CASE REPORT

Protein-Losing Enteropathy as the Principal Manifestation of Constrictive Pericarditis

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Constrictive pericarditis represents a rare cause of protein-losing enteropathy resulting from intestinal lymphangiectasia. We report the case of a patient with an atypical clinical presentation of constrictive pericarditis and protein-losing enteropathy as its principal manifestation; he was successfully treated with pericardiectomy. We conclude that constrictive pericarditis should be considered in the presence of protein-losing enteropathy and also, protein-losing enteropathy should be considered in the differential diagnosis of hypoalbuminemia.

KEY WORDS: constrictive pericarditis; protein-losing enteropathy; heart magnetic resonance imaging; technetium 99m-labeled human serum albumin scintigraphy; intestinal lymphangiectasia; pericardiectomy.

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Protein-losing enteropathy is characterized by excessive loss of serum proteins into the gastrointestinal tract. It might be caused by a diverse group of disorders; among them, constrictive pericarditis results in elevation of central venous pressure, congestion of bowel wall lymphatic vessels, and direct leakage via the surface epithelium of plasma protein-containing lymph inside the intestinal lumen.¹ We describe the case of a patient with protein-losing enteropathy secondary to constrictive pericarditis, and conclude that constrictive pericarditis should be considered in the presence of protein-losing enteropathy and also, protein-losing enteropathy should be considered in the differential diagnosis of hypoalbuminemia.

CASE PRESENTATION

A 76-year-old man was admitted to the hospital because the mild dyspnea on exertion that he had for several years deteriorated during the last 2 months; he also reported the intermittent presence of pitting, painless edema of both lower extremities for almost 20 years for which he had not undergone any evaluation. The patient's right kidney had been excised 53 years ago because of tuberculous (TB) nephritis.

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There was an 18-year history of atrial fibrillation and congestive heart failure and an 8-month history of diabetes mellitus. His medications comprised digoxin, furosemide, acenocoumarol, and glibenclamide. On physical examination, the heart rhythm was irregular. Pulsus paradoxus, Kussmaul's sign, and pericardial knock were not present and the jugular veins were not distended. Breath sounds were absent over the lower third of both lungs. The liver was hard and descended 4 to 5 cm below the right costal margin; ascites was not present. Painless, pitting edema was present in the pretibial regions and ankles of both legs. Laboratory values on admission are shown in Table 1. Protein excretion in a 24-hour urine collection was estimated at 72 mg. An electrocardiogram showed atrial fibrillation with occasional premature ventricular complexes. A chest radiograph revealed enlargement of the cardiac silhouette and bilateral pleural effusions but no pericardial calcification. A computed tomographic (CT) examination of the abdomen showed enlargement of the liver. Diagnostic thoracentesis revealed that the pleural effusion was a transudate. A liver biopsy disclosed nonspecific findings; moderate fibrosis was present. Serologic tests for the presence of IgA endomysial antibodies, anti-tissue transglutaminase antibodies, and anti-gliadin antibodies yielded negative results.

The presence of hypoproteinemia in the absence of renal or liver disease or malnutrition suggested the diagnosis of protein-losing enteropathy. Upper endoscopy was performed, and histopathologic examination of random biopsies obtained from the duodenum revealed markedly dilated lymphatics, compatible with intestinal lymphangiectasia (Fig. 1). Technetium 99m-labeled human serum albumin scintigraphy showed loss of the radionuclide inside the intestinal lumen (Fig. 2). We suspected the presence of constrictive pericarditis and thus performed transthoracic and transesophageal cardiac ultrasonographic study, which disclosed nonspecific findings. Nevertheless, CT examination of the heart showed increased thickness and extensive calcification of the pericardium and a minor pericardial effusion (Fig. 3); magnetic resonance imaging (MRI) study disclosed similar findings (Fig. 4). Right-sided cardiac catheterization showed dip-platform of left and right

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Table 1. Laboratory Findings on Admission and 4 months After Pericardiectomy

