

# Outcomes after heart bypass surgery better with 'no-touch' technique to remove leg veins

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When a modified surgical technique was used to gently remove sections of leg veins used in coronary artery bypass surgery, the grafts were less likely to become blocked and fewer people had a recurrence of heart-related chest pain, according to new research published today in the American Heart Association's flagship journal *Circulation*.

Coronary artery bypass grafting (CABG) is a surgical procedure that uses blood vessels taken from another part of the body to create a path (or bypass) for blood flow around blocked or narrowed coronary arteries, thus allowing more blood and oxygen to reach the heart muscle. The [saphenous vein](#) that runs along the inner thigh is one of the most common [blood vessels](#) used in CABG. Within a year after surgery, the vein segments can become blocked—about 15% of the time, which can lead to the recurrence of chest pain.

"Improving the rate at which vein grafts remain open has always been a core issue of CABG surgery," said cardiac surgeon Shengshou Hu,

M.D., Ph.D., senior author of the study and president of Fuwai Hospital in Beijing, China.

Aspirin and anti-clotting medications are used to reduce the risk of vein graft blockage after CABG. "However, we are aware of the potential for damage to the veins when harvesting them from the legs. Our goal was to determine if techniques to reduce damage to the veins during harvesting could reduce the incidence of these blockages," Hu said.

The current study is the first large, multicenter comparison of two vein harvesting techniques—conventional and "no-touch"—to understand if there are differences in the rate of blockage or chest pain following bypass surgery.

In conventional harvesting, just the vein is surgically removed. It is kept from closing by filling it with saline solution (salt water) during preparation for CABG. In the no-touch technique, an approach developed in Sweden in the 1990s, the vein is surgically removed along with a thin layer of surrounding tissue. With the protection of the surrounding tissue, the vein is less likely to spasm and close, so there is no need to keep it open with saline. Thus, the vein doesn't have to be handled or touched as much.

Hu and colleagues reported on 2,655 adults who had CABG at seven cardiac surgery centers in China. Participants were randomly selected to have their veins harvested using either the conventional (1,313 adults) or the no-touch technique (1,325 adults). Average age in both groups was about 61 years, and 78% of both groups were men. The participants were followed via clinic visits and CT scanning at 3 months and 12 months post-surgery.

In the first year after [coronary artery bypass](#)

[surgery](#), the researchers found:

- In CT scans of the coronary arteries after 3 months, 2.8% of the grafts had become blocked in the no-touch group, compared with 4.8% of the conventional-harvesting group;
- In CT scans taken after 12 months, 3.7% of the grafts had become blocked in the no-touch group, compared with 6.5% of the conventional-harvesting group;
- By 12 months, angina (heart-related chest pain) had recurred in 2.3% of the participants in the no-touch group, compared with 4.1% of the conventional harvesting group; and
- There was no difference between groups in the occurrence of heart attack, stroke, cardiovascular death or the need for an additional procedure to restore blood flow through a blocked coronary artery.

"We found that the occlusion (blockage) rate in the no-touch treatment group was surprisingly low. The rate was even comparable to grafts from the radial artery and gastroepiploic artery. We were also surprised to see that significantly fewer participants in the no-touch group suffered from recurrent angina, which had not been reported elsewhere. This finding implies the clinical benefit that no-touch brings to our patients by reducing vein graft occlusion and hence, improving their quality of life," said Hu.

Because the no-touch technique requires extra tissue surrounding the vein to be removed, there have been concerns that the technique could lead to wound complications such as infection. This study found there were more wound complications in the no-touch group: 10.3% of participants required surgical treatment to treat a leg wound within three months of bypass surgery, compared with 4.3% of those in the conventional-harvesting group.

With data analysis they found that being female, having type 2 diabetes or hypertension could be a risk for leg wound complications. "We also noticed that wound complications decreased as the study progressed. This means that leg wound

complications may be minimized by controlling risk factors and providing dedicated training to surgeons. Surgeons who continued using the no-touch approach after the study report that leg wound complications have been much lower," Hu said.

The study is limited by the relatively short 12-month follow-up period, although a 3-year follow-up of the participants is underway.

"It is still unknown whether the efficacy of the no-touch technique in our patients will be sustained in the long run," Hu said. "Inspiringly, previous single-center studies from Sweden with limited sample sizes have shown the no-touch technique is maintained as long as 16 years, however, these have no clinical results on the patients. Long-term follow-up of our large-sample patient cohort is necessary and continuing."

These results from China can likely be generalized to cardiac centers elsewhere in the world, with the no-touch technique already recommended in the 2018 European Revascularization Guidelines. "The benefits of the no-touch technique were consistent among centers performing different volumes of bypass surgery. Therefore, the results are likely to apply to other cardiac centers, whether domestic or abroad," Hu said.

"This manuscript highlights the central role bypass surgery continues to play in the treatment of multivessel coronary artery disease," said Jack H. Boyd, M.D., an American Heart Association volunteer expert and surgical director of the advanced coronary revascularization program and a clinical associate professor at Stanford University School of Medicine. "The one-year [vein graft](#) patency rates, in both cohorts across multiple institutions, clearly demonstrate excellent short-term results are the norm, even in varied practices. As a result of their well-conceived and performed study, there is novel data to help guide patients and heart teams to devise optimal revascularization strategies."

**More information:** *Circulation* (2021). DOI: [10.1161/CIRCULATIONAHA.121.055525](https://doi.org/10.1161/CIRCULATIONAHA.121.055525) , [www.ahajournals.org/doi/10.1161...](https://www.ahajournals.org/doi/10.1161...)

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