Title: Safety and efficacy of thrombectomy in patients undergoing primary percutaneous coronary intervention for Acute ST elevation MI: A Meta-Analysis of Randomized Controlled Trials

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Reviewer's report:

This meta-analysis evaluates results of studies comparing thrombectomy-assisted versus conventional primary PCI in acute ST-elevation myocardial infarction.

Due to the wealth of data that is continuing to emerge in this rapidly moving field of interventional cardiology, this paper is an important update of previous reports on one of the most problematic situations in primary PCI, the thrombotic culprit lesion and subsequent no-reflow. As so often with novel device-based interventional techniques, the clinician is left with uncertainty about risks and benefits of its use in the daily practice, and meta-analyses are the only way to overcome, albeit with all their inherent limitations, the scarcity of large adequately powered randomized trials.

Results of 17 randomized trials qualifying for this meta-analysis showed that for surrogate endpoints of myocardial reperfusion, such as ST-segment resolution, or angiographic measures (TIMI flow, myocardial blush grade), thrombectomy showed a significant benefit compared with conventional primary PCI. Hard clinical endpoints, such as 30-day mortality, target vessel revascularization (TVR) or reinfarction, however, were similar in the 2 treatment groups. Stroke was more often seen with thrombectomy than without, and there was a trend toward increased mortality with mechanical thrombectomy devices.

Comments:

1) The distinction between mechanical, manual and vacuum types of thrombectomy devices seems somewhat exaggerated. Both Rescue and Extract devices use vacuum as aspiration mechanism of thrombus removal. Therefore, it would seem more logical to limit the subcategories to “Aspiration” and “Mechanical”. The main difference to previous meta analyses is the exclusion of distal protection devices, which have shown no benefit but rather harm in the primary PCI setting.

2) Statistical analyses are a major part of this paper, but too complex for a clinician to judge its validity and strength supporting the main conclusions.

3) The apparent increase in stroke should be addressed and discussed in more detail, as it may be seen as an important caveat against the too liberal use of these “easy” devices.