**Primary failure rate of arterio-venous fistulae: Influence of surgical factors**

Background

Primary failure rate of AVF is often considered as a marker of performance of a vascular access team. Factors leading to primary failure often differ from centre to centre due to variation in patient demographics (such as age), access referral policies, surgeon’s expertise and vessel selection by the surgeon. Hence it is important for every centre to identify the factors predicting primary failure locally so that measures can be taken to reduce the primary failure rate. We present our single centre analysis of factors predicting primary failure of AVF.

Methods

We conducted a retrospective study of primary failure among primary native arteriovenous fistulae fashioned in our centre between January 2014 and December 2016. 347 upper limb fistulae [radiocephalic (RCF) = 181, brachiocephalic (BCF) = 146, basilic vein transposition (BVT) = 20] were fashioned by five surgeons during that time period; Surgeon A fashioned 118 (34%), Surgeon B 52 (15%), Surgeon C 129 (37%), Surgeon D 27 (8%) and Surgeon E 21 (6%).

Results

The overall primary failure rate was 29.9%. Primary failure rate was higher in patients with diabetes compared to those without (36% vs 25%: p=0.032). Failure rate of RCF exceeded that with other sites though not significantly (34% vs 26% p=0.113). ). Only 3 of the 20 BVT were subject to primary failure (15%). Fistulae fashioned by Surgeon A had a lower failure rate to those fashioned by other Surgeons (20% vs 35%: p=0.002). Age, gender, ethnicity (white v non-white), the presence of hypertension, and the presence of cardiovascular disease or peripheral vascular disease or previous history of cerebrovascular accidents were not related to primary failure rate in univariate analysis.

In logistic regression analysis including all the above variables, fistulae created by Surgeon A had a 56% less risk of primary failure than those created by other Surgeons (odds ratio 0.442: p = 0.003). Fistulae created in patients with diabetes had a 66% increased risk of primary failure (odds ratio 1.656: p = 0.034). There were no other independent predictors of primary failure. However the model accounted for only 6% of the variation and there was no statistically significant difference between the surgeons on primary failure if the analysis was confined to RCF.

A smaller proportion of the fistulae fashioned by Surgeon A were RCF compared to other Surgeons (39% vs 59%: p<0.001). Surgeon A was also responsible for fashioning 17 of the 20 BVT. There were no other significant differences.

Conclusion

Causes of primary failure of upper limb fistulae are largely unexplained by this analysis. The presence of diabetes increases the risk of failure. Surgical factors may play a role mediated in some part by selection of fistulae site.