

Vascular Access in Our Hemodialysis Population

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Introduction

After four decades of access surgery the ideal type of vascular access (VA) is still not available. Furthermore, complications arising from vascular access dysfunctions are the most common causes of morbidity among hemodialysis (HD) patients. The aim of this study was to analyze types of permanent vascular access – arteriovenous fistula (AVF), arteriovenous graft (AVG) and cuffed double lumen silicone elastomer catheter (Permcath) with respect to their relative use, complications and survival rate in our HD population.

Patients and Methods

On January 1. 2003. 196 patients on maintenance HD for at least one year were analyzed retrospectively for types of permanent vascular access, number of operations, episodes of thrombosis and rate of access survival.

Table 1. Hemodialysis population

Number of patients	196
Sex ratio (F/M)	94/102
Age (years) mean ±SD	55.9 ± 11.8
Duration of HD treatment (months) mean ± SD	76.3 ± 58.9
Primary renal disease	
Hypertensive nephrosclerosis	76
Glomerulonephritis	33
Diabetic	23
Polycystic	21
Pyelonephritis	17
Others & Unknown	26

Results

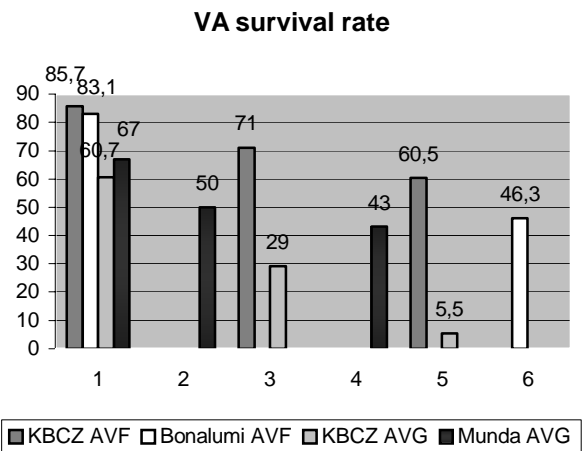
AV fistulas are the preferred form of vascular access (93,4%) in our HD population with the male/female ratio of 1.1. PTFE grafts (6.1%) are reserved for patients where placement of AV fistula failed. In the case of patient with double lumen cuffed tunneled catheter (Permcath) all available sites were previously exhausted. AVG were more often created in female gender (58.3%). Patients in this group were slightly younger, with longer HD duration and following aetiology of ESRD: 4 Glomerulonephritis, 4 Hypertensive nephrosclerosis, 2 diabetic nephropathy, 1 Pyelonephritis and 1 uncertain. One subject was markedly obese. The total of 291 operations were performed in our

HD patients (226 primary procedures, 65 secondary). In the case of AVG 39.4% of operations were secondary procedures (thrombectomies) as opposed to 20.1% in AVF group. Permanent access was created prior to the initiation of HD treatment in 20 patients (6 ± 8.7 months). Overall there were 0.06 episodes of thrombosis of vascular access per patient year (0.05 AV fistulae, 0.21 AV grafts). Vascular access survival rate was also analyzed, separately for AV fistulas and AV grafts. The results showed following rates: at 1 year 85.7% vs 60.7%, at 3 years 71% vs 29% , at 5 years 60.5% vs 5.5% for AVF and AVG respectively. Of 41 patients receiving HD for longer than 10 years, 29 retain their original AV fistula.

Discussion

The use of AV fistula in our center is similar to reports from European and Canadian HD centers (from 70%-92% of patients with AVF). (1-3)

Figure 1. VA survival rate/comparison with different sites %



YEARS

The situation is markedly different in USA where less than 30% of HD population have AVF. According to DOPPS study (2) AVF was used by 80% of European and 24% of US prevalent patients. For patients who were new to HD access use was: 66% AVF in Europe vs 15% in USA. Trend away from fistulas is observed in USA. Graft use increased from 51% in 1986-87 to 65% in 1990 (4). According to

DOQI guidelines AV fistulae should be constructed in at least 50% of all new kidney failure patients (5). Forty % of prevalent patients should have a native AVF. In order to achieve this patients should be referred to nephrologist within one year of anticipated need for dialysis which would facilitate AV access planning. 10.2% of our patients have a permanent access created before HD program. 25% of European and 46% of US incident patients did not have a permanent access placed prior to starting HD. DOQI guidelines work group found lower complication rate for AVF when compared to AVG (6). We also observed that use of PTFE has a higher incidence of thrombosis when compared with fistulae. The total number of complications of 0.24 episodes per patient per year at risk and the rate of thrombosis 0.1 was reported by other investigators (3). Similar to our results of fistula survival rate were reported by Bonalumi et al (7). Most centers describe cumulative fistula patency rates of 60%-70% at one year. Better results in fistula survival were observed in European compared to US centers. Lower overall patency rate for AVG was also found in DOQI meta-analysis (6). Our results for AVG survival at 1 and 3 years are similar to data reported elsewhere (8) but decreased rapidly afterwards. On the other hand DOQI work panel suggested that patency should be 50% at 3 years.

Conclusion

Although no current access type fulfills all of criteria for an ideal solution (adequate flow rate, long use life and a low rate of complications) AVF is closest in satisfying those requirements.

Efforts should be directed towards more pre-emptive AV fistula creation.

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