Massive Right Pleural Effusion and Ascites Caused by a Primary Constrictive Pericardial Band

A previously healthy 57-year-old woman with peripheral edema and exertional dyspnea had diminished right breath sounds and edema of both legs. Chest radiography showed massive right pleural effusion, and abdominal computed tomography showed ascites. During cardiac catheterization, pressure curves of both ventricles showed “dip-and-plateau” patterns. We diagnosed constrictive pericarditis and conducted pericardiectomy. During surgery, we found a thick fibrous pericardium surrounding the entire heart and a band of calcium in the atrioventricular groove. Histological examination of excised pericardial tissue showed fibrosis, hyalinization, and calcification, with thickening of \( \leq 18 \) mm. Cases of localized pericardial thickening, including constricting bands in the atrioventricular groove, are rare and many such complications occur postoperatively. We report a rare case of a primary constrictive pericardial band resulting in massive right pleural effusion and ascites. (Jpn J Thorac Cardiovasc Surg 2002; 50: 350–352)

Key words: primary constrictive pericarditis, constrictive pericardial band

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Constrictive pericarditis occurs when a fibrotic, thickened, adherent pericardium restricts diastolic heart filling. This typically results from symmetrical scarring that restricts uniform filling of all heart chambers. Rare localized pericardial thickening has been reported, including a constricting band in the atrioventricular groove. Many such complications occur postoperatively. We report a primary constrictive pericardial band resulting in massive right pleural effusion and ascites.

Case

On March 18, 2001, a previously healthy 57-year-old woman presented with peripheral edema and increasing exertional dyspnea. She was diagnosed with cardiac arrhythmia 4 years previously but received medication. On examination, her heartbeat was arrhythmic at 98 beats per minute and her blood pressure 120/80 mmHg. She also had diminished right breath sounds, a distended abdomen with fluctuation, and severe pitting edema of both legs. She was 162 cm tall and weighed 64 kg. Chest radiography showed massive right pleural effusion (Fig. 1), and electrocardiography showed atrial fibrillation with a right axis deviation of \(+103^\circ\). Blood tests showed hypoproteinemia and anemia, but no tumor markers except CA125 were elevated. Findings from antinuclear antibody and lupus erythematosus assays and a skin test with a purified protein derivative of tuberculin were negative.

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Received for publication October 31, 2001.
Accepted for publication February 22, 2002.
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Fig. 1. Chest radiography at admission showing massive right pleural effusion.
A right thoracostomy tube was inserted and pleural fluid was drained. The patient’s pleural effusion was a transudate that failed to grow bacteria or acid-fast organisms. Cytologic findings and adenosine deaminase activity were normal. Computed tomography (CT) of the chest showed massive right pleural effusion, and a pericardial calcification lay anterior to inferior along the right side of the heart. No mass was detected in the lung field, and mediastinal lymph nodes were not swollen. Abdominal CT showed massive ascites, but no tumor, including gynecological disease. Echocardiography showed the inferior vena cava was enlarged, without significant respiratory variation. After thoracocentesis and vigorous diuretic therapy, the patient’s pleural effusion and peripheral edema decreased, her body weight dropped from 64 to 48 kg, and her abdomen went from 90 to 70 cm.

During cardiac catheterization on April 9, pressure recordings (in mmHg) were as follows: right atrium, 13; right ventricle at the end of diastole, 14; pulmonary wedge, 10; and left ventricle at the end diastole, 15. Pressure curves of the left and right ventricles showed “dip-and-plateau” patterns. Endomyocardial biopsy findings were unremarkable. We diagnosed primary constrictive pericarditis, and conducted pericardiectomy on May 1.

During surgery, we found a thick fibrous pericardium surrounding the heart and a band of calcium in the atrioventricular groove, especially along the inferior surface of the right ventricle. After extracorporeal circulation was established, the parietal pericardium was dissected from the surface of both ventricles to the phrenic nerves, and the calcified band was removed.

Histological examination of the excised pericardium showed fibrosis, hyalinization, and calcification, with thickening of ≤18 mm (Fig. 2). The histopathologic diagnosis was chronic constrictive pericarditis.

The postoperative course was uneventful, and pleural effusion, ascites, and peripheral edema have not recurred. In cardiac catheterization May 18 (postoperative day (POD) 17), left ventricular end-diastolic pressure had decreased 3 mmHg and the right ventricular end-diastolic pressure was down 4 mmHg, but the dip-and-plateau pattern remained.

Discussion

The causes of constrictive pericarditis include tuberculosis, radiotherapy, mesothelioma, and previous surgery.1–5 This pericarditis usually results from symmetrical scarring that restricts the uniform filling of all heart chambers. Cases of localized pericardial thickening, including constricting bands in the atrioventricular groove, have been reported,5–8 but most were related to previous surgery. In our case, the patient was healthy prior to presentation and had none of the causative agents described above. Our patient thus presents a rare primary constrictive pericardial band unrelated to surgery.

Constrictive pericardial bands sometimes lead to right ventricular outflow obstruction or subpulmonic stenosis.5–7 During preoperative examination, we found no such obstruction, but transesophageal echocardiography during surgery showed deformation of the right ventricular inflow, relieved when the pericardial band was removed. The slope from dip to plateau of the intraoperative right ventricular pressure curve increased, suggesting that removing the constrictive band increased the blood flow from the right atrium to the ventricle. Our patient may thus have actually had a right ventricular inflow obstruction; if so, this caused the massive pleural effusion and ascites.

Conclusion

We identified a primary constrictive pericardial band resulting in massive right pleural effusion and ascites.

REFERENCES

1. Applefeld MM, Slawson RG, Hall-craigs M, Green