Marathwada Medical & Research Institute
Kamalnayan Bajaj Hospital
The Complete Hospital
(NABH ACCREDITED HOSPITAL)

CARDIOLOGY CHRONICLES

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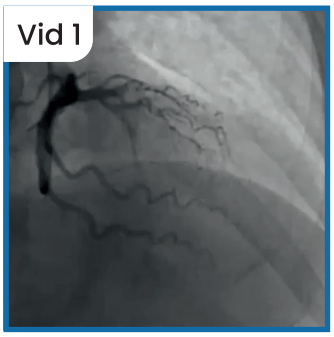
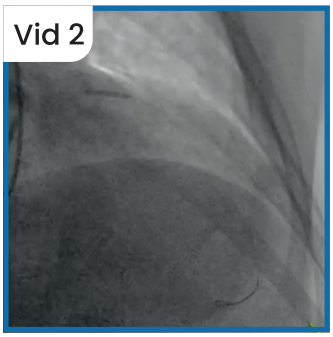
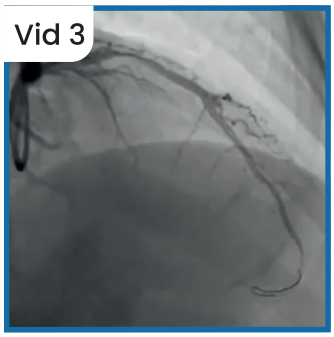
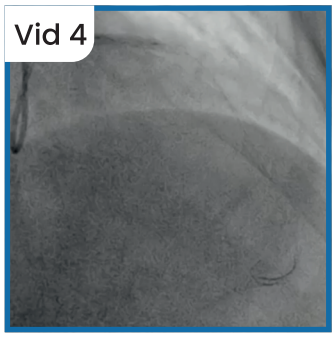
Coronary No-flow phenomenon: Causes and Management

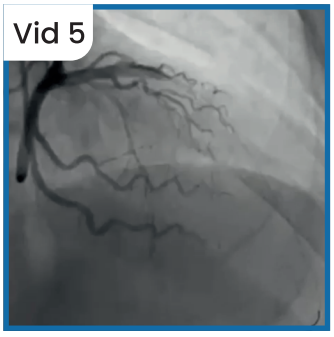
A 58 y diabetic smoker presented with acute anterior wall STEMI. He was taken for primary PCI. Angiogram revealed presence of total thrombotic occlusion of LAD (Video 1). The lesion was crossed with a 0.014" guide wire and dilated with a 2.5 x 12 mm semicompliant balloon (Video 2). This resulted in restoration of TIMI-III flow with presence of a residual lesion (Video 3). Now stenting was just a formality. Or so we thought! As soon as it was stented with a 3.5 mm x 15 mm DES (Video 4), there was no-flow in the coronary artery (Video 5). Patient remained hemodynamically stable. Four mg of Nikorandil was given through the guide catheter in two portions of 2 mg each at 1 min interval. There was no improvement in flow (Video 6). Then 100 micrograms of Sodium Nitroprusside was administered through a thrombus aspiration catheter placed in distal LAD and thrombus aspiration was performed while withdrawing the catheter. This resulted in partial restoration of flow (TIMI-I to II) (Video 7). A possibility of dissection at the distal edge of the stent could not be ruled out and hence another DES was deployed overlapping with the proximal stent (Video 8). The final angiographic result was excellent with TIMI-III flow (Video 9). Final OCT revealed a well deployed stent (Video 10) and hence post-dilatation of stent was deferred.

