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## Research Letter

### Applicability and reproducibility of ELSHAFFEY technique in different thrombus containing coronary lesions



Pathological findings of thrombus collected by thrombectomy procedures during PCI in the last few years corroborate the role of in situ thrombus in acute coronary syndromes. Histopathological analysis of aspirated thrombotic content show erythrocyte-rich (red) thrombus in about 35% of patients, predominantly in those presenting with low TIMI flow. A platelet-rich thrombus is identified in 65% of cases, particularly in the early hours of acute myocardial infarction.<sup>1</sup>

It has also come to light that the composition of thrombus is often heterogenous. The composition of the isolated thrombus often shows fresh thrombus along with features of organization, and lytic changes in the same tissue fragment.<sup>2</sup>

The layered composition of clots suggests episodic growth of thrombus for a finite interval before the onset of occlusive thrombus and clinical symptomatology. Analysis of electron microscopic images of thrombus obtained from thrombectomy procedures shows that formation of the thrombus is dynamic and that the composition of the thrombus varies with the ischemia time. Fresh thrombi have a highest proportion of platelets, whereas the proportion of fibrin fibers increases over time leading to older more fibrin rich thrombi.<sup>3</sup>

The behavior of thrombus during percutaneous intervention may be quite variable and may influence the outcome of the intervention. The extent and duration of fibrin polymerization and stabilization in an evolving thrombus may contribute to the differing behavior of thrombus including the tendency for friability during catheter or wire maneuvering despite rigid adherence to the underlying plaque. The fibrin network in thrombi, when examined by electron microscopy shows two distinct types of patterns.<sup>4</sup>

One pattern consists of dense scaffolding of thin fibers that is resistant to mechanical force and thrombolysis as compared to the

second pattern consisting of thick loosely packed fibers that are more susceptible to thrombolysis. Interactions between platelets, red blood cells, vessel wall, fibrinogen and other local chemicals in the local environment in addition to the age of the thrombus may all have an impact on the fibrin network and thus on the strength and behavior of a thrombus. The characteristics of the clots as seen on angiography correlate with the histology of extracted thrombus.<sup>5</sup>

**Elshafey** technique<sup>6</sup> is an innovative PCI modification of using balloon inflations in dealing with high burden thrombus containing lesions in non ST segment myocardial infarction, this technique based on the hypothesis of dealing with angiographically harder thrombi that could not be withdrawn by regular thrombus aspirating catheters, this technique is eventually based on the above mentioned data about the composition of thrombi in such cases. During the procedure of intervention I noticed that the pass of wire always becomes eccentrically sited near to the wall of the intervened artery and beside the thrombus core not traversing through the thrombus body so the core always harder than the superficial layers of the thrombus.<sup>5</sup>

I had applied this technique several times in different types and sites of lesions as left main, LAD, and native RCA. From the point of reproducibility and applicability I thought it is effective in achieving successful acute angiographic results as regard TIMI III flow and myocardial blush grade [Figs. 1–4](#).

As regard if there are specific guide wires and dedicated balloons for that technique?

I used traditional workhorse wires and regular compliant balloons as the aim of this technique is to refashioning the usage of workhorse tools in catheterization laboratories.

As regard the antiplatelet regimen?

No specific antiplatelet regimen was designed particularly for these cases it was as usually given Dual antiplatelet (DAPT) in the form of P2Y12 in all cases it was clopidogrel with recommended loading doses, plus loading dose of aspirin 300 mg, not all cases had taken GPIIb/IIIa Intracoronary.

