

Septic coronary embolism – A case report

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ABSTRACT

The embolization represents one of the most dreadful complications of infective endocarditis; however, coronary embolism is a rare entity with an incidence of 2.9%. The definite line of management is rather ambiguous in published literatures. We reported an urgent coronary revascularization with double valve replacement due to infective endocarditis with large vegetation complicated by coronary embolism and acute coronary syndrome.

Key words: Embolism, Heart valve implantation, Infective endocarditis, Myocardial revascularization

Infective endocarditis refers to conditions in which structures of the heart, most frequently the valves, harbor an infective process that leads to valvular dysfunction, localized or generalized sepsis, or sites for embolism [1]. The embolic events in infective endocarditis have a high prevalence, ranged from 13 - 49 % [2]; however, coronary embolism is a rare and accounts for an incidence of 2.9% with high mortality rate 64% [3]. In this study, we reported a case of native double valve disease, mitral and aortic regurgitation, complicated by large vegetation that led to coronary embolism in proximal left anterior descending (LAD) and circumflex (Cx) arteries, managed by coronary revascularization with valves replacement.

CASE REPORT

A 58 years old male patient presented to Ibn Al-Bitar hospital, causality unit, with dyspnea on exertion, easy fatigability and productive cough in addition to nocturnal fever for one month duration. He was a known case of non-insulin dependent diabetes mellitus and hypertension.

The patient was in NYHA functional class III at time of presentation. Electrocardiogram showed non-specific changes. Echocardiography, transthoracic (TTE) and transesophageal (TEE) revealed severe mitral regurgitation (MR) with moderate aortic regurgitation (AR) and mild aortic stenosis (AS). There was a mobile mass (vegetation) 10 × 20 mm attached to anterior mitral leaflet AML in atrial side (**Fig. 1 a, b**). Dilated left ventricle (LV) with generalized severe hypokinesis was also seen.

Blood cultures three days after cessation of pre-admission antibiotics revealed no growth of bacteria. As a part of the preoperative preparation for valve repair surgery, coronary angiography was performed and showed non-critical coronary artery lesions (**Fig. 2**). The patient was treated with Teicoplanin 200 mg 12 hourly on the first day then once daily and Gentamycin 80 mg every 12 hours intravenously.

After 12 days, during hospital stay, the patient experienced sudden severe chest pain and dyspnea. ECG showed ST elevation with T wave inversion in aVR, V1,

V2, V3 and V6 (**Fig. 3**). In addition, cardiac troponins level was also elevated. Coronary angiography was performed urgently and had shown filling defect due to saddle-like thrombus involving proximal Cx and ostial LAD (**Fig. 4**).

Decision was taken to perform an urgent open heart surgery, coronary bypass graft in association with double valve replacement. Median sternotomy was done with standard partial cardiopulmonary bypass CPB and mild hypothermia (32 C⁰). Removal of the vegetation and mitral valve excision with mechanical valve replacement using Sorin Biomedica Cardio S.r.l. size 29 through left atriotomy and aortic valve cusps excision and replacement with St Jude Medical mechanical valve size 23 through oblique aortotomy were performed. Then coronary revascularization using saphenous vein graft SVG to Circumflex and left internal mammary artery (LIMA) to LAD.

Postoperative hospital stay was 21 days due to assisted ventilatory dependence and wound infection. Then, discharged and followed him up for more than six months without specific events. The cultures of valves specimen revealed no bacterial growth. The histopathological study was consistent with nonspecific inflammatory process, pieces of tissue composed predominantly of necrotic debris, acute inflammatory cells, focal fibrosis and wide foci of calcifications.

DISCUSSION

The embolization represents one of the most dreadful complications of infective endocarditis. Dislodgement fragments from anterior mitral leaflet vegetation has a higher chance of coronary embolization [4]. Manzano et al [3] reported the higher incidence with periannular aortic complications. The risk of embolism was 71.4% during the first 14 days after diagnosis then it would be decreased after initiation of therapy [2].

