Rapid triage can be critical. For example, in acute vascular cases with potential neurological impact (eg, carotid artery dissection), care at a COE early has the potential to prevent a cascade of events leading to further complications (eg, intracerebral hemorrhage). While triage issues in catastrophic cases can be difficult even in the United States, the existence of protocols developed under the context of accreditation and certification programs and in consideration of medical-legal risk mitigation facilitates more effect decision-making [Bullock MR et al. *J Neurotrauma* 1996].

When seeking to transfer a patient with a complex or potentially catastrophic case, physicians should be familiar with the accepting institution and its staff. Building familiarity with neighboring COEs has proven challenging, yet is necessary to be able to direct patients with complex conditions at centers with the highest levels of expertise. This has ancillary economic benefits, for countries like Panama for example by increasing medical tourism. Difficulty in the Caribbean region results in some cases because the payments associated with these transfers, are limited by the lack of health insurance in the region. In those with insurance, difficulties may also arise especially with insurance companies, not only due to inaccessibility during off-hours but also potentially by poorly trained personnel who must make decisions influencing the care of critically ill patients.

Specialists are better able to share information when they speak with other practioners of the same speciality, according to Dr. Nedd. He added that new reimbursement mechanisms should greatly facilitate the creation of regional COEs by physicians and healthcare systems secondary to more predictable payment sources.

While new systems for triage may be especially important in the context of cerebrovascular complications, other brain injury, and trauma, the concepts used may be readily transferred to other areas of emergency medicine. While COEs in the Caribbean have provided new patient treatment opportunities, rapid planning is the essential underpinning of a successful transfer.

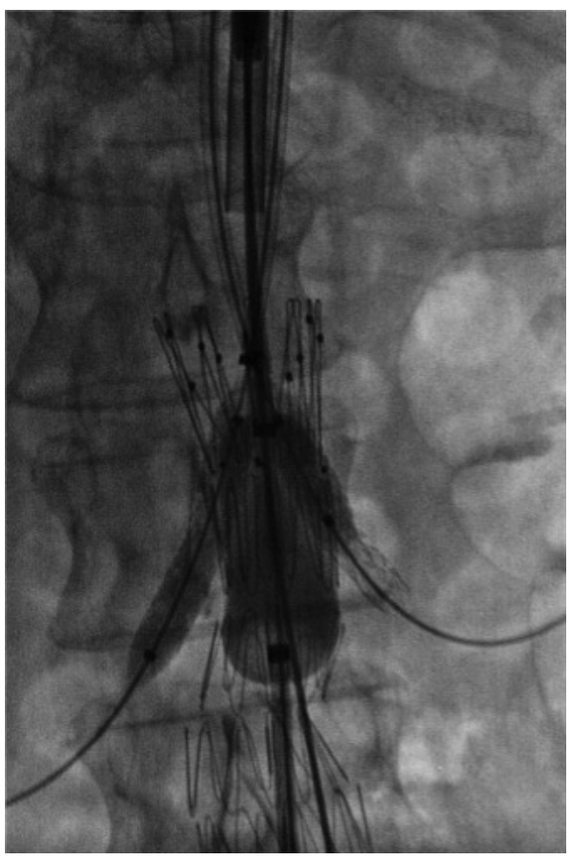
Percutaneous Repair of Aneurysms Now Possible Even in Obese or Difficult Patients

Written by John Otrompke

The majority of aortic abdominal aneurysms (AAAs) in the United States are repaired using an endovascular approach. Evolving techniques and technology have expanded the population eligible for an endovascular approach making it possible to use this approach in patients who were previously not considered good candidates according to Patricio Rosa, MD, Delray Medical Center, Delray Beach, Florida, USA. Dr. Rosa also noted that novel techniques and devices may further increase the number of endovascular procedures .

AAAs occur in ~2% to 5% of men aged >60 years and result in 9000 deaths per year in the United States. Open surgical repair was been the treatment of choice for many years; however, this procedure is associated with a high morbidity and mortality in some patient populations. For example, some studies have shown that the 1-year mortality of high-risk patients aged >70 years with chronic obstructive pulmonary disorder who undergo a suprarenal cross clamp can be as high as ~30% [Beck A et al. *J Vasc Surg* 2009]. Therefore, physicians have developed the chimney technique (stenting side branches), which is one technique that allows the physician to perform the procedure through an endovascular approach (Figure 1).

