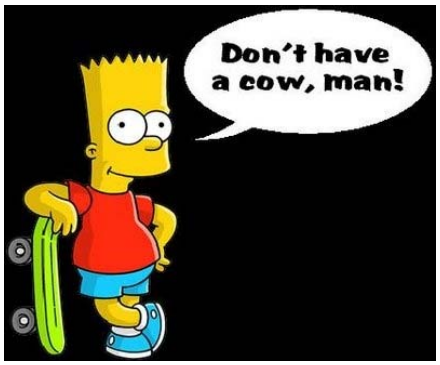


HOLY C.O.W.!

IT'S...

Clinical Question of the Week #8
August 18th, 2008 through August 25th, 2008

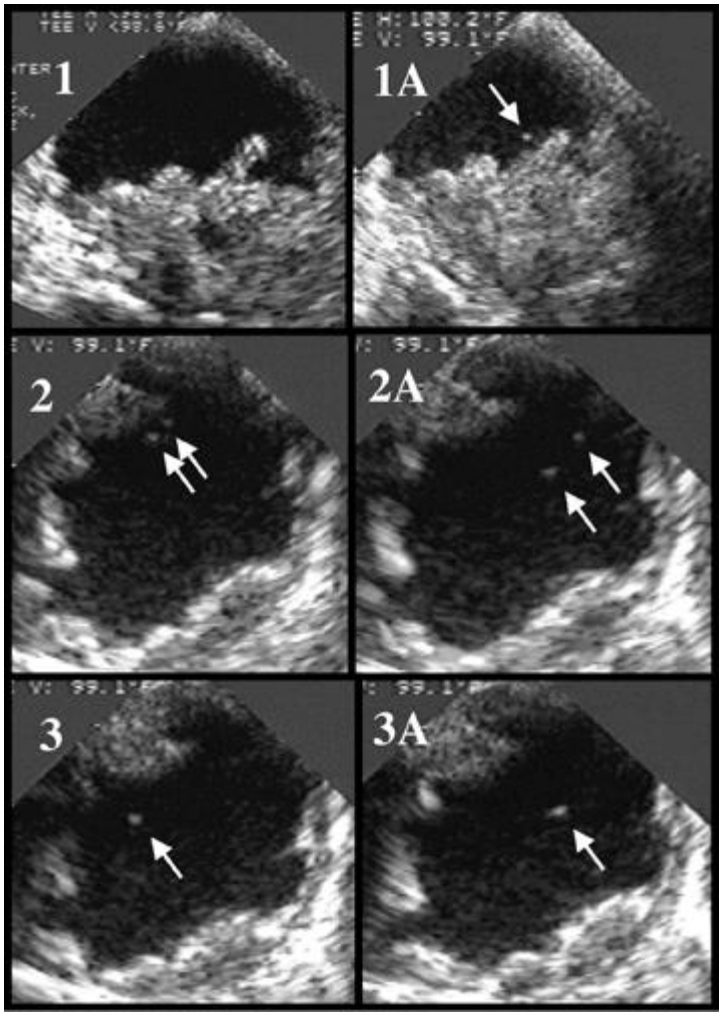
Please e-mail your answers to Kuo, Tim, Wendy, and Kevin (klian@mednet.ucla.edu; tprovias@mednet.ucla.edu; wsimon@mednet.ucla.edu; kbreger@mednet.ucla.edu) by 0800 on Monday, August 25th, 2008. The resident or intern with the most correct answers at the end of each month will receive a prize!

Case: A 71-year-old man with a history of hypertension and dyslipidemia presents for a new to doctor visit at IMS, two weeks after a recent right hemiarthroplasty, which was complicated by NSTEMI. During the hospitalization, the patient underwent coronary angiography and a stent was placed in the distal right coronary artery after an occlusion was found. His post-operative course has been otherwise unremarkable, he has been feeling well, and has had no significant complications from his NSTEMI. On review of systems, the patient reports occasional headache and muscle aches. He has also noticed mottled and spotty appearing skin changes, which he attributed to being anemic from the surgery. Physical exam reveals the finding on fundoscopic exam, shown below. Labs are obtained in clinic, which reveal WBC 10.2 (55% neutrophils, 30% lymphocytes, 5% eosinophils, and 3% monocytes), Hb 10.8, and plts 267. Chemistries are notable for a mild increase in his creatinine to 1.2, up from 0.8 noted a few months ago.

