

## **Constrictive Pericarditis with Atrial Septal Defect**

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**We report on a case of constrictive pericarditis (CP) with atrial septal defect (ASD) in a 50-year-old man. The combination of CP with ASD is rare and occasionally difficult to diagnose. Transthoracic echocardiography demonstrated ASD, but the finding of a thickened pericardium was poor. Diagnosis was confirmed by cardiac catheterization. Pericardiectomy and direct closure of ASD was performed during cardioplegic arrest under the support of cardiopulmonary bypass. The postoperative course was uneventful with marked improvement in symptoms.**

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**Key words:** constrictive pericarditis, atrial septal defect

### **Introduction**

The combination of constrictive pericarditis (CP) with atrial septal defect (ASD) is rare and occasionally difficult to diagnose. There are a few case reports of this combination, and these reports can possibly be clinically misleading.<sup>1–3)</sup> The exact diagnosis of CP is difficult even with modern imaging technique, such as echocardiography (ECG), computed tomography (CT) and magnetic resonance imaging (MR).<sup>4)</sup> We report a case of CP with ASD, in which echocardiography diagnosis of CP was difficult. CT and cardiac catheterization revealed definitive diagnosis of CP.

### **Case Report**

A 50-year-old man whose symptoms included fatigue and leg edema was admitted to hospital with CP with ASD, which was found by chest radiography and transthoracic echocardiography in another neighboring hospital. Physical examination revealed distended neck veins and the

presence of Kussmaul's sign. A chest X-ray showed mild cardiac enlargement with a cardiothoracic ratio of 0.58, and calcification on the anterior, posterior, and inferior parts of the cardiac silhouette. Transthoracic echocardiography demonstrated ASD, but the findings of a thickened pericardium was poor. CT showed a calcified and thickened pericardium and ASD (Fig. 1). A cardiac catheterization was performed to confirm the diagnosis. This revealed an early diastolic dip of right ventricular pressure and an oxygen step-up in the right atrium. The ratio of pulmonary blood flow and systemic blood flow was 2.42.

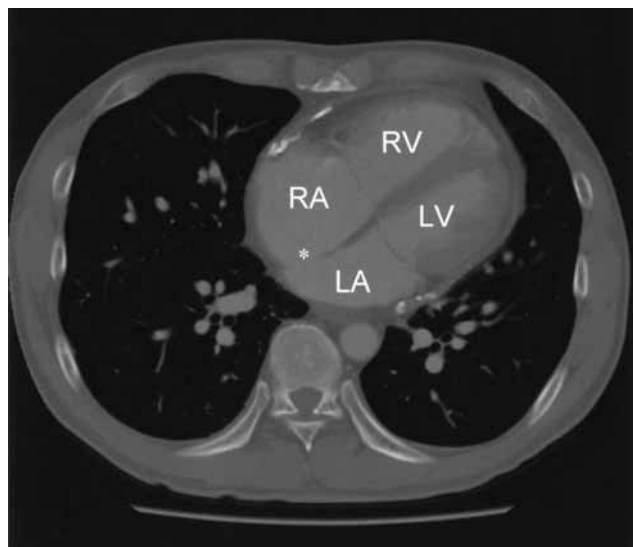
The patient was placed in a supine position. Anaesthesia was done with a standard intravenous technique with fentanyl, midazolam, and pancuronium for muscle relaxation. Median sternotomy was performed. The pericardium showed generalised thickening with calcification at the anterior and inferior parts. Adhesions were moderate to severe. After a pericardiectomy of the anterior part of the fibrotic and calcified pericardium (Fig. 2), a cardiopulmonary bypass was instituted using a heart-lung machine which consisted of a roller pump and a membrane oxygenator. Cannulation for cardiopulmonary bypass was undertaken with a separate superior and inferior venae cavae cannulae, returning the oxygenated blood to the ascending aorta with an arterial cannula. A venting tube was inserted into the left ventricle from the right pulmonary vein. After cross-clamping the ascending aorta, car-

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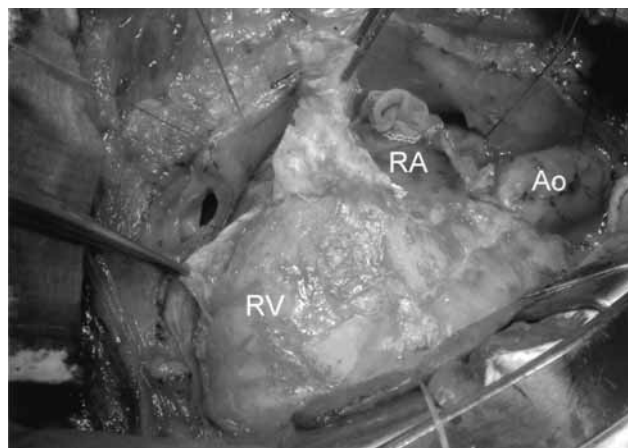
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**Fig. 1.** Computed tomography (CT) findings showed a calcified and thickened pericardium and atrial septal defect (ASD). RA, right atrium; RV, right ventricle; LA, left atrium; LV, left ventricle; \*, ASD.



**Fig. 2.** Operative findings showed a pericardiectomy of the anterior part of the fibrotic and calcified pericardium. RV, right ventricle; RA, right atrium; Ao, ascending aorta.

diac arrest was achieved by cold crystalloid cardioplegia. The atrial septal defect (fossa ovalis type) was found through the right atriotomy. The defect size was 35×15 mm. Direct closure of the defect was performed. No other cardiac anomalies were found. After closure of the right atriotomy, a pericardiectomy of the left side of heart was performed under cardiac arrest. Heart beating recovered with sinus rhythm spontaneously after releasing the aortic cross-clamp, and the weaning from cardiopulmonary bypass was smooth. A right side pericardiectomy was then performed. The cardiopulmonary bypass time was 104 minutes and the aortic cross-clamp time was 46 minutes. A blood transfusion was not performed. Central venous pressure decreased from 16 mmHg to 5 mmHg and pulmonary capillary wedge pressure decreased 18 mmHg to 8 mmHg after operation. The patient was extubated 5 hours after operation in the intensive care unit. The post-operative course was uneventful with marked improvement in symptoms.

## Discussion

We experienced surgical repair for CP with ASD in a 50-year-old man. This combination is very rare, and sometimes difficult to diagnose, since the signs of ASD may be masked by those of CP. CP cases have decreased, and

there may be cases in which this combination is overlooked. However, the recent advances in the diagnostic power of noninvasive examinations aid the exact diagnosis. Since surgical intervention is the only definitive treatment for these diseases, the exact diagnosis before operation is a necessity. In the present case, the calcification in chest radiography was initial suspicion of CP, and echocardiography diagnosis of CP was difficult. CT and cardiac catheterization revealed a definitive diagnosis of CP. ASD patients normally undergo operation by diagnosis based on echocardiography findings only. It is likely that CP may not be recognized before the ASD operation. The combination of CP with ASD is rare, but this possibility should be taken into consideration. An ASD patient has the possibility of complicating CP, whereas a CP patient has the possibility of complicating ASD or other cardiac anomalies. Divergent and various clinical examinations are necessary for the diagnosis of CP with or without other cardiac anomalies.

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