ISSN: 0975-3583,0976-2833 VOL16, ISSUE 1, 2025

A RARE OF CASE OF DOUBLE CHAMBERED LEFT VENTRICLE

Dr Pavan Nallamothu[1], Dr Swargam Venu[2], Dr Sampath Kumar P[3]

[1]Senior Resident, Department of Cardiology, Dr. PSIMS and RF

[2]MD, DrNB, Associate Professor, Dr. PSIMS and RF

[3]MD, DM, Professor, Dr. PSIMS and RF

Abstract

Double chamber left ventricle (DCLV) is developmental anomaly of human heart, in which the left ventricle (LV) chamber is divided into two by an abnormal muscle or septum. Its true incidence is unknow and there are very few case reports mentioned in the literature. We report a case of 54 year old man who sought cardiac evaluation after a recent accidental fall. This rare condition is usually detected incidentally and treatment is tailored to the individual and is generally conservative.

Keywords: Accessory left ventricle, cardiac magnetic resonance imaging, congenital heart disease, double chambered left ventricle

Case Report

A 54 year old man with history of a recent accidental fall and right radius fracture came for cardiac evaluation. On enquiry, he complained of mild shortness of breath and atypical chest pain that had persisted for six months. There was no orthopnea or paroxysmal nocturnal dyspnea associated with the breathlessness. He had no history of palpitations, syncopal episodes, cough, or fever.

He had no previous history of hypertension, diabetes mellitus, coronary artery disease, or cerebrovascular events. There was no history of coronary artery disease in his family. He was a chronic smoker and an alcoholic.

On physical examination, his blood pressure was 100/70 mmHg, pulse rate was 70 beats per minute and all peripheral pulses were palpable. Auscultation of the chest revealed no cardiac murmurs.

Electrocardiogram (Fig. 1) showed sinus rhythm with QS complexes in leads V1-V3, III, avF. 2-Dimensional Echocardiography (Fig. 2) was done which showed regional wall motion abnormality in mid and apical anterior wall, septum and apex with mild left ventricular systolic dysfunction with the presence of a mass in left ventricular apex.

Troponin T was done which was negative. Other routine laboratory investigations were done and found to be hugely unremarkable (Table. 1). A coronary angiogram was done which revealed normal coronaries (Fig. 3). The patient underwent cardiac magnetic resonance imaging (MRI) (Fig. 4 and 5), which demonstrated a wide necked left ventricular accessory chamber extending from the mid to apical septum measuring 5.7 x 2cm. The accessory chamber showed synchronous contractions with the main chamber. The left ventricular ejection fraction (EF) was 60% and there was no regional wall motion abnormality. This demonstrated the presence of a double chambered left ventricle. There was no myocardial

ISSN: 0975-3583,0976-2833 VOL16, ISSUE 1, 2025

oedema and on delayed enhancement imaging, no evidence of myocardial infarction, inflammation or infiltration was found.

Discussion

DCLV is an extremely rare congenital heart defect, and it is characterised by a division of the ventricular cavity by an anomalous septum or muscle bundle. The embryology of DCLV remains uncertain, though it is hypothesized that it may result from incomplete regression of the trabeculations, potentially a form of left ventricular non-compaction.[1,2] Another hypothesis is that the formation of an intra-myocardial aneurysm during embryogenesis or the hypoplasia of regional myocardial intra-trabecular sinusoids may cause DCLV.[3]

Differential diagnosis of DCLV includes left ventricular diverticulum and aneurysm. A true left ventricular aneurysm is a saccular protrusion of the LV wall caused by mechanical weakness. It contains all three layers of cardiac tissue, with scarred wall having wide based neck. The aneurysmal wall shows delayed gadolinium enhancement with impaired wall motion, and is either akinetic or dyskinetic.[3] Pseudoaneurysm, however, doesn't contain all three layers of cardiac tissue although it may show dyskinetic movement during systole, and has a narrow communication.

