the patient was started on a heparin infusion. An emergent transthoracic echocardiogram showed an LVEF of 0.30 to 0.35 with akinesis of the mid-to-distal anterior, anteroseptal, inferoseptal, and apical walls, which raised the possibility of an LAD lesion. There was a mobile vegetation (1.12 cm in length) attached to the ventricular surface

of the aortic valve in the left ventricular outflow tract. We planned urgent cardiac catheterization, but the patient refused the procedure. Later, his family arrived and persuaded him to agree to the cardiac catheterization. This process caused an 8-hour delay between the onset of chest pain and cardiac catheterization. Coronary angiograms revealed occlusion of the mid-LAD, with Thrombolysis in Myocardial Infarction (TIMI)-0 flow.

A 6F Extra Back-Up guiding catheter (3.75) was used to intubate the left main coronary artery. An Export® AP Aspiration Catheter (Medtronic, Inc.; Minneapolis, Minn) was then inserted over a 0.014-in guidewire, and embolic débris was successfully aspirated. This was followed by balloon angioplasty. After the procedure, TIMI-3 flow was present (Fig. 2), together with resolution of the patient's chest pain and ST-segment elevation (Fig. 3).

The coronary aspirate, sent to our pathology department, grew *C. albicans* in the embolic débris. The patient had a complicated course, including an embolic stroke that resulted in aphasia more than 24 hours after the embolectomy. On the 27th day of antifungal treatment, the patient was discharged to a long-term care facility with the plan of completing 6 weeks of high-dose intravenous micafungin, to be followed by lifelong suppression therapy with fluconazole. Two weeks later, he died at that facility of complications of endocarditis.

Fig. 1 *The initial electrocardiogram shows ST-segment elevation in leads V_2 through V_5.*

Discussion

Systemic embolization is more frequently seen in fungal endocarditis than in bacterial endocarditis, because of the larger size of the vegetation.[3] Fatal embolism to the left main coronary artery has been reported in association with *Aspergillus* endocarditis,[4] but not with *Candida* endocarditis. The incidence of ACS with IE was reported in one study[5] to be 2.9%, with a 64% mortality rate. *Candida* species was responsible for 7.1% of the cases of embolic ACS. The LAD was the most frequently affected vessel, and aortic valve endocarditis was typically associated with coronary embolism.[5]

Multiple trials of aspiration thrombectomy in the wake of STEMI have shown better ST-segment resolution, higher myocardial blush grade, and improved TIMI flow. Improved outcomes are seen because of decreased microvascular obstruction and improved myocardial reperfusion.[6,7] Cases have been described of aspiration thrombectomy in patients who experienced coronary embolism as a consequence of atrial fibrillation.[8,9] Yet the treatment of ACS in association with IE has been controversial. Although thrombolytic agents have been used successfully in a few cases, the consensus is that the increased risk of intracerebral hemorrhage due to mycotic aneurysms and cerebral infarcts (common sequelae of IE) militates against the use of such agents.[10] Percutaneous coronary intervention seems safer than thrombolysis, because most patients in reported cases survived the initial presentation; long-term outcomes, however, are unknown.[11] Percutaneous transluminal coronary angioplasty carries the risks both

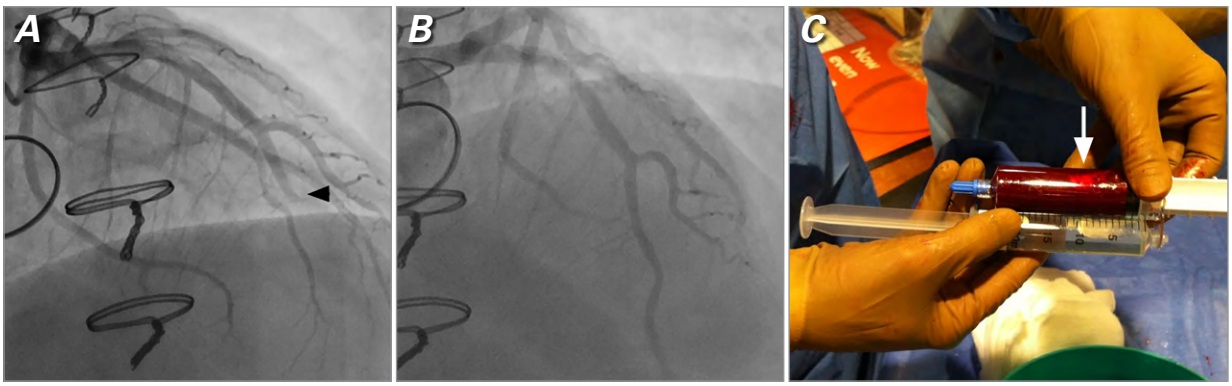

Fig. 2 *Coronary angiograms show the left anterior descending coronary artery (LAD)* ***A****) before and* ***B****) after aspiration thrombectomy; the arrowhead shows occlusion before intervention.* ***C****) Photograph shows embolic débris (arrow) aspirated from the LAD.*

Supplemental motion images are available for Figures 2A and 2B.

Fig. 3 *Electrocardiogram shows resolution of ST-segment elevation after aspiration thrombectomy and balloon angioplasty.*

of distal reocclusion by mobile emboli and of mycotic aneurysm development at the balloon dilation site.[12,13]

Aspiration thrombectomy appears to be a safer approach in this setting and has been successfully performed alone, as well as in union with coronary stenting in cases of ACS associated with IE.[14,15] The use of coronary stents in bacteremic patients is controversial because of the theoretical risk of microbial seeding of the stents. Surgical thrombectomy at the time of valve surgery has also been attempted,[16] but that practice is limited because the underlying comorbidities make these patients poor surgical candidates. For the treatment of fungal endocarditis of native and prosthetic valves, the Infectious Disease Society of America recommends a combined surgical and medical approach.[17]

In conclusion, we have reported a case of ACS secondary to septic embolism to the LAD in a patient with *Candida* endocarditis who was successfully treated with aspiration thrombectomy, followed by balloon angioplasty. Our literature review appears to indicate that this is the first case of embolic ACS in association with *Candida* endocarditis that was treated by aspiration thrombectomy. Acute coronary syndrome secondary to septic embolization in IE can be fatal, and aspiration thrombectomy seems to be a feasible and safe approach in this circumstance.

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