The Heart Surgery Forum #2015-1308
18 (5), 2015 [Epub October 2015]
doi: 10.1532/hsf.1308

Online address: http://journal.hsforum.com

Biventricular Mural Endocarditis on the Intraventricular Septum

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ABSTRACT

Mural endocarditis is an inflammation and disruption of the nonvalvular endocardial surface of the cardiac chambers. We present a rare case of mural endocarditis on the intraventricular (IV) septum on both the left and right ventricular side with intact valvular annulus. This case highlights the complexity of the operative and postoperative management in an unprecedented case of biventricular mural endocarditis.

INTRODUCTION

Mural endocarditis is an inflammation and disruption of the nonvalvular endocardial surface of the cardiac chambers [Kearney 1994]. We present a rare case of mural endocarditis on the intraventricular (IV) septum on both the left and right ventricular side with intact valvular annulus.

CASE REPORT

The patient is a 57-year-old male with history of hypertension, type 2 diabetes mellitus, and intravenous drug abuse, who presented with substernal chest pain. Urine drug screening was positive for cocaine. Electrocardiogram demonstrated ST elevation and right bundle branch block. Troponin was 1.2 ng/mL. Left heart catheterization showed a totally occluded distal left anterior descending (LAD) and normal left main and right coronary arteries with an ejection fraction (EF) of 50%. Given the preserved function, he was transferred to the unit for close monitoring. At presentation, he was afebrile with moderate leukocytosis.

On hospital day 2, the patient developed a fever of 39.9°C and was started on empiric vancomycin 1.5 g QD and ceftriaxone 2 g QD. Transthoracic echocardiogram (TTE) was obtained due to a concern of endocarditis. No valvular insufficiencies, vegetations, or septal defect were noted, but significant basal hypokinesis was observed. Two days later, blood culture grew Streptococcus agalactiae and the antibiotics were changed to ceftirazone and gentamycin per sensitivity results. The right ankle appeared infected, and aspiration of the right ankle yielded turbid fluid with WBC of 156,000/microliter. The patient underwent washout of the infected joint by orthopedic surgery.

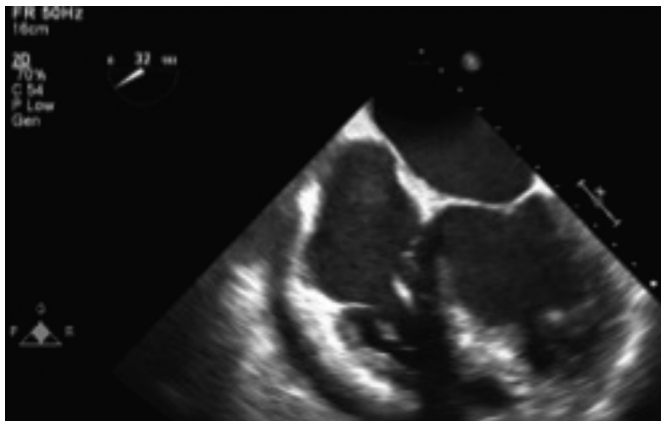

Figure 1. Preoperative transesophageal echo demonstrating enlarged but intact intraventricular septum. Preoperative 4-chamber view of transesophageal echo demonstrates intact intraventricular septum without obvious vegetations. Pericardial effusion is noted.

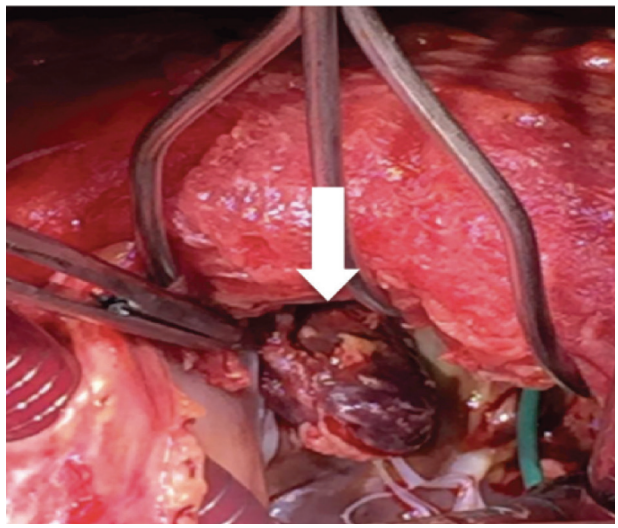

Figure 2. Intraoperative view of the vegetation from right ventricular side. Left side of the picture is cephalad. White arrow indicates the intraventricular septum on the right ventricular side. Black arrow at the suction tip is the tricuspid annulus.

