

# **Complete or Culprit Only Revascularization in Acute Coronary Syndrom What's New?**

**How Should We Manage Nonculprit  
Lesions in Patients with STEMI?**

**Complete revascularization is the clear  
winner. For patients with ST-segment**

elevation myocardial infarction (STEMI), prompt primary percutaneous coronary intervention (PCI) of the culprit lesion is the preferred reperfusion strategy. **(Ref:1)** Approximately half of all patients with STEMI have multivessel coronary artery disease (CAD); for such patients, it is unclear whether additional, nonculprit lesions warrant revascularization as well.

To determine the optimal management strategy for patients with STEMI and multivessel CAD, investigators randomized 4041 patients to undergo complete revascularization or culprit-lesion-only revascularization in a partially industry-funded trial .

Multivessel CAD was defined as at least one nonculprit lesion with  $\geq 70\%$  angiographic stenosis (by visual

estimate) or 50% to 69% angiographic stenosis and a fractional flow reserve  $\leq 0.80$  in a  $\geq 2.5$ -mm vessel. Patients assigned to complete revascularization underwent staged PCI of all significant nonculprit lesions either before hospital discharge or during a second hospitalization within 48 days of the index PCI.

During a median 36-month follow-up, the coprimary endpoint of death or nonfatal MI occurred in 7.8% of the complete revascularization group compared with 10.5% of the culprit-lesion-only group (hazard ratio, 0.74;  $P=0.004$ ), driven mainly by a 32% lower risk for new MI. The second coprimary endpoint (death, MI, or ischemia-driven revascularization) was

49% less likely in those with complete revascularization (8.9% vs. 16.7%,  $P < 0.001$ ). The benefits of complete revascularization were independent of the planned timing of nonculprit-lesion PCI. (Ref:1)

## **COMMENT**

This is the first adequately powered trial to demonstrate that for patients with STEMI and multivessel CAD, conducting

staged complete revascularization leads to meaningful reductions in death or MI over extended follow-up. These findings contrast with those in patients with stable CAD, where PCI has not been shown to reduce hard endpoints, and may reflect differences in plaque characteristics or thrombogenicity in patients with a recent STEMI. Coupled with similar benefits shown in several

previous trials, these findings are convincing and should change guidelines. In our practice, most of these patients will undergo staged PCI prior to hospital discharge unless there are compelling reasons to delay an additional procedure.



# **Summary and Take-home Messages: (Ref:2)**

- Percutaneous coronary intervention (PCI) clearly improves outcomes in patients with ST-segment elevation myocardial infarction and in high-risk patients with non-ST-segment elevation myocardial infarction. But 33% to 66% of patients who

undergo PCI are found to have residual, nonculprit stenosis.

- An analysis of  $\approx 9000$  patients in the Alberta COAPT registry with acute coronary syndrome and multivessel disease compared outcomes of complete revascularization (multivessel PCI with a residual angiographic jeopardy score  $\leq 10\%$ ) with those of incomplete

revascularization. At 5 years of follow-up, complete vs incomplete revascularization was associated with a 22% reduction in the primary composite end point of all-cause death or new myocardial infarction, a 39% reduction in the secondary end point of repeat revascularization, and a 21% reduction in all-cause death. There

was a significant and similar reduction in cardiovascular death.

- No statistical heterogeneity was observed among subgroups in the review of the Alberta COAPT registry, though men appeared to have a slightly larger benefit than women, and patients with preexisting heart failure were less

likely to undergo complete revascularization.

- For stable patients with an angiographically significant nonculprit lesion, proceeding to revascularization during the index hospitalization is an acceptable approach. For patients with risk factors (eg, patients with renal

insufficiency), staged PCI within 1 month is reasonable.

- Decision making for the management of nonculprit lesions with PCI should include an assessment of the patient's clinical status and symptoms, hemodynamic stability, amount of contrast agent used, and morphology and complexity of the lesion.

## References:

1. **Mehta SR, Wood DA, Storey RF, et al. Complete revascularization with multivessel PCI for myocardial infarction. *N Engl J Med*. 2019;381(15):1411-1421.**

**2. Baine y KR, Alemayehu W, Armstrong PW, Westerhout CM, Kaul P, Welsh RC. Long-term outcomes of complete revascularization with percutaneous coronary intervention in acute coronary syndromes. *JACC Cardiovasc Interv.* 2020;13(13):1557-1567.**