

Left Atrial Appendage Occlusion

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ABSTRACT

Left atrial appendage (LAA) occlusion is a treatment strategy to prevent blood clot formation in atrial appendage. Although, LAA occlusion usually was done by catheter-based techniques, especially percutaneous trans-luminal mitral commissurotomy (PTMC), it can be done during closed and open mitral valve commissurotomy (CMVC, OMVC) and mitral valve replacement (MVR) too. Nowadays, PTMC is performed as an optimal management of severe mitral stenosis (MS) and many patients currently are treated by PTMC instead of previous surgical methods. One of the most important contraindications of PTMC is presence of clot in LAA. So, each patient who suffers of severe MS is evaluated by Trans-Esophageal Echocardiogram to rule out thrombus in LAA before PTMC. At open heart surgery, replacement of the mitral valve was performed for 49-year-old woman. Also, left atrial appendage occlusion was done during surgery. Immediately after surgery, echocardiography demonstrates an echo imitated the presence of a thrombus in left atrial appendage area, although there was not any evidence of thrombus in pre-pump TEE. We can conclude from this case report that when we suspect of thrombus of left atrial, we should obtain exact history of previous surgery of mitral valve to avoid misdiagnosis clotted LAA, instead of obliterated LAA. Consequently, it can prevent additional evaluations and treatments such as oral anticoagulation and exclusion or postponing surgeries including PTMC.

Keywords: Left atrial appendage clot, left atrial appendage occlusion, mitral valve replacement, percutaneous trans-luminal mitral commissurotomy, trans-esophageal echocardiography

INTRODUCTION

One of the most important heart diseases is mitral stenosis (MS) that can due to left atrial and left atrial appendage clot. In 90% of atrial fibrillation, blood clots forms in the left atrial appendage (LAA) and they may lead to emboli, which can lead to ischemic damage to the brain, kidneys or other organs supplied by the systemic circulation.^[1] Left atrial appendage occlusion is a treatment strategy to prevent blood clot formation in left atrium.^[2]

The efficacy of oral anticoagulation (OAC) for stroke prevention in patients with non-rheumatic atrial fibrillation (AF) has clearly been established. However, mitral valve diseases with severe stenosis usually do not response to medical treatment.^[3]

Percutaneous trans catheter trans septal approach to LAA was done for excluding it from the systemic circulation.^[4] Also, Healy *et al.* showed LAA occlusion during coronary artery bypass grafting (CABG) was safe and could use to prevent stroke.^[5] LAA occlusion can be used as an alternative for patients who cannot use oral anticoagulants because of a recent or previous bleeding, pregnancy and so on.^[3] This goes especially for the elderly, although studies have indicated that they can also benefit from anticoagulants.^[6] Although LAA occlusion, usually was done by catheter-based techniques,^[7] it can be done during closed mitral valve commissurotomy (CMVC), open mitral valve commissurotomy (OMVC) and mitral valve replacement (MVR) too.^[5,8] Nowadays, PTMC is performed as an optimal management of severe mitral stenosis (MS) and many patients currently are treated by PTMC instead of previous surgical methods. One of the most important contraindications of PTMC is presence of clot in LAA. So each patient who suffers of severe MS is evaluated by TEE to rule out thrombus in LAA before PTMC.

Because the left atrial appendix (LAA) is the most common place of thrombosis formation in patients with atrial fibrillation (AF) and mitral stenosis (MS), it can easily be excluded from the systemic circulation at the time of cardiac surgery by excision, ligation, suturing, or stapling. The ongoing LAA occlusion study (LAAOS) is evaluating the efficacy of the routine LAA occlusion in patients undergoing elective coronary artery bypass graft surgery. Recently, two devices specifically designed for percutaneous trans-catheter LAA occlusion have been introduced: the percutaneous LAA trans-catheter occlusion (PLAATO; Appriva Medical Inc) and WATCHMAN LAA system (Atritech, Inc).^[9]

Trans-esophageal echocardiography (TEE) is one of the best tools for recognize thrombus in LAA and it is currently used for any patients who are suspected of LAA clot.^[10] Around surgery, a TEE has to be performed to judge completeness of closure and the presence of blood clots.

CASE REPORT

A 49-year-old woman was admitted to the Sina Heart Institute in Isfahan in Iran for mitral valve replacement on 18 July 2011. She had become progressively symptomatic since September of 2008. An irregular heartbeat had been present for many years. During the past several years, her physical activities were reduced significantly and she had recently become more symptomatic. Medical therapy of the patient included digoxin, diuretic and warfarin.

On admission the patient had an irregular pulse with an apical rate of 80-100 beat/min. The first heart sound was increased; a loud opening snap and a long, grade 3/6, diastolic, rumbling murmur, in addition to grade 3/6 pan systolic murmur were best heard at the apex in the fifth intercostal space in mid-clavicular line. Electrocardiography showed atrial fibrillation with a ventricular rate of approximately 80-100 beat/min and nonspecific ST-T changes. Last echocardiography showed severe mitral stenosis (MS) and regurgitation. Angiography of coronary arteries was normal.

Intra operative TEE was done just few min before surgery. Ejection fraction was 40%. There were mitral stenosis and mitral regurgitation 3/4+. Echocardiography revealed left atrial and ventricular enlargement; the mitral valve configuration was consistent with calcific mitral stenosis. Investigation of LA and LAA did not show clot [Figure 1].