A left ventricular diverticulum contains all three layers of the cardiac tissue, and differs from DCLV in that is has a narrow neck connecting to the left ventricular cavity. In DCLV, there is also a muscular or membranous accessory septum to separate the ventricle. Both DCLV and LV diverticulum contain all layers of cardiac tissue that typically contract synchronously with the rest of the ventricle, as opposed to dyssynchrony observed in aneurysms.

This condition can be diagnosed by echocardiography, though it may sometimes be misdiagnosed. Because of its better spatial resolution and tissue characterization ability, and its usefulness in differentiating normal myocardium from fibrosis or scar, cardiac magnetic resonance imaging is the preferred diagnostic tool.[4]

DCLV is usually asymptomatic and carries a benign prognosis. As such, patients are often diagnosed incidentally during evaluation for other conditions.[5] Conservative treatment with a follow-up is generally sufficient. Nevertheless, few cases with ventricular arrhythmias have been described.[6-8]

Treatment for each patient needs to be individualized, based on their clinical presentation and associated complications, like antiarrhythmic drugs for symptomatic ventricular arrhythmias, anticoagulation for systemic embolism. In symptomatic patients with left ventricular obstruction or when associated with other cardiac structural anomalies, surgical resection could be considered.[9,10]

Conclusion

The presence of a double chambered left ventricle or accessory left ventricle is a rare condition with undetermined clinical significance. There is a lack of comprehensive data on treatment options, prognosis and potential complications. 2-dimensional echocardiography

ISSN: 0975-3583,0976-2833 VOL16, ISSUE 1, 2025

might be helpful, but multimodality imaging is necessary to accurately diagnose this condition and to guide further management decisions.

References

1. Gufler H, Anderson RH, Annette M, Voigtlaender T. Double chambered left ventricle in a patient with chest pain. Clin Res Cardiol 2018; 107:1180-2.

2. Novo G, Dendramis G, Marrone G, Novo S, Thiene G. Left ventricular noncompaction presenting like a double-chambered left ventricle. J Cardiovasc Med (Hagerstown) 2015; 16: 522-4.

3. Zhang X-Y, Cao T-S, Yuan L-J. Double-chambered left ventricle in echocardiography. Echocardiography. 2012;29:E67–E68. doi: 10.1111/j.1540-8175.2011.01569.x.

4. Nacif MS, Mello RAF, Lacerda Junior OO, et al. Double-chambered left ventricle in an adult: diagnosis by CMRI. Clinics. 2010;65:1393–1395. doi: 10.1590/S1807-59322010001200028.

5. Masci PG, Pucci A, Fontanive P, et al. Double-chambered left ventricle in an asymptomatic adult patient. Eur Hear J Cardiovasc Imaging. 2012;13:E1–E3. doi: 10.1093/ejechocard/jer242.

6. Sharma S, Dinwoodey DI, Chaudhry GM, et al. Congenital double-chambered left ventricle presenting as monomorphic ventricular tachycardia. CASE. 2019;3:51–55. doi: 10.1016/j.case.2018.11.008.

7. Köz C, Yokuşoğlu M, Uzun M, et al. Double-chambered left ventricle with nonsustained ventricular tachycardia. Anadolu Kardiyol Derg. 2009;9:E5.

8. Kato M, Sasaki S, Dote K. Double-chambered left ventricle with ventricular fibrillation. Intern Med. 2012;51:2245–2246. doi: 10.2169/internalmedicine.51.7972.

9. Dogan OF, Alehan D, Duman U. Successful surgical management of a double-chambered left ventricle in a 13-year-old girl: a report of a rare case. Heart Surg Forum. 2004;7:E198–200. doi: 10.1532/HSF98.20041011.

10. Ohlow MA. Congenital left ventricular aneurysms and diverticula: Definition, pathophysiology, clinical relevance and treatment. Cardiology 2006; 106:63-72.