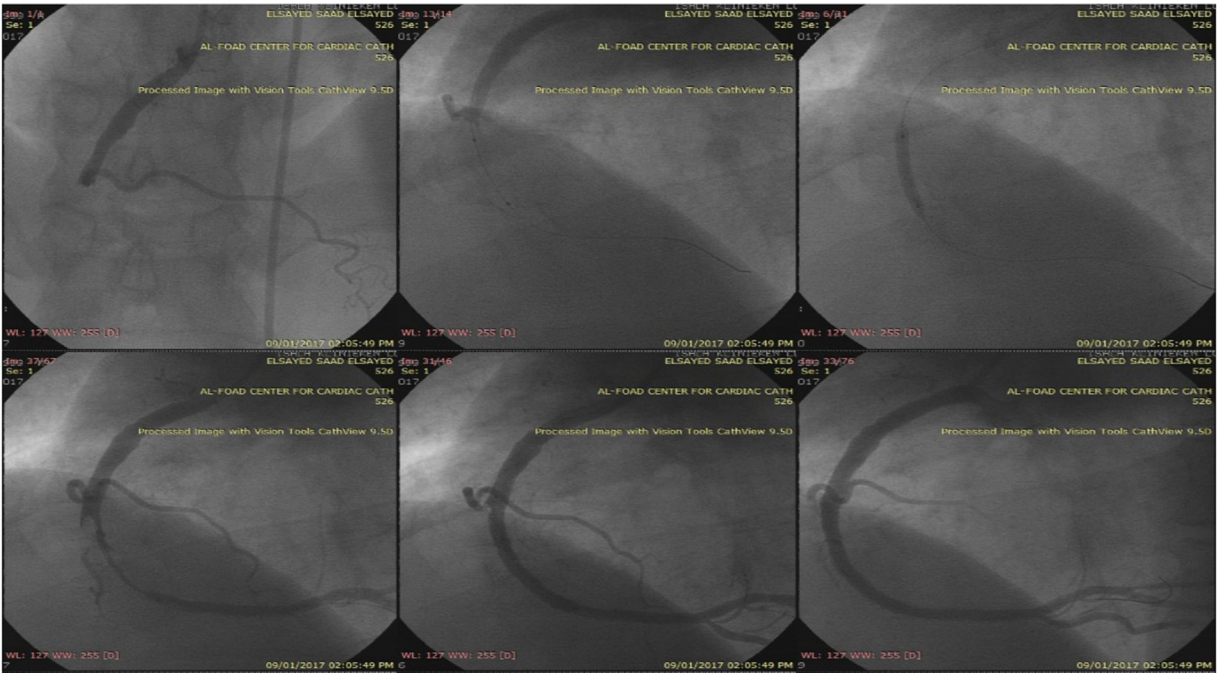


Fig. 1. Mid RCA with total vessel closure in NSTEMI patient.

