

Usefulness of chest x-ray in detecting mitral valve calcification and the risk of atrioventricular disruption

Utilidad de la radiografía de tórax en la detección de la calcificación valvular mitral y el riesgo de disrupción auriculoventricular

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Atrioventricular disruption is a serious complication of mitral valve replacement. Its mortality is close to 100%, although its incidence is low.^{1,2} Among its predisposing factors are severe calcification of the mitral valve apparatus, its annulus, and the ventricular wall, as well as intraoperative maneuvers such as excessive retraction, extensive resection of papillary muscles, and the use of high-profile or over-sized mechanical prostheses.³

Ventricular rupture is classified into three types according to the site of occurrence. Type I, the most complex, occurs in the posterior atrioventricular sulcus.²

A chest X-ray in posteroanterior view (**Figure 1**), enlarged in **Figure 2**, is presented. In the region of the mitral valve projection, a mechanical prosthesis is implanted, and a radiopaque image with a calcific density and irregular contours is seen contouring it, forming an incomplete ring due to extensive calcifications. The cardiothoracic index is normal; there is straightening of the left heart border and mild enlargement of the right atrium. Slight bilateral hilar thickening with a congestive appearance, which in the lateral view (**Figure 3**) assumes a rounded shape related to the pulmonary artery. Radiopaque images in the sternal projection corresponding to suture material. Valve calcifications may be radiologically evident. The mitral valve projects to the left of the spine, and the aortic valve lies above the mitral valve; it is often difficult to locate them in a posteroanterior projection because they are most often overlapped by the spine.⁴ Aortic valve calcification is more common than mitral valve calcification. Its presence on a chest X-ray indicates hemodynamically significant stenosis.⁴

The most common cause of mitral valve calcification is rheumatic fever, followed by chronic degenerative processes. It can extend to the annulus, with a nodular or amorphous pattern. It is not common to detect mitral valve calcifications on plain X-rays, for which echocardiography is more sensitive.⁵

In the patient whose X-ray is shown, the surgical technique was carefully performed to avoid atrioventricular disruption because of the potential risk posed by the significant calcification.

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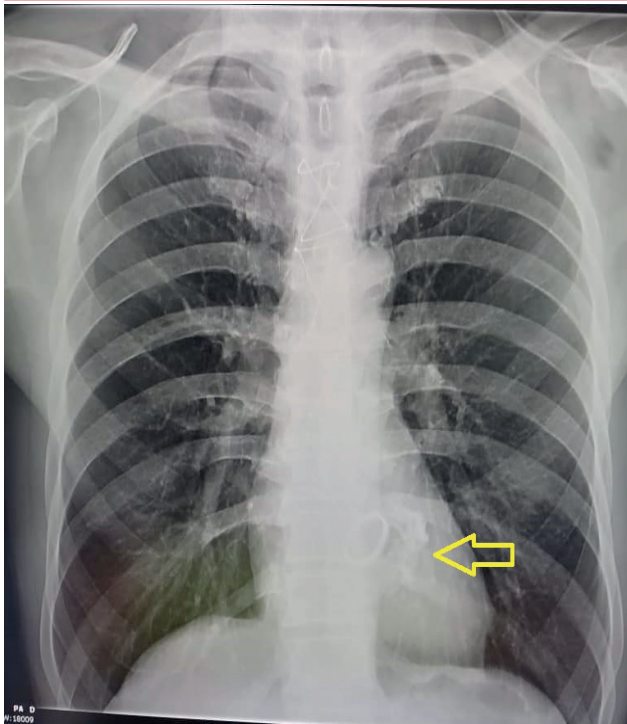


Figura 1. Chest X-ray in posteroanterior view. The yellow arrow indicates the coarse calcification contouring the mechanical prosthesis. It is located in the projection of the mitral valve apparatus, extending to the annulus and ventricular wall.



Figura 2. Enlargement of the chest X-ray in posteroanterior view. The arrow indicates the coarse calcification described above.

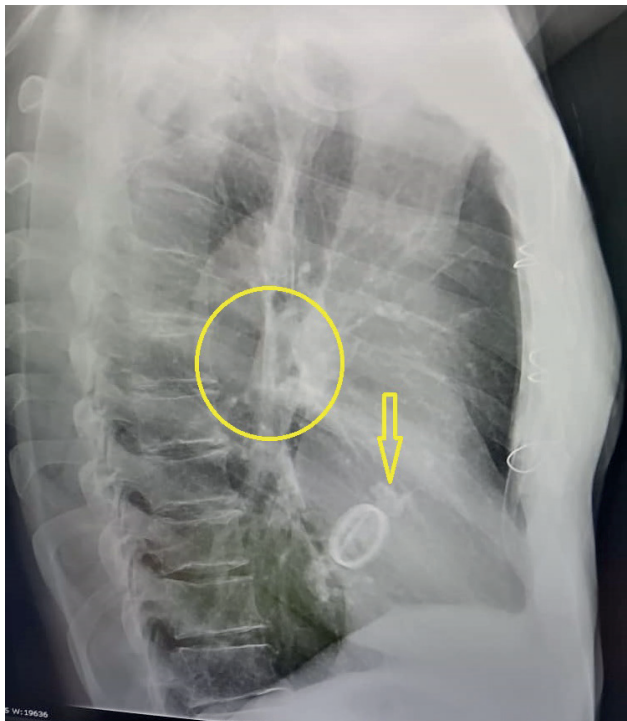


Figura 3. Chest X-ray in right lateral view. The yellow circle indicates the hilar thickening, and the yellow arrow indicates the calcification described in the posteroanterior view.

References

1. Federico Núñez, Catalina Tovar, Germán Franco, Lucía Casanova, Sonia Pachón. Disrupción auriculo-ventricular durante una plastia de la válvula mitral y corrección con parche de pericardio y Bioglue®. R.F.S Revista Facultad de Salud. 2016; 8 (2): 30-33
2. A.F. Guerrero et al. Disrupción auriculoventricular posterior a reoperación de reemplazo valvular mitral: reparación y evaluación ecocardiográfica. Rev Colomb Cardiol. 2016;23(4):333. e1---333.e4com (A.F. Guerrero). <http://dx.doi.org/10.1016/j.rccar.2016.04.006>
3. Martínez-Hernández Magro R y cols. Ruptura ventricular en cirugía valvular mitral. Experiencia de cinco años Cir Ciruj 2005;73:269-272
4. Murrieta González H, Buenrostro Aldana M. Radiología del corazón. En: Ángel Juárez VM, Levinstein Jacinto M, Delgado Barriga JA. El ABC de la cardiología 2018. 1ª ed. Ciudad de México: Editorial Alfil; 2018. Capítulo 3, p
5. Goienetxea Murgiondo A, Ugarte Nuño A, Biurrun Mancisidor K, Vega Eraso J, Esnal Andueza IG, calvo Apraiz L. Nuestra historia cardiovascular escrita con calcio: Calcificaciones cardiovasculares. Seram [Internet]. 22 de noviembre de 2018 [citado 29 de abril de 2026]; Disponible en: <https://piper.espacio-seram.com.php/seram/article/view/2731>