Stapled aortic graft-to-graft anastomoses: Is automation optimization?

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The design, functionality, and versatility of surgical stapling devices have evolved over the past several decades and have led to more widespread use in a variety of clinical scenarios. In addition to being used as an instrument for resection, staplers are increasingly being used for anastomoses. In this article, Idrees and colleagues¹ present their experience in 44 patients undergoing prosthetic aortic graft-to-graft anastomoses using an automated circular stapler. The authors report excellent technical outcomes related to the anastomosis: No early or late anastomotic bleeds, strictures, or pseudoaneurysms at 2-year follow-up.

In cardiac surgery, the use of staplers for anastomoses admittedly lags behind other surgical fields such as gastrointestinal surgery where stapled anastomoses are common. The authors should be congratulated on applying this technology in a novel manner and achieving favorable outcomes. This experience will hopefully serve as a platform to evaluate the utility of automated staplers in native aorta-to-graft anastomoses. The use of buttressed staplers to reinforce the suture line in such cases may be prudent.

A question that arises is the generalizability of these outcomes to other surgeons. Technical issues including kinking, size mismatching, narrowing, or tearing related to mishandling of the instrument or faulty execution of the steps are potential pitfalls, particularly with surgeons who may not be familiar with the end-to-end anastomosis stapler. These issues can, of course, also happen with a hand-sewn anastomosis. It is also unclear how much time would actually be saved by using the stapler. Many aortic surgeons can sew a graft-to-graft anastomosis quite rapidly, and placing pursestrings, engaging the components of the stapler, firing the stapler, and placing reinforcement stitches may take at least a few minutes, particularly with someone who is not familiar with this technique. In our personal

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Central Message

Stapled graft-to-graft anastomoses are feasible and safe, but questions arise regarding generalizability and anastomosis quality.

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experience in using these staplers in general surgery, certain technical issues such as incomplete “doughnuts,” staple line tears, and staple line bleeding can occur. In addition, some tenting of mucosal tissue can occur, which, in the case of a colorectal anastomosis, typically will slough off and have no clinical sequelae, but in the setting of a vascular anastomosis it is unclear what effect this may have on flow dynamics and vascular integrity. As the authors allude to, embolization of staples is another concern although fortunately this was not encountered in their experience. With respect to costs, a few additional minutes saved in the operating room may be outweighed by stapler and cartridge costs.

Despite these potential issues, the authors fulfill their mission to establish the feasibility of using automated staplers for graft-to-graft anastomoses. The outcomes from this preliminary series are favorable and suggest that this technique is safe in experienced hands with promise for further advancement of this technology.

Reference

1. Idrees JJ, Yazdchi F, Soltesz EG, Vekstein A, Rodriguez C, Roselli EE. Outcomes after aortic graft to graft anastomosis using an automated circular stapler – a novel approach. *J Thorac Cardiovasc Surg*. 2016;152:1052-7.