

Distal Vessel Contrast Injections for Characterization of the No Reflow Phenomenon

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The absence of distal flow during coronary intervention is an ominous phenomenon. This may occur at the commencement of the procedure, following wire passage, or following ballooning or stent deployment. A number of pathological processes can result in this phenomenon. A successful conclusion to the intervention is dependent upon the correct diagnosis and the institution of its appropriate treatment.

The Twin-Pass catheter is a microcatheter with a distal monorail lumen and an off-center slightly proximal over-the-wire lumen. This second lumen can be used for a second wire, pressure measurement or drug and contrast delivery. We assessed this catheter to determine the pathological process underlying the lack of distal flow, by performing distal vessel contrast injections and characterizing the angiographic response.

Methods: In 6 cases of lack of antegrade flow occurring following wire positioning or balloon inflation, the Twin-Pass was deployed distal to the occlusion and a diluted contrast injection performed.

Results: Four specific processes were defined, a proximal occlusive lesion (dissection or thrombus)(2), no reflow due to distal vascular bed plugging (2), a distal spiral dissection with the wire residing in the true lumen(1), a distal spiral dissection with the wire residing in the false lumen(1). In the presence of a proximal occlusive lesion, distal injection results in distal vessel filling only with rapid run off to the distal vascular bed. Distal injection with the absence of distal run off but unimpeded retrograde filling of the proximal artery is the hallmark of distal vascular plugging. When the wire resided in the true lumen of dissected vessel, progressively more proximal injections allowed for the clear definition of the inflow and outflow tracts of the dissection. Injection into the dissection plane demonstrated contrast stasis along the vascular wall.

Conclusions: In the presence of the "no flow" phenomena, distal vessel contrast injections using the Twin-Pass catheter allows for the characterization of four distinct pathological processes and provides the operator with the diagnostic information necessary to select the appropriate intervention.