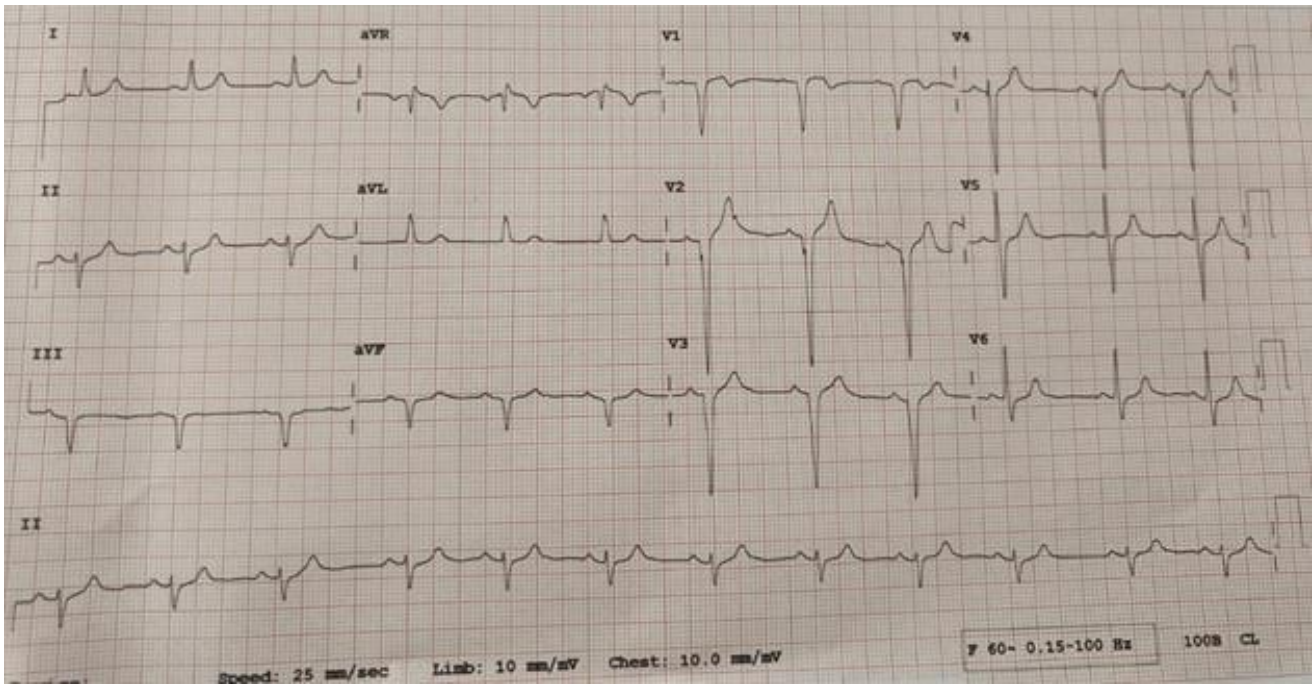
ISSN: 0975-3583,0976-2833 VOL16, ISSUE 1, 2025

Table 1 : Laboratory investigations of the patient

Laboratory Investigation	Value
Hemoglobin	12.8 gm%
Total Leucocyte Count	4600 cells/µL
Platelet Count	206000/µL
Erythrocyte Sedimentation Rate	6 mm/hr
Serum Creatinine	1.2 mg/dL
Urea	24 mg/dL
Sodium	138 meq/L
Potassium	3.7 meq/L
Chloride	103 meq/L
Total Bilirubin	1.0 mg/dL
Total Proteins	8.0 g/dL
Serum Albumin	4.4 g/dL
Aspartate aminotransferase	24 U/L
Alanine transaminase	23 U/L
Alkaline Phosphatase	58 U/L
Total Cholesterol	107 mg/dL
Triglycerides	99 mg/dL
High density lipoprotein cholesterol	52 mg/dL
Low density lipoprotein cholesterol	36 mg/dL
Glycated hemoglobin (HbA1c)	5.70%
Total Triiodothyronine (T3)	0.99 ng/mL
Total Thyroxine (T4)	5.41 µg/dL
Thyroid stimulating hormone (TSH)	1.83 µIU/mL