At open heart surgery, replacement of the mitral valve was performed and it replaced with artificial

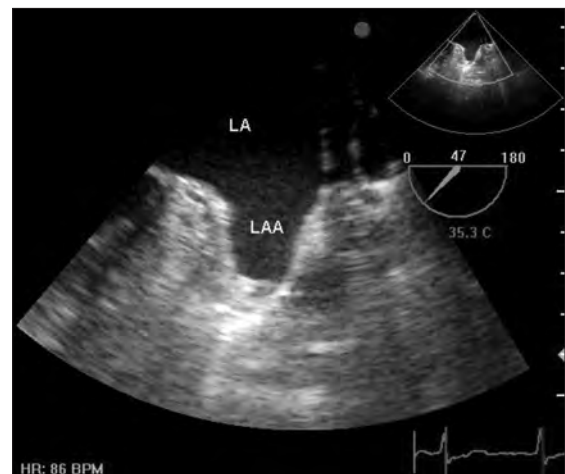


Figure 1: Pre-surgery echo of left atrial appendage

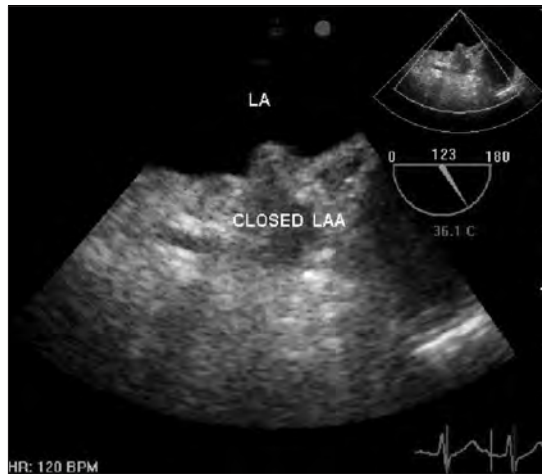


Figure 2: Post-surgery echo of left atrial appendage

valve. Left atrial appendage occlusion was done during surgery. Post-pump TEE demonstrated an echo imitated the presence of a clot in left atrial appendage area [Figure 2]. Indeed thrombus was filled the LAA and this thrombus would be organized with no chance of emboli. The post-operative course was uneventful, and the patient was discharged on 27 July 2011.

DISCUSSION

Left atrial thrombi are a relatively frequent finding in patients with mitral stenosis and left atrial thrombi are usually located in the left atrial appendage. Left atrial appendage occlusion may cause a thick, non-mobile echo finding that mimics the presence of a thrombus and discrimination of these two entities is difficult by surgery so we should obtain exact history of previous surgeries, especially left atrial appendage occlusion, when we suspect to thrombus of left atrial. It can prevent additional evaluations and treatments such as oral anticoagulation and exclusion or postponing surgeries including PTMC.

REFERENCES

1. Parekh A, Jaladi R, Sharma S, Van Decker WA, Ezekowitz MD. Images in cardiovascular medicine. The case of a disappearing left atrial appendage thrombus: Direct visualization of left atrial thrombus migration, captured by echocardiography, in a patient

- with atrial fibrillation, resulting in a stroke. *Circulation* 2006;114:e513-4.
2. Blackshear JL, Odell JA. Appendage obliteration to reduce stroke in cardiac surgical patients with atrial fibrillation. *Ann Thorac Surg* 1996;61:755-9.
3. Gottlieb LK, Salem-Schatz S. Anticoagulation in atrial fibrillation, Does efficacy in clinical trials translates into effectiveness in practice? *Arch Intern Med* 1994;154:1945-53.
4. Park JW, Leithäuser B, Rittger H, Brachmann J. Treatment strategies for prevention of cardio embolic stroke in atrial fibrillation. *Clin Hemorheol Microcirc* 2010;46:251-64.
5. Crystal E, Lamy A, Connolly SJ, Kleine P, Hohnloser SH, Semelhago L, *et al*. Left Atrial Appendage Occlusion Study (LAAOS): A randomized clinical trial of left atrial appendage occlusion during routine coronary artery bypass graft surgery for long-term stroke prevention. *Am Heart J* 2003;145:174-8.
6. Mant J, Hobbs FD, Fletcher K, Roalfe A, Fitzmaurice D, Lip GY, *et al*. Warfarin versus aspirin for stroke prevention in an elderly community population with atrial fibrillation (the Birmingham Atrial Fibrillation Treatment of the Aged Study, BAFTA): A randomised controlled trial. *Lancet* 2007;370:493-503.
7. Schmidt H, Hammerstingl C, von der Recke G, Hardung D, Omran H. Long-term follow-up in patients with percutaneous left atrial appendage transcatheter occlusion system (PLAATO): Risk of thrombus formation and development of pulmonary venous obstruction after percutaneous left atrial appendage occlusion. *J Am Coll Cardiol* 2006;47:36A.
8. Healey JS, Crystal E, Lamy A, Teoh K, Semelhago L, Hohnloser SH, *et al*. Left Atrial Appendage Occlusion Study (LAAOS): Results of a randomized controlled pilot study of left atrial appendage occlusion during coronary bypass surgery in patients at risk for stroke. *Am Heart J* 2005;150:288-93.
9. Onalan O, Crystal E. Left atrial appendage exclusion for stroke prevention in patients with nonrheumatic atrial fibrillation. *Stroke* 2007;38:624-30.
10. Mackensen GB, Swaminathan M, Mathew JP. PRO editorial: PRO: Three-dimensional transesophageal echocardiography is a major advance for intraoperative clinical management of patients undergoing cardiac surgery. *Anesth Analg* 2010;110:1574-8.

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