

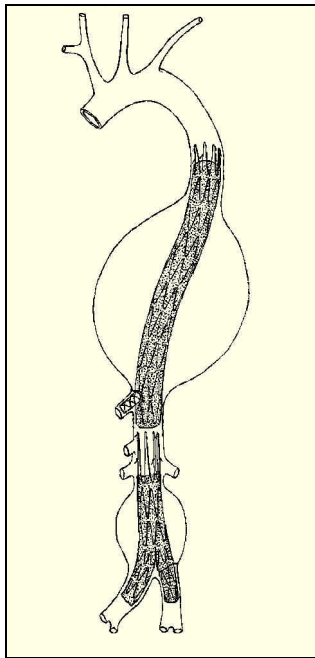
Vascular surgery

THE PREVALENCE OF VASCULAR DISEASE in our society has led to innovations in vascular surgery that focus increasingly on less invasive techniques to diagnose and treat disease.

Prevention. There has been little progress with prevention of arterial or venous disease. Conventional risk factors for atherosclerosis appear to be as prevalent as ever, but new risk factors have emerged. Homocysteinaemia may be just as important as lipid disorders, is present in 10% of the population, and can be controlled by vitamin supplements. Other factors identified are metalloproteases for aneurysms, and cytokines, growth factors and inflammatory cells responsible for atherogenesis and venous ulceration, yet none have yet led to tangible therapeutic advances.

Diagnosis. Duplex ultrasound scanning is replacing angiography for preliminary assessment and may become the definitive investigation for some conditions. It is simple, relatively inexpensive, and non-invasive, and can be applied to disease at most sites. It is used by many surgeons in Australasia as the sole investigation to select patients for carotid endarterectomy.¹ Computer analysis of carotid plaque echogenicity by ultrasound promises to better define plaques that pose an increased risk for stroke. Ultrasound scanning can be used to select techniques for femoral artery bypass grafting, and most surgeons now use it to predict whether endovascular therapy is a realistic option. Regular ultrasound surveillance improves results after femoral artery vein bypass grafting, although its value for other interventional techniques has yet to be proven. For chronic venous disease, up to 30% of important deep to superficial connections can be missed by clinical examination alone, inviting early recurrence.² Many surgeons now scan most patients before treating varicose veins.

Treatment. There has been great interest in endovascular therapy. Until recently, surgeons' enthusiasm has outstripped the manufacturers' ability to produce suitable systems, resulting in valid criticism. A Sydney team leads the world in assessing outcome for endoluminal grafting for aortic aneurysms.³ Relatively atraumatic insertion of a stent or graft through the femoral arteries is a most attractive alternative to major open repair for abdominal or thoracic aortic aneurysms. The technique has been limited by difficulties in sealing grafts to normal arteries above and below aneurysms to prevent "endoleak" into the aneurysm sacs. Surgeons in Perth and Adelaide have pioneered innovative techniques to incorporate vital arterial branches (just above and below most aneurysms) with side stents or grafts (see Figure).⁴ This will allow the main graft to be taken above the renal and visceral arteries in the abdomen or carotid arteries in the thorax. Studies show that aneurysms can shrink to produce strains on grafts that can lead to their late disruption,



tion, and this has influenced newer graft designs. It has yet to be determined whether the current fabric cover and stent scaffold is sufficiently strong to withstand repeated pulse deformation over long periods.

The debate is even more lively as to whether endovascular stenting for carotid stenosis has advantages over conventional carotid endarterectomy.⁵ The open operation is far less traumatic than that for aneurysms and is probably safer than current techniques for carotid stenting, so that enthusiasm for the latter has evolved slowly. However, new filter devices that trap embolised material passing up the carotid arteries after balloon dilatation have advanced the endovascular approach in its inevitable incursion into traditional management.

A more prosaic but potentially explosive development has been the introduction of minimally invasive techniques to treat varicose veins. Ultrasound follow-up after all forms of treatment has shown that residual or recurrent

connections are frequent. Surgical stripping is not universally popular with patients, although specialist phlebologists obtain excellent long-term results with good cosmetic appearance and minimal morbidity. Endovenous alternatives are attractive but have not been objectively assessed. These began with sclerosant injection into major saphenous veins under ultrasound guidance. This gained considerable impetus when it was appreciated that the detergent sclerosants can be injected as a foam which stays in the vein for far longer and is easy to track with ultrasound. More recently, techniques are being evaluated for obliterating the saphenous vein with radiofrequency or laser probes introduced by percutaneous puncture.

Quality. ASERNIPS (the Australian Safety and Efficacy Register of New Interventional Procedures – Surgical) has done well to introduce an effective audit for assessing safety and efficacy after endoluminal grafting for aorto-iliac aneurysms. The challenge for the vascular surgical community is to better audit and evaluate all existing and new techniques for diagnosis and treatment to ensure that they are effective.

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