Infective Endocarditis causing Myocardial Infarction and Multiple Embolic Strokes and Brain Abscesses secondary to Septic Emboli

Timothy Cobb, DO, St Joseph's Hospital/Upstate Medical University, Family Medicine Residency Program Faculty, Syracuse, New York

James Si Yu Zhao, MD, St Joseph's Hospital/State University of New York Medical Center Family Medicine Residency, Syracuse, New York
History

- 51 year old male with history of prosthetic aortic valve due to aortic insufficiency, HTN and history of illicit drug abuse presents to the ED with generalized malaise and confusion for 2 days. Per patient’s daughter, patient is currently grieving the death of his wife and has been consuming more than 10 cans of beer/day along with illicit drugs otherwise non specified for the past week prior to presentation to ED.
Physical Exam, Imaging and Lab Results:

- Physical exams were significant for temp of 101 F, confusion and Janeway lesions (Fig. 1) noted on palmer side of hands and feet, in addition to splinter hemorrhages of finger nails.
- Urine toxicology was positive for cocaine.
- CBC 9.1 x 1000, 94% PMNs.
- ECG showing normal sinus rhythm.
- Troponin was elevated at 3.17 ng/mL on admission (peaked at 9.27 ng/mL and trended down to 5.94 ng/mL).
- Transthoracic echocardiogram showed ejection fraction of 25–30%, with a normal functioning prosthetic aortic valve.
- CT head w/o contrast reviewed multiple hemorrhagic strokes involving left temporal/frontal lobe and cerebellum (Fig. 2).
- Blood and Urine cultures were positive for MSSA.
- CSF was significant for MSSA with thousands of PMNs.
- MRI with IV contrast of brain and spine reviewed multiple abscesses in the brain with the largest measuring 3.1 cm by 2.9 cm in the left temporal lobe, with mild mass effect, without midline shift noted (Fig. 3).
Images and Photos,

Fig. 1: Janeway lesion similar to what was noted on patient's foot.

Fig. 2:
CT Head without Contrast: Cortical contusions in the left temporal and frontal lobes with a focal subdural collection measuring 1.3cm overlying the left temporal lobe. There are multiple cerebellar hemispheric infarcts.
Fig. 3
MRI Brain with contrast: Numerous hemorrhagic septic emboli with abscess formation. The largest lesions are in the left temporal lobe and right cerebellar hemisphere. There is mild mass effect on the paramesencephalic cistern, but no significant midline shift or impending herniation.

Fig. 4
Trans-esophageal Echocardiogram similar to that of the patient:
The left ventricle is mildly dilated. The LV ejection fraction is moderate to severely decreased. The left atrium is moderately dilated. Bio-prosthetic aortic valve with small mass suggesting vegetation (arrow), and large echo free space suggesting a surrounding abscess and dilated aortic root. Mild to moderate mitral regurgitation
Prosthetic Valve Endocarditis with Multiple Septic Emboli

Neurosurgery was consulted, due to the presence of multiple abscesses, the decision was made to proceed with medical management per ID recommendations: oxacillin, gentamicin and rifampin IV for prosthetic valve endocarditis and brain abscesses.

Patient's neurological status improved from Glasgow coma score of 8 on the day of admission to 14 after 2 weeks of hospital stay, all repeat blood cultures showed no growth of bacteria. [Key point]

Due to significant improvement of patient's condition, he was medically stable to obtain trans-esophageal echocardiogram (TEE) (Fig. 4).
TEE reviewed small mass suggesting vegetation on the bioprosthetic aortic valve and large echo free space suggesting surrounding abscess and dilated aortic root, LVEF remained unchanged at 25–30%.

Decision was made to proceed with bioprosthetic aortic valve replacement.

Although patient denied any symptoms, repeat troponin was elevated at 41.6 ng/mL with repeat EKG showing new onset ST segment elevation in anterior leads V1–4. Diagnostic cardiac catheterization was subsequently performed which reviewed 99% "hazy" stenosis in proximal LAD and 40% stenosis in RCA. In the evening following cardiac catheterization, the patient developed hypotension due to worsening systolic congestive heart failure and later found to be in asystole and expired.
Conclusions

- The case presented describes two major complications of prosthetic valve endocarditis, the presence of both neurological and cardiovascular involvement are associated with high mortality and morbidity.

- The presence of cocaine in patient's urine rendered embolism induced myocardial infarction difficult to diagnose.

- One study has shown the mortality rate in the presence of acute coronary syndrome with infective endocarditis to be 64%, with LAD being the most commonly affected vessel.[6-7] Fatal embolism of the left main coronary artery has been reported in association with fungal endocarditis including Aspergillus and Candida due to the commonly larger size of vegetation, but less commonly in bacterial endocarditis.[8]

- Management is complicated by the presence of multiple hemorrhagic strokes and brain abscesses, which render anticoagulation unsafe.
Conclusions

- Treatment of septic coronary artery emboli is controversial. Percutaneous coronary intervention with stents has been successfully performed in the past,[9] however is associated with risk of bacterial seeding of the stent. Treatment with aspiration thrombectomy may be safer, and has been successfully performed with and without using coronary stents.[10, 11]

- This case illustrates the importance of having broad differential diagnosis in the setting of IV drug induced infective endocarditis complicated by acute myocardial infarction, which may prompt the clinician to proceed to immediate coronary angiography and aspiration thrombectomy.

- More studies and guidelines, regarding to modality, and time frame of treatment in patients with acute myocardial infarction due to septic coronary embolism may help to reduce mortality and morbidity rates, for patients such as ours in the future.
Mortality rate of infective of endocarditis in the presence of acute coronary syndrome has been shown to be approximately 64%, with LAD being the most commonly affected vessel (7).

The importance of broader differential causes of acute myocardial infarction in the setting of IV drug associated infective endocarditis, which may prompt the clinician to proceed to immediate coronary angiography and aspiration thrombectomy.

More studies and guidelines, regarding to modality, and time frame of treatment in patients with acute myocardial infarction due to septic coronary embolism may help to reduce mortality and morbidity rates in the future.