Comet in left Ventricle: a Case of False Tendon Creating a False Impression!

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ABSTRACT

Left ventricular false tendon in a structure with unknown physiology. It was first described by Turner. It has been implicated in origin of innocent murmur and some form of ventricular tachycardia but the significance has not been proven beyond doubt. During echocardiography the false tendon may be misleading many times. Here we present such a case where the false tendon really created a false impression to begin with.

Key words: Aortic regurgitation, False tendon, Hyperechogenic, Left ventricle, Interventricular septum.

CASE REPORT

A 23 year old female patient, a known case of a congenital heart disease who underwent percutaneous procedure at age of 10 years, presented with complaints of palpitation NYHA II for last 3 months. Patient did not have any previous records as she lost them. On examination, pulse was 80 beats per minute, regular, high volume. BP-140/60 mm of Hg. S1 normal, S2 soft, Grade 2 ejection systolic murmur at aortic area and Grade 3 early diastolic murmur at left 3rd intercostals space. ECG revealed sinus rhythm with volume overload pattern. Echo was suggestive of mildly dilated LV with severe Aortic regurgitation and mild aortic stenosis. There was a hyperechogenic focus in left ventricle with reverberation effect (Figure 1). It was looking like a comet in Left ventricle. Considering her past history, we initially thought it to be either a disc of Ventricular septal closure device or a dislodged coil. False tendons are usually diagnosed by echocardiography. In our patient since the tendon appeared as a calcified spot at the point of contact of the aortic regurgitation jet, it had lead to some confusion. Subsequently we were able to conclude it as a false tendon by analyzing multiple views. Cardiac MRI is a use full modality to delineate and differentiate a false tendon from other mimics like thrombus, subaortic membrane.Thorough examination revealed it to be false tendon which had been hyperechogenic due to continuous impact of aortic regurgitation flow (Figure 2, supplementary video 1). Patient has been kept on follow up.

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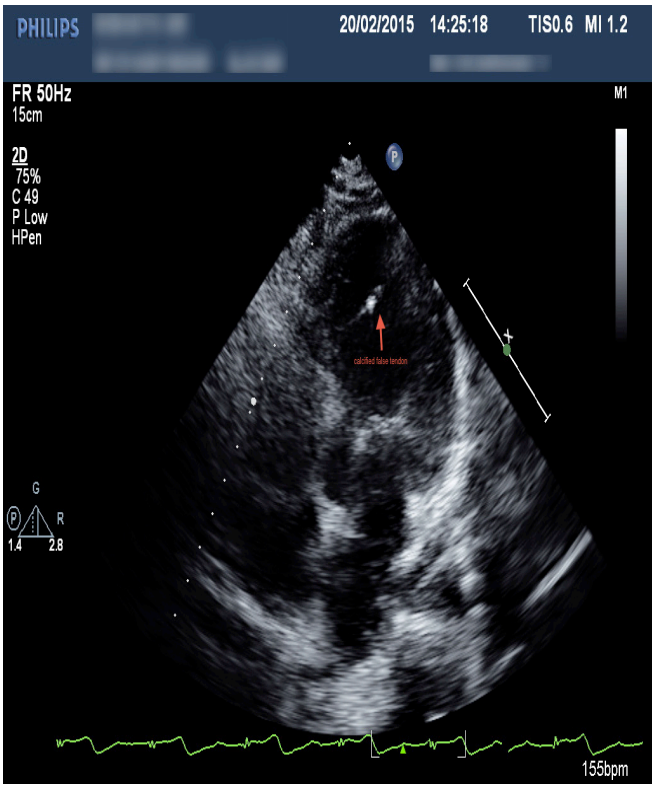

