3D visualization of a large left ventricular apical aneurysm

Clinical Case Portal

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Authors:
Dr. Margherita Cinello: margherita.cinello@libero.it
Dr. Luigi Badano: badano.luigi@aoud.sanita.fvg.it
Dr. Pasquale Gianfagna: gianfagna.pasquale@aoud.sanita.fvg.it

Cardiopulmonary Science Department, S.O.C. Cardiologia, Azienda Ospedaliero-Universitaria di Udine, P.le S.Maria della Misericordia, 15. 33100, Udine, Italy.

Case Report

We report a case of visualization of a large left ventricular apical aneurysm using different 3D display techniques.

Patient history prior to current observation:

68 years-old, woman, with history of coronary artery disease (antero-septal myocardial infarction in 1985, inferior relapse in 1992 treated with PTCA + stent on right coronary artery, moderate left ventricular systolic dysfunction and apical aneurysm) admitted for typical angina.

Clinical findings on admission, evolution and outcome:

A 2D (fig. 1, fig. 2, fig. 3) and 3D (fig. 4, fig. 5, fig. 6) rest echocardiogram was performed to assess left ventricular (LV) regional and global systolic function.

Conclusion
True ventricular aneurysms are mechanical complications of myocardial infarctions and arise from expansion and thinning of transmural infarcted tissue (1). Several 3D display techniques are available to visualize left ventricular morphology and function (2,3). Using the surface rendering technique, a mathematical model or cast of the left ventricle is obtained from endocardial border tracing (fig. 4). With this technique the surfaces of the left ventricle are displayed as a solid structure. This technique is used mainly for volume and systolic function analysis. Using the full-volume data-set, we may analyze the anatomy and regional function of the left ventricle. Using electronic tools, we can crop away the anterior wall of the left ventricle and obtain the 3D-echo shape of a four-chamber view using the rendering technique to show the anatomical details of the large apical aneurysm (fig. 5). Otherwise, we can electronically section the 3D data-set of the left ventricle in 9 transversal equidistant short axis views of the left ventricle (fig. 6) from the base (right lower panel showing the mitral valve) to the apex (left upper panel) and appreciate detailed regional wall motion and the areas of the left ventricular short axis at different levels. Note the larger areas, thinned walls and wall motion at apical level.

References


Video 1 :
Left ventricle apical aneurysm Transthoracic parasternal long-axis view

Video 2 :
Left ventricle apical aneurysm Transthoracic apical four-chamber view

Video 3 :
Left ventricle apical aneurysm Transthoracic apical two-chamber view

Video 4:
Left ventricle apical aneurysm Left ventricle cast

Video 5:
Left ventricle apical aneurysm 3D full volume mode acquisition from apical approach

Video 6:
Left ventricle apical aneurysm Transthoracic 3D echo 9-slice view