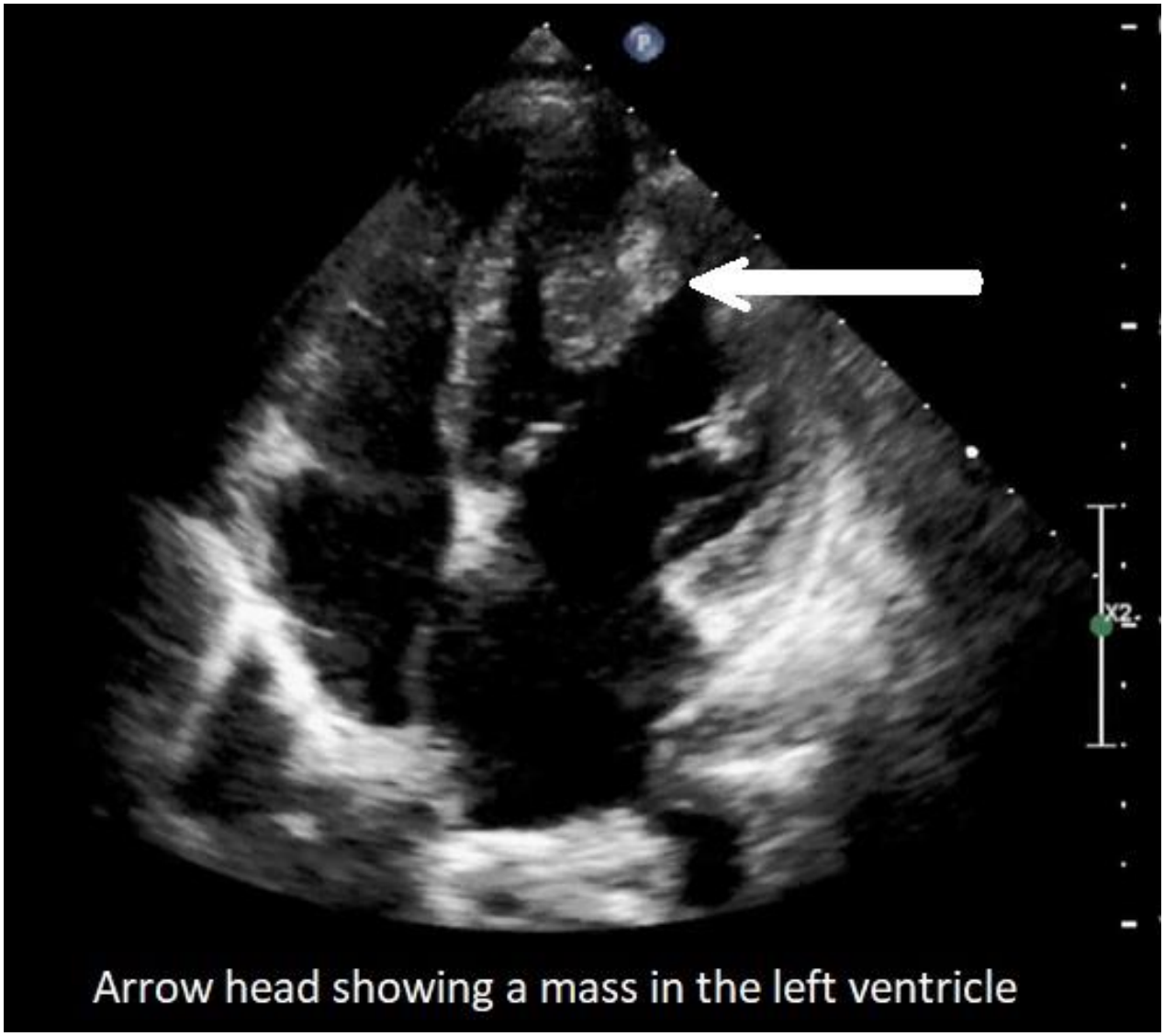
ISSN: 0975-3583,0976-2833 VOL16, ISSUE 1, 2025

