Cholesterol crystal embolism: Diagnostic and treatment

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To the Editor: In his recent in-depth review of cholesterol crystal embolization syndrome (CCE), Meyrier has delineated the pathogenesis, differential diagnoses, and therapeutic aspects of CCE. In addition to therapeutic measures of paramount importance such as restriction of further intravascular interventions, stop of anticoagulation, and treatment of renal insufficiency with dialysis, we would like to add the possibility of performing renal transplantation in selected CCE cases with end-stage renal disease and stable clinical course after diagnosis of CCE. We have previously reported a patient with CCE successfully undergoing renal transplantation. According to the best of our knowledge, there are so far no other published cases of the renal transplantation after CCE-induced end-stage renal disease.

Briefly, a 63-year-old patient with a high load of atherosclerotic risk factors (heavy smoker, hypertension 160/80–180/100 mm Hg, severe hyperlipidemia (triglycerides up to 500 mg/dl; low-density lipoprotein cholesterol up to 240 mg/dl)) suffered from end-stage renal disease owing to cholesterol emboli after coronary angiography because of symptomatic coronary artery disease in October 1997. Within 1 week, the patient developed renal failure necessitating hemodialysis since December 1997. Smoking cessation, effective control of blood pressure (<130/80 mm Hg), and serum lipids (low-density lipoprotein cholesterol <100 mg/dl) was achieved and maintained until successful renal transplantation from a living related donor in 1998. Until his last follow-up in May 2006, kidney function has remained stable with a current serum creatinine level of 1.28 mg/dl, corresponding to a calculated creatinine clearance of 60 ml/min. Serum lipids have remained normalized with diet and pravastatin therapy (40 mg/day) with total cholesterol levels of about 187 mg/dl and low-density lipoprotein cholesterol levels of about 120 mg/dl as well as normotensive blood pressure levels have been achieved with losartan, doxazosin, nitrrendipin, and nebivolol combined antihypertensive therapy, and the patient refrained from smoking.

In conclusion, secondary prevention of CCE, that is, rigid long-term control of the underlying atherosclerotic risk factors may enable a selected subgroup of patients with CCE to undergo successful renal transplantation with excellent long-term patient and graft survival.

Response to ‘Cholesterol crystal embolism: Diagnostic and treatment’

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Kryoshey et al.’s experience with renal transplantation to treat end-stage renal disease following cholesterol crystal embolism to the kidney is quite interesting. That renal replacement was not complicated by relapse of cholesterol crystal embolism on the transplant confirms the interest of stabilizing atherosclerotic plaques with statins, as already shown by Scolari et al. However, patients with massive cholesterol crystal embolism do not die from renal failure but from vital organ injury, such as mesenteric and pancreatic ischemia. From this standpoint, the writers of this letter confirm the essential role of preventing cholesterol crystal embolism in patients at risk, that is, lifelong smokers with lipid disorders and widespread atherosclerosis.

Cardiac troponins and chronic kidney disease


To the Editor: We were interested in the recent paper by Kanderian and Francis in which they review hypothetical mechanisms contributing to the increase in serum troponin concentrations observed in chronic kidney disease (CKD). The work of Diris et al., who demonstrated fragments of the cardiac troponin T (cTnT) molecule ranging in size from 8 to 25 kDa in hemodialysis patients, is discussed. It is suggested...
that these fragments, which would normally be small enough to be cleared by glomerular filtration, accumulate in the circulation of patients with end-stage renal disease and crossreact in immunoassays for cTnT.

Recent evidence, unavailable to Kanderian and Francis when their paper was accepted, argues against this. Firstly, cTnT concentrations are significantly increased among patients with CKD long before end stage is reached (i.e. when significant glomerular filtration remains). Secondly, using a direct gel-filtration chromatography approach, we have shown that the form of cTnT circulating in dialysis patients and reacting in the commercial cTnT immunoassay is an intact, free form, identical in size to that observed among non-CKD patients following an acute coronary syndrome, with no evidence of smaller molecular weight fragments. Diris et al. used a complex analytical approach including the use of Western blotting, which is known to be susceptible to artifact.

Much work is needed before the pathophysiology underlying cardiac troponin increases in CKD is fully understood. However, it is important that this presentation is not dismissed as an artifact due to fragment accumulation: increases in CKD are real and predict death.

We thank Lamb et al. for bringing to our attention new data regarding the mechanism of elevated circulating troponin levels (cTnT) in patients with renal dysfunction. We were unaware of their recently published results. Their work indicates that it is the free-form cTnT that is being measured in patients with chronic kidney disease (CKD), identical in size to that of cTnT observed in non-renal disease patients, and not a smaller fragment of cTnT as suggested earlier by Diris et al. We agree that although the mechanism of altered cTnT levels in CKD is not fully understood, increased cTnT levels are consistently associated with an incremental change in morbidity and mortality, and cannot be dismissed as laboratory artifact.


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Differences between type I and II membranoproliferative glomerulonephritis

To the Editor: Little et al. recently analyzed post-transplantation recurrence risk in patients with membranoproliferative glomerulonephritis (MPGN). They found that age and crescents on initial biopsy determined this risk rather than the type of MPGN. The authors suggest that type II MPGN may not be very different from type I MPGN. However, it is evident that type I and II MPGN are pathologically and pathogenetically different entities. Likewise, membranous nephropathy and focal segmental glomerulosclerosis are totally different diseases, although the nephrotic syndrome rather than the diagnosis determines outcome. Crescents may be a common risk factor for recurrent disease, as has been suggested for immunoglobulin A-nephropathy. From the data we cannot retrieve if clinically silent recurrences of type II MPGN have been missed. Furthermore, the multivariate analysis did not include potential risk factors as repeated transplantation and living-related donor transplantation.

In our single-center studies, we noted significant differences between type I and II MPGN with regard to post-transplant recurrence. A recurrence of type I MPGN occurred in almost 50% of recipients and was invariably accompanied by clinically significant proteinuria. Increased risk of recurrence was observed with human lymphocyte antigen-identical living-related donor kidneys, the human lymphocyte antigen-B8DR3 haplotype, and repeated transplants. In contrast, all patients with type II MPGN who had been biopsied (11 of 13) showed a recurrence. Most recurrences were, however, clinically silent and required immunofluorescence or electron microscopy for diagnosis. Still, patients with type II MPGN had poor graft survival. Crescents in the original biopsy were not specific predictors.

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We thank Lamb et al. for bringing to our attention new data regarding the mechanism of elevated circulating troponin levels (cTnT) in patients with renal dysfunction. We were unaware of their recently published results. Their work indicates that it is the free-form cTnT that is being measured in patients with chronic kidney disease (CKD), identical in size to that of cTnT observed in non-renal disease patients, and not a smaller fragment of cTnT as suggested earlier by Diris et al. We agree that although the