Isolated Pulmonary Valve Endocarditis Leading To Right Ventricular Outflow Tract Obstruction - A Case Report

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Citation

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Abstract

Introduction

Infective endocarditis involving right side of the heart is uncommon and isolated involvement of pulmonary valve is even rare. It is highly unusual in patients with no apparent precipitating factors like intravenous drug use, congenital heart disease or valvular abnormalities. We describe a case of 37-year-old male who presented with very large vegetation on pulmonary valve leading to right ventricular outflow tract obstruction.

Case Report

A 37-year-old African-American male with significant medical history of diabetes mellitus and recent tooth infection was admitted to hospital for fever and worsening shortness of breath. He had elevated jugular venous distention and bilateral lower extremity edema on clinical examination. The chest X-ray and CT scan was consistent with multiple bilateral cavitary lesions in the lungs. His blood cultures grew staphylococcus aureus (MSSA). Trans-esophageal echocardiogram revealed a big mobile mass on the pulmonary valve causing complete right ventricular outflow tract obstruction. The mass was resected and surgical pathology was positive for acute inflammation with numerous gram-positive cocci consistent with staphylococcal endocarditis. Patient's clinical status significantly improved after surgery and 6 week coarse of intravenous cefazolin.

Conclusion

Isolated pulmonary valve involvement in infective endocarditis is rare and occurs only in 1-2 % of patients. It usually occurs in presence of certain risk factors, intravenous drug abuse being the important one. Our patient presented with big vegetation on the pulmonary valve causing near total right ventricular outflow tract and signs of right heart failure. Although uncommon but pulmonary valve endocarditis should be kept in mind even in low risk patients presenting with right heart failure.

INTRODUCTION

Isolated pulmonary valve endocarditis is a rare type of infective endocarditis with fewer than 100 cases being previously reported and account for only 1.5% of hospital admissions for infective endocarditis .The most common site of involvement is tricuspid valve either isolated or accompanied with pulmonic valve involvement. The reason for low incidence of endocarditis on right side is usually attributed to low incidence of congenital heart disease on right side, low hemodynamic pressure and low oxygen saturation. In right heart endocarditis, the most common reason for hospital admission is progressive shortness of breath (66.7%), and fever (44.4%). Most cases of reported pulmonary valve endocarditis are in children with congenital heart disease or in intravenous drug abuser. Most commonly involved agent is staphylococcus. We describe a case of isolated pulmonary valve endocarditis in a patient with no commonly associated risk factors like intravenous drug use, congenital heart disease, alcohol abuse and central venous catheter or pacemaker lead insertion.

CASE REPORT

A 37 years old African-American male with significant medical history of type 1 diabetes mellitus presented to our emergency department with 5 days history of subjective fever, malaise and worsening shortness of breath. He also complained of recent tooth pain and dental infection 1 month

ago but could not seek medical attention due to lack of insurance. The review of system was positive for generalized weakness, fever, decreased appetite, shortness of breath on exertion and bilateral leg swelling. He denied any chest pain, exertional angina, palpitations, productive cough, abdominal pain, vomiting or weight loss. Patient was ex-smoker; he quit smoking around 3 years ago. He also denied any history of current or remote intravenous drugs or alcohol use. Significant family history of diabetes in two siblings was reported. He did not have any history of previous surgeries or valve replacements. Physical examination was pertinent for an anemic male with poor oral hygiene, elevated jugular venous pressure and pitting pedal edema in bilateral lower extremities. Cardio-pulmonary examination was negative for any abnormal breath sounds or cardiac murmur. No parasternal thrill was appreciated.

The initial laboratory work up revealed anemia with hemoglobin of 9.5 gm/dL, leukocyte count of 9900/mm3, platelet count 1,46, 000/mm3, blood glucose of 245 mg/dL, creatinine 0.4 mg/dL, bicarbonate 13 mmol/Lwith elevated beta-hydroxy butyrate (4.1). His glycosylated hemoglobin was 10.3 %. Given anion gap metabolic acidosis and elevated ketones he was initially treated with intravenous insulin and fluid resuscitation. He responded well with correction of metabolic acidosis and blood sugar control. The blood and urine cultures were sent. His Chest X-ray was suggestive of 1.3 cm density with central lucency in left mid lung field [Figure 1]. He underwent contrast enhanced CT scan of chest, which was suggestive of multiple cavitary and non-cavitary nodules in bilateral lung fields suspicious of septic emboli. There was also incidental finding of splenomegaly in upper abdominal cut sections [Figure 2,3]. The blood and urine cultures came out positive for methicillin sensitive Staphylococcus aureus (MSSA). Patient was started empirically on vancomycin and cefazolin and later switched to cefazolin after reviewing sensitivity report.

