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CASE REPORT

Isolated anterior mitral valve leaflet cleft: The usefulness of 3D transthoracic echocardiography



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1. Background

Isolated cleft mitral valve (ICMV) is a rare congenital cardiac disease characterized by a cleft on the anterior mitral valve leaflet that is not associated with an ostium primum atrial septal defect or other features of atrioventricular septal defect.¹

2. Case report

A 6 year old female patient presented to our facility with her parents complaining of progressive exertional dyspnea and recurrent hospitalization with repeated chest infection. Her parents reported that she was born with a congenital heart disease that they could not recall and they did not follow her later on. Her cardiac examination revealed a pan systolic murmur heard maximum at the apex. Electrocardiogram was normal. 2D transthoracic echocardiography (TTE) assessment showed severe eccentric mitral valve regurgitation and the jet was directed posteriorly swirling in the left atrium (Fig. A). The mitral leaflets were mildly thickened and non-calcific and showed normal motion. There was no evidence of valve prolapse. In the parasternal short axis view the anterior mitral leaflet cleft was evident (Fig. B). There were no primum atrial septal defect (ASD) and no papillary muscles abnormalities noted. The left ventricle showed a normal size and function. 3D TTE was performed and showed a deep cleft bisecting the middle anterior scallop (A2) and was extending into the anterior mitral annulus sparing both commissures (Fig. C).

The maximum cleft depth was 2.0 cm in length and 1.2 cm in width, both measured in mid-systole (Figs. D and E). The patient was referred to the cardiothoracic surgeons and they decided surgical repair. The cleft was repaired with multiple interrupted prolene sutures. Postoperative 2D and 3D TTE showed successful repair of the anterior mitral leaflet cleft (Fig. F). There was a mild residual mitral valve regurgitation (Fig. G).

3. Discussion

Isolated cleft mitral valve is a correctable cause of congenital MR with good surgical results. Such surgery is indicated for patients with moderate to severe MR even if asymptomatic. It probably should be done relatively early as the results of such repair are good and may avoid the risk of valve replacement or cardiac dysfunction.²

Due to its higher image resolution, 3D transesophageal echocardiography (TEE) has been described for the evaluation of ICAML in several case reports.^{3–5}

In our patient, 3D TTE allowed us to visualize ICAML from a surgical perspective, define its exact position, morphology, and size, and assist in planning the surgical procedure.

A similar case report had been recently published and demonstrated the value of 3D TTE in the diagnosis of anterior mitral valve leaflet cleft and how nicely it demonstrated a full morphologic assessment. This directed the surgical procedure toward valve replacement rather than direct surgical suture or an autologous patch implant.⁶

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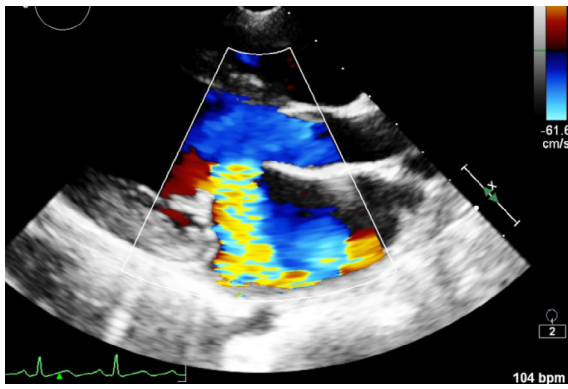


Figure A 2D TTE long axis view with color Doppler showing a severe eccentric regurgitant flow through the anterior mitral leaflet. The regurgitant flow is directed toward the left atrial posterior wall.

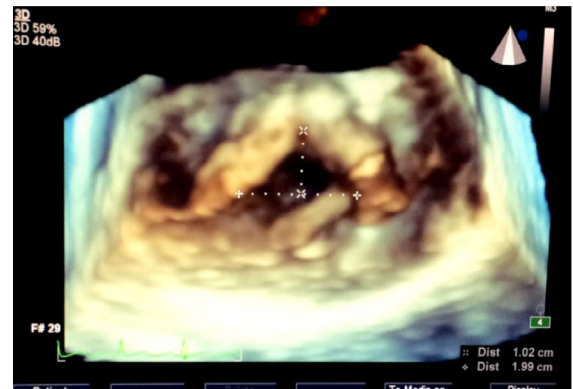


Figure D 3D TTE ventricular "en face" demonstrating the depth and width of the cleft in the anterior mitral leaflet.

