A Stable and Sufficient Source of Blood for Regular Dialysis Treatment

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The arterio-venous fistula is an improvement on the Scribner shunt (The Cimino-Brescia Fistula, 1968). Unfortunately even a fistula has its imperfections. Therefore, we tried to overcome these difficulties by another method, an arterio-veno-arterial bypass.

A saphenous vein graft was joined end-to-side to the brachial artery and end-to-side to the distal part of the radial artery. In addition the proximal part of the radial artery was connected with a vein of the forearm by means of the fibrin tunnel (Bartos et al., 1967). Both needles, for the inflow to and outflow from the machine could be put into the brachio-radial bypass or the inflow needle into the bypass and the outflow one into the vein of the fistula.

The transplanted vein, which is a natural and living part of the body, constitutes a sufficient source of arterial blood, since:

1. It is beneath the skin, so that it can be used in obese patients too
2. It is long enough for an infinite number of punctures
3. Blood flows in the normal direction into the hand, so that changes can occur neither in the central nor peripheral circulation
4. This method can be used even when all other sources of the arterial blood have been exhausted.

REFERENCES

Figure 1. Diagram of the arterio-veno-arterial bypass and arterio-venous fibrin tunnel fistula.

Figure 2. Picture of a 14-day old arterio-veno-arterial bypass and arterio-venous fibrin tunnel fistula during the dialysis. One needle was inserted into the bypass, the other into the vein of the fistula.

Figure 3. Picture of a 2-month old arterio-veno-arterial bypass
Figure 4. Arteriogram of the bypass:
(a) transplanted vein is connected end-to-side to the brachial artery,
(b) middle part of the bypass,
(c) connection of the transplanted vein with the distal part of the radial artery.