Angiographic and histological assessment of successfully treated late acute stent thrombosis secondary to a sirolimus-eluting stent

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A 47-year-old man with hypertension presented with angina in August 2005. Angiography showed a severe proximal left anterior descending (LAD) artery stenosis (Panel A). Following predilatation, a 3.0×18 mm sirolimus-eluting stent (Cordis, Johnson & Johnson) was deployed to 12 atm. (Panel B). He remained well and asymptomatic until he presented in August 2006 (3 months after stopping clopidogrel) with an acute myocardial infarction and occlusion of the LAD stent (Panel C). Following passage of a guidewire, a Pronto (Vascular-Solutions, Inc., Minneapolis) thrombus extraction catheter was used, successfully retrieving small fragments. This was followed by balloon dilatation using a 3.5 mm non-compliant balloon with an excellent final result (Panel D). Haematoxylin and Eosin-stained sections of the extracted thrombus demonstrated a mixture of fibrin and platelet aggregates admixed with a moderate inflammatory cell infiltrate consisting of neutrophils and eosinophils (Panel E and F).

Much of what is currently known relating to the histopathological features of drug-eluting stent (DES) thrombosis is derived from post-mortem and animal studies, and, as such this report is unique. Persistent fibrin deposition has been linked to poorer DES endothelialization while inflammatory cells, particularly eosinophils represent an allergic hypersensitivity reaction induced by the DES polymer. In our case, these findings, together with obvious stent under-expansion, highlight the multi-faceted nature of stent thrombosis. There are often a number of antecedent events culminating in the eventual, more often fatal occlusion. The successful outcome achieved in our case should serve to encourage the wider application of thrombus aspiration where feasible to further aid in the understanding of this complex disease entity.

Panel A. Left cranial view showing an isolated severe proximal LAD artery stenosis (August 2005). Panel B. Following treatment with a 3.0×18 mm sirolimus-eluting stent deployed to 12 atm. Panel C. 12 months following the index procedure showing occlusion of the previously implanted LAD stent at its origin (arrow). Panel D. Left cranial view following thrombus aspiration and dilatation to 22 atm. using a 3.5 mm non-compliant balloon. Panels E and F. Haematoxylin and Eosin-stained section of the extracted thrombus demonstrating a mixture of fibrin and platelet aggregates admixed with a moderate inflammatory cell infiltrate consisting of neutrophils and eosinophils.