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Calcified Neoatherosclerosis Causing "Undilatable" In-Stent Restenosis

Insights of Optical Coherence Tomography and Role of Rotational Atherectomy

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We report a patient with undilatable in-stent restenosis (ISR) presenting 11 years after initial stent implantation. Optical coherence tomography (OCT) disclosed severe calcified neoatherosclerosis as the underlying substrate of ISR (**Figures 1A and 1B**). Multiple high-pressure inflations with noncompliant balloons and the use of buddy-wire techniques and scoring balloons all failed to dilate this lesion. Eventually, rotational atherectomy was required to obtain procedural success. Rotational atherectomy was able to ablate the calcified intrastent tissue (**Figures 1C and 1D**) allowing subsequent vessel dilation and repeat stent implantation with adequate final stent expansion (**Figures 1E and 1F**).

OCT provides unique insights in this setting revealing the underlying etiology accounting for dilation failure (1). Indeed, OCT may readily differentiate severe stent underexpansion from calcified intrastent tissue. The use of rotational atherectomy to ablate the metallic struts of severely underexpanded stents (i.e., stent ablation or rotastenting) has been reported in anecdotal cases, but this remains an unpredictable and very risky procedure (2,3). Alternatively, the use of rotational atherectomy to ablate the calcified intrastent neoatherosclerotic tissue is highly appealing (4). The minimal lumen area was used to select the burr size, avoiding the risk of stent damage.

We propose that rotational atherectomy be considered as the therapy of choice in severe, nondilatable, calcified neoatherosclerosis causing stent restenosis. OCT plays a major role in identifying this scenario and in helping to select the appropriate burr size.

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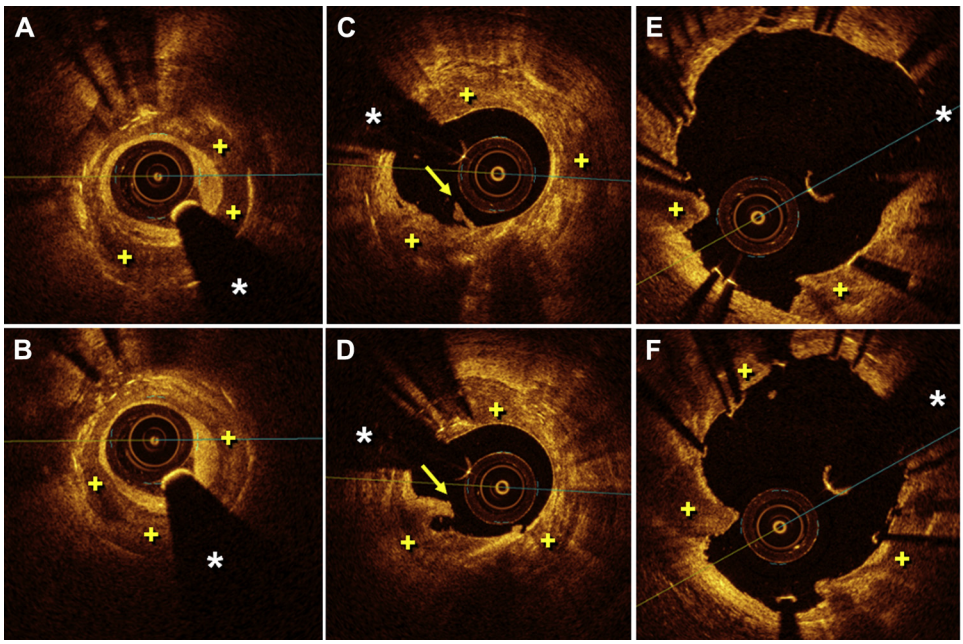
FIGURE 1 Optical Coherence Tomography Findings



(A,B) Before intervention. **(C,D)** Images obtained after rotational atherectomy. **Arrows** indicate ruptures in calcified plaque. **(E,F)** Images after stent implantation and high-pressure balloon inflations. + signs denote calcium; * denotes wire artifact.

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