

## Case Report

# Successful Management of Massive Hemopericardium Secondary to Uremic Pericarditis: A Case Report

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### ABSTRACT

Uremic pericarditis is a major complication of acute or chronic end-stage renal disease (ESRD). A significant cause of morbidity and mortality in most hemodialysis programs, uremic pericarditis can occur before dialysis or on dialysis. The causes of uremic and dialysis pericarditis remain uncertain. Accurate hemodialysis and pericardiocentesis result in marked improvements. The diagnosis of uremic pericarditis, in addition to other causes such as idiopathic, malignant, coagulopathy, and tuberculous pericarditis, should, therefore, be considered in the differential diagnosis for cases presenting with hemorrhagic pericardial effusion. Here, we describe a 50-year-old man, who presented with shortness of breath and altered levels of consciousness of 5 days' duration with a history of hypertension, diabetes, and ESRD on hemodialysis over the past 5 years. The patient was admitted to our hospital with a diagnosis of acute massive hemopericardium secondary to uremic pericarditis after staining and cytology detected an exudate pericardial effusion despite no evidence of infection (eg, tuberculosis) or malignancy. He was admitted into the intensive care unit and successfully managed with hemodialysis and pericardiocentesis. (*Iranian Heart Journal 2021; 22(3): 119-122*)

**KEYWORDS:** Uremic pericarditis, Hemopericardium, End-stage renal disease, Hemodialysis, Pericardiocentesis

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Uremic pericarditis and dialysis pericarditis are among the complications of acute or chronic end-stage renal disease (ESRD). They can occur before dialysis or on dialysis and beget life-threatening complications such as hemopericardium. The incidence of uremic pericarditis was high in the past and was associated with a high mortality rate. Richard Bright in 1836 reported the first cases of uremic pericarditis in postmortem studies. The prevalence of uremic pericarditis used to range from 3% to 41%;

then it dropped to about 5% to 20% and in the recent decades, to less than 5%.<sup>9, 10</sup> The pathogenesis of uremic pericarditis remains unclear. Here, we report a case of massive hemopericardium secondary to uremic pericarditis that was successfully managed with hemodialysis and pericardiocentesis.

### Case Report:

A 50-year-old man presented to the emergency department with an altered mental status and shortness of breath of 5 days' duration with a history of hypertension,

diabetes, and ESRD on hemodialysis over the past 5 years. On examination, the patient was afebrile, while his Glasgow coma scale score was 12/15. He had a heart rate of 90 bpm, a blood pressure of 160/100 mm Hg, a respiratory rate of 30 breaths per minute, and an oxygen saturation level of 90% on room air. He had no jugular venous distention. Cardiovascular examinations were unremarkable. Laboratory studies revealed a white blood cell count of 18.5x, a hemoglobin level of 7.5 mg/dL, a platelet count of 216x, a serum potassium level of 7.0 mmol/L, a sodium level of 149 mmol/L, and a blood urea level of 330 mg/dL, while the creatinine and uric acid levels were 19.7 mg/dL and 18.7 mg/dL, respectively. The arterial blood gas analysis revealed marked metabolic acidosis (pH =7.1, HCO<sub>3</sub><sup>-</sup> =5.6 mmol/L) and hypoxemia (SO<sub>2</sub> =72%). The remaining electrolytes, liver function tests, and coagulation studies were normal. A chest X-ray revealed cardiomegaly (Fig. 1-A), and echocardiography demonstrated a massive

pericardial effusion (Fig. 2-A). The patient was admitted to the intensive care unit and received hemodialysis. On the next day, the cardiologist performed ultrasound-guided pericardiocentesis to identify the etiology and type of the pericardial effusion and to improve the patient's condition. Pericardiocentesis resulted in the removal of 1500 mL of a bloody fluid. The patient exhibited hemodynamic improvements, and he managed to return to his daily activities. The pericardial fluid analysis, staining, and cytology detected an exudate pericardial effusion, but there was no evidence of infection (eg, tuberculosis) or malignancy. On day 3, the patient returned to the cardiology department, where he underwent a follow-up echocardiogram and chest X-ray. The results showed a minimal pericardial effusion with no cardiomegaly (Fig. 1-B & Fig. 2-B). On day 5, the patient was discharged, and he was able to return home on foot with a plan of routine hemodialysis 3 times per week.