Questions:

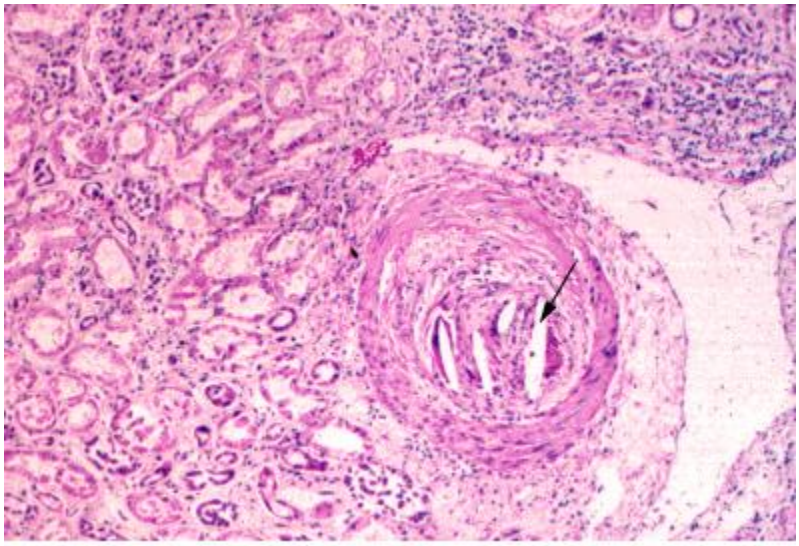
1. **What is the diagnosis?**
   Atheroembolism (also known as cholesterol crystal embolism or cholesterol embolism) is a complication of significant aortic atherosclerotic disease, which results in multiple small artery occlusions from small pieces of atheromatous plaque break off. It is a separate phenomenon from aortic ***thrombo***embolism, which results in medium or large artery occlusions leading to stroke, TIA, renal infarction, intestinal infarction, or limb ischemia.

Below is a series of TEE images that reveals small atheroemboli actually flying off of a large thoracic aortic plaque.



Transesophageal echocardiogram of the descending thoracic aorta in a patient who later died from cholesterol crystal embolization syndrome, with intestinal infarction and renal failure. Note the massive atherosclerotic plaque. Freedberg, RS, Tunick, PA, Kronzon, I. Emboli in Transit: The Missing Link. J Am Soc Echocardiogr 1998, 11:826. (*UpToDate*)

The incidence atheroembolization is relatively low and is fairly uncertain, with estimates ranging from 0.4-12%. Approximately 50-60% of cases are spontaneous; iatrogenic causes including angiography (85% iatrogenic cases) and surgery. Anticoagulation has also been implicated, although the risk appears to be low. Cholesterol clefts are the classical pathology finding, demonstrated below on a renal biopsy section. Diagnosis is based on high index of clinical suspicion as the presentations of this condition are myriad. Fundoscopic evaluation and echocardiography may be instrumental in making the diagnosis. (0.5)



Light micrograph of an atheroembolus in a muscular renal artery showing cleft-like spaces (arrow) due to washout of the cholesterol crystals during histologic processing. Courtesy of Helmut Rennke, MD. (UpToDate)

2. **What are the risk factors for this condition?**
   Risk factors include the risk factors for atherosclerosis – the three major risk factors of which include smoking, hypertension, and age. Other risk factors include dyslipidemia, obesity, diabetes, generalized inflammation (elevated CRP), and angiographic/surgical vascular intervention. (1)

3. **What is the finding shown in the image?**
   Hollenhorst plaques, which are cholesterol crystals in the retinal arteries, may be seen on fundoscopic evaluation in approximately 6-10% of patients, and are highly indicative of the diagnosis. The finding is named after Dr. Robert Hollenhorst (1913- 2008), an ophthalmologist at Mayo Clinic who first described the crystal plaque in 1961 (Hollenhorst RW. "Significance of bright plaques in the retinal arterioles". *JAMA 1961* **178**: 23-29). (0.5)

4. **Other than the finding above, name three other manifestations of this condition.**
   General symptoms may include fever, myalgias, headache and weight loss. Skin manifestations include the classic “blue toe syndrome,” although this is uncommon. More common skin findings include livedo reticularis (16%), gangrene (12%), cyanosis (10%), ulceration, purpura, and painful erythematous nodules (each less than 10%). Acute renal failure is a common manifestation resulting from crystal embolization, which may result in an incremental stuttering decrease in renal function. Rare manifestations include gastrointestinal involvement, necrotizing pancreatitis, focal hepatic necrosis, and acalculus necrotizing cholecystitis. (1)