CASE REPORT

Innocent left ventricular outflow tract membrane masquerading as vegetation

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SUMMARY

Innocent left ventricular outflow tract (LVOT) membranes are a rare entity and found incidentally on echocardiography. The authors report a case of innocent LVOT membrane in a patient who was admitted with ischaemic stroke. Initial transthoracic echocardiography showed a possible valvular vegetation which was thought to be the cause of embolic stroke. Anticoagulation with coumadin and antibiotics were started. Subsequent Transesophageal echocardiography showed that it was more consistent with innocent LVOT membrane and not vegetation. Anticoagulation and antibiotics were discontinued, and on a follow-up over 5 years later, the membrane was stable in size and location without any complications.

BACKGROUND

As the name implies, most of the innocent left ventricular outflow tract (LVOT) membranes are of no haemodynamic significance but their origin, shape, size and structure should be documented to help distinguish them from fibrin thread, thrombus, papillary fibroelastoma, discrete subaortic stenosis, vegetation and tumour. They originate from the central fibrous body of the heart which corresponds to the cartilage of the calf's heart. This fibrous body of heart also provides a framework for attachments of valve leaflets and attachment of the atrial and ventricular myocardium.

CASE PRESENTATION

We describe a case of a 63-year-old woman with a medical history of hypertension, diabetes mellitus, end-stage renal disease and coronary artery disease who was admitted with ischaemic stroke. On admission, the blood pressure was 190/82 and there was right-sided weakness with exaggerated reflexes and decreased sensations. Auscultation of precordium revealed a 2/6 holosystolic murmur in aortic area with no radiation. Stroke workup was emphasised which included a transthoracic echocardiography (TTE). TTE showed a highly mobile linear mass (video 1) that appeared attached to the aortic valve which was suspicious of vegetation and could have explained the embolic phenomenon causing stroke (figure 1). Initially, the patient was started on anticoagulation and antibiotics. Subsequent transesophageal echocardiography (TEE) was performed (video 2) with three-dimensional (3D) pictures revealing a discrete subaortic membrane with regular borders originating along the anterior aspect of LVOT. Its appearance was highly mobile and during systole it prolapsed into the aortic valve orifice. Colour

Video 1 Doppler showing dynamic movements of innocent membrane.

Figure 1 Echocardiogram image showing innocent membrane bulging into aortic orifice.

Video 2 Color Doppler showing no aortic regurgitation.

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Video 3 MPR loop with 3D.

Doppler showed only a negligible degree of obstruction to flow across LVOT (video 3). There was borderline elevated LVOT velocity and mean gradient of 12 mm Hg. The aortic valve structure and function was normal (figure 2). This regular membrane did not look like a cause of stroke. MRI of the brain showed small parenchymal haemorrhages and vasculitis as a possible cause of stroke. The diagnosis of innocent LVOT membrane was performed and therapy with anticoagulation and antibiotics were discontinued.

DIFFERENTIAL DIAGNOSIS

Fibrin thread, thrombus, papillary fibroelastoma, discrete sub-aortic stenosis, vegetation and tumor.

TREATMENT

No treatment is needed as this membrane is asymptomatic and does not cause any haemodynamic compromise.

OUTCOME AND FOLLOW-UP

Repeat TTE showed a similar membrane and it was confirmed by TEE. At the 5-year follow-up, the membrane was stable in size, structure and location. Transvalvular gradient was also the same. The patient did not have any further episodes of stroke or transient ischemic attack.

DISCUSSION

We performed a literature review to find the characteristics of patients who had innocent LVOT. There have been only two cases reported in the literature and their characteristics are mentioned in table 1. All of them were women and none of them had any underlying structural heart disease.¹ One patient had another cardiac issue (atrial fibrillation) and the other one had stroke. Age was variable for all of them.

It is crucial to differentiate them from fibroelastoma, discrete sub-aortic stenosis, myxoma and thrombi. Fibroelastomas are lobulated, oval to round and irregular,² mostly attached to the valves (aortic valve being the most common) and only 16% are attached to the non-valvular surface of endocardium.³ Discrete subaortic stenosis presents as fibromuscular band and it progressively causes obstruction and increased transvalvular gradient.⁴ Cardiac thrombi are laminated in appearance: irregular with lobulated border, having microcavitations and the absence of pedicle.⁵ Myxomas are mostly located in the left atrium and have characteristic stalk attached to the endocardium and appear as heterogeneous.⁶ In only one case (our patient), this membrane was taken as vegetation based on TTE findings with an underlying history of stroke and was started on anticoagulation and antibiotics initially. This case emphasises the need for a 3D TEE to better evaluate and prevent unnecessary treatments like anticoagulation therapy and surgical resection.⁷ Biopsy is the gold standard of diagnosis but it was never performed, most likely due to the benign nature of the disease.

Figure 2 Three-dimensional still images showing innocent membrane in systole.

Table 1 Characteristics of patients having innocent LVOT membrane							
Number	Age	Sex	Presentation	Actual diagnosis	Underlying structural heart condition	Description of the membrane	Underlying medical conditions
1	63	Female	Right-sided weakness	Ischaemic stroke	None	Subaortic, originates from anterior LVOT	ESRD, stroke, HTN, CAD, DM
2	79	Female	Shortness of breath	Paroxysmal atrial fibrillation	None	Not available	Paroxysmal atrial fibrillation
3	26	Female	Shortness of breath	Asthma	None	Not available	Asthma

CAD, coronary artery disease; DM, diabetes mellitus; ESDR, end-stage renal disease; HTN, hypertension; LVOT, left ventricular outflow tract.

Learning points

- ▶ Innocent left ventricular outflow tract membrane is a very rare condition and found incidentally on echocardiology.
- ▶ It may easily be mistaken for valvular vegetation, and transesophageal echocardiography should be performed for better evaluation.
- ▶ It is asymptomatic and does not need any intervention.

Contributors AJ reviewed the literature and wrote the manuscript. SZ en-crafted pictures and videos. SC performed transthoracic echocardiography and

transesophageal echocardiography (TEE), reviewed and edited the manuscript. LA supervised the whole study and en-crafted TEE videos.

Competing interests None.

Patient consent Obtained.

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