Direct repair of the aortic root and arch in acute type A dissection: Is outcome related to technique, patient selection, or experience?

Leonard N. Girardi, MD

From the Department of Cardiothoracic Surgery, Weill Cornell Medicine, New York, NY.

Disclosures: Author has nothing to disclose with regard to commercial support.

Received for publication Dec 17, 2017; accepted for publication Dec 27, 2017; available ahead of print Jan 25, 2018.

Address for reprints: Leonard N. Girardi, MD, 525 E 68th St, M-404, New York, NY 10065 (E-mail: lngirard@med.cornell.edu).

J Thorac Cardiovasc Surg 2018;155:1355-6

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2017.12.087>

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Central Message

In experienced hands, direct repair of type A dissection provides a stable anastomosis and excellent early outcomes. Longer follow-up will be needed to determine the durability of this technique.

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In this issue of the *Journal*, Yang and colleagues¹ report their experience with “direct repair” of acute type A aortic dissection (ATAAD) without the use of biological glues or prosthetic reinforcement of the dissected aortic wall. In a total cohort of 94 patients with ATAAD, a highly selected group of 45 patients were treated by a single, experienced aortic surgeon with “root repair.” Patients with intimal tears at the root, connective tissue disorders, root diameter greater than 4 cm in patients aged less than 65 years, and root diameter less than 4.5 cm in patients aged more than 65 years were treated with root replacement (n = 39). The repair technique consisted of a circumferential reapproximation of the walls of the dissected aorta at the sinotubular junction and arch with 5-0 polypropylene suture followed by a similar anastomosis to a Dacron graft. The authors did not invert the adventitia to further reinforce the suture line.² The operative mortality for this cohort was 7%, and over a mean follow-up period of 22 months, the repair cohort was free of pseudoaneurysm formation, recurrent or residual root dissection, major changes in root diameter, or significant aortic insufficiency. Overall survival after repair was 85% at 4 years, significantly better than for those undergoing root replacement (57%). Is this technique a substantial improvement over more traditional methods of repair, and will it reduce the risk of late root and arch complications needing riskier reoperations?

A closer look at the short-term and long-term outcomes of surgery for ATAAD is warranted to contextualize the results reported in this editorial. Operative mortality continues in the 15% to 20% range in large registries using a variety of surgical techniques.^{3,4} In centers of excellence, where teams perform these high-risk procedures rather than a single surgeon, mortality rarely falls below 10%.^{5,6} Once the patient gets through the initial risk of the acute event, follow-up imaging is crucial to detect late complications. Approximately 27% of patients will develop significant root disease after surgery for ATAAD. Ten percent of

patients will ultimately require root reoperation, with half of those procedures being secondary to the development of late anastomotic pseudoaneurysms.⁷ Downstream aortic complications are also of concern. The incidence of these events was not influenced by the use of the direct suture technique in the arch. More than half of the 45 patients in whom this technique was used experienced distal false lumen thrombosis. One patient required open repair of a descending aneurysm. An increase in descending aortic diameter was also seen in a few patients having follow-up imaging up to 4 years. More late imaging will be necessary to see how this ultimately plays out.

The direct repair technique may turn out to be an improvement. Biological glues have deservedly come under intense scrutiny and have been shown to lead to substantial late tissue necrosis.^{8,9} When Teflon felt is used, it sticks to every surrounding structure, so its elimination would be a blessing for those having to perform these complicated reoperations (if you try to tell me felt doesn't bother you during a reop...c'mon!). However, the mean follow-up time reported in this series is quite limited and substantially less than the 5.4 years between the index procedure and the reoperation reported by other experienced surgeons.⁷ The elimination of adjuncts to secure hemostasis may result in improved early and late outcomes. As always, however,

patient selection (not too large a root or arch, no connective tissue disease), preoperative comorbidities (shock, tamponade, malperfusion, previous open surgery),¹⁰ and greater surgeon experience are likely to be the most influential factors improving the expected outcomes for patients in need of surgery for ATAAD.

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