

Pitfalls of Placing Artificial Grafts

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Introduction

In 1960, Scribner et al described an external arteriovenous shunt and chronic hemodialysis became a reality. Soon after, Brescia and Cimino created an arteriovenous fistula in the forearm. In 1973, PTFE was introduced and became the most common non-autogenous conduit.

Today, conduits such as bovine grafts and early stick, self-sealing grafts are being marketed.

Graft Complications

Despite advances, certain complications continue to be of concern. Thrombosis remains the most common cause of graft failure. Treatment includes surgical or percutaneous intervention. The second most common is infection. Death secondary to infection in dialysis patients is estimated at 36%. Schild et al reviewed the medical records of 1574 consecutive vascular procedures for infection and found that the overwhelming majority of infections occurred in PTFE grafts (131/132). While the overall operative infection rate was 0.51%, dialysis centers were responsible for 50% of infections. Antibiotics and surgical intervention are required treatment.

Steal Syndrome, occurs in 1-8% of patients on dialysis, particularly elderly patients with diabetes and small vessel disease. Treatments include decreasing inflow, ligation or the DRIL procedure.

Seromas arise from the hydrophobic nature of PTFE grafts. They occur when the graft is immersed in alcohol, solvents or when irrigated with heparin. Treatment requires the removal of the seroma and the involved portion to prevent recurrence.

In addition to those already discussed, certain complications arise more frequently in the dialysis centers - hematoma, blood pressure drop, pseudoaneurysm, and infections.

Pseudoaneurysms result from multiple cannulations at the same place or when the graft is torn during cannulation. The latest treatment is to place a covered stent and then aspirate the aneurysm. This treatment allows the continued use of the graft.

Over 50% of infections occur in dialysis centers. Infections result from poor sterile technique and lack of proper training. The majority of dialysis centers in the United States are privately owned and unfortunately pay poorly.

Conclusion

Despite numerous pitfalls in the use of access grafts, many can be easily overcome. A recent study of 1700 consecutive procedures, has shown that there is no statistically significant difference between fistulas and grafts except for infections. The patency rates are approximately the same if one includes the 30% of fistulas that never mature or are able to be cannulated. Therefore, in patients who have no veins available for a primary autologous fistula, grafts are a very good alternative as compared to double lumen catheters.