Figure 1

Chest X-Ray showing 1.3 cm left mid-lung nodule with central lucency

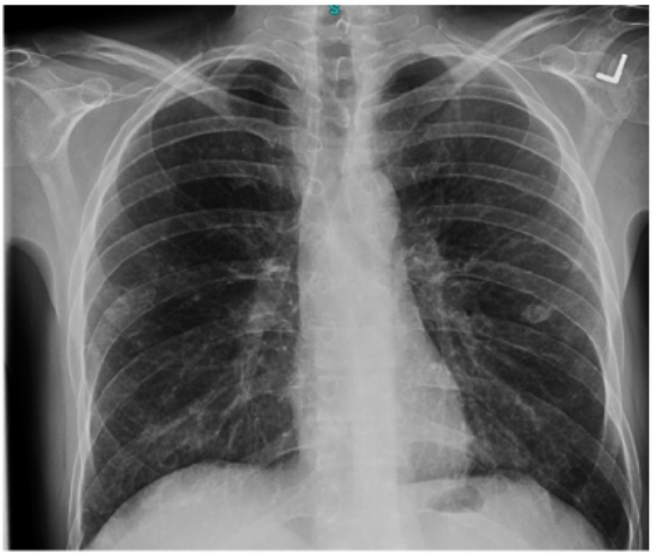
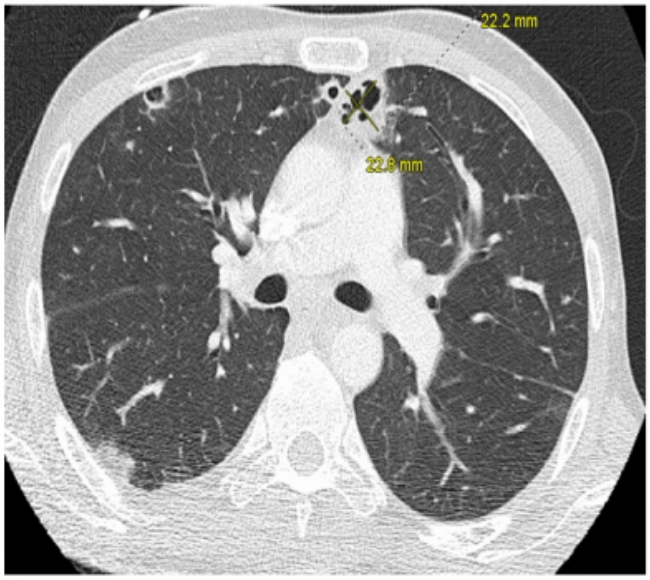


Figure 2

CT chest with contrast showing multiple cavitary nodules in both the lung fields consistent with septic emboli



Given high suspicion of infective endocarditis, cardiology department was consulted and patient underwent trans-esophageal echocardiography that revealed a large 4 cm x 3 cm echogenic mass arising from pulmonary valve and extending into the pulmonary artery causing right ventricular outflow tract obstruction [Figure 3, 4]. Emergent consult to cardiothoracic surgery was made given high risk of embolization of a big echogenic mobile mass. The mass was excised and pathology was positive for acute fibrinous and

inflammatory exudate containing numerous gram-positive cocci consistent with staphylococcus endocarditis. Patient also had radiological imaging of his jaw including x-ray of face and WBC tagged nuclear scan that showed periodontal phlegmon in the left mandible suggestive of osteomyelitis [Figure 5]. Patient improved clinically and was discharged with 4 weeks of cefazolin. Patient was referred to an Oral maxillofacial surgeon as outpatient for further management of osteomyelitis of the mandible.

