Looking inside arteries

Vascular surgery is a highly skilled, technically demanding specialty: even a minor error may lead to thrombosis at an anastomosis or suture line, possibly resulting in the loss of a limb or in death.

In general, operations on the blood vessels are possible only because atheroma is a patchy disease, so that the healthy sections of artery can be joined by a bypass of the diseased segments or an endarterectomy. Yet however painstaking the surgeon's techniques, some vascular procedures fail within a month of operation, and most of these failures are thought to be caused by technical errors. The two common causes of early postoperative thrombosis are stenosis at the anastomosis and loose flaps of intima that project into the blood stream. Surgeons have tried many methods for detecting such faults during the operation so that they can correct them. For example, stenosis can be detected by measuring the blood flow through the artery: a rate of flow below 60 ml min in a saphenofemoral bypass is associated with a high chance of early thrombosis. A low rate of flow does not, however, indicate the exact site of the obstruction; nor can flowmeters detect non-stenosing flaps of intima.

At present most surgeons believe that operative arteriography is the best way of confirming the technical quality of a vascular operation. Some perform an arteriogram at the end of every operation, while others do it in selected cases. If arteriography is performed on every occasion 10-15% of patients will be found to have a remediable abnormality, correction of which will improve the early patency rates. On the other hand, good quality arteriography requires a special operating table, an x-ray machine in the operating theatre, and a radiographer—all expensive and not always available.

An attractive alternative is for the surgeon to inspect the inside of the arteries with a small endoscope. The first clinical studies of the value of arterial endoscopy were by Pinet and Vollmar, who tried to look inside blood-filled unclamped vessels by perfusing them with saline. The perfusing technique, however, makes the procedure messy and difficult, and it has not become popular. Towne and Bernhard have recently described their experience of arterial endoscopy without perfusion in clamped vessels at the end of arterial surgery. The inside of the vessel was easy to see, and they found many small flaps of intima and pieces of thrombus that they considered worth removing. Unfortunately the endoscope cannot measure the size of an anastomosis and so cannot detect minor degrees of stenosis. They tried both stiff and flexible instruments, none of which were specifically designed for arterial endoscopy, and found the rigid instruments best, though all needed modification and further development.

Arterial endoscopy seems unlikely to replace operative arteriography, but, if the instruments can be further developed, so making possible the removal of loose strips of intima, they may improve the early results of arterial operations.

Typhoid and its serology

Serology plays a minor part in the diagnosis of enteric fever: at times it can help, but at other times it may confuse. Fortunately there are few opportunities to study the serology of typhoid on an epidemic scale in Britain, but Brodie's extensive investigations of the 1964 Aberdeen outbreak have recently been published. These highlight the clinical limitations of serology.

The commonly used Widal test reaction is an agglutination test using bacterial suspensions of Salmonella typhi and S paratyphi A and B, treated to retain only the somatic (O) or flagellar (H) antigens. These are used to detect the corresponding antibodies in patients' serum. The earliest serological response in acute typhoid fever is said to be a rise in the titre of the O antibody. The H antibody usually develops more slowly but persists longer than the O. Towards the end of the first week of the illness titres of either antibody may be as high as 1:160, but paired sera taken four to five days apart give

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