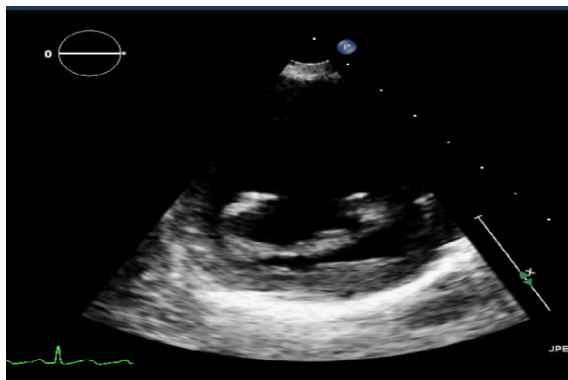


Figure B 2D TTE short axis view showing a cleft in the anterior mitral leaflet.

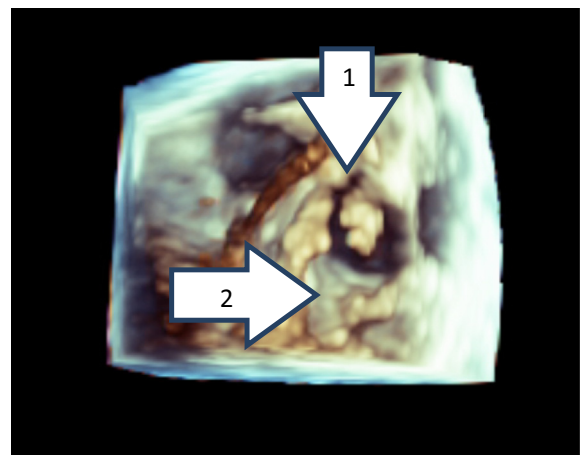


Figure E 3D TTE ventricular "en face" full volume acquisition demonstrating the depth of the cleft within A2, mid-systolic frame. Arrow (1) points to the annular end of the defect in the longitudinal direction. Arrow (2) points to the ventricular orifice of the mitral valve.

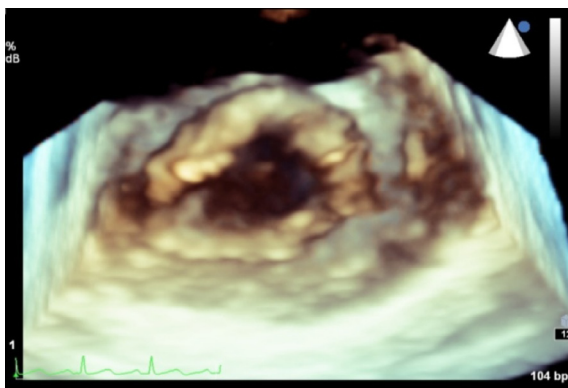


Figure C 3D TTE ventricular "en face" view of the mitral valve demonstrating the cleft in A2.

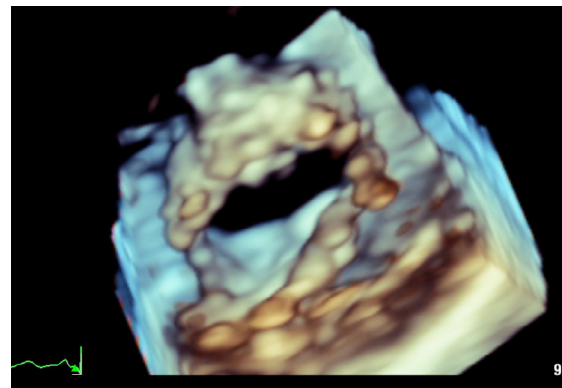


Figure F 3D TTE ventricular "en face" demonstrating successful repair of (A2) cleft.

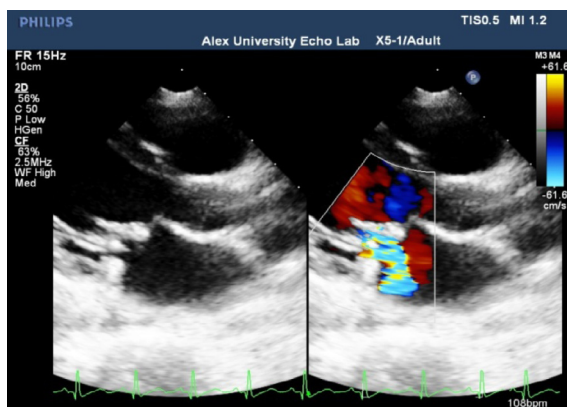


Figure G 2D TTE long axis view with color Doppler showing a residual mild central mitral valve regurgitation.

4. Conclusion

In patients with good acoustic window, preoperative 3D TTE assessment is important for the diagnosis and morphologic assessment of mitral valve leaflets clefts. 3D TTE assists in planning the surgical procedure before entering the operating room. In our patient, 3D TTE identified the exact site of the cleft in A2. The commissures were not involved. It demonstrated the size of the cleft in its maximum depth and width. These data helped the surgeon to decide direct surgical repair without the need for annular ring insertion or valve replacement.

Conflict of interest

There is no conflict of interest.

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.ehj.2016.01.004>.

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