Figure-1-A

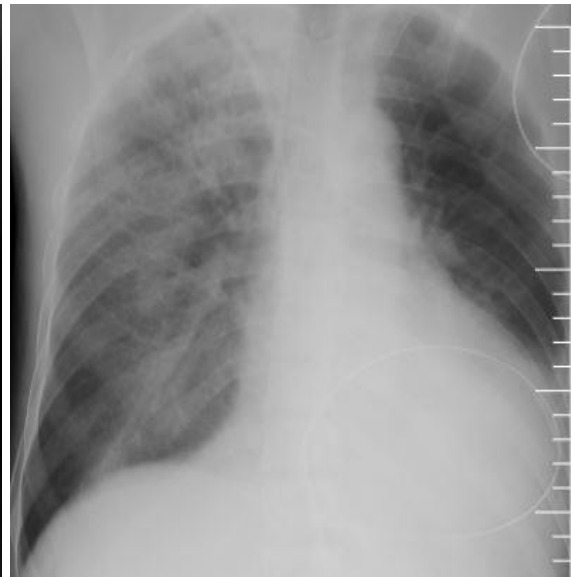


Figure-1-B

**Figure 1.** Posteroanterior (PA) chest X-ray reveals an increased cardiothoracic ratio (cardiomegaly) and no pleural effusion (panel A). PA chest X-ray after hemodialysis and pericardiocentesis shows no cardiomegaly and no pleural effusion.

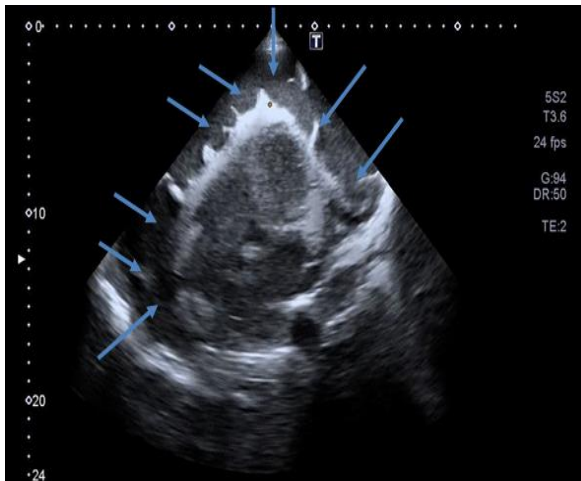


Figure-2-A



Figure-2-B

**Figure 2.** Echocardiography before hemodialysis and pericardiocentesis reveals a massive pericardial effusion (blue arrows on panel A). On panel B, the follow-up echocardiogram shows a minimal pericardial effusion.

## DISCUSSION

Uremic pericarditis is a significant complication of acute or chronic ESRD that can occur before dialysis or on dialysis.<sup>4</sup> ESRD is one of the common causes of pericardial diseases and induces huge pericardial effusion in 20% of patients. Two types have been reported: uremic pericarditis, which may occur in 35% to 50% of patients with chronic renal failure on predialysis, and dialysis-associated pericarditis, which accounts for 8% to 12% of patients after the commencement of dialysis.<sup>1, 2</sup>

Large pericardial effusions can mostly be exudates, transudates, hemopericardium, or pyopericardium.<sup>5</sup>

Hemopericardium may be idiopathic or iatrogenic (eg, postsurgical) or it may be due to neoplasms, uremic pericarditis, post-trauma, tuberculosis, myxedema, or aortic dissection.<sup>6</sup> In the present case, the patient was diagnosed with hemopericardium secondary to uremic pericarditis.

Dad et al<sup>7</sup> reported that between 70% and 100% of their patients with uremic or

dialysis pericarditis had asymptomatic pericardial effusion, likely due to either pericarditis or volume overload. In our case, the patient presented with an altered level of consciousness and shortness of breath of 5 days' duration due to hemopericardium secondary to uremic pericarditis.

The pathogenesis of uremic pericarditis remains unclear. Although pericardiocentesis is related to significant mortality and morbidity, including pneumothorax, pneumoperitoneum, costochondritis, and myocardial punctures, uremic pericarditis can be easily diagnosed and managed even if it causes large pericardial effusions or tamponade in patients with chronic renal diseases with or without dialysis.<sup>8</sup> Our patient had signs of uremic pericardial effusion secondary to uremic pericarditis, and he remained symptomatic until he was treated via hemodialysis with pericardiocentesis.

In conclusion, this case report emphasizes the importance of the early diagnosis and awareness of hemopericardium secondary to uremic pericarditis as the crucial elements of successful management with dialysis and

pericardiocentesis to avoid such rare complications even in asymptomatic adults with ESRD.

### Conflict of Interest

We declare that we have no competing interests.

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