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Case Report

Very late (>5 years) thrombus formation on an atrial septal defect device: a case report

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ABSTRACT

Though percutaneous transcatheter atrial septal defect closure with newer generation occluder devices is a standard treatment at present, these devices have significant long-term risks (>1 year) associated with such as thrombus formation. Here, we present a case of 28 year-old patient presented with few symptoms and had a history of ASD device closure using amplatzer septal occluder device five years back. The patient was found to have a large thrombus (30×33 mm) attached to the device which was managed using anticoagulants and patients was advised for regular echocardiographic follow-up.

Keywords: Atrial septal defect, Percutaneous device closure, Thrombus, Late complications

INTRODUCTION

Atrial septal defect (ASD) is one of the most encountered congenital defects, accounting around 7-10% of all congenital heart defects in adults.[1] Progressively, with evolution of inter-atrial septal occluder devices, transcatheter closure approach has grown up as an efficacious and less invasive alternative to surgical interventions for the repair of ASD.[1,2] However, these transcatheter occluders are not devoid of complication. Few short term and long term complications associated with ASD devices are cardiac erosion, device embolization, atrial arrhythmia, distal migration, pericardial effusion, transient ischemic attack, stroke, and late/very thrombus formation.[1,3,4] Late device thrombosis (>1 year) is a rare complication but of a paramount concern for interventional cardiologists. Here, we report a rare case of very late device thrombosis, after 5 years of ASD closure, of an amplatzer septal occluder (St. Jude medical, St. Paul, MN) device in 28 year old female which was non-surgically managed using anti-coagulants.

CASE REPORT

A 28 year old female presented with fever, shortness of breath, palpitations, and orthopnea. Her medical history revealed presence of ASD which was closed before five years using an amplatzer septal occluder device. At presentation, she was not taking any medication. Her laboratory and blood culture examination were negative. She didn't report any history of bleeding or thrombosis.

Electrocardiogram showed diastolic murmur at apex. Presence of infective endocarditis, atrial myxoma or ASD device thrombus were considered as a differential diagnosis based on her physical and clinical examination. Furthermore, echocardiographic examination revealed

existence of echogenic mass of 30×33 mm attached to ASD device confirmed the presence of thrombus (Figure 1). Patient was advised for surgical removal of ASD device along with thrombus, but she refused to hospitalize for further workup. Thus, anti-coagulation with low molecular weight heparin bridging with warfarin was started. Transesophageal echocardiography at one-month follow-up revealed decreased mass size to 15×13 mm. Thus, she was recommended to continue anti-coagulation and advised for regular follow-up.

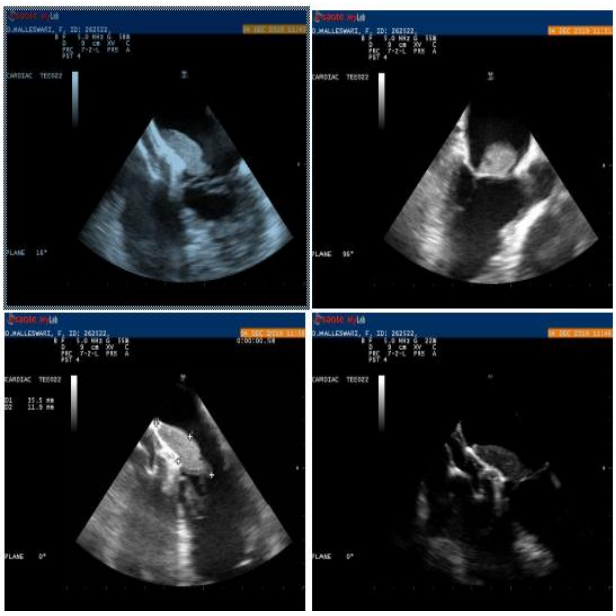

Figure 1: Transesophageal echocardiographic images showing the location and extent of thrombus attached to atrial septal defect closure device Upper left-A) Four chamber view of thrombus on the ASD device, Upper right- B) Three chamber view of thrombus protruding into left ventricle inflow, Lower left- C) Four chamber view of thrombus dimensions and Lower right- D) Four chamber view of thrombus encroaching the AML

DISCUSSION

ASD, if left untreated, can lead to atrial arrhythmias and right sided heart failure, thus early detection and management of this defect is crucial for optimum outcome. The constant development of ASD device technology have make the job of interventional cardiologist much easier as percutaneous transcatheter ASD closure with newer generation devices have reported less incidences of complications and better clinical outcomes.[1] However, the very long-term safety of these devices is still a question that needs answer. Although only few cases of late thrombosis (>1 year) of ASD devices have been reported, it need prevention to prove long-term safety of these devices.[2,3,5-10]

In a study involving 407 patients with ASD which were closed using different occluders, Krumsdorf et al found amplatzer septal occluder as less thrombogenic than other device.[11] In a systemic review which included 17 case reports, thrombosis was reported in all currently used devices, but showed lower incidence with new generation devices such as amplatzer septal occluder.[8] However, majority of studies evaluated patients up to 1-2 years after device deployment and most of the thrombi resolved with antiplatelet and/or anticoagulation therapy by that time. The present case reported occurrence of late thrombosis, after 5 years, in a female who had undergone ASD closure with amplatzer septal occluder device. Similarly, Camilo et al reported a case of left atrial thrombus with amplatzer septal cccluder after 8 years of implantation in 59 year old patient, which was also resolved with medical therapy as in our case.[8] Olawale et al also reported a case of late thrombus formation on an amplatzer septal occluder device after 3 years of implantation in a 13 year old girl.[6] There are cases of such very late ASD device thrombosis (5-6 years) with other intra-atrial septal occluder as well. Gaul et al reported a case in which patient developed left atrial thrombus 5.7 years after the implantation of a Buttoned inter-atrial septal occluder.[9] Similarly, Satish et al also reported a case of left trail thrombus formation in 74 year old woman after 5 years of Star Flex atrial septal occluder device implantation.[10,11]

The cause of late thrombosis after ASD device closure is not known but the antiplatelet regimen might play a crucial role. No guidelines or randomized controlled trials clearly suggest a particular duration of antiplatelet or antithrombotic therapy following transcatheter closure of ASD. The standard clinical practice recommend aspirin for 6 months following closure, along with clopidogrel or any P2Y12 inhibitor for 1-6 months post-closure.[12] However, more long-term follow-up studies are required to reconsider the duration or type of anticoagulation and antiplatelets in children/adults with devices closures to reduce the occurrence of late thrombosis.

Guidelines and manufacturer recommend up to 2 years of follow-up after percutaneous device closure. However, the present case and previously reported cases have created concerns about the long-term safety of these devices and suggested the aptness of prolong clinical and echocardiographic evaluations to prevent the occurrence of late thrombosis and other serious complications after device closures and for timely treatment.

CONCLUSION

The present case of late thrombus formation after 5 years of ASD device closure add one more evidence to the late (>1 year) complications of devices closure. Though most of the thrombotic events related to ASD devices occur within 1 year of implantation, very long (>5 years) clinical and echocardiographic follow-up should be consider for the patients who underwent percutaneous device closure and cardiologists should always reserve

the occurrence of chronic thrombus in this patient population.

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