

Letter to the Editor

Editöre Mektup

The relationship between visible thrombus aspiration material with no-reflow and in-hospital mortality ratio in patients with acute anterior ST-elevation myocardial infarction

Dear Editor,

We read the article about the relationship between visible thrombus aspiration material with no-reflow and in-hospital mortality ratio in patients with anterior ST-elevation myocardial infarction treated with primary percutaneous coronary intervention (PCI) published by Şeker et al.^[1] with great interest. The rate of no-reflow or in-hospital mortality was found to be lower in patients with acute anterior ST-elevation myocardial infarction and the presence of visible thrombus aspiration material, but there are some points that should be clarified. The infarction time is similar between groups, but a shorter door-to-balloon time and lower Killip class II-IV ratio may be confounding factors. These factors may explain the low in-hospital mortality.

An aggravated microvascular obstruction with a high thrombus burden can lead to poor myocardial perfusion, adverse ventricular remodeling, and death due to heart failure.^[2] Thrombus aspiration has reduced the distal embolization risk and local thrombus burden, thereby improving stent deployment and reducing the risk of incomplete stent apposition and stent thrombosis and allowing for more reliable stent diameter/length selection.^[2] However, the TAPAS (Thrombus Aspiration During Percutaneous Coronary Intervention in Acute Myocardial Infarction), TASTE (Thrombus Aspiration in ST-Elevation Myocardial Infarction in Scandinavia), and TOTAL (Trial of Routine Aspiration Thrombectomy With PCI Versus PCI Alone in Patients With STEMI) trials did not demonstrate a significant benefit from routine thrombus aspiration in reducing major adverse cardiac events at 30 days or at 1 year. In the subgroup of patients with a high thrombus burden in the TASTE trial, thrombus aspiration might have played a role in decreased mortality, but in the TOTAL trial, routine thrombus aspiration in patients with high a thrombus burden didn't improve outcomes at 1 year and also increased the risk

of stroke.^[2-4] In a meta-analysis of large, randomized controlled trials, when compared with conventional PCI, thrombus aspiration with PCI, especially among high thrombus burden patients, might have lead a possible decrease in major adverse cardiac events, but this positive effect was counterbalanced by an increased risk in stroke.^[2-4] In this study, there was no information on stroke rates, which would have an impact on in-hospital mortality. Any difference in the stroke rate between the visible and non-visible thrombus aspiration groups should be included. Mahmoud et al.^[5] reported that patients who underwent thrombus aspiration with PCI had higher direct stenting rates compared with conventional stenting without thrombus aspiration, but that the 1 year clinical outcomes, electrocardiographic, and angiographic myocardial reperfusion measures were not significantly different between the groups.

On the other hand, in clinical practice, we have observed a higher thrombus burden in cases of inferior myocardial infarction treated with PCI. In TOTAL trial, in the PCI with thrombus aspiration group of the trial, the myocardial infarction ratio was 39% anterior location and 55.8% inferior location.^[3,4] In this study, could the results have been affected by the fact that the patient group included only those with an anterior myocardial infarction?

We think that this study is interesting because it brings a different perspective to the use of thrombus aspiration, but these points should be clarified.

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References

- Şeker T, Türkoğlu C, Akkuş O, Gür M. The relationship between visible thrombus aspiration material with no-reflow and in-hospital mortality ratio in patients with anterior ST-elevation myocardial infarction treated with primary percutaneous coronary intervention. *Turk Kardiyol Dern Ars* 2019;47:95-102.



2. Mastoris I, Giustino G, Sartori S, Baber U, Mehran R, Kini AS, Sharma SK, Dangas GD. Efficacy and safety of routine thrombus aspiration in patients with ST-segment elevation myocardial infarction undergoing primary percutaneous coronary intervention: An updated systematic review and meta-analysis of randomized controlled trials. *Catheter Cardiovasc Interv* 2016;87:650–60. [CrossRef]
3. Jolly SS, Cairns JA, Lavi S, Cantor WJ, Bernat I, Cheema AN, et al; TOTAL Investigators. Thrombus Aspiration in Patients With High Thrombus Burden in the TOTAL Trial. *J Am Coll Cardiol* 2018;72:1589–96. [CrossRef]
4. Jolly SS, James S, Džavík V, Cairns JA, Mahmoud KD, Zijlstra F, et al. Thrombus Aspiration in ST-Segment-Elevation Myocardial Infarction: An Individual Patient Meta-Analysis: Thrombectomy Trialists Collaboration. *Circulation* 2017;135:143–52. [CrossRef]
5. Mahmoud KD, Jolly SS, James S, Džavík V, Cairns JA, Olivecrona GK, et al. Clinical impact of direct stenting and interaction with thrombus aspiration in patients with ST-segment elevation myocardial infarction undergoing percutaneous coronary intervention: Thrombectomy Trialists Collaboration. *Eur Heart J* 2018;39:2472–9. [CrossRef]

Authors reply

Dear Editor,

We thank the authors for their interest in our article entitled “The relationship between visible thrombus aspiration material with no-reflow and in-hospital mortality ratio in patients with anterior ST-elevation myocardial infarction treated with primary percutaneous coronary intervention,” published in the Archives of the Turkish Society of Cardiology.^[1] As we noted in the discussion section, “the lower in-hospital mortality of patients with VTA [visible thrombus aspiration] in our study may also be associated with a shorter door-to-balloon time, lower Killip class, and better TIMI [Thrombolysis in Myocardial Infarction] flow after TA [thrombus aspiration].” Delayed door-balloon time can be a reason for a higher Killip classification in patients without VTA, and these decompensated patients, naturally, cannot undergo revascularization during ST elevation myocardial infarction. Our study population consisted of solely anterior myocardial infarction patients, and our results differed from the mentioned clinical trials (TOTAL, etc.).^[2,3] An anterior location might provide additional engagement and back-up support for the guiding catheter to the ostial location of the coronary artery, and thromboemboli/stroke risk might be reduced during retrieval of the aspiration catheter. Thus, the stroke risk might be lower than in right coronary interventions. We did not see any case of stroke in our study population. Finally, clinical trials have suggested that

features of the higher thrombus burden of the right coronary artery lesions might trigger increased stroke risk.

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References

1. Şeker T, Türkoğlu C, Akkuş O, Gür M. The relationship between visible thrombus aspiration material with no-reflow and in-hospital mortality ratio in patients with anterior ST-elevation myocardial infarction treated with primary percutaneous coronary intervention. *Turk Kardiyol Dern Ars* 2019;47:95–102.
2. Jolly SS, Cairns JA, Lavi S, Cantor WJ, Bernat I, Cheema AN, et al; TOTAL Investigators. Thrombus Aspiration in Patients With High Thrombus Burden in the TOTAL Trial. *J Am Coll Cardiol* 2018;72:1589–96.
3. Mahmoud KD, Jolly SS, James S, Džavík V, Cairns JA, Olivecrona GK, et al. Clinical impact of direct stenting and interaction with thrombus aspiration in patients with ST-segment elevation myocardial infarction undergoing percutaneous coronary intervention: Thrombectomy Trialists Collaboration. *Eur Heart J* 2018;39:2472–9.

