

# Routine clot removal after heart attack not beneficial, may have risk

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The largest study ever of its kind, led by researchers from McMaster University and the University of Toronto, has found that a routine strategy of blood clot removal during treatment for heart attacks was not beneficial and was associated with an increased risk of stroke.

The results of the TOTAL trial were presented today at the American College of Cardiology's 64th Annual Scientific Session and published in the *New England Journal of Medicine*. The [randomized controlled trial](#) involved 10,732 patients from 87 hospitals in 20 countries. The study was coordinated by the Population Health Research Institute at McMaster University and Hamilton Health Sciences (HHS).

It showed there was no benefit from the routine use of thrombectomy, or blood clot removal, and that [heart attack patients](#) receiving this were more likely to have a stroke compared to those undergoing percutaneous coronary intervention (PCI) alone. PCI, also known as angioplasty, is a common procedure that involves opening up a blocked artery in the heart usually with a balloon followed by a stent.

"The message from this study is that thrombectomy should not be used as a routine strategy," said lead author Dr. Sanjit Jolly, an associate professor of medicine of McMaster's Michael G. DeGroote School of Medicine. "This is still an important therapy, but given the downsides we observed in our trial, its use should be quite selective and as a measure when an initial balloon angioplasty attempt fails to open up the artery, rather than as a routine strategy."

In manual thrombectomy, the cardiologist uses a syringe attached to a tube to create suction to remove the clot from the artery.

Jolly, who is also an interventional cardiologist with HHS, said earlier studies suggested this treatment

may be beneficial and "it makes sense that if you prevent the blood clot from going downstream and blocking little branches that you could potentially reduce the size of the heart attack and improve outcomes, however we did not observe that in our trial."

Current guidelines leave it to physicians to decide whether to routinely perform thrombectomy during PCI or use it only as a backup strategy in cases where the angioplasty fails to open the blockage.

In the TOTAL trial, researchers randomly assigned half of the patients to receive PCI alone and half to receive PCI with manual thrombectomy. All of the participants underwent PCI in response to the most severe type of heart attack where the artery is completely blocked. Bailout thrombectomy was performed, when angioplasty failed, in seven per cent of the patients assigned to receive PCI alone.

After six months of follow-up, the study revealed no differences between patients who received PCI alone versus those who also received manual thrombectomy, in terms of a combination of the rates of cardiovascular death, subsequent [heart attack](#), cardiogenic shock and the most severe category of heart failure.

The researchers found an increase in stroke in the thrombectomy group. One potential reason is that when the blood clot is pulled out of the heart it can be lost during removal and go up to the brain. However, the continued increase in stroke between 30 days and six months is unexplained, the authors note, adding they cannot rule out play of chance due to the relatively small number of strokes observed in the study.

The researchers saw no difference in outcomes based on the size of the [blood clots](#), despite previous speculation that the procedure might be particularly beneficial in patients with larger clots.

"There are still open questions that aren't resolved by our study," said Jolly. "Clearly, for patients who fail an initial angioplasty attempt, thrombectomy is really the only way to open up the artery."

Dr. Vlad Džavík, the study's co-principal investigator who is a professor of medicine at the University of Toronto and an interventional cardiologist at the Peter Munk Cardiac Centre, University Health Network, said: "We did not design the trial to test the effectiveness of selective or bailout thrombectomy," adding, "Thrombectomy remains an important treatment when the patient's blood vessel is still filled with blood clot when the PCI procedure is done, or if it cannot be completed successfully because of the clot."

Previous smaller studies have suggested benefits of routine thrombectomy or showed mixed results, but these studies involved fewer patients and some were limited to a single hospital.

"Our findings illustrate the importance of doing large trials," said Jolly. "There are many things in clinical practice that we believe are beneficial but need to be tested in large randomized trials. Only by doing this can we be certain of what helps [patients](#) and move the field forward."

Provided by McMaster University

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