

REPLY FROM THE AUTHORS: CAN WE JUST TRUST OUR SUTURE LINES!



Reply to the Editor:

In this issue of the *Journal*, Motekallemini and colleagues¹ commented on the techniques of aortic root repair in acute type A aortic dissection (ATAAD) and reported their technique of modified adventitial inversion in contrast to the buttress suture reported by Takana and colleagues.² It is a simple technique, as shown in their figure, where they obliterate the false lumen in the aortic root without using Teflon felt or biological glue, which is potentially toxic to the aortic tissue and a challenge for reoperations.^{3,4}

Surgeons have been very cautious when handling the dissected aorta in ATAAD. The worry of sutures tearing the dissected aorta and dissection flap at the anastomoses supported surgeons using Teflon felt, biological glue, or adventitial inversion as tissue reinforcement. Using adventitia may offer a solution without using Teflon felt or biological glue, both of which, although efficacious, could cause pseudoaneurysms at the anastomotic sites and offer future potential challenges for reoperations.^{3,4} The adventitia inversion technique has been used by my colleagues at the University of Michigan as well. However, I personally do not use the inversion of adventitia for the following reasons: (1) aortic adventitia is composed of connective tissue, including fibroblasts, pericytes, and adipocytes in the supporting environment of

collagen, which contains a large amount of tissue factor. Tissue factor is constitutively expressed by adventitial cells surrounding blood vessels, such as pericytes and adventitial fibroblasts, and initiates clotting by activating the extrinsic clotting pathway with plasma factor VII.⁵ This mechanism stops bleeding from injury to smaller blood vessels and tissue lacerations. To minimize the thrombus or microthrombus formation due to aortic adventitia at the anastomoses, we avoid putting the adventitia in the lumen of the aorta. (2) The dissected aortic flap can hold a fine suture, such as 5-0 PROLENE. Even though the dissected aorta is fragile, directly suturing the 2 dissected layers of aorta is simple and well tolerated. Gentle handling of the tissue and following the suture is key. (3) The same technique has been applied to the anastomoses at the dissected aortic arch or arch branch vessels, such as the carotid artery ([Figure 1](#)). Direct suturing without adventitial inversion or technical adjuncts is straightforward and saves time during arch anastomoses or carotid artery anastomosis when hypothermic circulatory arrest is used. We have completed 147 ATAAD open repairs with this technique with no incidence of anastomotic pseudoaneurysms. The intraoperative mortality was 0%, 30-day mortality was 6%, and 100% of patients are free from reoperations for the proximal aortic pathology (including aortic root, ascending aorta, or aortic arch) at 7.5 years. These outcomes support the direct repair of dissected aortic root, arch, or aortic branch vessels without any surgical adjuncts or inversion of adventitia and is safe and effective.^{3,4}

