A Retrograde Arteriovenous Forearm Fistula

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Shunt failure continues to be one of the most troublesome problems in chronic haemodialysis programmes. Increasing survival time of patients requires new methods to guarantee the accessibility of blood vessels in addition to the classic Teflon-Silastic-Cannula and the subcutaneous arteriovenous fistula.

If multiple vascular operations caused by shunt complications have destroyed the main forearm arteries and veins further haemodialysis treatment
may be performed via an arteriovenous fistula in the antecubital fossa.

Commonly a side-to-side arteriovenous communication between the brachial artery and the basilic vein is used. This type of fistula has the disadvantage that the majority of arterial bloodflow is drained to the vena cava without arterialisation and dilation of the veins in the forearm distal to the fistula. As we observed in eight patients this situation causes three problems:

1. arterial insufficiency resulting in coolness, paleness and pain in the forearm (steal syndrome)
2. high arteriovenous shunt volume with the risk of cardiac overload
3. lack of vascular access for haemodialysis.

Because of these problems in patients whose superficial veins of the arms were obliterated or destroyed, we constructed an end-to-side anastomosis between the brachial artery and the distal end of the basilic or cephalic vein. This resulted in an optimal retrograde arterialisation of the few still available veins of the forearm. In none of our patients with this type of anastomosis did significant insufficiency of the veins occur. In all the patients, however, a 'new' venous system developed which was easily accessible to venepuncture.

SURGICAL TECHNIQUE

The brachial artery and its bifurcations and the basilic or cephalic veins were exposed after a transverse incision in the antecubital fossa. Following preparation and mobilisation of the distal part of the vein, an end-to-side arteriovenous anastomosis was made. In order to facilitate maximum blood flow, the diameter of anastomosis was 12-15mm.

RESULTS

Between October 1972 and February 1973 five arteriovenous fistulæ of the retrograde type were made in five patients participating in our haemodialysis programme. Three of them were in women, two in men. All the patients had had previous multiple shunt failures; one patient suffered from diabetic microangiopathy. The age of the patients ranged from 25 to 50 years. The fistulæ became puncturable 4-8 weeks after the operation. One fistula now has been successfully in use for more than 100 haemodialyses. In the fifth patient, who suffered from staphylococcal sepsis, periphlebitis and a mycotic aneurism of the fistula developed.

Initial oedema of the upper arm and forearm occurred in all patients, but it regressed spontaneously.

SUMMARY

In five patients participating in chronic haemodialysis treatment, five end-to-side arteriovenous fistulæ were constructed between the brachial artery
and the distal ends of the basilic or cephalic veins. Because of previous shunts in all patients the radial artery and the main veins of the forearm were no longer available. All the fistulae except one were very effective. The steal syndrome or other complications typical for side-to-side fistulae in the antecubital region were not observed.

These results indicate that this special type of proximal arteriovenous fistula may permit regular haemodialysis of patients, in whom the arterial and main venous vessels of the forearm are no longer available.