Figure 1. The Chimney Technique



Reproduced from Bruen KJ et al. Endovascular chimney technique versus open repair of juxtarenal and suprarenal aneurysms. J Vasc Surg 2011;53(4):895-905. With permission from Elsevier.

Early data suggests that the chimney technique may provide results that are similar to open procedures in terms of success of repair even when the patient has anatomy that makes traditional endovascular repair difficult, said Dr. Rosa. In a nonrandomized study of 21 patients with juxtarenal or pararenal aneurysms who underwent repair using the chimney technique and were compared with 21 matched open cases, mortality was similar at 4.8% in each group (one death in each group). The frequency of renal dysfunction was also similar between the two groups occurring in 6 patients (29%) in the endovascular group and 5 patients (1 patient with acute kidney injury and 4 patients with acute renal failure) in the open group. Dr. Rosa pointed out that this yielded a rate of renal complications similar to that found in the literature for open cases in which the renal cross-clamp is performed [Bruen KJ et al. *J Vasc Surg* 2011].

Another technique that makes percutaneous aneurysm repair possible is the preclose method. This technique prepares the arteriotomy for percutaneous repair prior to removal of the sheath. This method was successful in 94.3% of cases according to a study in which 559 Proglide devices were used to repair 279 femoral arteries [Lee WA et al. *J Vasc Surg* 2007]. There were only 16 failures, some of which were attributed to patient obesity and severe calcifications of the artery. Dr. Rosa commented that even in the presence of severely calcified vessels, the preclose method could still be performed if used in conjunction with an ultrasound device.

Custom-made fenestrated grafts used to accommodate visceral arteries is another way to increase the available proximal landing zone in difficult to treat patients. According to a retrospective observational study conducted at the Cleveland Clinic [Greenberg RK et al. *J Vasc Surg* 2009], 30 patients were treated with fenestrated devices over a 1-year period, with a 100% procedural success rate. Two-year follow-up data was available for 23 patients, and showed that 69.6% of the patients experienced a decrease in size of their aneurysm. There were no aneurysm-related deaths, ruptures, or conversions into open repair at 2-year follow-up.

Dr. Rosa concluded that percutaneous repair of aneurysms has now become the predominant method of performing the procedure and will likely become even more widespread with the invention of new techniques and devices which expand their indication.

Sex-Specific Differences in Pathophysiology, Presentation, and Outcomes in Coronary Artery Disease

Written by John Otrompke

The past decades have demonstrated significant improvements in the care and resulting outcomes of patients presenting with an acute coronary syndrome (ACS). In her presentation, Angela Maas, MD, PhD, University Medical Center in St Radboud, Nijmegen, The Netherlands, highlighted some of the differences between the development of coronary disease, its clinical presentation, and the outcomes between men and women. For example, a well-described phenomenon is that women presenting with ST-elevation myocardial infarction are more than twice as likely to have "nonobstructive" coronary epicardial disease compared with men, yet higher mortality [Anderson RD et al. *Circulation* 2007].

One possible cause of higher mortality rate in women might be a longer time from symptom onset to hospital presentation, perhaps because the impact of cardiovascular disease is often underappreciated by women and the presence of "atypical" symptoms may obscure the true etiology. For instance, 37% of women present without pain during an ACS, compared with only 27% of men [Canto JG et al. *Arch Intern Med* 2007]. Other symptoms in women could include difficulty breathing, flu symptoms, fatigue, anxiety or loss of appetite. Studies in the past decade have found that women usually present 17 to 20 minutes later than men when having an MI (Figure 1) [Kaul P et al. *Am Heart J* 2011; Diercks DB et al. *Am Heart J* 2010]. Consideration of alternative diagnoses in women is also critical, especially coronary dissection in those aged <60 years and stress-induced cardiomyopathy depending upon the presentation [Mackman N. *Nature* 2008].

Physicians should also be aware that mortality is higher in women despite better TIMI flow at the time of the patient's first angiography and less multi-vessel disease [Otten AM et al. *Eur Heart J Acute Cardiovasc Care* 2013]; perhaps related to more vasospasm during an acute MI [Thygesen K et al. *J Am Coll Cardiol* 2012]. Study of women with unstable and stable coronary disease has revealed that women have less calcification, more often diffuse epicardial disease without discrete luminal narrowing, and significant involvement of the coronary microvasculature circulation [Reynolds HR et al. *Circulation* 2011]. In contrast to men, women with ACS may have other exacerbating factors such as estrogen deficiency, and are more likely to have metabolic syndrome and diastolic dysfunction [Pizzi C, Bugiardini R. *Heart* 2010].