

**00291 Effect of Stent Malapposition on Acute Stent Thrombogenicity in DES: Insights From in Vitro Benchtop Model**

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**Aims:** Stent thrombosis is a major and often fatal complication in percutaneous coronary intervention (PCI). Malapposed stent struts (which are a distance away from the vessel wall) cause flow disturbances in the physiological flow, forming regions of recirculating flow and higher shear rates. High shear rate is known to trigger thrombosis. However, In vitro experimental evidence of stent malapposition triggering acute stent thrombosis is scarce. Hence the aim of this experiment is to study the impact of stent malapposition on metallic drug eluting stents (DES) on acute stent thrombogenicity.

**Methodology:** DES samples (n=6) were deployed in silicone vessel models with the proximal portion malapposed. The silicone models were subsequently perfused with porcine blood at a flow rate of 200ml/min for 4 minutes. Optical coherence tomography (OCT) analysis was done on perfused samples to quantify and compare the average cross sectional thrombus area between the well apposed and malapposed sections. Immunofluorescence imaging of samples was used to compare the average fluorescent intensity as well as the longitudinal thrombus area between the well apposed and malapposed sections.

**Result:** The main findings from the in vitro perfusion model is that stent malapposition is significantly more thrombogenic than well apposed stents. From the OCT analysis, malapposed sections of the DES showed significantly larger cross sectional thrombus area compared to the well apposed section (1.92mm<sup>2</sup> vs 0.05mm<sup>2</sup>, p<0.001). The same trend can also be observed from the longitudinal thrombus area (13.9mm<sup>2</sup> vs 0.41mm<sup>2</sup>. p<0.001) as well as the average fluorescent intensity (67.4mm<sup>2</sup> vs 9.39mm<sup>2</sup>, p<0.001).

**Conclusion:** Using in vitro perfusion models, the effect of malapposition on acute stent thrombogenicity on DES has been demonstrated. This highlights the importance of proper stent optimization during implantation of DES during PCI procedures.