Figure 1: Apical 4chamberview Showing Calcified False Tendon

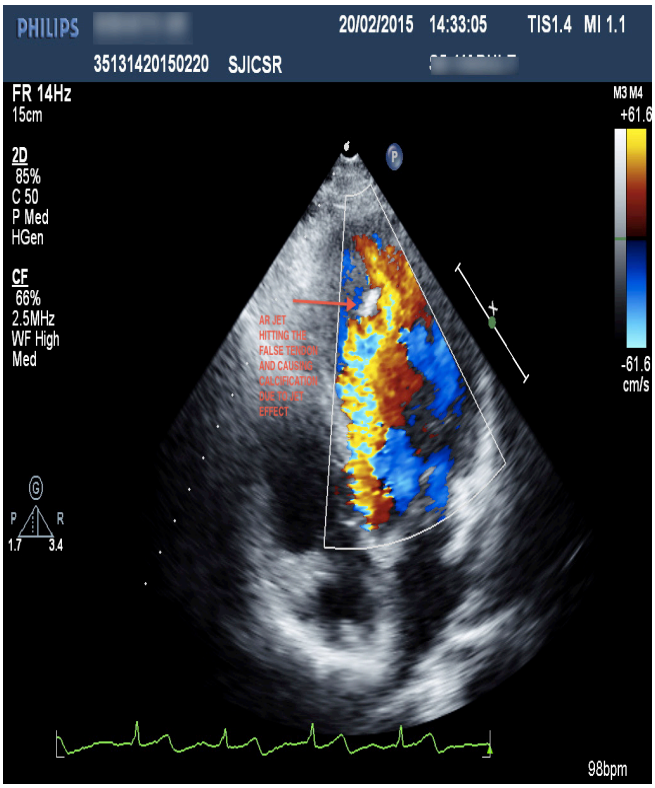

Figure 2: Apical 4chamberview Showing Ar Jet Hiting the False Tendon

DISCUSSION

False tendons are band-like structures seen in left ventricle. Incidence of false tendons in various reported series is approximately 6.4%.[1] They extend from invterventricular septum to the papillary muscle or to the free wall, but not to the mitral valve. They are usually situated at mid or apical level of LV cavity.[2] They are usually thin, thread like structures, but sometimes, they can be thick, appearing like a rope. In a few patients it looked as Y-figure and net like. Three histological type of false tendons have been proposed-fibrous, fibromuscular and muscular.[3] Another study has divided false tendons according to directon. Two types of false tendons are found–longitudinal from interventricular septum to posteroapical wall and transverse- from septum to lateral wall. One study of 483 autopsy specimens,tendons were observed in 265 specimens (55%), and their incidence was greater in hearts from male than from female subjects (61 versus 49%; $p<0.01$). Neither the incidence nor the location of false tendons varied appreciably with age.

After 1oo years of initial description of false tendon, still the significance has not been clear. They have been proposed to have both favourable and deleterious effects. It has been suggested that the false tendons retard the remodelling of the LV wall to which they are attached. It has been proposed that false tendons decreases the severity of functional mitral regurgitation by maintaining the position of papillary muscle. LVFTs is a useful anatomical landmark of LV for the differentiation of morphological LV and right ventricle in segmental analysis of congenital heart disease.

LV tendons may also have some adverse effects on LV hemodynamics. It has been implicated in formation of discrete subaortic membrane. In fetal echo it can be misleading appearing as echogenic focus.[4] It is one the most common causes of innocent murmur in children.[5] They can also cause echocariographic observations of the endocardium of the interventricular septum to be misinterpreted.[6] LVFTs could be a contributory factor in the generation of dysrhythmias during LV catheterization studies. In various studies, they have been implicated in generation of premature ventricular contraction (PVC).[4] Some hypothesis have been proposed for the generation of PVC . Histologic examinations have shown that human ventricular false tendons contain specific conduction cells.[7] Continuous mechanical stretch might increase the automaticity of these cells. The other mechanism is that the mechanical stretch on the left ventricular wall where this tendon is attached can also cause premature ventricular contraction. Various cases have been reported where false tendon was a focus for ventricular tachycardia. One interesting

case of monomorphic ventricular tachycardia in left lateral position was reported which used to disappear on deep inspiration, probable site of origin of VT from false tendon.[8]

False tendon may mimick other structural pathology. It may give impression of torn papillary muscle or vegetation. The hyperechogenic false tendon may give impression of thrombus or some calcification. In our case, it was looking like some device strut or coil due to reverberation effect. Later it turned out to be false tendon with hyperechogenicity due to impact from aortic regurgitation jet.

CONCLUSION

Although benign, false tendons have been implicated in production of innocent murmur or ventricular tachyarrythmias. It can have a favourable effect in form of decreasing intensity of functional mitral regurgitation. On echocardiography, false tendons have a fibrous or fibromuscular structure. The thinner the tendon is, the higher fibrous component they have, and at greater thickness, a greater fibromuscular component. The diagnosis of a LVFT should be based on the finding of a distinctive linear echogenic strand, traversing the LV cavity, connecting the LV free wall or papillary muscle and the ventricular septum, not related to the mitral valve apparatus, and identified in at least two echocardiographic planes of view. On Cardiac MRI, in the four-chamber view, they appear as a fibromuscular band that stretches across the LV from the septum to a papillary muscle and therby helping to differentiate from tumours, subaortic membranes, thrombus borders or septal hypertrophy. So before proceeding for any management decision, the possibility of false tendon should be ruled out.

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ABBREVIATION

LV : Left ventricle

LVFT : Left ventricle false tendon

MRI : Magnetic resonance imaging

PVC : Premature ventricular contraction

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