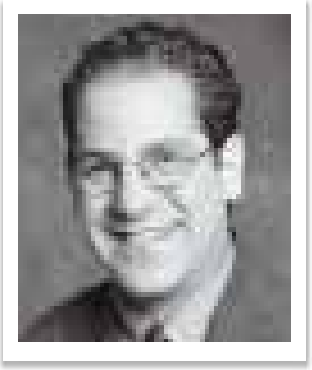
Ross Milner, MD

Dr. Milner discusses some of the many decisions facing vascular specialists today with new technological developments in the fields of thoracic, abdominal, and carotid disease therapy.

What can you tell us about recent clinical studies involving remote pressure-sensing technologies in aortic aneurysm therapy?

The APEX trial showed the safety and effectiveness of remote pressure-sensing devices in the determination of acute aneurysm exclusion, and the PRICELESS study is being initiated to look at long-term efficacy of the pressure-sensing technology. The PRICELESS study has been designed, and there are a number of sites that are going to be involved. Remote pressure-sensor technology is currently only FDA approved for acute exclusion, but we are in the process of getting approval through the Institutional Review Board to begin participating in the study at Emory.



What is the potential for pressure-sensing technology to teach us about aneurysmal disease pathology after therapy, in addition to monitoring for sac pressure and regression?

If an aneurysm is well excluded and shrinking, then the operator has performed an effective repair. The bigger issue is for the patients with type II endoleaks; we do not yet understand which aneurysms are going to expand and which will remain stable, and we see these type II leaks and do not always know how best to treat them. I think that over time, as we follow more patients, we will gain a better understanding regarding which type II endoleaks have high levels of pressure that require early intervention before the aneurysms expand and potentially are at risk of rupture.

Is reimbursement and cost-effectiveness a concern when choosing whether or not to use a pressure sensor?

There is now a CPT (current procedural terminology) code for implantation of a pressure sensor, and there is a 99-series code for surveillance. It has really changed the paradigm for the way I follow abdominal aortic aneurysm patients. None of the patients in whom I have implanted a sensor gets contrast for CT scans during follow-up imaging. This reduces the risk of contrast-induced nephropathy, and patients receive less radiation and do not need an IV. I find it to be a useful and necessary technology. The way I relate whether any additional costs are justified is to say, if you are implanting an aortic endograft and you have a type I endoleak, you would never think twice about placing an aortic extension cuff to address the endoleak, and the cost of the sensor is roughly equivalent to placing an aortic extension cuff.

Have similar results been observed in thoracic aneurysms?

Yes, but the experience is much smaller. More than 4,000 sensors have been placed worldwide, and 95% of those have been placed in abdominal aneurysms; the remaining 5% have been placed in thoracic aneurysms. We are seeing the same ability to detect pressure changes, and the results with the thoracic pressure sensors are similar to those we are finding with abdominal sensors. The experience is certainly smaller, but it appears that the sensor is going to be similarly efficacious in thoracic aneurysms.

New endovascular stent graft options have recently been approved for use in thoracic aortic aneurysms in the US. How do you select which device is right for your patients? How much does facility and familiarity with a certain platform or the relationship of device characteristics to unique anatomy influence your decision?

It is a combination of both elements. There is no doubt that most physicians are more comfortable using the devices with which they have the most experience, but I think each of the devices does have slight differences that make it better for one patient versus another. The two devices that just received FDA approval (TX2, Cook Medical, Bloomington, IN; Talent, Medtronic Vascular, Santa Rosa, CA) are just becoming available for use. My 3-year experience with the TAG device (Gore & Associates, Flagstaff, AZ) has been very good. There is room for other thoracic devices, and for the most part, I think individual device selection will be based on the anatomy and disease of the patient, as well as the physician's comfort with a particular device.

With respect to devices approved for use in the thoracic anatomy, to what degree do you think familiarity with the manufacturer's abdominal aortic platforms will have an impact on any associated learning curves?

It will have a fair amount of impact because we all develop relationships with certain companies and become familiar and comfortable with their technolo-

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gies, and I think that will play a role in how some physicians choose which thoracic stent grafts to use, as well.

Switching gears to the carotid anatomy, are there ever carotid artery stenting patients in whom you prefer not to use an embolic protection device? How do current regulations and instructions for use have an impact on this decision making?

I always prefer to use embolic protection, and I never go into the procedure with the plan not to use it. However, some patients have extremely complex anatomy involving very tortuous carotid arteries, and embolic protection device placement can be difficult or impossible. If an endarterectomy cannot be performed because it would be unsafe, I proceed with stenting without an embolic protection device if necessary to complete the intervention.

How would you describe a patient with carotid artery disease in whom you would have difficulty choosing between endarterectomy and stenting?

The asymptomatic low-risk patients who are referred to me for carotid stent placement are the most difficult to treat. Sometimes, they are sent to me with the impression that they need a carotid stent, and I am of the belief that low-risk asymptomatic patients are likely best served with endarterectomy. I have a long conversation with these patients, explaining the risks and the benefits of the procedures, as well as the recent data that have shown that there may be a greater risk of complications. If they are adamant that they want a stent, I will likely try to get them into a clinical trial; if not, I will perform endarterectomy.

In 2002 and 2003, you studied at the University Medical Center in Utrecht, the Netherlands. How did this experience shape your career and influence your view of vascular surgery and endovascular intervention?

I was fortunate enough to receive the Marco Polo Fellowship for the Society for Vascular Surgery, and it was an unbelievable experience. It was one of the best professional and personal experiences I have had during my career. The opportunity to travel and to work abroad was such a worthwhile professional time because I became involved with some of the initial animal work that was done with pressure sensing, and I got to see how vascular surgery is practiced in another country. I had a great research experience and a great clinical experience, and I have maintained a lot of the relationships that I started when I was there, especially with Jan D. Blankensteijn, MD, PhD, and Hence J.M. Verhagen, MD, PhD.

What advice would you offer physicians entering vascular surgery fellowships today?

I would emphasize the importance of being trained in a facility that provides as broad an exposure as possible; do not just focus on learning endovascular techniques—learn all of the open techniques as well, and make sure that you are well versed in everything that you need to do from both an open and endovascular approach. Secondly, train in an institution that will give you some academic potential so that you have an opportunity to publish or present research early on in your career. Even if you do not ultimately want to be in academics, it allows you to think critically at a very formative time. ■