Case report - Cardiac general

Cystic mass formation in restrictive pericarditis and epicarditis after open-heart surgery

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Abstract

We report a case of locally constrictive pericarditis and epicarditis, which did not indicate typical findings of CT and MRI, late after open-heart surgery. A 74-year-old man with a history of coronary artery bypass grafting was transferred to our hospital for treatment of heart failure. Transthoracic echocardiography, computed tomography (CT) and magnetic resonance imaging (MRI) showed a cystic lesion that compressed the right ventricle and main pulmonary artery without enhancement. However, the pericardial hypertrophy was not clear. We suggested a benign, cystic lesion based on these examinations and planned surgical removal of the mass to release the compression of the heart and to confirm the diagnosis of the capsulized mass. At surgery, cystic mass formation was covered by a thickened fibrous tissue, pericardium and epicardium and was filled with transparent yellowish fluid. We performed a waffle procedure without cardiopulmonary bypass. Histopathologic examination of the excised epicardium revealed neovascularization, minimal inflammation and thickened hyaline connective tissue and was diagnosed as constrictive pericarditis and epicarditis.

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1. Introduction

Constrictive pericarditis after open-heart surgery is relatively rare [1, 2]. Moreover, local capsulated effusion associated with constrictive pericarditis and epicarditis is extremely rare. We report a unique case of a patient with cystic mass formation combined with constrictive pericarditis and epicarditis after open-heart surgery.

2. Case report

A 74-year-old man with a history of coronary artery bypass grafting (CABG) and left ventricular thrombectomy a year ago repeated heart failure a few months previously. A cystic lesion anterior to the right ventricle (RV) was identified six months ago. He was admitted to our hospital for close examination because the cystic lesion had grown sufficiently to compress the RV.

He had no traumatic history including a chest blow. On initial examination, his blood pressure was 93/68 mmHg. He had no thoracic murmurs, and mild peripheral edema was present. An electrocardiogram (ECG) showed atrial fibrillation at 106 beats per minute. His white blood cell count was 7830/µl and his plasma level of C-reactive protein was 1.61 mg/dl, and these findings were negative for an inflammatory reaction. Blood, urine and phlegm culture tests and a serologic test for syphilis were negative.

A chest X-ray showed bilateral pleural effusion without cardiomegaly. Slight hepatomegaly without ascites was noted on transabdominal ultrasonography. Transthoracic echocardiography (TTE) showed an echo-free space that compressed the RV (Fig. 1a). TTE also showed paradoxical septal motion, and the left ventricular ejection fraction was 74%. Non-gated contrast computed tomography (CT) revealed a low density area, cystic lesion which was located in the anterior mediastinum adjacent to the RV extended to the right ventricular outflow tract (RVOT) without enhancement (Fig. 1c,d). The mass was clearly separate from the myocardium by a thickened capsule. Non-contrast magnetic resonance imaging (MRI) of the chest showed a cystic lesion with a clear boundary at the same location as observed on CT (Fig. 2a,b). The inner region of the mass showed a low intensity on T1-weighted imaging (T1WI) and a high intensity on T2-weighted imaging (T2WI). The pericardial hypertrophy was not clear on CT and MRI. Coronary angiography was performed. All bypass grafts were patent. Cardiac catheterization indicated the intracardiac pressures were RV: 27/7 mmHg with an early diastolic dip (Fig. 1b); pulmonary artery (PA): 28/18 mmHg; mean pulmonary artery wedge pressure: 17 mmHg; central venous pressure: 14 mmHg. Low density without enhancement on CT and MR signals suggested a benign, cystic lesion, such as a pericardial cyst, hydatid cyst or chronic expanding hematoma. Surgical removal of the mass was planned to release the compression of the heart and to confirm the diagnosis of the mass.
carditis and epicarditis were diagnosed. The adhered pericardium and epicardium were dissected from the surface of the RV and main PA. Since bypass grafts, including the left internal thoracic artery and great saphenous veins, were adhered to the thickened pericardium, we underwent partial pericardectomy and performed a waffle procedure [3] without cardiopulmonary bypass (Fig. 2c). TTE after the operation showed that the mean PA pressure decreased and cardiac motion became much more forceful. In addition, postoperative ECG showed normal sinus rhythm. Culture of the pericardial fluid did not grow any microorganisms. Histopathologic examination of the excised epicardium revealed neovascularization, minimal inflammation and thickened hyaline connective tissue without calcification, neoplasm or infection and was diagnosed as constrictive pericarditis and epicarditis. His postoperative course was uneventful and his symptoms improved markedly. He had no cardiovascular event after surgery.

3. Discussion

Diseases that can lead to ventricular diastolic dysfunction include cardiomyopathy, constrictive pericarditis, ventricular compression from a tumor within the pericardium, mediastinum or thoracic cavity and chronic expanding hematoma, in addition to cardiac tamponade. Constrictive pericarditis after open-heart surgery is relatively rare, and the incidence has been reported to range from 0.2 to 0.3% [1, 2]. The cause of constrictive pericarditis is uncertain, but it is generally considered that injured pericardium, pericardial bleeding, iced saline solution for topical cooling, irrigation with povidone iodine, air drying or chemical exposure may cause pericarditis [1]. In addition, this condition may be the result of an immune response or a viral infection. Common effusive constrictive pericarditis with pericardial effusion exhibits pericardial effusion around the whole heart. Local capsulated effusion, such as that observed in this case, is extremely rare. In this case, the effusion was initially considered to be a cystic lesion that grew gradually during the late postoperative period. CT revealed a sharply-defined lesion with a regular border, and the internal structure was even without contrast effect. The T1WI MR image showed low signal intensity and the T2WI revealed high signal intensity, suggesting that the lesion contained a liquid rather than a solid component. Hematomas sometimes show uneven and mosaic signals because the signal depends on the stage of the hematoma. Most tumors exhibit a contrast effect and the internal component is usually inhomogeneous [4]. Therefore, it is relatively easy to distinguish cystic lesions from others by CT and MRI. In this case, since thickening of the pericardium and epicardium was not clearly shown on preoperative CT and MRI, we considered that diastolic dysfunction was induced by compression of the cystic lesion. However, the intraoperative findings were thickening of the pericardium and epicardium, constrictive pericarditis. In brief, in a patient in which a tumor-like lesion compresses the RV and thickening of the pericardium is not clearly shown on CT or MRI, such as with this case, constrictive pericarditis can be masked. To avoid severe symptoms, including thickening of the pericardium and epicardium, when pericardial effusion or a cystic lesion in the pericardium are found, it is

At surgery, a median sternotomy was performed. The mass was broken before approaching the heart and was filled with transparent yellowish fluid. Cystic mass formation was located anterior and inferior to the RV and extended to the main PA and was covered by a thickened fibrous tissue, pericardium and epicardium. The right ventricular surface was covered with a thick, white epicardium because the pericardium was left open at the previous surgery. The RV showed signs of constriction; therefore, constrictive pericardium and epicardium were found, it is
important to suspect constrictive pericarditis for early diagnosis.

References


