

.017). Including perioperative events at 2 years, there were no differences between groups in ipsilateral stroke, any stroke, disabling stroke, death, or any stroke or death.

Comment: The study is interesting in that it suggests that the choice of CEA technique may influence periprocedural events but not long-term ipsilateral stroke or overall death. The limitations of this study are obvious: it used a nonrandomized post hoc analysis, with no information about why one CEA technique was chosen over the other, and lacked a blinded outcome assessment. The authors also note that an infinite hazard ratio confidence interval for ipsilateral stroke >30 days and the wide odds ratio confidence intervals for death rates indicate that, statistically, a substantial technique-dependent effect has not truly been ruled out by this study. Nevertheless, this was an independently monitored, multicenter study and therefore may have more generally applicable and accurate data than a single-center study.

Risk of Chronic Dialysis and Death Following Acute Kidney Injury

Wald R, Quinn RR, Adhikari NK, et al. *Circulation* 2012;125:585-93.

Conclusion: Survivors of acute kidney injury (AKI), even when dialysis is not required, remain at higher risk of chronic dialysis thereafter. Absolute risk of death after AKI is more than eight times the risk of requiring chronic dialysis after AKI.

Summary: Data indicate that modest changes in serum creatinine are associated with adverse short-term outcomes (Chertow GM et al, *J Am Soc Nephrol* 2005;16:3365-70). AKI increases risk of death after hospital discharge (Wald R et al, *JAMA* 2009;302:1179-85). The authors hypothesize that AKI not associated with dialysis or death will result in a higher subsequent death rate and higher rates of long-term dialysis. This was a population-based cohort study of patients between 1996 and 2006 in Ontario, Canada, with the diagnosis of AKI who did not require in-hospital dialysis and who survived dialysis-free for >30 days after hospital discharge. Patients with AKI (n = 41,327) were matched one-to-one with patients without AKI during the index hospitalization. Factors used in matching were age (± 1 year), sex, history of chronic kidney disease, use of mechanical ventilation during the index hospitalization, and a propensity score for developing AKI. The primary outcome was the subsequent need for chronic dialysis, and secondary outcomes were all-cause mortality and rehospitalization. Patients were a mean age of 70 years, and median follow-up was 2 years (maximum, 10 years). The incident of chronic dialysis was 1.78/100 person-years in the patients with AKI and 0.74/100 person-years in unaffected controls (adjusted hazard ratio 2.7, 95% confidence interval [CI], 2.42-3.00). Among the patients with AKI, rates were also higher for all-cause mortality (15.34 vs 14.51/100 person-years; adjusted HR, 1.1; 95% CI, 1.07-1.13) and rehospitalization (44.93 vs 37.18/100 person years; adjusted HR, 1.21; 95% CI, 1.18-1.24).

Comment: The data in the study were derived from a diverse group of patients with multiple primary diagnoses. The authors, however, did present subgroup analysis. With the exception of patients with pre-existing chronic kidney diseases and diabetes mellitus, the incidence of chronic dialysis after AKI in patients with peripheral vascular disease was higher than in those with all other diagnosis, including patients with myocardial infarction, cerebral

vascular disease, those undergoing cardiac surgery, those having suffered an episode of sepsis, and those undergoing abdominal aortic aneurysm repair. The data were not stratified for magnitude of recovery after AKI; however, by 10 years of follow-up, the patients whose hospitalization included AKI had an ~12% risk of chronic dialysis. Even if a patient "recovers" renal function after AKI, patients with AKI never truly fully "recover." They remain at a relative high risk for chronic dialysis and death compared with matched controls without AKI.

The United States Registry for Fibromuscular Dysplasia: Results in the First 447 Patients

Olin JW, Froehlich J, Ziaokui G. *Circulation* 2012;125:3182-90.

Conclusion: Fibromuscular dysplasia (FMD) occurs primarily in middle-aged women but presents across all ages. Cerebrovascular FMD and renal FMD occur equally frequently. Many patients with FMD present with nonspecific symptoms that result in a delay in diagnosis.

Summary: FMD is a noninflammatory vascular disease that most commonly affects the extracranial carotid and renal arteries. Patients with renal artery involvement may present with hypertension, and those with carotid artery involvement may have transient ischemic attacks, stroke, pulsatile tinnitus, or headache. The prevalence of FMD in the general population has not been studied, but ~4% of patients who undergo renal angiography have FMD (Cragg AH et al, *Radiology* 1989;172:145-7). Most information on FMD consists of case series, and little new information has been published in the past 30 years. The authors developed a registry for FMD with the goal of better understanding the epidemiology of FMD and the management and outcomes of patients with FMD. This report includes the first 447 adult patients entered into the registry. The authors reviewed clinical features, presenting symptoms, and vascular events for these patients enrolled from nine United States sites. Vascular beds were imaged selectively based on clinical presentation and local practice. Patients (91% female) were a mean age at diagnosis of 51.9 years (standard deviation, 13.4; range, 5-83 years). Hypertension, headache, and pulsatile tinnitus were the most common presenting symptoms. FMD in first- or second-degree relatives was reported only in 7.3%, but there were self-reported family histories of stroke in 53.5%, aneurysm disease in 23.5%, and sudden death in 19.8%. FMD was identified in the renal arteries in 294 patients and in the extracranial carotid artery in 251, with 82 having vertebral artery involvement. Transient ischemic attack or stroke had occurred in 19.2% of the patients, arterial dissection in 19.7%, and aneurysms in 17%. Indications for therapy were primarily hypertension, aneurysm, and dissection.

Comment: There are a number of interesting points here. First, renal and cerebral vascular FMD appear to occur with relatively equal frequency. One in five patients experience a dissection and 17% have an aneurysm; however, only ~20% of patients have lateralizing neurologic events. The authors appropriately emphasize that the presence of a carotid bruit in a patient aged <60 years or an epigastric bruit in a patient with hypertension should bring to mind the possible diagnosis of FMD so that appropriate treatment can be applied and the consequences of poorly controlled hypertension avoided and aneurysms and dissections identified.