中文題目：亞急性生物二尖瓣膜及心房中隔壁血栓

英文題目：Subacute bioprosthetic mitral valve and inter-atrial septum mural thrombosis

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Introduction

Bioprosthetic valve replacement is widely performed nowadays in degenerative valvular disease due to the claims of extended durability of the newer generation and less thrombogenic risk without need for long term anticoagulation as compared to mechanical valves. However, recent studies demonstrated a significant prevalence of bioprosthetic valve thrombosis (BPVT) due to more frequent access to echocardiogram, cardiac computed tomography and magnetic resonance imaging for post-operative evaluation. We herein describe a case of subacute bioprosthetic mitral valve thrombosis complicating moderate mitral stenosis occurring two weeks after surgical porcine mitral valve replacement in spite of post-operative oral anticoagulation therapy.

Case Presentation

A 75-year-old woman with a history of mitral valve prolapse, systemic hypertension and type 2 diabetes mellitus experienced a sudden onset of dyspnea for four days, where acute severe mitral regurgitation due to posterior scallop of posterior mitral leaflet (P1) chordal rupture resulting in acute pulmonary edema was diagnosed. Coronary angiography revealed patent coronary arteries. Surgical porcine mitral valve replacement with 27-mm St. Jude Epic (E100-27M-00, Brazil) was performed smoothly after that. Postoperative transthoracic echocardiogram on day 6 estimated normal function of the bioprosthetic mitral valve with preserved left ventricular ejection fraction. Considering her paroxysmal atrial fibrillation (AF) and adequate control of postoperative bleeding, anticoagulation therapy with oral warfarin 5 mg once daily was prescribed with INR at around 1.5-1.7.

Unfortunately, the patient exhibited dyspnea accompanied by AF with rapid ventricular response on day 16 and chest Xray revealed pulmonary congestion. Acute moderate mitral stenosis (mitral valve area

(MVA) of 1.01 cm2 by pressure half time (PHT) and mean trans-valvular pressure gradient (MPG) of 10.5 mmHg) and mild pericardial effusion were detected by transthoracic echocardiogram. Transesophageal echocardiogram disclosed a mural thrombus inside the left atrium around the ring of the mitral valve scaffold extending to the inter-atrial septum and restricted mobility of one leaflet of the bioprosthetic mitral valve. (Figures A,B and D). Blood cultures, autoimmune and coagulation profiles yielded negative findings. Subacute bioprosthetic mitral thrombosis resulting in moderate mitral stenosis and inter-atrial septum mural thrombosis were impressed. Subcutaneous enoxaparin 1mg/kg twice daily was provided in addition to oral warfarin. Transesophageal echocardiogram followed up after one week of treatment disclosed gradually diminishing mural thrombus over inter-atrial septum and para mitral annulus ring with the recovery of bioprosthetic mitral valve mobility with MVA of 3.1 cm2 and MPG of 7 mmHg. (Figures C and E). The patient was then discharged from the hospital in good condition with oral warfarin 2.5 mg once daily and INR greater than 2.0. Transthoracic echocardiogram followed up two months later revealed complete resolution of the thrombus with an MPG of 6 mmHg.

Discussion

According to the Mayo Clinic pathology database between 1997 and 2013, prevalence of histologically proven BPVT after explantation occurs at rates of 10.9%, 12.7%, 12.1%, and 11.6% within the aortic, mitral, tricuspid, and pulmonary positions, respectively.[1] Another report showed the freedom from valve thrombosis at 5 years was 98.3% with St Jude Epic porcine mitral valve.[2] The clinical spectrum of BPVT can range from an incidental finding in asymptomatic patients to acute heart failure and cardiogenic shock in symptomatic ones. Symptomatic BPVT occurs in less than 1% of patients undergoing surgical valve implantation.[3] Factors contributing to higher thrombosis rate include bioprosthetic porcine valve, implantation in mitral position, recipients with hypercoagulable states, previous thromboembolic events, recent withdrawal of anticoagulation, subtherapeutic INR, atrial fibrillation and low left ventricular ejection fraction.[4, 5] Sixty-five percent of BPVT occurred >12 months after implantation where peak incidence was at 13 to 24 months.[1, 6] Recipients of bioprosthetic mitral valve replacement who were anti-coagulated have lower thromboembolic risk than those who are not.[7] Current ESC and ACC/AHA

guidelines recommend three to six months of oral anticoagulation with vitamin-K antagonists post-surgical bioprosthetic mitral valve replacement even in patients with no other indications of anticoagulation to maintain international normalized ratio of prothrombin time at a level of 2.5 in those with low risk of bleeding.[8, 9] In patients with confirmed BPVT, vitamin K antagonist or unfractionated heparin is recommended if hemodynamically stable, otherwise, surgery or fibrinolysis should be considered. Naser et al. showed that recovery from BPVT was significantly faster in mitral than aortic (median 2.5 vs 4.8 months, $p = 0.038$) and tricuspid (median 5.9 months, $p = 0.025$ vs. mitral) positions.[10]