Figure 3

Trans-esophageal echocardiogram showing big mobile mass measuring 4 cm x 3 cm arising from pulmonary valve and extending in to the pulmonary artery leading to dynamic right ventricular tract obstruction

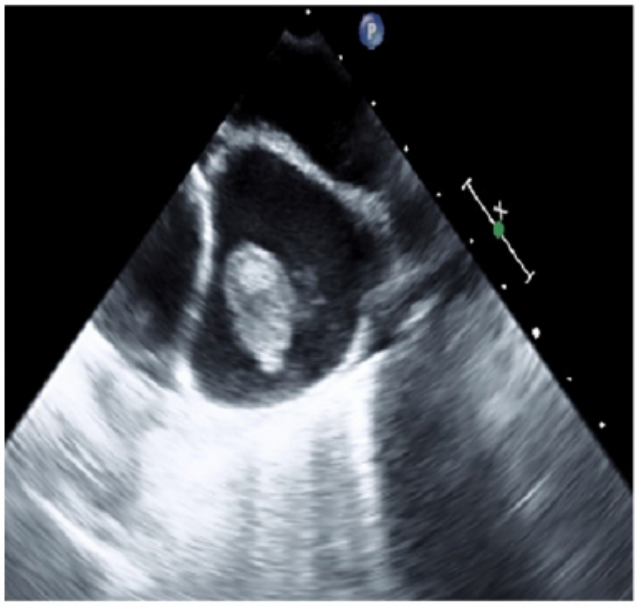
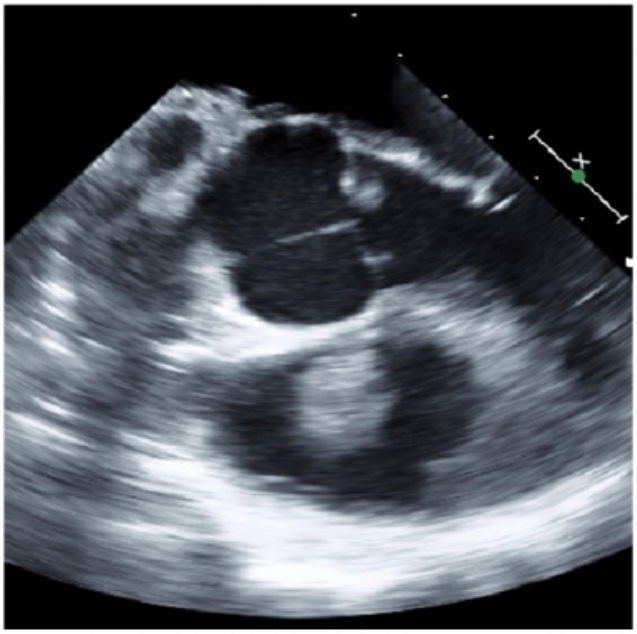


Figure 4

Trans-esophageal echocardiogram showing big mobile mass measuring 4 cm x 3 cm arising from pulmonary valve and extending in to the pulmonary artery leading to dynamic right ventricular tract obstruction



DISCUSSION

There have been limited case reports and series on isolated pulmonary valve endocarditis in non-intravenous drug users. The major predisposing factors for pulmonary valve endocarditis have been reported to be intravenous drug abuse in 30% of cases, central venous catheter in 14% and alcoholism in 11% of cases.

The most common pathogen associated with pulmonary valve endocarditis, on reviewing the literature, has been noted to be staphylococcus aureus followed by streptococcus, streptcococcus bovis and gonococcus [2]. Our patient had uncontrolled diabetes mellitus and periodontal infection spreading to mandible with associated osteomyelitis as a risk factor for infective endocarditis. Patients with pulmonary valve endocarditis typically presents with respiratory symptoms like shortness of breath along with low grade fever and malaise. Trans-esophageal echocardiography is superior to transthoracic echocardiography in diagnosis of pulmonary valve endocarditis (sensitivity reported to be 87% versus 30% in later). We support use of trans-esophageal echocardiography if 2 d echocardiogram is negative in setting of high clinical suspicion of infective endocarditis. Infective endocarditis with large vegetations carries high risk of embolization and

usually require surgical intervention, while smaller ones could be treated with long term antibiotics.

CONCLUSION

Isolated Pulmonary valve endocarditis is a rare phenomenon, and we conclude that uncontrolled diabetes mellitus and low economic status are probably a major predictor for possible endocarditis in patient with bacteremia or sepsis. The clinical presentation of fever and malaise along with evidence of septic emboli on chest X-ray in our patient raised suspicion of endocarditis. Presence of positive blood cultures and large vegetation on the pulmonary valve noted on trans esophageal echocardiogram confirmed our diagnosis. We also conclude that TEE instead of 2D echocardiogram should be the standard diagnostic testing in any suspected right heart endocarditis to avoid missing the pulmonic valve vegetation when its small.

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