SUPPLEMENTAL TABLE I. Association between baseline covariates of the study cohort ( $\mathrm{N}=30$ ) and total vascularization in pre-access veins and AVFs

|  | Veins |  | AVFs |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Total VVD | Total VVA | Total VVD | Total VVA |
| Age | 0.1 (-0.4 to 0.6) | -0.2 (-0.7 to 0.3) | -0.06 (-0.5 to 0.4) | -0.3 (-0.7 to 0.2) |
| Female | -0.1 (-0.5 to 0.3) | 0.01 (-0.4 to 0.4) | 0.06 (-0.4 to 0.5) | 0.1 (-0.3 to 0.5) |
| Non-Hispanic Black | -0.1 (-0.6 to 0.3) | -0.2 (-0.7 to 0.2) | -0.3 (-0.8 to 0.1) | -0.4 (-0.9 to 0.04) |
| Hypertension | -0.1 (-0.6 to 0.4) | -0.09 (-0.5 to 0.4) | -0.1 (-0.6 to 0.3) | -0.2 (-0.7 to 0.2) |
| Diabetes | -0.01 (-0.4 to 0.4) | 0.2 (-0.2 to 0.6) | 0.2 (-0.2 to 0.6) | 0.2 (-0.2 to 0.6) |
| Antiplatelet agents | -0.01 (-0.5 to 0.5) | -0.2 (-0.7 to 0.3) | 0.03 (-0.5 to 0.5) | -0.2 (-0.7 to 0.4) |
| Statin | -0.06 (-0.5 to 0.4) | 0.1 (-0.3 to 0.6) | -0.002 (-0.5 to 0.5) | 0.09 (-0.4 to 0.5) |
| ACE-I/ARB | 0.5 (0.08 to 0.9) | 0.5 (0.05 to 0.9) | 0.3 (-0.1 to 0.7) | 0.2 (-0.2 to 0.6) |

Total vasa vasorum density (VVD) was calculated as the total number of microvessels over the wall area. Total vasa vasorum area (VVA) was quantified as the total luminal area of the microvessels over the wall area. Associations are presented as standardized $\beta$ coefficients ( $95 \%$ confidence interval). Significant associations are shown in red.

SUPPLEMENTAL TABLE II. Lack of association between pairwise change in vascularization during the vein to AVF transformation and maturation failure

Change in VVD
Intima
-0.09 (-0.3 to 0.1)
Change in VVA

Media
0.2 (-0.1 to 0.6)
-0.2 (-0.6 to 0.2)

Adventitia
0.02 (-0.3 to 0.3)
-0.06 (-0.4 to 0.3)
Total
0.1 (-0.2 to 0.4)
-0.03 (-0.4 to 0.3)
Vasa vasorum density (VVD) was calculated as the number of microvessels per layer (and total) over the area of the corresponding wall layer or of the entire wall. Vasa vasorum area (VVA) was quantified as the luminal area of the microvessels per layer (and total) over the area of the corresponding wall layer or of the entire wall. Associations with AVF maturation failure are presented as standardized $\beta$ coefficients (95\% confidence interval).

SUPPLEMENTAL TABLE III. Postoperative morphometry in fistulas that matured and failed

|  | Matured | $\underline{\text { Failed }}$ | P value |
| :--- | :---: | :---: | :---: |
| Intima/Media Area Ratio | $1.16[0.84-2.06]$ | $0.92[0.60-2.21]$ | 0.32 |
| Min. Intimal Thickness $(\boldsymbol{\mu m})$ | $109.0[61.7-206.8]$ | $133.7[58.3-165.0]$ | 0.44 |
| Max. Intimal Thickness $(\boldsymbol{\mu m})$ | $799.7 \pm 349.0$ | $724.7 \pm 421.7$ | 0.60 |
| Min. Intima-to-Media Thickness $(\boldsymbol{\mu m})$ | $487.2[276.8-686.8]$ | $331.3[195.0-518.7]$ | 0.34 |
| Max. Intima-to-Media Thickness $(\boldsymbol{\mu m})$ | $1189.0 \pm 421.8$ | $1105.0 \pm 451.2$ | 0.60 |
| Medial Fibrosis $(\%)$ | $\mathbf{4 4 . 2 2} \pm \mathbf{1 3 . 2 1}$ | $\mathbf{5 4 . 8 2} \pm 9.80$ | $\mathbf{0 . 0 2}$ |

Normally distributed data are presented as mean $\pm$ standard deviation and compared using the Student's $t$-test; otherwise, data are presented as median [interquartile range] and compared using the Mann-Whitney test. Significant comparisons are shown in red.

SUPPLEMENTAL TABLE IV. Correlation between pre-existing, postoperative, or pairwise change in medial and adventitial vascularization and postoperative morphometry

|  | Pre-existing | Postoperative | Change |
| :---: | :---: | :---: | :---: |
| Medial vasa vasorum density |  |  |  |
| Min. Intimal Thickness | 0.05 ( $\mathrm{p}=0.79$ ) | 0.28 ( $p=0.13$ ) | 0.21 ( $\mathrm{p}=0.26$ ) |
| Max. Intimal Thickness | 0.28 ( $\mathrm{p}=0.14$ ) | 0.53 ( $\mathrm{p}=0.003$ ) | 0.04 ( $\mathrm{p}=0.84$ ) |
| Medial Fibrosis | 0.05 ( $\mathrm{p}=0.81$ ) | 0.07 (p=0.73) | 0.08 ( $\mathrm{p}=0.67$ ) |
| Adventitial vasa vasorum density |  |  |  |
| Min. Intimal Thickness | 0.06 ( $\mathrm{p}=0.77$ ) | 0.22 ( $\mathrm{p}=0.25$ ) | 0.26 ( $\mathrm{p}=0.17$ ) |
| Max. Intimal Thickness | 0.17 ( $\mathrm{p}=0.37$ ) | 0.10 ( $p=0.61$ ) | 0.15 ( $\mathrm{p}=0.43$ ) |
| Medial Fibrosis | 0.01 ( $\mathrm{p}=0.95$ ) | 0.05 (p=0.78) | 0.03 ( $\mathrm{p}=0.88$ ) |
| Medial vasa vasorum area |  |  |  |
| Min. Intimal Thickness | 0.09 ( $\mathrm{p}=0.63$ ) | 0.18 (p=0.33) | 0.22 ( $\mathrm{p}=0.24$ ) |
| Max. Intimal Thickness | 0.25 ( $\mathrm{p}=0.18$ ) | 0.37 ( $\mathrm{p}=0.045$ ) | 0.10 ( $\mathrm{p}=0.59$ ) |
| Medial Fibrosis | 0.08 ( $\mathrm{p}=0.69$ ) | 0.16 (p=0.40) | 0.19 ( $\mathrm{p}=0.32$ ) |
| Adventitial vasa vasorum area |  |  |  |
| Min. Intimal Thickness | 0.05 ( $\mathrm{p}=0.80$ ) | 0.15 (p=0.44) | 0.20 ( $\mathrm{p}=0.29$ ) |
| Max. Intimal Thickness | 0.00 ( $\mathrm{p}=0.98$ ) | 0.04 (p=0.85) | 0.04 ( $\mathrm{p}=0.82$ ) |
| Medial Fibrosis | 0.06 ( $\mathrm{p}=0.77$ ) | 0.03 (p=0.87) | 0.01 ( $\mathrm{p}=0.96$ ) |

Correlations are presented as r (p-value). Significant associations are shown in red.