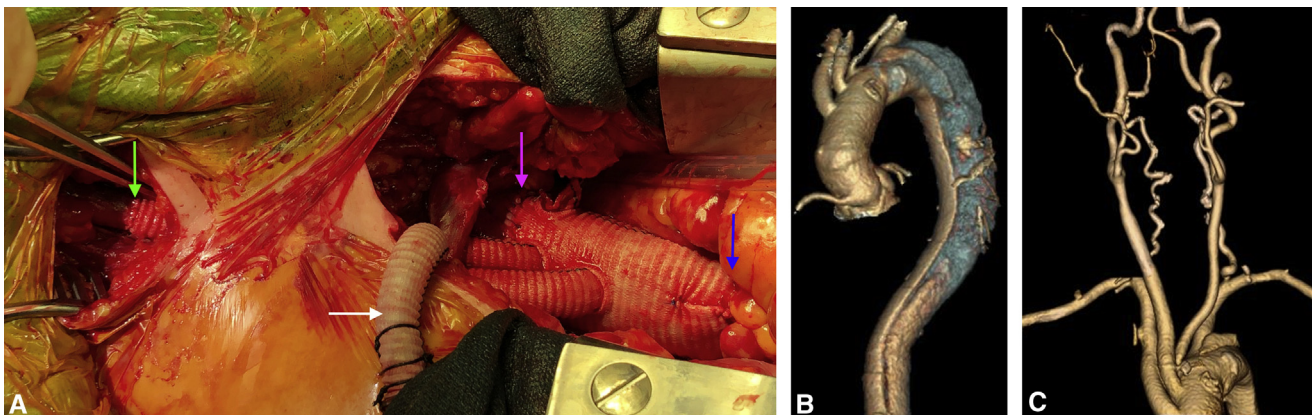


FIGURE 1. A 65-year-old female patient presented with acute type A aortic dissection complicated with innominate artery and right carotid artery dissection/occlusion and right cerebral stroke. The acute type A aortic dissection was repaired emergently, including intrathoracic right subclavian artery cannulation with an 8-mm chimney Dacron graft (*white arrow*), direct aortic root repair (*blue arrow*), aortic valve resuspension, zone 1 arch replacement (*pink arrow*), right common carotid artery replacement (*green arrow*), and aorto-right subclavian artery bypass without technical adjuncts or inversion of adventitia (A). The patient was discharged without any complications or neurologic deficits. Five-month postoperative computed tomography angiogram showed no pseudoaneurysms at the root and arch anastomoses (B) and no residual dissection of right subclavian artery, right common carotid artery, or its branches (C). Echocardiogram showed no aortic insufficiency and normal ventricular function. *Blue arrow*: anastomosis at the sinotubular junction. *Pink arrow*: zone 1 arch anastomosis. *Green arrow*: right common carotid artery anastomosis. *White arrow*: 8-mm Dacron graft sewn to intrathoracic right subclavian artery as arterial perfusion line for cardiopulmonary bypass.

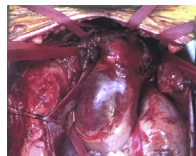
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**DISSECTION FOR
DISSECTION: LIMITED
FOR DELIBERATE
CABROL FISTULA OR
EXTENDED FOR
OPTIMAL EXPOSURE?**



To the Editor:

In the current issue of the *Journal*, Zhang and colleagues¹ reported their experience in applying the modified Cabrol fistula in surgical repair of acute type A aortic dissection (aTAAD), and the authors should be commended for their good management of this high-risk surgical emergency, especially for their 0% reexploration to check bleeding and low 30-day mortality (2.6%) in the fistula group.¹ Although not emphasized in this article, several intraoperative characteristics were also impressive, such as many complex aortic reconstructions involving the root or arch performed and their short aortic crossclamp and selective cerebral perfusion times.

Although indications of the modified Cabrol fistula were mentioned in the study, the decision was made before aortic reconstruction, irrespective of inaccessible surgical bleeding after the procedure. Thus, most fistulas should be considered “deliberate.” Besides proper closure of the transverse pericardial sinus (although difficult, it could be

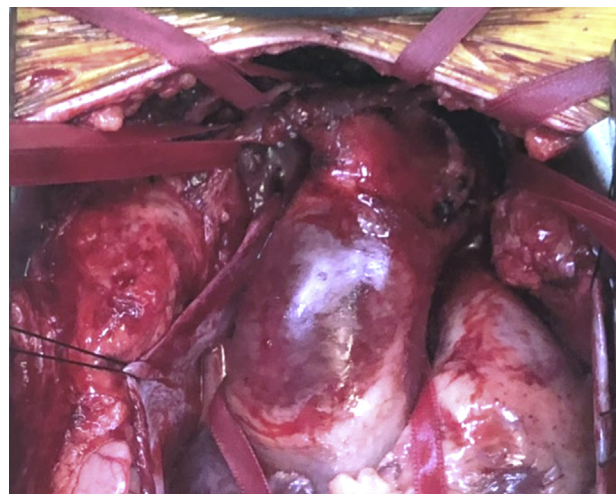


FIGURE 1. Optimal surgical exposure during repair of aTAAD is accomplished by removal of the entire thymic remnant, wide opening of the cranial portion of the pericardial reflection, and extended dissection of the anterior mediastinal tissue. Along with the ascending aorta, the structures exposed and looped by the tapes are (from left to right) the innominate vein, innominate artery, left common carotid artery, left subclavian artery, and vagus nerve.

performed after aortic graft implantation), securely anchoring a pericardial patch to cardiac or mediastinal structures is the decisive factor to successfully restricts exsanguination to the factitious space, followed by creating a draining fistula connected to the venous system. A limited mediastinal dissection might be necessary for “deliberate” Cabrol fistulas using the “anterior pericardial recess coverage” technique. It would especially be true in patients with aortic reconstruction extending to the arch, as shown in Figure 2, C in the article, in whom the innominate vein has to be sutured to the cranial part of the mediastinal tissue after being anchored by the pericardial patch caudally, which might be impossible once extended dissection has been performed for better exposure of the arch branches and distal aortic segments.

Nevertheless, to avoid bleeding complications after surgical repair of aTAAD, the fundamental remains to prevent it in advance and to fix it immaculately, both of which could be carried out with good exposure (Figure 1). Good exposure not only makes suturing the fragile aortic tissue more precise but also facilitates the subsequent hemostatic process. Repairing any bleeders after aortic reconstruction for aTAAD in a poorly exposed surgical field could be not only difficult but also dangerous, because excessive traction of poorly mobile aorta might result in catastrophic breakdown at the anastomosis sites. We recommend the modified Cabrol fistula as a salvage procedure for patients with inaccessible surgical bleeding after surgical repair of aTAAD, but not being unduly applied