Variable	On Admission	4 months After Pericardiectomy	Normal Range
Hematocrit (%)	32.6	38.0	40.0–52.0
Hemoglobin (g/dL)	10.5	12.2	14.0–18.0
Mean corpuscular volume (fL)	61.4	73.8	80.0–99.0
Glucose (mg/dL)	143	140	75–115
Urea (mg/dL)	61	54	17–43
Creatinine (mg/dL)	1.1	1.2	0.81–1.44
Prothrombin time (s)	24.1	22.4	13–15
Total protein (g/dL)	4.8	7.7	6.6–8.3
Albumin (g/dL)	2.3	3.8	3.5–5.2
Total cholesterol (mg/dL)	170	170	120–200
Triglycerides (mg/dL)	420	160	50–150
Ferritin (ng/mL)	6	190	15–300

ventricular pressure curves with diastolic equilibrium, while the ejection fraction was within normal limits. This combination of imaging and hemodynamic findings established the diagnosis of constrictive pericarditis. Pericardiectomy was performed, and histologic examination confirmed the diagnosis of constrictive pericarditis. The patient had an uneventful postoperative recovery and was discharged from the hospital on the sixth postoperative day; at that time, his symptoms and signs had already shown significant improvement.

In a follow-up examination 4 months later, the patient reported no symptoms; lower-extremities edema and pleural effusions had completely resolved. Laboratory values had almost normalized—including the microcytic anemia that was likely caused by iron malabsorption—and are shown in Table 1.

DISCUSSION

Diagnosis of protein-losing enteropathy in our patient was based primarily on technetium 99m-labeled human serum albumin scintigraphy. This examination allows the exact localization and quantitation of protein loss, and can also be used to monitor response to therapy.² In follow-up examination, our

FIGURE 1. Histopathologic examination of multiple random biopsies of the intestinal mucosa obtained from the duodenum revealing markedly dilated lymphatics in the submucosa (arrows).

FIGURE 2. Technetium 99m-labeled human serum albumin scintigraphy showing loss of the radionuclide inside the intestinal lumen (arrows).

patient exhibited significant amelioration of anemia, hypoalbuminemia, and hypertriglyceridemia, indicating at least partial resolution of intestinal lymphangiectasia.³

Constrictive pericarditis results from scarring of the pericardium with consequent loss of its elasticity; in 33% to 42% of cases no cause is identified.^{4,5} Given the prior history of TB nephritis, we considered the diagnosis of TB pericarditis in our patient; nevertheless, pericardial biopsy, the most sensitive test for the diagnosis of TB pericarditis, showed no such evidence.⁶

Constrictive pericarditis typically presents with chronic insidious signs and symptoms, and its recognition still comprises a major challenge.^{7,8} Our patient showed symptoms of decreased cardiac output only a few months before his admission. Among the main clinical findings of constrictive pericarditis (Table 2), our patient exhibited only peripheral edema and pleural effusion that were initially attributed to hypoalbuminemia per se.⁹

FIGURE 3. Computed tomographic examination of the heart showing extensive calcification of the pericardium (arrows).

FIGURE 4. Magnetic resonance imaging study of the heart disclosing increased thickness of the pericardium, a minor pericardial effusion, and distortion of the left ventricle (arrows).

Noninvasive cardiac imaging techniques have had a striking impact on the evaluation of pericardial disorders. Computed tomography is able to detect pericardial calcifications that are often helpful to make the diagnosis of constriction.^{10,11} Magnetic resonance imaging exhibits superb contrast resolution and multiplanar capability, thus providing an exact evaluation of the pericardium thickness; it is currently the imaging diagnostic procedure of choice for the detection of constrictive pericarditis.^{10–12} Nevertheless, the diagnosis cannot generally be established with certainty by noninvasive methods. Additional information from cardiac catheterization is still needed for the diagnosis of constriction.¹³ Association of characteris-

tic hemodynamic changes and abnormal pericardial thickness > 3 mm confirms the diagnosis of constrictive pericarditis.¹⁴

The definitive treatment of constrictive pericarditis is surgical removal of the pericardium. Although medical treatment may temporarily alleviate symptoms, patients do poorly without pericardiectomy.¹⁵ Nowadays, the vast majority of patients with constrictive pericarditis can be operated on safely, and can achieve improvement in functional class and a favorable impact on the natural history of this debilitating condition.^{15–18}

In conclusion, we must emphasize again that constrictive pericarditis should be considered in the presence of protein-losing enteropathy and also, protein-losing enteropathy should be considered in the differential diagnosis of hypoalbuminemia.

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Table 2. Main Clinical Findings of Patients with Constrictive Pericarditis⁹

Distended jugular veins
Peripheral edema
Pleural effusion
Hepatomegaly
Ascites
Splenomegaly
Hypotension with low pulse pressure
Kussmaul's sign
Prominent x and y waves of the internal jugular pulse
Pulsus paradoxus
Pericardial knock
Reduced apical pulse
Muscle wasting