

Images in Cardiology

Contribution of Chest Radiography in Calcific Constrictive Pericarditis: A Massive Hull Around the Heart

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A 50-year-old Moroccan man presented to the emergency unit with asthenia and dyspnea on exertion, which had been evolving for 3 months. He had lower-extremity edema, and increased venous pressure. He was living with his brother and undergoing treatment for pulmonary tuberculosis. Anteroposterior (Fig. 1A) and lateral (Fig. 1B) chest radiography (CR) showed massive arcuate calcifications circumscribing the outline of the left atrium, projecting onto the left atrioventricular groove and the anterior part of the left ventricle. The electrocardiogram showed a sinus tachycardia, and the echocardiogram revealed a calcified and thickened pericardium measuring 8 mm (Fig. 2A) with a dilation of the inferior vena cava of 27 mm (Fig. 2B). Ultimately, the diagnosis of calcified constrictive pericarditis (CCP) secondary to tuberculosis was made. He was referred for surgery, consisting of a decortication, using a vertical median sternotomy approach. Thickened, calcified, and densely adherent pericardium was resected and excised from right cavities and partially from the left ventricle. The postoperative course was uncomplicated. The patient's symptoms of heart failure improved 1 month after surgery, with resolution dyspnea and lower extremity edema. The antituberculosis chemotherapy regimen consisted of rifampicin, isoniazid, pyrazinamide, and ethambutol for 2 months, followed by isoniazid and rifampicin for 4 months. The patient remained asymptomatic at the three month visit. Follow-up echocardiography at that time showed normalization of mitral inflow velocity as well as IVC diameter and compliance.

Constrictive pericarditis is a result of a pathologic inelastic pericardium, leading to a restriction of cardiac chamber expansion.¹ Calcifications are a possible cause, forming a rigid hull around the heart, restricting the ventricular filling, and causing signs of right-sided heart failure.²

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Ethics Statement: This research adhered to relevant ethical guidelines.

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See page 742 for disclosure information.

Novel Teaching Points

- CR, when it shows pericardial calcifications, makes a relevant contribution in the diagnostic workup of CCP.
- It may dispense with further and more expensive examinations, particularly in a context highly suggestive of tuberculosis, in developing countries.

CR is a routine examination in the diagnostic workup of heart failure, and it can show nonspecific signs such as pulmonary vascular congestion, or pleural effusion.¹ However, calcifications, if present, strongly suggest CCP in patients with heart failure.³ In a series of 34 constrictive pericarditis patients in which most had tuberculosis, calcifications were found in 76% on CR.⁴ More recently, in a study of 135 patients with constrictive pericarditis in which most were idiopathic, 27% had calcifications as shown on CR.³ The most frequent locations of the pericardial calcification are the inferior (diaphragmatic) and anterior (right ventricle) surfaces, due to the displacement of pericardial fluid from the contracting left ventricle.³ Our case is also notable for posterior pericardial involvement, adjacent to the left atrium. This location has not been reported previously, and in our case, had no impact on surgical resection and subsequent outcome. Historically, the most common causes of CCP are tuberculosis, followed by idiopathic, prior cardiac surgery, and radiation therapy.¹ In developing countries, tuberculosis is still frequent, as in the case of our patient. Antitubercular drugs consist of rifampicin, isoniazid, pyrazinamide, and ethambutol, for at least 2 months, followed by isoniazid and rifampicin for 4 months, with a total of 6 months of therapy.⁵ The prognosis has significantly improved since the start of use of antibiotics: from 80%-90% mortality in the preantibiotic era, to 8%-34% mortality currently.⁵

This case highlights the interest in performing CR, which is a simple and cost-effective way to assess CCP.

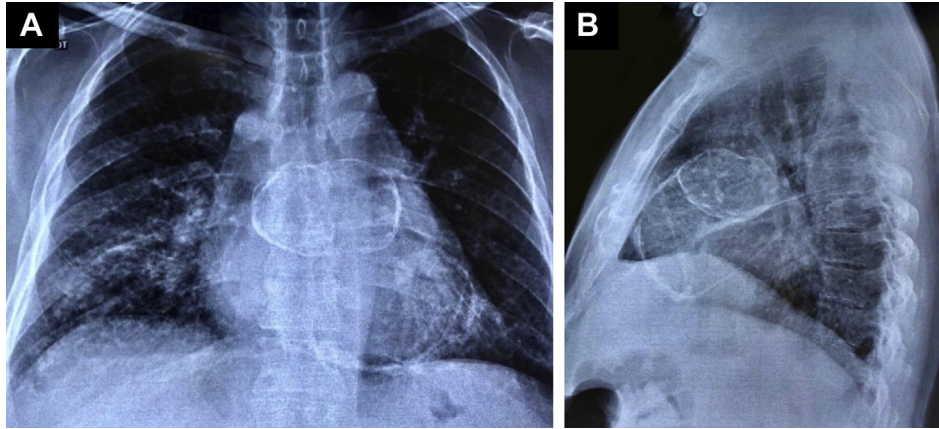


Figure 1. (A) Anteroposterior chest radiograph showing massive calcifications circumscribing the outline of the left atrium and the anterior part of the left ventricle. (B) Lateral chest radiograph showing calcifications outlining the left atrium, the left atrioventricular groove, and the anterior part of the left ventricle.

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Disclosures

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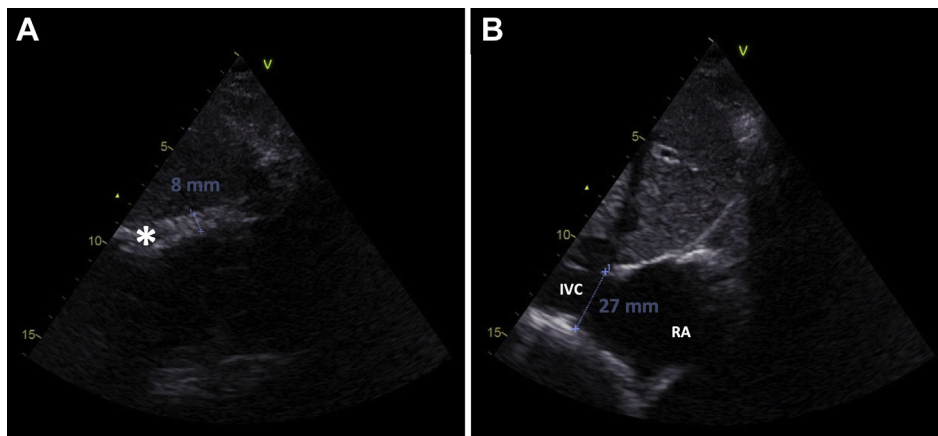


Figure 2. (A) Subcostal echocardiographic view showing calcified pericardium (**white star**) adjacent to the right ventricle free wall. (B) Dilation of the inferior vena cava (IVC) in its insertion in the right atrium (RA).