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Impact of manual thrombectomy on microvascular obstruction among STEMI patients

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Background: Manual thrombectomy (MT) in ST segment elevation myocardial infarction (STEMI) is not associated with improved outcome and may even be harmful. Microvascular obstruction (MVO) assessed with cardiac magnetic resonance (CMR) imaging is among the strongest outcome predictors after STEMI.

Purpose: We aimed to investigate the impact of MT on MVO occurrence and extent.

Method: Between December 2010 and June 2017, 401 consecutive STEMI patients admitted for primary PCI, and still hospitalized in our tertiary care hospital at day 3 or later, (i.e. not transferred to another hospital) underwent a CMR during the index hospitalization (routine care at our institution during this period). Among them, 383 patients fulfilled the inclusion criteria and were classified into 2 categories (with or without MT) while 18 patients were excluded because of incomplete CMR data. The 2 co-primary endpoints were the occurrence and the extent of MVO, with these latter being analyzed either as a categorical variable (MVO vs. No-MVO) or as a semi-continuous variable (numbers of segments with MVO), respectively.

Results: In total, 188 (49.1%) patients experienced MVO. Both the incidence of MVO and the median number of segments with MVO were significantly higher in the MT group as compared to the no-MT group (59.5% vs 38.9%, respectively $p<0.001$, Figure 1A) and (0 [0; 2] vs 1.5 [0; 4]; respectively, $p<0.001$). When stratifying the analysis on coronary thrombus grade (Figures 1B and 1C), similar results were found only in patients with high thrombus burden (43.5% vs 60.7%, respectively, p=0.004). When adjusting for baseline differences between the 2 groups, MT remained a determinant of MVO (OR 1.90 (CI 95% 1.08 to 3.34); p=0.026) in patients with high thrombus grade.

Conclusion: In STEMI patients undergoing primary PCI, MT is associated with the occurrence and the extent of MVO assessed by CMR, especially in patients with a high thrombus grade. This suggests thrombus fragmentation with distal embolization as a potential mechanistic explanation.

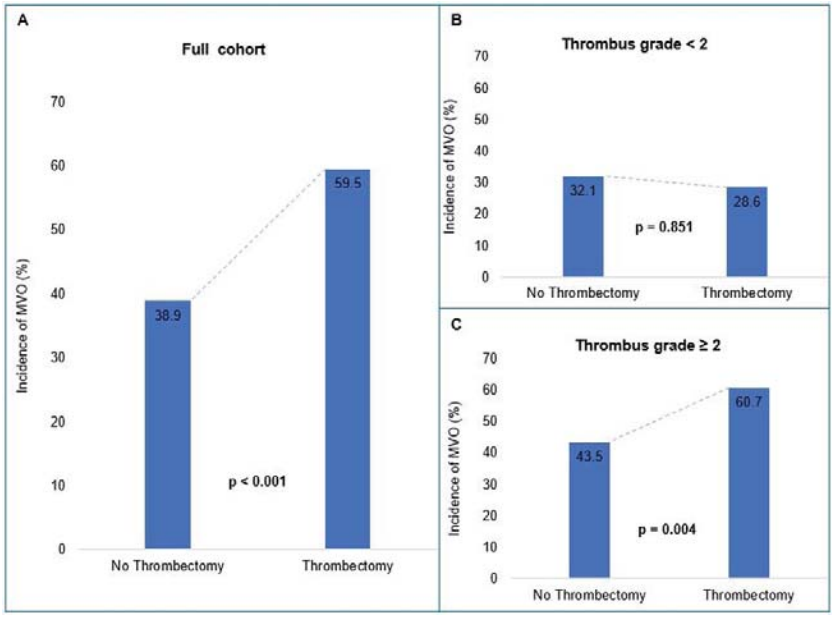

Figure 1