

IMAGES IN INTERVENTION

Drug-Eluting Stent Implantation on Calcified Nodule



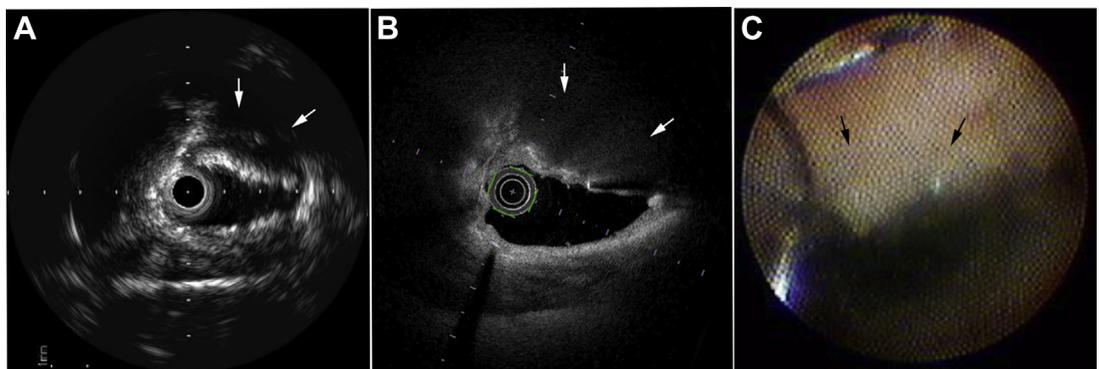
Ex Vivo Intravascular Images and Histopathology

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A 70-year-old woman was admitted to our hospital due to cardiogenic shock and died of heart failure 1 day after admission. She had a 12-year history of hemodialysis. Biodegradable-polymer biolimus-eluting stent (NOBORI, Terumo Corporation, Tokyo, Japan) was implanted in the left anterior descending artery 2 months before. An autopsy was performed, and ex vivo intravascular ultrasound (Terumo Corp.), optical frequency domain imaging (Terumo Corp.), and coronary angiography (FiberTech, Tokyo, Japan) were examined.

Intravascular ultrasound, optical frequency domain imaging, and coronary angiography demonstrated a hypoechoic mass (Figure 1A), a high backscattering protruding mass with signal attenuation (Figure 1B), and a yellowish protrusion with uneven strut expansion (Figure 1C), respectively, at the stent-implanted region. Neointima coverage was minimal, and struts were visible. Histology demonstrated a large calcified nodule (CN) (1) underneath the stent struts (Figure 2A). A healthy vessel wall was stretched with medial necrosis and nearly ruptured by

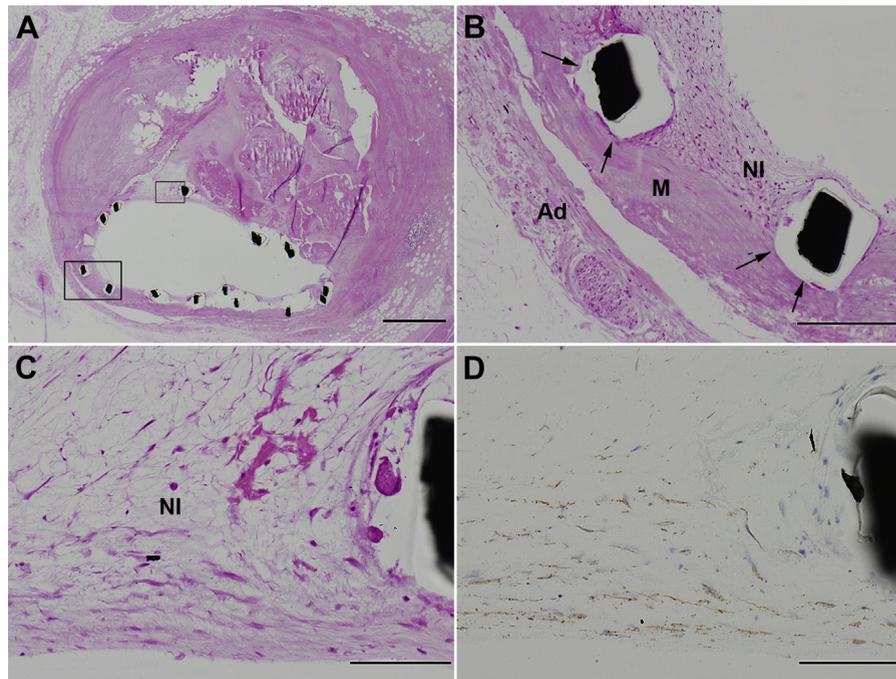
FIGURE 1 Ex Vivo Intravascular Imaging of Calcified Nodule 2 Months After Biolimus-Eluting Stent Implantation



(A) Intravascular ultrasound demonstrated a hypoechoic mass underneath the stent struts (arrows). (B) Optical frequency domain imaging illustrated a high-backscattering protruding mass with signal attenuation (arrows). (C) A yellowish protrusion mass was observed and the struts were visible by coronary angiography (arrows).

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FIGURE 2 Pathology After Biolimus-Eluting Stent Implantation on a Calcified Nodule

(A) A calcified protruding mass was observed underneath the stent struts. (B) The struts nearly reached to the adventitia at the healthy vessel wall (arrows). Loose extracellular matrix (C) and α -smooth muscle actin-positive spindle-shaped cells (D) were identified within the neointima. (A to C) Hematoxylin eosin. (D) α -Smooth muscle actin. (A) Scale bar = 1 mm. (B) High magnification view of left lower boxed area in A. Scale bar = 200 μ m. (C, D) High magnification view of right upper boxed area in A. Scale bar = 100 μ m. AD = adventitia; M = media; NI = neointima.

stent implantation (Figure 2B). Most of the stent struts were covered by minimal neointima with loose extracellular matrix (Figure 2C) and scattered α -smooth muscle actin-positive spindle-shaped cells (Figure 2D).

The target lesion calcification is an important determinant of the expansion of stent (2). A CN hardly expands by the tensile strength of stent deployment. In fact, the stent area was insufficient in the present

case. Furthermore, a healthy vessel wall might be overstretched and rupture during the intervention. We need to exercise every precaution for an intervention of a CN.

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