Figure 1 : 12-lead electrocardiogram of the patient



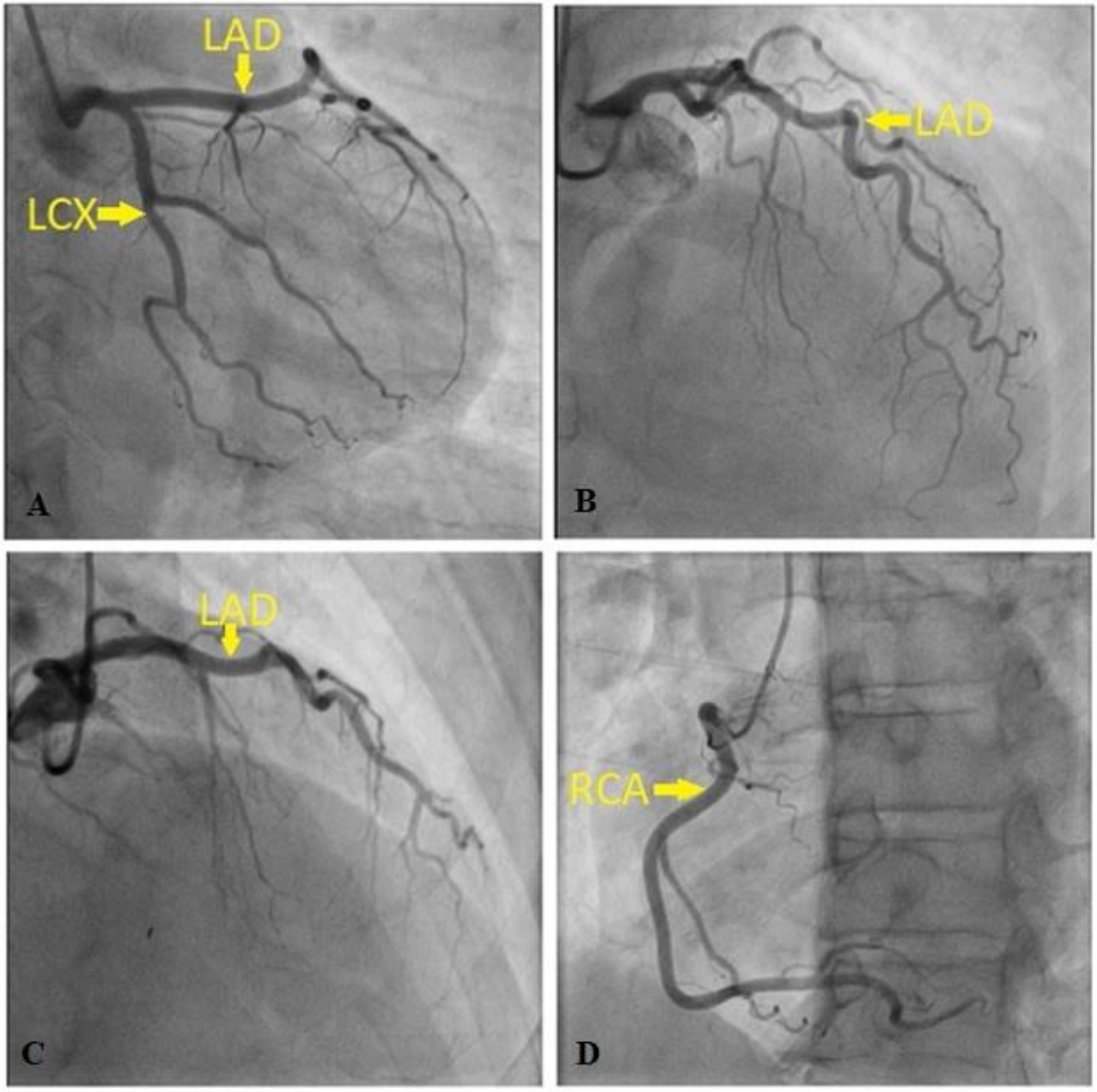
ISSN: 0975-3583,0976-2833 VOL16, ISSUE 1, 2025

