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IMAGES IN INTERVENTION

Intimomedial Abrasion Complicating Coronary Thrombus Aspiration

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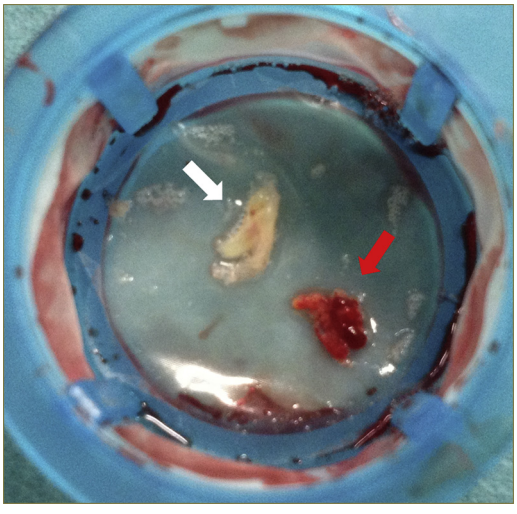
A 73-year-old man referred for primary percutaneous coronary intervention (pPCI) presented with complete occlusion of the proximal left anterior descending artery (LAD) (Online Video 1). Aspiration thrombectomy was performed with an Export AP catheter (forward-facing tip, 1.09-mm inner lumen diameter, 1.73-mm outer diameter; Medtronic Cardiovascular, Santa Rosa, California), thus removing a red thrombus (**Figure 1**) and restoring distal Thrombolysis In Myocardial Infarction grade III flow. Milking (i.e., muscular bridge) was then observed in the mid-LAD (Online Video 2). After stent implantation in the proximal LAD, the ST-segment leveled out and chest pain remitted. However, 5 mins later and before sheath removal, chest pain relapsed with transient recurrent ST-segment re-elevations. Repeat angiography found only a slightly hazy region around the milking segment (Online Video 3). Optical coherence tomography (OCT) revealed an intracoronary structure proximal to the milking segment, with high optical backscattering and low attenuation, attached to the vessel wall by a filiform proximal pedicle (**Figures 2A and 2B**) in direct continuity with a proximal intimomedial abrasion (**Figure 3**). These OCT findings suggested the intracoronary mass to be a pediculated intimomedial flap versus a white thrombus as the differential diagnosis, so a second careful aspiration was performed and the mass was successfully removed (**Figure 1**). A final OCT scan confirmed removal and absence of new iatrogenic lesions (**Figure 2C**). Milking shows a regular oval shape of the 3 vascular layers in the first pullback (obtained in systole) (**Figure 4A**), absent in the corresponding matched cross sections in the second pullback (obtained in diastole) (**Figure 4B**).

The optical properties of the intraluminal mass and the clinical course strongly suggest an intimomedial flap abraded during thrombectomy, attached to the wall by a distal filiform endothelial pedicle and everted distally into the lumen. This flap might cause recurrent transient ischemia via a valvular mechanism. A white thrombus might have a similar macroscopic appearance and optical properties (1,2),

FIGURE 1 Macroscopic Appearance of the Specimens Harvested in the Aspiration Thrombectomy



Red thrombus aspirated during primary percutaneous coronary intervention of a proximal left anterior descending artery (LAD) **(red arrow)**; intimomedial flap aspirated from the mid-LAD after abrasion during thrombectomy **(white arrow)** (Online Video 1).