Conclusion

Subacute bioprosthetic mitral valve thrombosis was thought to be a rare event that optimal initial treatment timing and dosing of anticoagulants after bioprosthetic mitral valve replacement are still controversial. In our case, even oral anticoagulation therapy with warfarin was prescribed immediately after adequate control of post-operative bleeding and INR was at a value of greater than 1.5, our patient still encountered valvular and mural thrombosis. Thus, in patients with atrial fibrillation, reducing anticoagulant window period and more aggressive anticoagulation protocol may prevent such events in the future.

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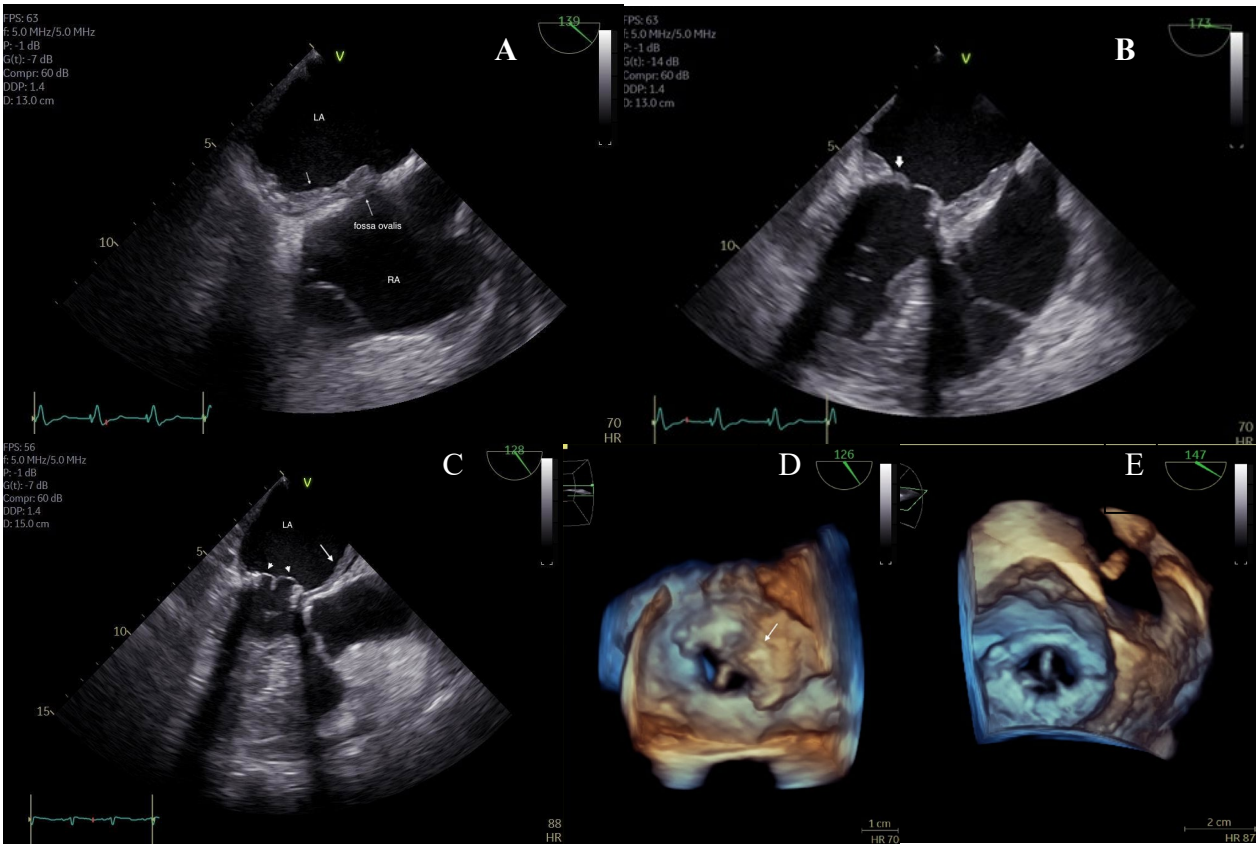

A. Mural thrombus (arrow) over the left atrium extending to the inter-atrial septum.

B. Thickening of mitral leaflet with thrombus (arrow).

C. Diminishing inter-atrial septum thrombus (arrow) with thin mitral leaflets (arrowhead).

D. Thrombus (arrow) over mitral bioprosthesis.

E. Resolution of thrombus with recovery of bioprosthetic mitral valve mobility.