Figure 2 : Apical 4 chamber view on 2D echocardiography showing a mass in the left ventricle



ISSN: 0975-3583,0976-2833 VOL16, ISSUE 1, 2025

Figure 3 : Coronary angiogram (A) Anterior Posterior(AP)-Caudal, (B) AP-Cranial (C) Left Anterior Oblique(LAO)-Caudal (D) LAO views , demonstrating normal coronaries



ISSN: 0975-3583,0976-2833 VOL16, ISSUE 1, 2025

Figure 4 : Cardiac magnetic resonance imaging in short axis view

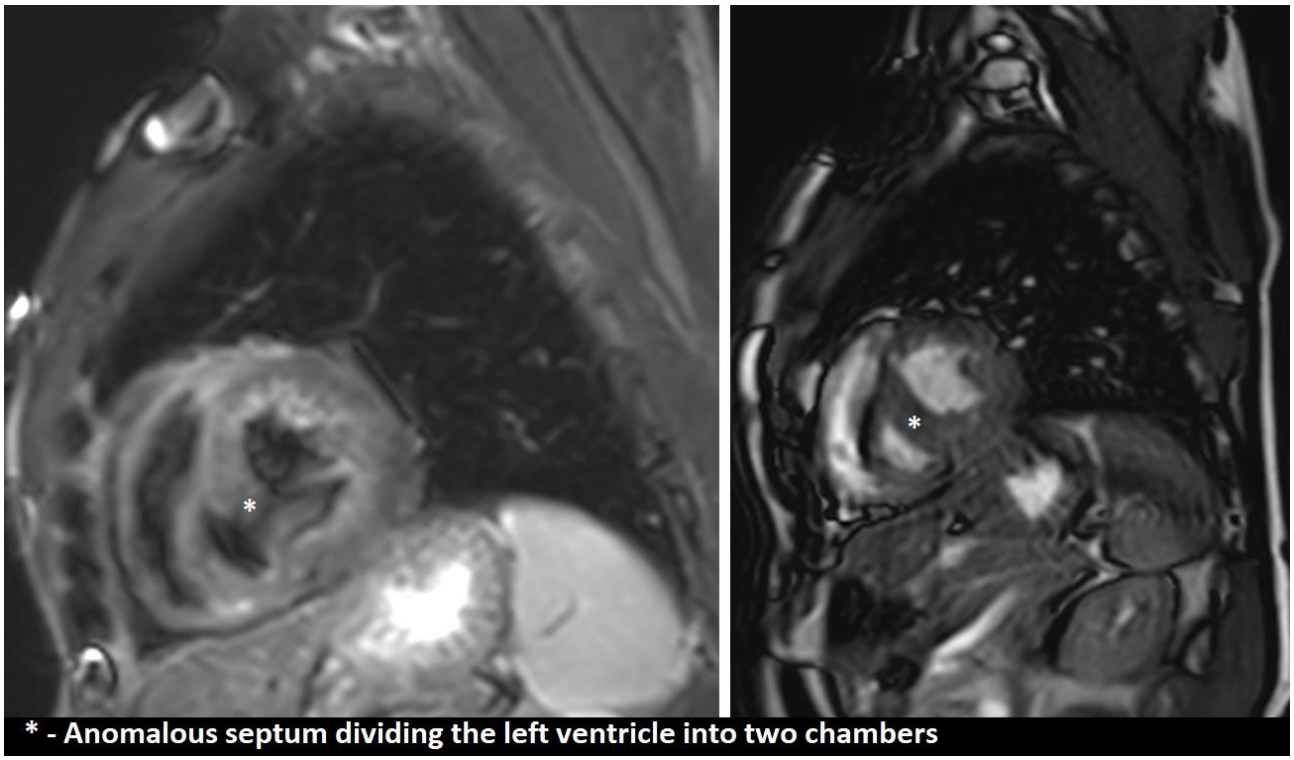


Figure 5 : Cardiac magnetic resonance imaging in (A) 3 chamber (B) 4 chamber views