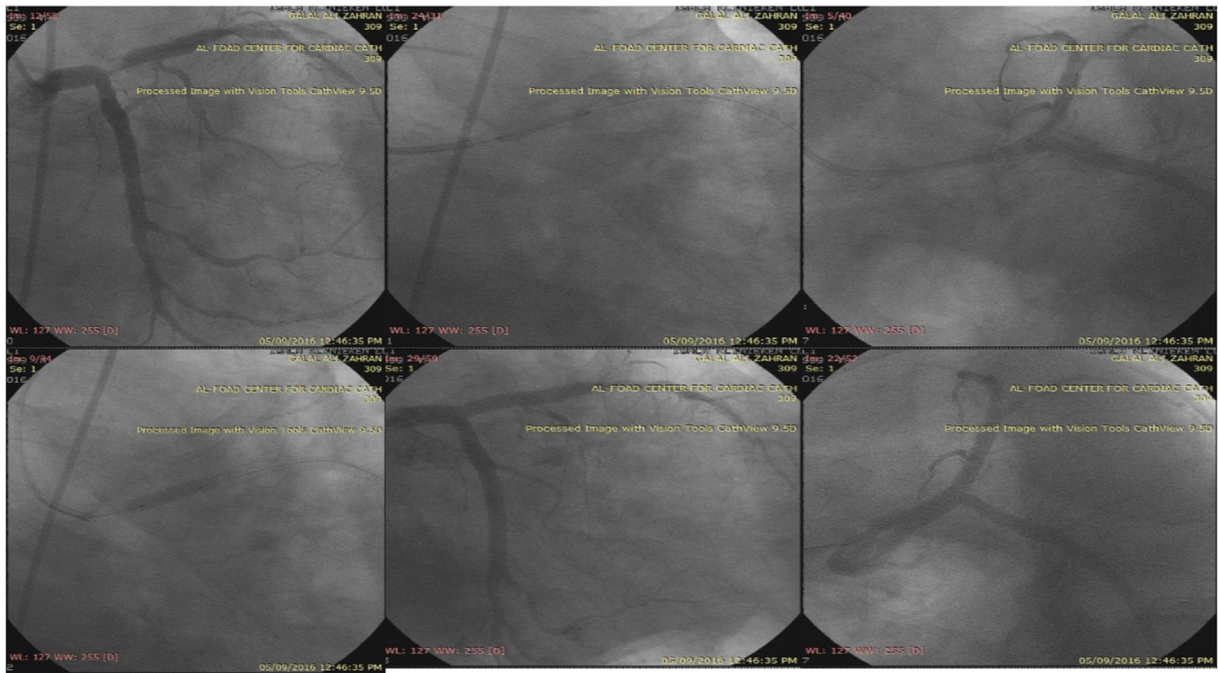


Fig. 2. Distal LM-LAD localized thrombus with subtotal vessel occlusion in NSTEMI patient.

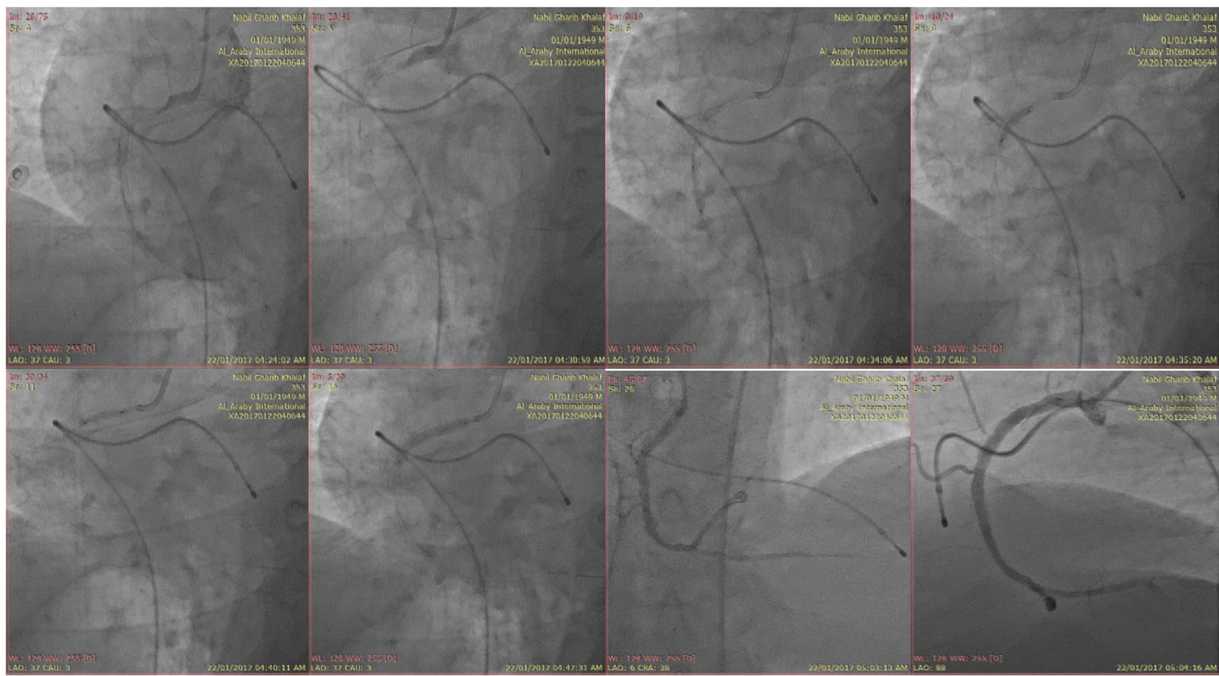


Fig. 3. Proximal RCA acute occlusion with heavy thrombosis and AV blockage (paced) with failure of thrombus aspiration.



Fig. 4. Distal RCA visible mobile thrombus that was moving in a Bing bong fashion causing distal occlusion.

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None.

**Conflict of interest**

None.

**Acknowledgement**

To My Wife.

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