“...investigate the role of wall shear stress in aspects of the formation of fibrin sheath and intimal thickening in a dog model” Wang et al (2015).

Reference:


The role of wall shear stress in aspects of the formation of fibrin sheath http://ctt.ec/eddTa+
@ivteam #ivteam

Click To Tweet

Abstract:

PURPOSE: To investigate the role of wall shear stress in aspects of the formation of fibrin sheath and intimal thickening in a dog model.

METHODS: Tunneled silicone 14.5-F catheters were inserted into the left internal jugular vein in eight dogs. The dogs were separated into two groups according to catheter indwelling time of 14 and 28 days. All dogs underwent extracorporeal circulation three times a week. Multidetector computed tomography venography (MDCTV) examination was used to examine
the catheter tip thrombus. After the animals were sacrificed, histological and immunohistochemistry evaluations were performed to confirm specific cell populations. We used computer modeling to generate wall shear stress profiles for the blood flow through the catheter.

RESULTS: Catheter-related sheaths were identified in all catheter specimens, but there was no fibrin sheath around the catheter tip. There were also differences in wall shear stress between the different venous wall sites. Differences in vein wall thickening at different sites have been found at both 14 days (intima to media (I/M) ratio S1 vs S2: p = 0.01, S3 vs S4: p<0.01) and 28 days (I/M ratio S1 vs S2: p<0.01, S3 vs S4: p<0.05).

CONCLUSIONS: After catheter placement, fibrin sheath formation partially covered the catheter. Meanwhile, focal areas of intimal thickening were also seen in the venous wall adjacent to the sites of high wall shear stress. These findings indicate an important role of wall shear stress profiles in fibrin sheath formation and intimal thickening.

Thank you to our partners for supporting IVTEAM