On hospital day 6, transesophageal echo (TEE) for further evaluation of endocarditis revealed severe aortic insufficiency

Received June 11, 2015; accepted July 16, 2015.

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with a mobile mass on the left and non-coronary cusps causing concern for endocarditis without evidence of aortic root or intraventricular septal abscess (Figure 1). Chest computed tomography revealed fluid and inflammatory stranding in the left sternoclavicular joint with concern for septic joint. On hospital day 7, he developed complete heart block requiring transjugular temporary pacing. The patient was started on inotropes and intubated due to respiratory distress. The patient underwent urgent surgery due to concern of progressive endocarditis refractory to medical management.

In the operating room, abundant purulent material in the mediastinum was noted after median sternotomy, requiring irrigation. Cardiopulmonary bypass was initiated and the aorta was cross-clamped. Cardioplegic arrest was performed. Aortotomy revealed a totally destroyed left coronary cusp, which was excised. The other 2 cusps appeared relatively clean. Before implanting the valve, we noticed a 3-mm circumscribed protrusion on the intraventricular septum on the left ventricular side. The mass was excised. A 23-mm Magna valve (Edwards Lifescience, CA, USA) was implanted with non-pledgeted sutures, demonstrating good function upon testing. The right atrium was opened to examine the mass from the RV side, and revealed a phlegmon-like dark red mass of 2.5 × 2 cm on the intraventricular septum below the insertion of the tricuspid valve (Figure 2).

The mass was excised and the ventricular septum was gently debrided. Out of concern for developing a ventricular septal defect (VSD), a pericardial patch was secured with interrupted mattress pledgetted sutures. The edges of the patch were further oversewn with a running 4-0 Prolene. The patient was successfully weaned off bypass with intraaortic balloon pump (IABP). Closure TEE demonstrated a well-functioning aortic valve with trace paravalvular leak, and EF of 40% with no evidence of VSD. Cultures of the specimen did not yield any growth.

Antibiotic treatment with gentamycin 60 mg TID and ceftriaxone 2 g QD was continued postoperatively. The patient initially recovered gradually and was off all vasoactive medications and IABP and was extubated by postoperative day 11. After that, the postoperative course was complicated by profound hemodynamic instability. Continuous renal replacement therapy was initiated for worsening creatinine (3.40 mg/dL) and lactate (4.39 mmol/L). The patient was reintubated for worsening respiratory distress. TTE on postoperative day 15 showed 1 cm-supracristal VSD with small mobile segments and an aneurysmal basal septum. The antibiotics regimen was changed to vancomycin 1g QD, gentamycin 60 mg BID, and meropenem 500 mg QD. With the poor prognosis for recovery, the patient received a peripherally inserted central catheter for antibiotic treatment and was placed in inpatient hospice on postoperative day 18.

DISCUSSION

Mural endocarditis is an inflammation and disruption of the nonvalvular endocardial surface of the cardiac chambers [Kearney 1994]. Mural endocarditis with paravalvular intraventricular (IV) septal involvement from contiguous spread from the aortic valve is relatively common [David 2007]. Our case is distinct from this entity in that the patient was found to have intact valvular annulus with isolated vegetation on the IV septum in both LV and RV sides. Mural endocarditis has been reported to occur in all cardiac chambers, aorta, pulmonary veins and arteries [Kearney 1994; Shirani 1995; Bosch 2006]. To our knowledge, only one case of biventricular mural vegetation exists [Ahmed 2006], making this the first report of biventricular mural endocarditis involving IV septum from both ventricular chambers.

The patient's presentation of STEMI that caused basal and apical hypokinesis likely resulted in hemodynamic and anatomic substrates, facilitating the formation of IV septal vegetations. Introduction of Streptococcus agalactiae was likely from the intravenous drug use. The etiology of the presenting MI remains unclear as to whether it was due to cocaine-induced vasospasm or preexisting coronary arterial disease. IV septum by TEE or TTE did not demonstrate any septal vegetations in the preoperative period and no VSD was observed either by echo or under direct vision intraoperatively, making the finding of the IV septal involvement on both sides of the ventricle more intriguing.

The complexity of managing this patient can be interpolated from the operative mortality of 16% associated with the surgical management of intramyocardial abscess [David 2007]. This case highlights the complexity of the operative and postoperative management in an unprecedented case of biventricular mural endocarditis involving intraventricular septum from both ventricular chambers.

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