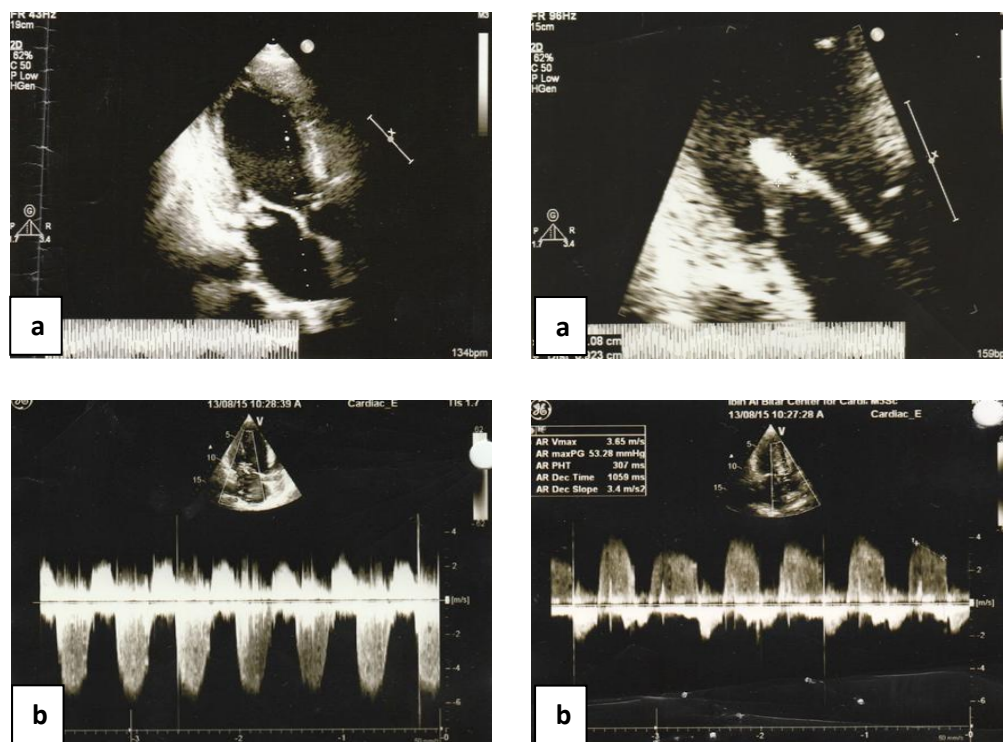
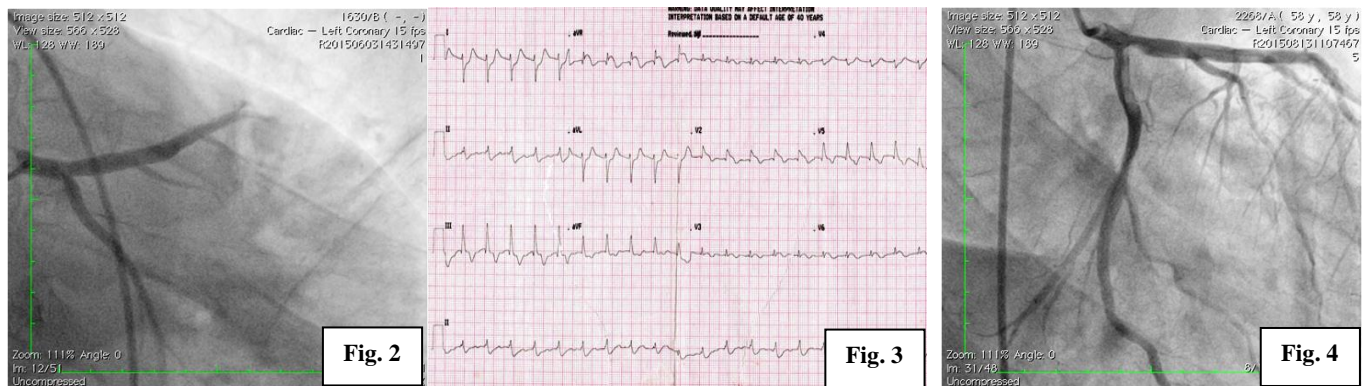


Figure 1 - Echocardiography in patient with native double valve disease with infective endocarditis demonstrating: (a) Vegetation on mitral valve (b) Flow patterns on continuous pulsed wave Doppler reveal severe mitral regurgitation and moderate aortic regurgitation respectively.



Figures: Fig. 2 - Coronary angiogram in a patient with double valve disease and infective endocarditis shows insignificant left coronary lesion. Fig. 3 - ECG shows ST-elevation myocardial infarction in aVR, V1, V2, V3 and V6 in a patient with native valve infective endocarditis. Fig. 4 - Coronary angiogram after acute coronary syndrome shows a saddle-like thrombus filling defect, involving ostial LAD and proximal Cx.

The LAD is the most common involvement site of embolism in endocarditis [3,4]. Its takeoff and downward course is more favorable than the perpendicularly laying right coronary artery RCA and Cx [5]. The pathogenesis of acute coronary syndrome in infective endocarditis may be explained by following etiologies [3,6]: 1) Coronary artery compression secondary to presence of major periannular aortic valve complications. 2) Coronary embolization from the mitral or aortic valve vegetation. 3) Obstruction of the coronary ostium due to large vegetation. 4) Presence of arteriosclerotic coronary lesion. 5) Decrease perfusion pressure in the coronary arteries secondary to severe aortic valve regurgitation. 6) Activation of platelet elements and thrombus formation.