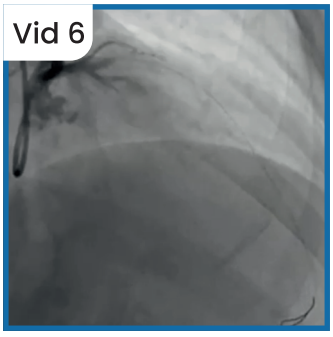


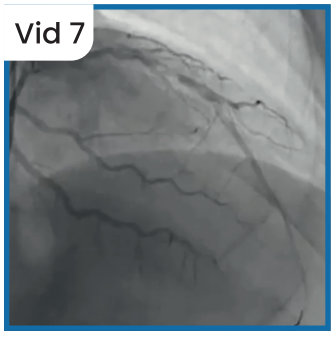


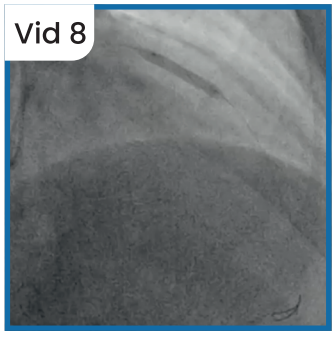


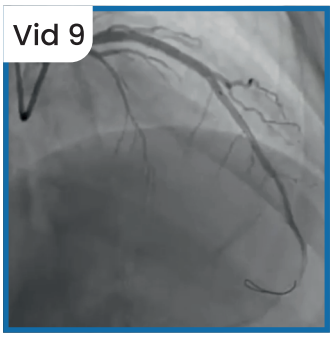


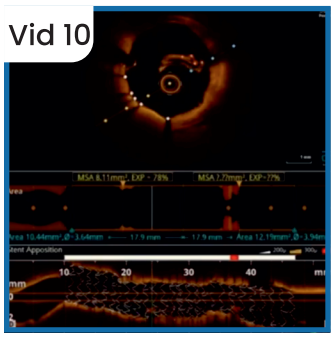




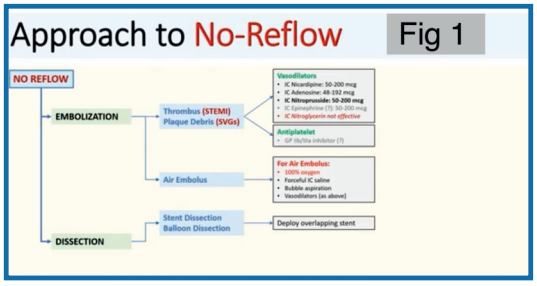


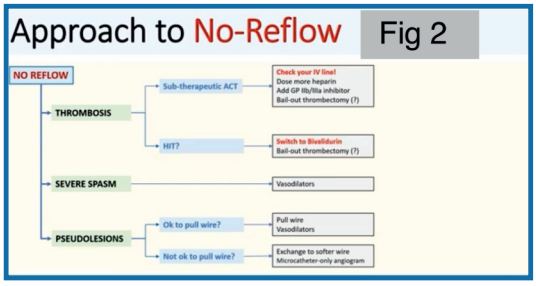






No-flow phenomenon is often seen in thrombotic coronary lesions during STEMI or SVG interventions. It is usually a result of distal embolization of athero-thrombotic debris in microcirculation. It may result in worsening ischemia and hemodynamic instability often necessitating prompt treatment. The other uncommon causes of no-flow could be air embolism, dissection, in-situ thrombus, spasm and severe concertina effect causing pseudo-lesions. Figures 1 and 2 explain the drugs (coronary micro-vasodilators) used in treatment and the management protocols.





Some important points in management are as follows:

1. If patient becomes hemodynamically unstable, administer vasopressors, manage bradycardia by atropine and urgent pacing and addressing airway and ventilation.

2. Coronary micro-vasodilators should be administered deep into the coronary artery via a microcatheter. A thrombus aspiration catheter comes handy for administering drugs as well as aspiration of thrombus. Injection of contrast through the microcatheter placed in distal coronary artery is useful to demonstrate patency of the epicardial coronary artery.

3. It is advisable to be familiar with a couple of vasodilator drugs. Intracoronary adrenalin is generally used as the last resort.

4. High pressure post-dilatation of the stent can result in recurrence of slow flow and should be avoided. Imaging can be used to confirm proper deployment of the stent in these situations.

5. Intracoronary Nikorandil is very useful in management of no-flow. It rarely causes hypotension and can be given in boluses of 2 mg every 2-3 minutes. Its dose should be reduced to 200 to 400 micrograms when given deep into the coronary artery.

6. Intracoronary nitroglycerin is generally not effective in treating no-flow

7. Intravenous IIb-IIIa antagonists may be used to prevent platelets micro-plugging in distal circulation

Take Home Messages

1. No-flow is more common during STEMI and SVG interventions. It is caused by distal embolization of athero-thrombotic debris in microcirculation

2. Intracoronary micro-vasodilators should be used first to improve the flow

3. Other causes like dissection, spasm, air embolism or pseudo-lesions should be considered in cases where no improvement is seen with vasodilators.