AUTOGONOUS SAPHENOUS VEIN AV FISTULAE FOR
HAEMODIALYSIS: EIGHT YEARS EXPERIENCE WITH 30
PATIENTS

W Lornoy, I Becaus, J P Gillardin, J Cuvelier, J Schelstraete,
M Vermaut, P Van Malderen, G Souffriau

O L Vrouwziekenhuis, Aalst, Belgium

Summary

Since 1973, 41 autogenous saphenous vein (ASV) fistulae in the arm or the leg
have been constructed in 30 chronic haemodialysis patients.

The mean patency rate for the arm fistulae was 36.8 months and 21.9 months
for leg fistulae. Eight patients received a leg fistula, after their arm fistula throm-
bosed: in this group the mean patency rate for the arm and leg fistulae was 15.4
and 20 months respectively.

If a conventional fistula is not feasible, an ASV fistula is the method of
choice for some patients.

Introduction

Saphenous vein grafts have been generally accepted in revascularisation of ische-
ic lower limbs [1] and of the ischaemic heart [2]. In dialysis patients the
Cimino-Brescia arteriovenous fistula is widely used [3]. In a minority of patients
the formation of a suitable fistula is impossible due to poor peripheral veins,
thrombosed superficial veins or previous Scribner shunt operations. In these
patients regular haemodialysis can be maintained by the use of ASV fistulae. This
type of fistula was first described by May in 1969 [4]. Since then several reports
have been published [5-11]. This report describes our eight year experience.

Patients and methods

In 30 patients, 23 females and 7 males with a mean age of 50 years (20-69
years), 41 ASV fistulae were created.

Prior to surgery, physical examination with particular attention to the per-
ipheral pulses and an oscillography were performed. In some cases a venography
was undertaken to assess the size of the saphenous vein. The operative procedure
has been described previously [10,11]. In leg fistulae we generally used epidural
anaesthesia and sedative drugs. Careful subcutaneous re-routing was always carried out, avoiding any twisting or kinking of the saphenous vein.

In 20 instances the ASV was inserted in the forearm as a loop between the brachial artery and a suitable vein in the antecubital fossa. Twenty-one ASV fistulae were created subcutaneously in the leg: 15 in a straight manner with an end-to-side anastomosis with the superficial femoral artery above the knee and six as a loop in the thigh with anastomosis to the common femoral artery. Three patients had two leg fistulae. Eight patients received a leg ASV fistula, after an arm ASV fistula thrombosed.

All patients, except two, had one or several previous Scribner shunts or fistulae failures. Subclavian catheter dialysis was temporarily performed in several patients.

Results

Patency

The total patency rate of the 41 fistulae amounts to 1199 patient months with a mean of 29.2 months (0.5–99 months). The fistulae could be used for a total of 1150 patient months with a mean of 28 months.

Table I and Figure 1 show the mean and cumulative patency rate in the arm and leg fistulae. Eight patients with a thrombosed arm fistula received a leg fistula (Figure 2). The cumulative patency rate of the arm fistulae was 68 per cent at one year, 57 per cent at two and five years; for leg fistulae patency was 62 per cent at one year, 48 per cent at two years and 23 per cent at five years. For the eight patients who had leg fistulae after failure of arm fistulae the cumulative patency rate was at two years 12 per cent for the arm and 48 per cent for the leg fistulae.

Nineteen fistulae remained usable to the end of the study (31 December 1981) or till the patients’ death or transplantation: 11 in the arm with a mean of 51.5 months (15–99 months) and eight in the leg with a mean of 33 months (0.5–96 months).

Twenty-two ASV fistulae thrombosed: nine in the arm at a mean of 18.7 months and 13 in the leg at a mean of 15.1 months. Seven leg fistulae throb-

**TABLE I. Comparison of 20 arm and 21 leg ASV fistulae**

<table>
<thead>
<tr>
<th></th>
<th>Arm (1–99)</th>
<th>Leg (0.5–96)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean patency (months)</td>
<td>36.8</td>
<td>21.9</td>
</tr>
<tr>
<td>Mean patency (months) in eight patients with both fistulae</td>
<td>15.4</td>
<td>20</td>
</tr>
<tr>
<td>Sudden thrombosis</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Stenosis</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Small size</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Aneurysm (true and false)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Ischaemia of the distal limb</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
bosed within the first six months, four in the first month. In contrast only three arm fistulas clotted in the first six months.

Complications (Table 1)

Sudden thrombosis for no apparent reason was most frequent in leg fistulae. Stenoses occurred at the curve of the loop or at the puncture sites. The appearance of aneurysms made a corrective operation necessary, except in one case of several small aneurysms. In one patient stenosis of the superficial femoral artery occurred after 44 months, necessitating the insertion of a PTFE graft between the common femoral artery and the popliteal artery with satisfactory results. In a second patient thrombosis of the common femoral artery occurred in the early post-operative period, this being successfully treated. In two cases of loop fistula a Scribner shunt insertion was possible after definitive failure of the ASV. This shunt functioned for respectively six months in the arm and two years in the thigh.

In two cases spontaneous haemorrhage occurred requiring surgical repair. In four fistulae with stenosis, a short segmental replacement with a PTFE graft prolonged patency in all cases. There has been no increase in infections, or cardiac complications attributable to these fistulae.

Discussion

Since 1973 41 ASV fistulae have been performed in our patients with conventional AV fistula failure (Figure 3). Only in two patients did an ASV fistula prove necessary as a first access.

The 30 patients requiring an ASV fistula represent 20 per cent of our total dialysis population, which is a rather high proportion. This is mainly due to the high incidence of analgesic nephropathy in our area [13]. These patients consisted of 50 to 60 year old females. In addition there were two patients with obesity of the Laurence-Moon-Biedl syndrome.

All patients were dialysed with the single needle device using a double head-pump, which enables easy control of the high venous pressure of these fistulae [12]. In general cannulation proved easy. In case of emergency these grafts may be used as early as two days after construction.

The mean and cumulative patency rate (Table 1 and Figure 1) show fair results, especially for arm grafts. Nevertheless the Logrank test did not show statistically significant differences comparing the mean patency rate in the arm and leg fistulae and comparing both fistulae in the same patients.

Thrombosis was the main cause of failure. The high venous pressure of these fistulae may cause bleeding at the end of dialysis, especially in leg fistulae. Therefore the use of protamine is necessary. Preoperative venography of the lower limb should be performed routinely, since small size or poor quality of the saphenous vein indicates early failure. A poor arterial status, diabetic and hypertensive patients represent contraindications for an ASV fistula, especially in the leg.
In our opinion an ASV graft has proved to be a valuable alternative in cases of conventional fistula failure. The arm fistula seems to offer better results, but the operation is more complicated than in the leg. We now have abandoned the thigh loop fistula, which requires anastomosis with the common femoral artery and causes more stenosis at the curve and haemorrhage.

Providing the failure rate of the straight leg fistula can be improved within the first six months by better patient selection and careful operative and puncture technique, these grafts, together with arm fistulae, can be recommended.

Acknowledgment

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Address for correspondence: I Becaus, O L Vrouwzijckenhuis, B-9300 Aalst, Belgium