



NECTAR TURNS BITTER - INFECTIVE ENDOCARDITIS COMPLICATED BY HEART FAILURE FOLLOWING PERCUTANEOUS CORONARY INTERVENTION.

Cardiothoracic

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ABSTRACT

Percutaneous cardiac interventions are on the rise and number of cardiac interventions in sick patients with multiple comorbidities have increased. Infective endocarditis (IE) and aortic valve cusp injury are rare complications of cardiac catheterization and intervention. We are presenting the case report of a 48-year-old gentleman who developed infective endocarditis and heart failure secondary to cusp injury, post percutaneous coronary intervention for his coronary artery disease and required aortic valve replacement for the same. We would like to emphasize that though, infective endocarditis is rare in this context, maximal effort should be taken to avoid injury to aortic valve leaflet apparatus and seeding of bacteremia particularly among those at high risk.

KEYWORDS

Infective endocarditis, coronary angiography, heart failure, aortic cusp injury, severe aortic regurgitation.

INTRODUCTION:

Percutaneous cardiac interventions are on the rise and number of cardiac interventions in sick patients with multiple comorbidities have increased. Infective endocarditis (IE) is a rare complication of cardiac catheterization and intervention. Though transient bacteremia during cardiac intervention is described, it rarely translates into IE. However, in patients with underlying valvular or congenital heart defects with associated infections and reduced immunity, endocarditis can occur. Furthermore, destruction of valve leaflet and progression to heart failure is seen very rarely. In this case report, we describe the clinical scenario of endocarditis following invasive cardiac intervention, to improve awareness of this rare clinical problem as well as to re-emphasize the importance of preventive measures.

Case Report:

A 48-year-old gentleman, in good health and physically active with no comorbidities, presented with acute coronary syndrome to emergency department of a tertiary care hospital. His atherosclerotic risk factor was dyslipidemia. He had no history of prior valvular heart disease or intra venous drug abuse. Index echocardiography showed normal left ventricular function with no regional wall motion abnormalities and no valvular lesions. He was stabilized with appropriate medical management and later underwent coronary angiography and angioplasty with single drug eluting stent to left anterior descending artery (LAD) via right radial artery access. Total procedure time was 60 minutes. Post procedure course was uneventful, except for low-grade fever which responded to antipyretics.

Ten days following the procedure, he developed high grade fever associated with symptoms of heart failure. Clinical examination revealed early diastolic murmur of aortic regurgitation (AR). Echocardiography showed perforation in aortic leaflet with severe AR. Two sets of blood cultures had grown methicillin-sensitive *Staphylococcus aureus*. He was started on intravenous cephazolin and linezolid and referred to our center for surgical valve replacement.

Patient had persistent intermittent high-grade fever with worsening heart failure. In view of persistent fever, antibiotics were switched to intravenous vancomycin and linezolid. Chest X ray showed bilateral pleural effusion. Echocardiography revealed trileaflet aortic valve with perforation and eversion of right aortic cusp. Multiple vegetations were noted with largest measuring 3 x 7 mm. Aortic root abscess measuring 4 mm near the commissure between right coronary cusp (RCC) and non-coronary cusp (NCC) extending into the interventricular septum was also noted. In view of persistent heart failure, he underwent urgent surgery once the blood culture became sterile.

Intraoperative TEE showed (Figure.1A and 1B), complete disruption

of NCC and RCC with prolapse into the left ventricular outflow tract. Right cusp was perforated and abscess cavity was seen below the RCC and NCC annulus with extension into the interventricular septum.

Primary median sternotomy revealed acutely inflamed pericardium (Figure.2) with moderate pericardial effusion and fibrinous exudates. He had significant stenosis in the obtuse marginal branch, whose bypass grafting could not be done due to adhesions and pericardial inflammation. Transverse aortotomy revealed RCC perforation (Figure.3). All three leaflets were excised. Sub valvar abscess in the region of NCC and RCC was debrided and annulus was reinforced with bovine pericardial patch. A 21 size Chitra Heart Valve prosthesis (TTK healthcare limited, Chennai, India) was sutured into aortic position. Intra-operative TEE showed no para valvar leak. Patient was weaned off CPB on high inotropic supports.

Post operatively, inotropic supports were gradually tapered. All subsequent blood cultures remained sterile and antibiotics (Vancomycin and linezolid) were given for six weeks prior to discharge. Clinical recovery was excellent.

