[F-PO1566] Differences in Anatomical Configuration Influence Flow and Diameter in Arteriovenous Fistulae in a Pig Model

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Arteriovenous fistula (AVF) failure due to venous segment stenosis is an important clinical problem, responsible for a significant clinical morbidity and economic cost. Studies have suggested that a rapid increase in flow and diameter after AVF creation could be a marker for successful AVF maturation. The aim of this study was to examine the effect of anatomical configuration on changes in flow and diameter in a pig model of AVF stenosis.
Curved (C) and straight (S) AVFs were placed bilaterally in 8 pigs. Blood flow was measured using duplex doppler ultrasound immediately after AVF creation (0d) and at 2d, 7d and 28d. Diameter was measured immediately after AVF creation (calipers) and at the 2d, 7d and 28d time points (64 slice CT scans) at at 4 representative points (8 mm, 11 mm, 19 mm and 25 mm) proximal to the AV anastomosis.
The mean blood flow and diameter for the curved and straight AVF configurations at different time points are shown in Table 1. C-AVFs had a greater blood flow and diameter at all time points as compared to S-AVFs. The interval change in flow (ml/min/day) was greater in C-AVFs as compared to S-AVFs between 0-2d (C = 53 ml/min, S = 27 ml/min); 2d-7d (C = 148 ml/min, S = 113 ml/min) and 7d-28d (C = 91 ml/min, S = 61 ml/min). Similarly the percentage change in diameter was greater in C-AVFs as compared to S-AVFs between 0-2d (C = +48%, S = +45%), 2d-7d (C = +38%, S = +16%) and 7d-28d (C = +34%, S = -7%).
The greater absolute values for flow and diameter in the C-AVFs, the continuing relative increase over defined time intervals in both these parameters for the C-AVFs and finally the relative reduction in diameter between 7d-28d for the S-AVFs as opposed to a continuing increase in the C-AVFs; all suggest that differences in anatomical configuration of an AVF could have a very significant impact on clinical outcomes. Studies to translate these findings into the clinical setting are currently in progress.

Flow rate & diameter variation

	Flow(ml/min)		Diameter(mm)	
	C	S	C	S
0d	1139	862	4.25	4.2
2d	1245	916	5.86	5.76
7d	1984	1481	7.98	6.69
28d	3888	2761	10.6	6.17

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