

# Most Thoracic Aneurysms and Thoracoabdominal Aortic Aneurysms Are Best Treated Open: What Does the Future Hold?

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## **Background**

Over the past decade, technical innovations in open surgery have led to enormous improvements in spinal cord neurologic deficit following thoracic/thoracoabdominal aortic repair. Mortality and renal morbidity have been more resistant to change, probably because of the difficulty of ascertaining modifiable risk factors for these outcomes. Here we present a statistical model of the evolution of neurologic deficit risk over the past 12 years and also describe the search for modifiable risk factors for mortality and renal morbidity.

## **Methods**

Between 1991 and 2005, we repaired 1,106 thoracic/thoracoabdominal aortic aneurysms. Median age of the population was 69 years and 36% were female. We studied risk factors for morbidity and mortality, and evaluated changes in the effects of these factors over time using multiple logistic regression analysis.

## **Results**

An immediate neurologic deficit occurred in 36 (3.3%) of 1,106 patients overall. This rate averaged 7.5% in the first 5 years' experience (1991 to 1995) and declined to 1.1% overall by 2005. This reduction could not be explained by changes in patient risk factors (eg, extent, acute dissection) but was accounted for by long-term adjunct (cerebrospinal fluid drainage plus distal aortic perfusion) use in the population. In addition, we found that mortality (162 of 1,106; 14.6%) and renal failure (229 of 1,106; 20.7%) were highly correlated with baseline glomerular filtration rate (GFR) (both  $p < .0001$ ). Indeed, when GFR is normal according to American Kidney Foundation criteria, mortality is 5.4%.

## **Discussion**

Open repair of thoracic/thoracoabdominal aortic aneurysm is a proven therapy that has vastly superior results to that of just 10 years ago. Neurologic morbidity has been reduced to roughly 1% at present. With normal kidney function, mortality is 5%. This is a difficult standard upon which to improve with endovascular treatment. Postoperative mortality and renal failure are explained largely by preoperative GFR, and the hunt is on to find ways to counter this risk factor. Open surgery offers numerous potential strategies for the management of renal perfusion and function without the use of contrast loads required in endovascular cases.