The onset of sudden ischemic chest pain or undergoing cardiogenic shock in patients with infective endocarditis raises the suspicion of coronary embolism especially in the presence of atrial fibrillation, valves prosthesis, dilated cardiomyopathy or in presence of a large vegetation, where either thrombus or vegetation dislodgement embolizes into coronary circulation [7].

The exact role of echocardiography in predicting embolization events necessitates more effort to be clearly comprehensible [2]. Some authors suggest that the characteristics of vegetations identified by echocardiogram are not helpful in predicting embolic risk in infective endocarditis patients [8]. Others mentioned that vegetation's size and its mobility has strong predictive and prognostic values in embolic risk, even under antibiotic therapy [2].

By transthoracic echocardiography, vegetation's size measuring more than 10 mm was associated with a 50% incidence of embolic events, while vegetation less than 10 mm had a 42% incidence of embolization in infective endocarditis patients [9]. Bacteriologically, infective endocarditis caused by *Staphylococcus aureus*, *Candida* species, HACEK organisms (*Haemophilus* species, *Actinobacillus*, *Cardiobacterium*, *Eikenella*, *Kingella* species) and *Abiotrophia* species carry a higher risk of embolization [10].

The management modalities of coronary embolism in setting of infective endocarditis remain controversial and there is no definite line of management [6]. Surgical embolectomy by direct coronary incision to debride and re-canalize the occluded coronary artery at time of valve replacement was reported by Baek et al [11]. The underlying co-morbidities may make this as a limited practice because of poor surgical candidates [12].

The surgical procedure that performed in this study comprised coronary revascularization distal to the site of thrombus. We have avoided the interference with the thrombus or extract it as we thought that the thrombus would be adhered as long as no interference was done. In addition, proximal site of saddle-like thrombus at the bifurcation makes it inaccessible.

CONCLUSION

Coronary revascularization bypassing site of thrombus in association with removal of infected tissue could be

regarded as one of safe and effective modality in management of septic coronary embolism in infective endocarditis.

REFERENCES

1. Kouchoukos NT, Blackstone EH, Hanley FL, Kirklin JK. Kirklin/Barratt-Boyes Cardiac surgery, vol. 1. Elsevier Saunders, 2013. P. 672.
2. Thuny F, Disalvo G, Belliard O, Avierinos J-F, Pergola V, Rosenberg V et al. Risk of embolism and death in infective endocarditis: prognostic value of echocardiography. *Circulation* 2005; 112: 69 – 75.
3. Manzano MC, Vilacostal I, Roman JAS, Aragoncillo P, Sarria C, Lopez D et al. Acute coronary syndrome in infective endocarditis. *Rev Esp Cardiol* 2007; 60 (1): 24 – 31.
4. Khan F, Khakoo R, Failing C. Managing embolic myocardial infarction in infective endocarditis: current options. *J Infect* 2005; 51: 101 – 105.
5. Gultekin N, Kucukates E, Bulut G. A coronary septic embolism in double prosthetic valve endocarditis presenting as acute anteroseptal ST-segment elevation myocardial infarction. *Balkan Med J* 2012; 29: 328 – 330.
6. Zeller L, Flusser D, Shaco-Levy R, Giladi H, Merkin MS, Liel-Cohen N. A rare complication of infective endocarditis: left main coronary artery embolization resulting in sudden death. *J Heart Valve Dis* 2010; 19 (2): 225 – 227.
7. Luther V, Showkathali R, Gamma R. Chest pain with ST segment elevation in a patient with prosthetic aortic valve infective endocarditis: a case report. *J Med Case Rep* 2011; 5: 408.
8. De Castro S, Magni G, Beni S, Cartoni D, Fiorelli M, Venditti M et al. Role of transthoracic and transesophageal echocardiography in predicting embolic events in patients with active infective endocarditis involving native cardiac valves. *Am J Cardiol* 1997; 80: 1030 – 1034.
9. Heinle S, Wilderman N, Harrison JK, Waugh R, Bashore T, Nicely LM et al. Value of transthoracic echocardiography in predicting embolic events in active infective endocarditis. Duke Endocarditis Service. *Am J Cardiol* 1994; 74: 799 – 801.
10. Kitkungvan D, Denktas AE. Cardiac arrest and ventricular tachycardia from coronary embolism: an unusual presentation of infective endocarditis. *Anadolu Kardiyol Derg* 2014; 14: 201 -208.
11. Baek MJ, Kim HK, Yu CW, Na CY. Mitral valve surgery with surgical embolectomy for mitral valve endocarditis complicated by septic coronary embolism. *Eur J Cardiothorac Surg* 2008; 33(1): 116 - 118.
12. Maqsood K, Nosheen S, Eftekhari H, Lotfi A. Septic coronary artery embolism treated by aspiration thrombectomy: a case report and review of literature. *Tex Heart Ins J* 2014; 41 (4): 437 – 439.

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