THE BIOCARBON® VASCULAR ACCESS DEVICE (DiaTAB®) FOR HAEMODIALYSIS

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Summary

The Biocarbon® vascular access device (DiaTAB®) is a relatively new method in secondary access surgery. Punctures, often the cause of complications can be avoided because it is a no-needle method of dialysis. However thrombosis due to stenosis of the venous anastomosis or of the efferent vein is a continuing problem. A new experience is the fibrin flap formation under the plug of the device, which can be removed easily.

Introduction

Secondary access surgery is often hampered by complications. Several of these complications like bleeding, infection, thrombosis and formation of pseudoaneurysms are related to the puncturing necessary for access to the bloodstream [1–4]. DiaTAB is a no-needle method of dialysis. The main advantage is that puncture lesions can be avoided. This inherent quality of the DiaTAB should make it less complication-prone compared to other devices in which punctures are necessary for access and dialysis.

This report gives our early experience with this access device in patients eligible for secondary access surgery.

Methods and materials

From July 1982 until July 1984 16 DiaTAB devices were implanted in 11 patients (Figure 1). The indications for placing such a device were multiple failed previous access procedures, unsuitable skin conditions for repeated puncture, needle phobia and home dialysis patients.

Five of these patients were diabetics. Their ages ranged from 37–68 years. The mean dialysis period was 48 months (range 12–74 months). The mean number of preceding access operations was eight (range 4–16). Fourteen straight
grafts were placed in the upper arm and two loop grafts were positioned in the groin. The mean follow-up period of the grafts was 10 months with a range of two to 24 months. Prophylactic broad spectrum antibiotics and anticoagulants (coumarin derivatives and/or acetylsalicylic acid) were used routinely.

Results

In six DiaTAB devices thrombotic episodes were observed over a total of 4,896 observation days. Thrombectomy was successfully performed in five grafts. In three of these five grafts the thrombosis, due to stenosis of the venous anastomosis, demanded replacement of the device. In the remaining DiaTAB a lesion of the wall opposite the plug was observed. This lesion was caused by inexperience with this method of dialysis. This DiaTAB needed replacement because of irreversible thrombosis.

A new problem in access surgery related to this no-needle method was fibrin flap formation under the plug. In three DiaTAB devices several episodes of
fibrin flap formation were observed. Although the graft was patent effective
dialysis was not possible. The flap can be removed easily using a Fogarty®
catheter through the port of the device. Interestingly enough the fibrin flap
formation was noted in combination with venous outflow obstruction in all
three cases.

Infection was observed in only one graft. Because this infection occurred
three months after the operation and an abscess was observed on the extremity
of the graft, the infection was considered to be secondary to the abscess. After
removal of the graft and treatment of the primary focus the patient received
a new DiaTAB.

A steal syndrome was observed in one graft. Banding of the arterial anastom-
osis was successfully performed. However the patient died 36 hours after the
operation due to a massive myocardial infarction.

Handling of the DiaTAB during operation and replacement was never difficult.
The patient and nurse compliance was excellent although extensive instruction
to patients and dialysis staff is necessary.

Conclusion

Thrombosis still remains the main problem but is the consequence of using
prosthetic vessel material. Prevention is difficult because most often it is a
sequela of the arterialisation of the arterialisation of the efferent vein. Arterial-
isation leads to phlebosclerosis and subsequent stenosis of the efferent vein.

Perioperative mortality was observed in one patient and could not be related
to the method described in this preliminary series.

Other types of complications like steal syndromes, fibrin flap formation and
even infection were observed relatively infrequently compared to the incidence
of puncture-related complications with other methods [5]. The DiaTAB no-
needle method of dialysis seems to be a promising tool in secondary access
surgery. It is not complication-free but less complication-prone.

References

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5 Sloof MJH, Smits PJH, Lichtendahl DHE, Van Der Hem GK. Proc EDTA 1982; 19: 234