acute limb ischemia, as observed by improved perfusion ratios, increased arteriolar density, and decreased fibrosis.

Time to Traverse Lesion Association with Outcomes in Lower Extremity Revascularization for Peripheral Artery Disease

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INTRODUCTION: Percutaneous intervention is performed to treat femoropopliteal artery (FPA) atherosclerotic disease. We hypothesize the time required to cross the lesion is associated with outcome.

METHODS: A retrospective analysis of patients undergoing FPA revascularization from 2011 to 2018 was performed. Time required to cross the lesion, termed recanalization time (RT), was measured using time-stamped intraoperative imaging. Kaplan-Meier analysis was used to assess overall survival (OS), amputation-free survival (AFS), and target vessel revascularization (TVR) through 4-year follow-up.

RESULTS: Overall, 524 patients (mean age, 69.5 years; male, 59.7%) with a median RT of 16.6 minutes (interquartile range 10.0-29.4 min) were included. Patients were divided into tertiles by RT, resulting in cutoffs of 12 and 24 minutes. With increasing RT, age (67.3 vs 69.7 vs 71.3 years, p = 0.02), hypertension (87.4% vs 91.3%, vs 96.0%, p = 0.01), and hyperlipidemia (58.3% vs 65.9% vs 71.6%, p = 0.03) increased. There were no differences in paclitaxel use, chronic limb threatening ischemia, diabetes, or chronic kidney disease (CKD). Longer RT resulted in decreased OS (60.2% vs 55.8% vs 44.0%, p = 0.02) and reduced AFS (52.8% vs 48.2% vs 35.1%, p = 0.02), but similar rate of TVR (62.3% vs 53.7% vs 54.8%, p = 0.15). Multivariable Cox-regression yielded age (hazard ratio [HR] 1.02; p = 0.0002), RT (HR 1.01; p = 0.04), non-PTX use (HR 1.48; p = 0.003), CKD (HR 2.09; p < 0.0001), and chronic limb-threatening ischemia (HR 2.60; p < 0.0001) as predictors of failed AFS. (Figure).

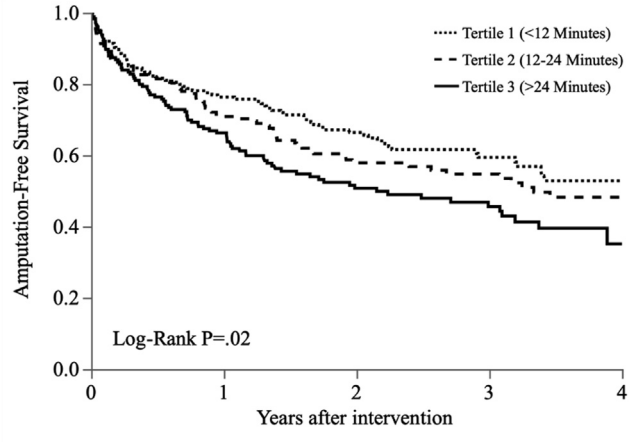

Figure.

CONCLUSION: Longer RT is associated with inferior 4-year OS and AFS, but is not correlated with TVR. Future studies with additional lesion characteristics such as calcification burden may help better guide procedural choice.

Vascular Graft with Dynamic Topography Exhibits Reduced Platelet Adhesion Compared with Standard Synthetic Graft

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INTRODUCTION: Peripheral arterial disease (PAD) is a growing problem in the aging population of the US and worldwide. Advanced PAD is treated with surgical bypass using autologous vein or synthetic vascular grafts. Due to the poor long-term patency rate of current synthetic grafts, there is a need for novel synthetic grafts with improved patency rates. We have shown that surface topography that oscillates between wrinkled and smooth configurations resists surface adhesion. Therefore, we hypothesize that a novel bilayered silicone graft that exhibits dynamic luminal wrinkles under pulsatile flow will have reduced surface thrombogenicity compared with polyethylene terephthalate (PET) and polytetrafluoroethylene (PTFE) grafts.

METHODS: Thrombin-activated human platelets were circulated through PET, PTFE, and wrinkled silicone grafts for

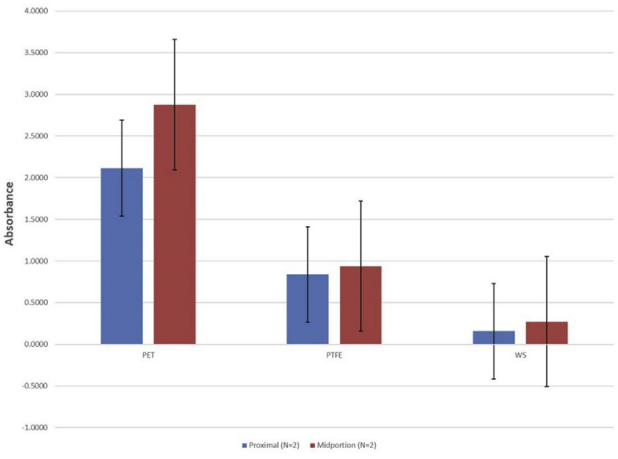

Figure. Colorimetrie assay measure of LDH released from platelets adhered to proximal and midportion of PET, PTFE, and wrinkled silicone grafts.

70 minutes using a pulsatile pump. One cm^2 samples of each graft were processed with 2% Triton-X, and lactate dehydrogenase released from adhered platelets was measured using a colorimetric assay.

RESULTS: Platelet adhesion was compared between PET, PTFE, and the silicone graft with luminal wrinkles. Wrinkled silicone grafts had 6-fold and 10-fold less platelet adhesion as compared with commercially available PTFE and PET grafts, respectively. There was some regional difference in platelet adhesion with increased platelets in the midportion of the PET and the wrinkled grafts (Figure).

CONCLUSION: PET and PTFE grafts exhibit significant platelet accumulation under pulsatile flow. Silicone grafts that undergo dynamic luminal surface topography exhibited much lower levels of platelet adhesion. Novel grafts that can use arterial pulsations to drive dynamic surface structure can resist platelet adhesion and may improve synthetic graft patency.