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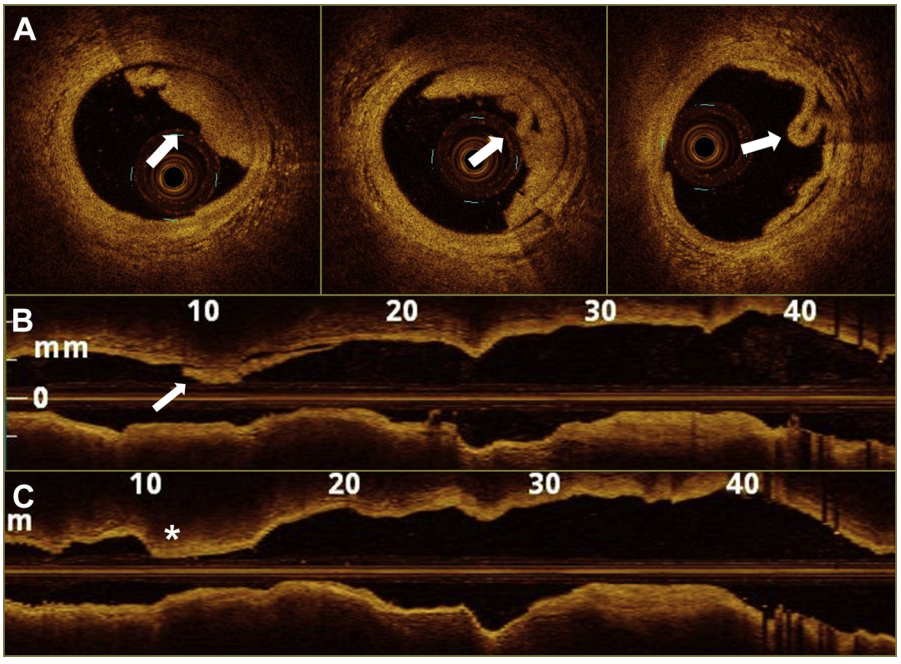
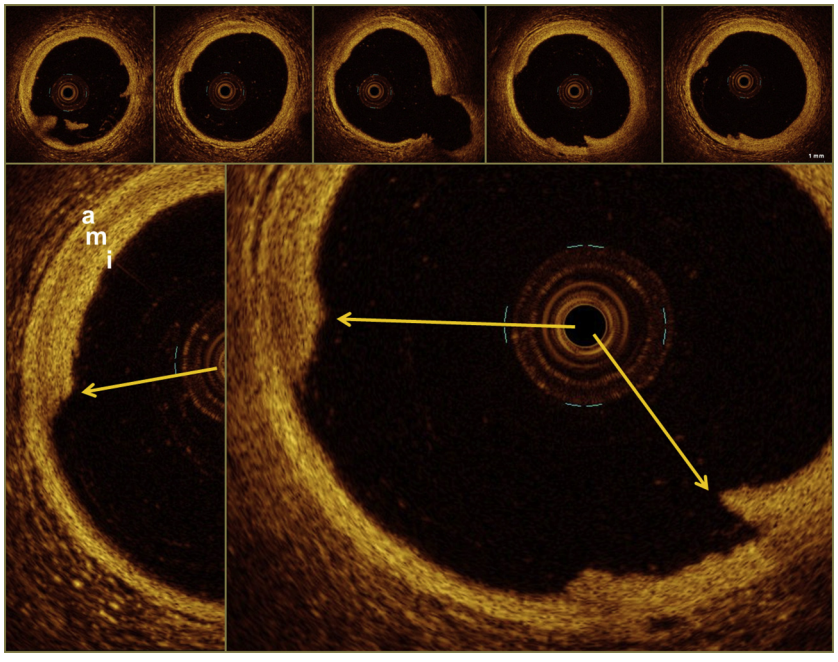
FIGURE 2 Intimomedial Flap Detected in the OCT Pullback



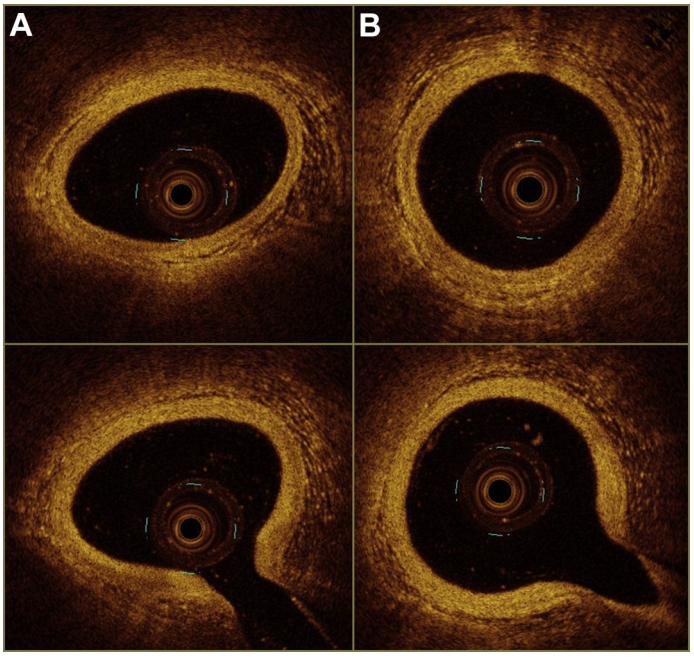
Intimomedial flap on optical coherence tomography **(A, B, white arrow)**. **(C)** Optical coherence tomography (OCT) image of the same coronary segment after removal of the flap; notice the milking phenomenon in systole (*).

FIGURE 3 Intimomedial Abrasion in a Coronary Sector After Aspiration Thrombectomy



Note the 3 vascular layers in the noninjured sector: intima **(i)**, media **(m)**, and adventitia **(a)**, whereas in the injured sector, only 1 medioadventitial layer is seen (Online Video 2).

FIGURE 4 Milking Phenomenon (i.e., Muscular Bridge) as Observed in OCT



Matched cross sections of a coronary segment with milking phenomenon imaged during systole **(A)** and diastole **(B)** (Online Video 3). Abbreviation as in **Figure 2**.

but the relatively regular contour and the thickness gradient (thicker distally than proximally) do not support this differential diagnosis. Milking might have increased the risk of intimomedial abrasion due to dynamic reduction of the vessel caliber (**Figures 2B and 2C**).

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KEY WORDS aspiration thrombectomy, intimomedial abrasion, optical coherence tomography, primary percutaneous coronary intervention, STEMI

APPENDIX For supplemental videos, please see the online version of this article.