

# Atheroembolic Renal Disease In A Potentially High Risk Patient

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## Citation

Y Hung. *Atheroembolic Renal Disease In A Potentially High Risk Patient*. The Internet Journal of Nephrology. 2005 Volume 3 Number 2.

## Abstract

Cholesterol crystal embolism, sometimes separately designated as atheroembolism, is an increasing and still under-diagnosed cause of renal dysfunction antemortem in elderly patients. One-year mortality is over 60% in the symptomatic forms. We here present a lethal case of a 74 year old male presenting with PAOD, unknown cause of acute renal failure, and multiple pruritic erythematous plaques over trunk and limbs. He finally died of ischemic enterocolitis and diffuse atherosclerotic ulcers.

## INTRODUCTION

Atheromatous embolism is a systemic disease resulting from cholesterol crystal embolization in many organs, including the kidneys. Aging is predictive of poor prognosis. (1) Cholesterol emboli are a classic complication of atheroembolic disease and may mimic an inflammatory and multisystemic disease with renal, cardiac, pulmonary, digestive, neuropsychiatric, skin and muscle involvements due to ischemic phenomena leading to necrosis. (2,3)

One-year mortality is over 60% in the symptomatic forms. We present a lethal case of a 74 year old male presenting with PAOD, unknown cause of acute renal failure, and multiple pruritic erythematous plaques over trunk and limbs. He finally died of ischemic enterocolitis, and diffuse atherosclerotic ulcers.

## CASE REPORT

A 74 year old male presented with progressive cold and painful sensation over his right leg. He had a history of diabetes and hypertension without regular treatment and used to be a heavy smoker for decades. He began to suffer intermittent claudication 3 months before this admission that was first impressed as PAOD. The ensuing angiography revealed diffuse stenotic atherosclerotic lesions from abdominal aorta downstream to popliteal arteries, especially right side. He received the operation of axillo-femoro-popliteal bypass a few days later and was discharged in a stable condition. During hospitalization BUN was 29 and serum creatinine was 1.5 mg/dl. One month later he was readmitted on account of progressive cold and painful

sensation over the right leg. In the meantime elevated serum creatinine (8.4 mg/dl) and BUN (84 mg/dl) were found and complicated with fluid overload and pulmonary edema that was treated effectively with forced diuresis initially. Other laboratory data showed CBC: WBC, 18900/cumm; Hb, 12.7 g/dl; Plt, 112 K/cumm; DC, Neut/Lym/Eosino 64/16/9. The kidney sonogram revealed borderline echogenicity of both kidneys and normal size, RK=LK=9.5 cm.

Renal biopsy was performed for unknown cause of acute renal failure and the pathological examination showed Cholesterol emboli are seen as empty spaces where the cholesterol crystals have been dissolved by routine processing. The empty spaces of cholesterol crystals in the interlobular artery were surrounded by the organized fibrotic tissue.

Intermittent hemodialysis was performed later because of reappearance of pulmonary edema that responded poorly to diuresis. After all, he was discharged without long-term dialysis and the serum creatinine was 5-6 mg/dl.

Unfortunately, one month later he was admitted again for right toes gangrene that was amputated immediately. The BUN/Cr was 124/8.5 mg/dl. HD was done on account of decreased urine amount and pulmonary edema with poor response to diuretics. Meanwhile multiple pruritic erythematous plaques over trunk and limbs were found and the pathologic examination of skin biopsy showed PMNs and eosinophils infiltration.

Abdominal CT scan was done for abdominal pain and suspicion of ischemic bowel disease and revealed poor

enhancement of renal parenchyme, smaller caliber of superior mesenteric vein than that of its arterial counterpart, suggesting high risk for ischemic enterocolitis, and diffuse atherosclerotic ulcers. After two weeks' hospitalization in the last admission, he died in spite of supportive management.

### DISCUSSION

Cholesterol crystal embolism, sometimes separately designated as atheroembolism, is an increasing and still under-diagnosed cause of renal dysfunction antemortem in elderly patients. (3) Renal atheroembolic disease is a difficult and controversial diagnosis for the protean extrarenal manifestations of the disease. In the past, the diagnosis was often made postmortem. However, in the last decade, awareness of atheroembolic renal disease has improved, enabling us to make a correct premortem diagnosis in a number of patients. Correct diagnosis requires the clinician to be alert to the possibility. (3,4) Cholesterol emboli are being increasingly recognized as an important cause of renal dysfunction in an aging US population. Irregularly shaped atheroemboli typically cause partial obstruction of small renal vessels resulting in ischemia. A vasculitis-like picture often evolves with an inflammatory reaction and giant cell formation. (4)

Our case presented initially with acute renal failure, hypereosinophilia and mild thrombocytopenia. The kidney sonogram revealed borderline echogenicity of both kidneys and normal size. Initial differential diagnosis may include thrombotic microangiopathies (5), acute interstitial nephritis (6,7) and atheroembolic renal disease. (8) However, histologic examination of biopsy of kidney or skin revealed extensive atheroembolic in the vasculature and there was no evidence of vascular or tubulointerstitial inflammation. Therefore, renal biopsy is very helpful in the case of such presentation.

Cholesterol emboli may be temporally related to vascular manipulation, anticoagulant, or thrombolytic drug use. (4) Although cholesterol crystal embolization can occur spontaneously, it is increasingly recognized as an iatrogenic complication from an invasive vascular procedure, such as manipulation of the aorta during angiography or vascular surgery, and after anticoagulant and fibrinolytic therapy. (3)

This case of renal cholesterol atheromatous embolism was confirmed by tissue examination. The risk factors for developing included underlying diabetes and hypertension, smokers, vascular surgery.

Therapy is supportive with particular emphasis on management of hypertension and hypercholesterolemia. (4) The combined therapy by use of corticosteroids and plasma exchange had been proposed (9) However there is still no consensus till now.

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