Images in Intervention

Combined In Vivo Insights Unraveling the Underlying Substrate of an Acute Myocardial Infarction Treated With a Bioabsorbable Vascular Scaffold

From Imaging to Pathology

Fernando Alfonso, MD,* Cecilia Cuevas, MD,* Pilar Jimenez-Quevedo, MD,* Nieves Gonzalo, MD,* Natalia Escribano, MD†

Madrid, Spain

An 86-year-old man presented with an ST-segment elevation inferior myocardial infarction. Coronary angiography revealed a large filling defect in the proximal right coronary artery (Fig. 1A) that was significantly reduced after thromboaspiration (Fig. 1B). On visual examination, the aspirated material appeared to be just a large red thrombus (Figs. 1D and 1E). Optical coherence tomography (OCT) disclosed the culprit lesion, which consisted of a red thrombus and a ruptured thin-cap fibroatheroma (Figs. 2A and 2A'). After thrombectomy, a large lumen was obtained, but a thin-cap fibroatheroma with some calcified areas and...
residual protruding red thrombus with posterior shadowing were seen (Figs. 2B and 2B'). Eventually, a bioabsorbable vascular scaffold was implanted with excellent angiographic results (Fig. 1C). On OCT, the device (classic “open-box” appearance without shadowing) was well expanded and nicely apposed against the vessel wall with minor intraluminal tissue protrusions (Figs. 2C and 2C'). Notably, a subsequent detailed histological analysis of the aspirated material (Masson trichrome staining) revealed a large red thrombus but also a ruptured fibrous cap (Fig. 1D) underlying a complex fibroatheroma, including cholesterol crystals and foam cells (Fig. 1E) and a large necrotic core (Fig. 1F). Rupture of a thin cap fibroatheroma constitutes the main underlying substrate for acute myocardial infarction. In this setting, OCT provides unique visualization of the culprit lesion, although pathological in vivo confirmation of these images remains elusive (1,2). A detailed analysis of the material obtained during thromboaspiration may prove extremely valuable in this regard. Our findings demonstrate that the aspirated material may include remnants of the culprit plaque, thus providing an in vivo pathological confirmation of the underlying substrate. In this scenario, the use of bioabsorbable vascular scaffolds (3) might emerge as an attractive strategy potentially able to prevent the risk associated with late malapposition.

Reprint requests and correspondence: Dr. Fernando Alfonso, Cardiac Department, Hospital Universitario de La Princesa, Calle Diego de León 62. Madrid 28006 IIS-IP, Madrid, Spain. E-mail: falf@hotmail.com.

REFERENCES

Key Words: bioabsorbable vascular scaffold — myocardial infarction — necrotic core — thrombus — thromboaspiration.