DISCUSSION:

Even-though the incidence of IE has come down, it is still not uncommon in developing nations. It is associated with high mortality and morbidity, despite early diagnosis, sensitive antibiotic therapy and early surgical intervention (Cahill et al., 2017).

All efforts should be taken to prevent IE, as it is a difficult disease to cure. Microorganisms producing IE form biofilms which protect these organisms from host defense mechanisms and stay resistant to antibiotics. Bio-film producing capacity is an important determinant of virulence of IE produced by staphylococcus species (Chung & Toh, 2014).

Bacteremia following cardiac catheterization and interventional procedures are very rare (Banai et al., 2003) and not well reported in literature (Jayasuriya & Movahed, 2009). Though bacteremia can occur in < 1% of cases, as endothelium remains intact, it does not result in IE. Reported risk factors for IE following catheterization include obesity, duration of the procedure, number of balloons used and number of skin punctures performed. Obese patients are predisposed to have *S. aureus* as colonizer in their groin and femoral puncture may result in bacteremia.

In our patient, temporal association suggests procedure related endocarditis. The presumed injury to right aortic cusp and bacteremia during the procedure might have resulted in endocarditis. His presumed risk factors include obesity, prolonged procedure and greater number of balloons used. Latent period of development of

endocarditis following exposure can vary from days to weeks to months (Strabelli et al., 2010).

Various surgical techniques include valve repair, Ross procedure in children, mechanical or bioprosthetic valve replacement. However, none is superior over other with 10-year survival rates of 40% to 60% in various series (Manne et al., 2012). Irrespective of procedure chosen, debridement of infected tissue and restoration of valve function is mandatory. As per recent guidelines, indications for surgery are heart failure, uncontrolled infection and prevention of embolism.

Timing of surgery has always remained a challenge. A study by Kang et al. has shown early surgery reduced the composite endpoint of in-hospital death and embolic events within 6 weeks from 23% to 3% (Kang et al., 2012). Urgent surgery during same hospitalization and before completion of full course of antibiotics should be considered for all cases.

CONCLUSION:

Though infective endocarditis secondary to cardiac catheterization procedure is rare, maximal effort should be taken to avoid injury to aortic valve leaflet apparatus and seeding of bacteremia particularly in those who are at high risk. Echocardiography plays a major role in diagnosis, in patients, developing features of infection with acute heart failure. Prompt management with broad spectrum intravenous antibiotics and surgery to replace affected valve should be undertaken. In such cases, antibiotic therapy for 4-6 weeks might not be warranted in view of refractory heart failure.

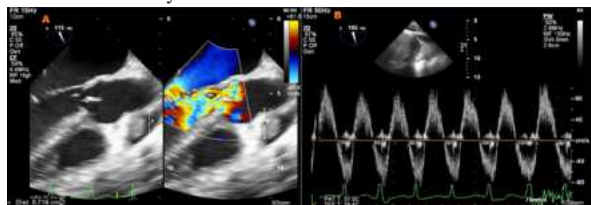


Figure.1: (A) Tear in right coronary cusp with AR jet (B) Holo diastolic flow reversal suggestive of severe AR. AR – Aortic Regurgitation.



Figure.2: Acute pericardial inflammation secondary to infective endocarditis, which precluded OM bypass grafting. OM – Obtuse Marginal.

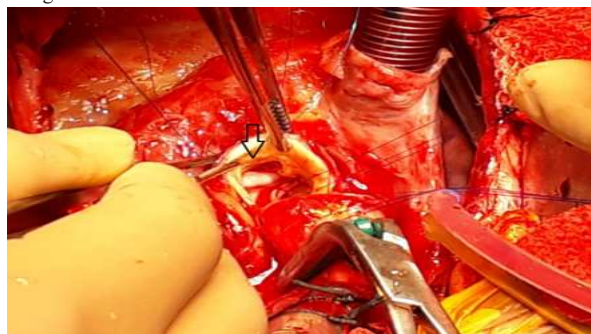


Figure.3: Aortotomy showing right coronary cusp damage (arrow mark) secondary to intervention followed by infective endocarditis.



Video clip file.mp4

Video.1: An intra-operative transesophageal echo video clip demonstrating aortic regurgitation jet in the region of non-coronary cusp of aortic valve.

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