

Eggshell Calcification in Progressive Constrictive Pericarditis

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A 44-year-old man presented with worsening dyspnea and pedal edema over the past 3 months. He was diagnosed with hypertension 14 years ago and has been undergoing regular hemodialysis for 11 years due to end-stage renal disease (ESRD). His blood pressure was 100/64 mmHg, pulse rate was 86 bpm, and respiratory rate was 18/min. Physical examination revealed distended neck veins, regular heartbeats without a cardiac murmur, and grade 3 pitting edema in both lower legs. An electrocardiogram revealed sinus rhythm with a rate of 86 bpm. Chest radiography showed extensive calcification along the cardiac border (Fig. 1A) and left pleural effusion. Transthoracic echo-

cardiography revealed normal left ventricular systolic function but also showed septal bouncing, biatrial enlargement, and “annulus inversus,” which is a reversed ratio of septal and lateral annular myocardial velocities in early diastole (Fig. 1B, 1C). These findings suggest the presence of constrictive pericarditis (CP). Computed tomography (CT) revealed that the heart was encased by a severely calcified pericardium (Fig. 2A). Interestingly, an abdominal CT scan performed 11 years earlier when the patient started dialysis showed pericardial thickening but no calcification (Fig. 2B). Preoperative fluoroscopic imaging showed an extensive “eggshell” calcification of pericardium (Fig. 1D).

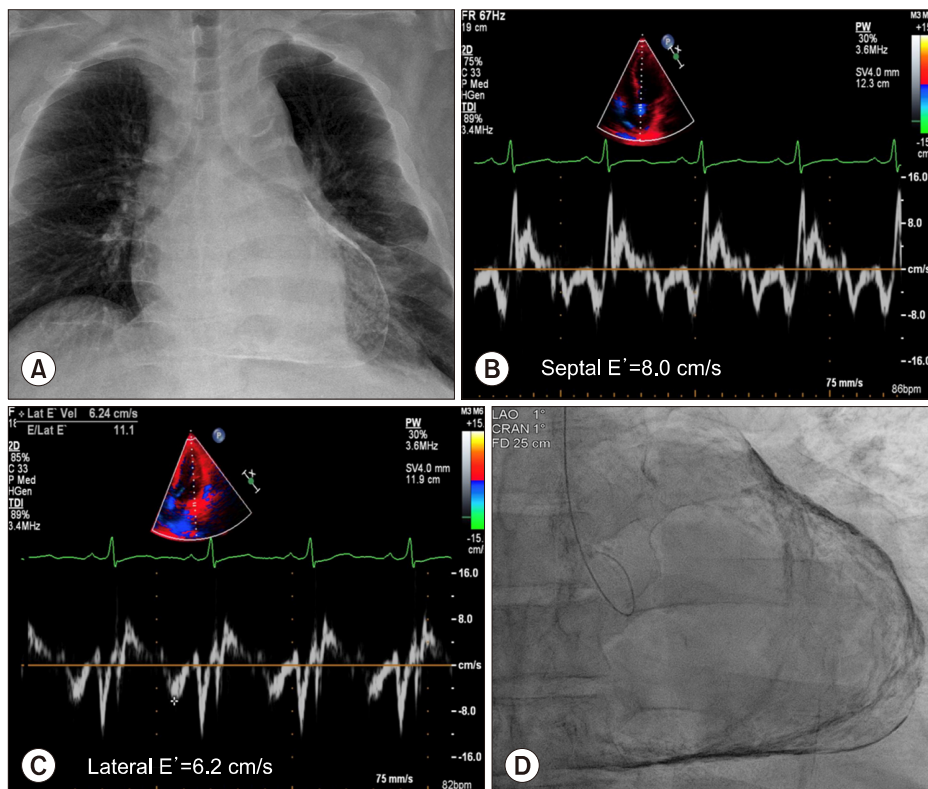


FIG. 1. (A) A chest radiograph showing extensive pericardial calcification. Doppler echocardiography demonstrating “annulus inversus,” a reversed ratio of (B) septal (8.0 cm/s) and (C) lateral (6.2 cm/s) annular myocardial velocities in early diastole suggesting pericardial constriction. (D) Fluoroscopic imaging showing an extensive “eggshell” calcification of pericardium.

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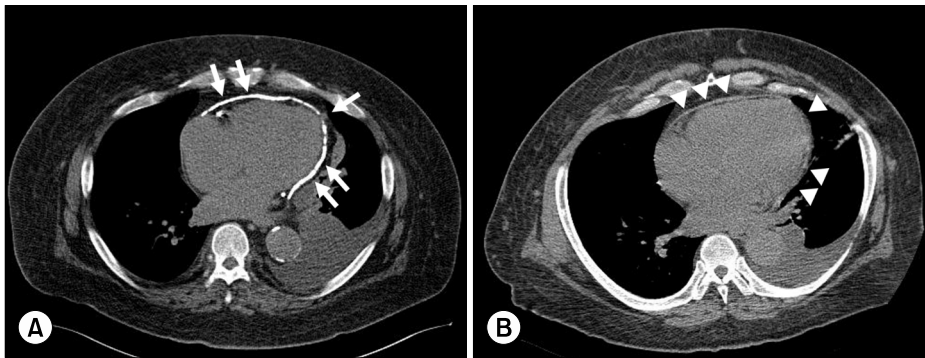


FIG. 2. (A) Computed tomography (CT) revealing severely calcified pericardium (arrows). (B) An abdominal CT scan taken 11 years earlier showing pericardial thickening without calcification (arrowheads).

Given these imaging and echocardiographic findings, the patient was diagnosed with CP with heavy calcification and underwent a successful radical pericardiectomy. Pathologic examination revealed fibrous tissue with hyalinization and dystrophic calcification, which is consistent with CP. The patient has been doing well for over 1 year after surgery.

Pericardial diseases, including pericardial effusion and pericarditis, are not uncommon cardiac complications in patients with chronic kidney disease (CKD). Pericarditis in patients with CKD can present as typical pericarditis, similar to pericarditis of other causes, accompanied by chest pain and fever. Constrictive pericarditis (CP) is a rare but most severe form of pericarditis, which manifests with nonspecific symptoms such as dyspnea and peripheral edema rather than inflammation-related symptoms, and sometimes can be challenging to diagnose. CP is thought to occur as a sequel after acute, effusive, or hemorrhagic pericarditis, and it can occur without any specific preceding factors.¹ It had been reported that 3.7-12.1% of dialysis pericarditis progresses to CP.² The exact mechanism of uremic pericarditis is not well understood, but it is believed to be caused by inflammation of the pericardium due to the accumulation of toxins related to uremia, altered calcium metabolism, hyperparathyroidism, and hyperuricemia.³ For patients with uremic and dialysis-associated pericarditis, starting or intensifying dialysis is an important treatment

method for removing the causative uremic toxins.⁴ For CP, complete pericardiectomy is the definitive treatment and should be performed in conjunction with treatment for the underlying cause. This patient had subclinical uremic pericarditis with pericardial thickening before starting dialysis and had progressed to symptomatic CP with heavy calcification during 11 years of dialysis treatment. Patients with CKD or those on dialysis should be recognized as a population at risk for developing CP, and diagnostic tests and appropriate treatment should be performed if symptoms are suspected.

CONFLICT OF INTEREST STATEMENT

None declared.

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