experience. Nevertheless, as we stated in our article, Doppler ultrasonography of extracranial arteries should be the basis for choosing the proper cannulation site in all elective patients in whom carotid cannulation is planned. Among almost 250 elective patients with aortic aneurysm in whom Doppler ultrasonography was performed prior to surgery, we saw no significant carotid arteriosclerosis of both sides in any patients.

Furthermore, we do not agree with the letter's authors that carotid artery cannulation eliminates the circulation through the vertebral artery during antegrade perfusion. Cannulation of the right carotid artery provides the same right vertebral perfusion as does cannulation of the right axillary artery. However, as we have demonstrated, it remains questionable whether additional perfusion of the vertebral artery during unilateral cerebral perfusion under moderate hypothermia is even necessary.

Dr AK and Dr Dogan believe that axillary artery cannulation is superior to carotid artery cannulation even though they recognized that several, partly life-threatening, complications related to axillary cannulation have been reported. Also, they do not even mention that axillary cannulation is not always possible and a switch to other cannulation sites is necessary in some cases. In our present, overall experience with almost 300 carotid artery cannulations, no switch to another cannulation site was necessary in any patient, and no vascular, local neurologic, or wound complications were observed. The overall stroke rate was 1%. Despite these results we do not intend to suggest that carotid cannulation is superior to axillary cannulation; let the surgical experience speak for itself.

Paul Urbanski, MD, PhD
Herz- und Gefaess-Klinik
Bad Neustadt, Germany

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Limitations with transapical aortic cannulation in type A aortic dissection: What about aortic regurgitation and cardiopulmonary bypass time?

To the Editor:

I read with great interest the recent article by Dr Wada and colleagues¹ detailing their experience with transapical cannulation in type A dissection (n = 138; 22.5% with significant aortic regurgitation). In their Methods section, they list the following contraindications to this technique: severe aortic stenosis, prior aortic valve replacement, and certain reoperation cases, presumably with dense adhesions.

What about the impact of significant aortic regurgitation that occurred commonly in this study?^{2,3} Baseline significant aortic regurgitation in the setting of transapical cannulation would be expected to cause significant retrograde flow into the left ventricle. The consequences could be inadequate forward flow with vital organ ischemia, left ventricular distention with inadequate myocardial protection, and/or excessive left ventricular vent return.

The authors conducted this cannulation technique with echocardiographic guidance. Clearly, the degree of aortic regurgitation and ventricular distention could be precisely monitored with transesophageal echocardiography. Careful review of their article does not reveal their management strategy for these important considerations.

Last, a possible disadvantage of this technique is the inability to clamp the ascending aorta during cooling, which represents lost operative time and, as a consequence, extended cardiopulmonary bypass time with added risk for morbidity. The authors do not present their cardiopulmonary bypass times in their article.

I would greatly appreciate feedback from the authors about these intraoperative considerations.

John G. T. Augoustides, MD, FASE
Department of Anesthesiology
and Critical Care
Hospital of the University of Pennsylvania
Philadelphia, Pa

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doi:10.1016/j.jtcvs.2006.11.067

Reply to the Editor:

I would like to answer Dr Augoustides' questions regarding possible aortic regurgitation, the disadvantage of not clamping the aorta, and the prolongation of operative time with our technique.

In fact, the degree of aortic regurgitation decreased during cardiopulmonary bypass with transapical aortic cannulation. We do not know the exact mechanism, but this certainly has been our experience. Type A aortic dissection causes detachment of the commissures of aortic cusps and prevents central coaptation, resulting in aortic regurgitation. The aortic flexible cannula located in the center of the aortic valve during cardiopulmonary bypass may enhance coaptation of the leaflets. We could observe by transesophageal echocardiography that the degree of aortic regurgitation was decreased.

We consider the inability to clamp the ascending aorta during cooling not particularly disadvantageous. Rather, we prefer the no-clamp technique during cooling on cardiopulmonary bypass to avoid undue pressurization or malperfusion of the aortic false lumen. Our mean cardiopulmonary bypass time was already presented in our article; it was 233 ± 68 minutes (median, 222 minutes).

Shinichi Wada, MD
Aortic Center
Kawasaki Saiwai Hospital
Kawasaki-shi, Kanagawa, Japan
doi:10.1016/j.jtcvs.2007.01.005

Transapical aortic cannulation: The technique of choice for type A dissection

To the Editor:

We congratulate Dr Wada and colleagues for their excellent and extensive experience in transapical aortic cannulation for type A dissection.¹ Although first described more than 35 years ago,² transapical aortic can-

nulation remains widely accepted and popularized for reasons that remain unclear. This is despite the fact that it is the most “physiologic” approach in establishing cardiopulmonary bypass in acute type A aortic dissection. We have been using this technique exclusively since 1995 for the reasons outlined by Dr Wada and associates. However, we would like to share additional valuable comments that our experience has demonstrated.

Although placement of the aortic cannula through the aortic valve into the true lumen is desirable, it is not essential. In some cases of cardiomegaly we found that the cannula was too short to traverse the aortic valve. The tip was therefore guided into the left ventricular outflow tract under transesophageal echocardiography. We encountered no compromise in perfusion pressures, flow rates, or ventricular distension. Furthermore, although Dr Wada and colleagues suggest that the technique is not practical after previous cardiac surgery, our experience is to the contrary. We recently used the transapical approach in a patient who presented with recurrent type A aortic dissection some years after his initial presentation. The dissection flap involved both femoral arteries and neck vessels, precluding all other sites for extrathoracic cannulation. The left ventricular apex was easily exposed through a small left thoracotomy and a 21F Bio-Medicus cannula (Medtronic, Minneapolis, Minn) introduced through a stab incision. The presence of such patients with no option for extrathoracic cannulation because of extensive dissection is not uncommon, and they would otherwise be denied surgery. However, perfusion of the true lumen can be ensured with the transapical approach.

The theoretic disadvantages to the approach include potential problems with the stab incision repair. Our arterial cannula is designed for percutaneous femoral cannulation and has a rigid sharp introducer. Our stab incision, which measures less than 4 mm, is not full thickness because the myocardium is split along the fibers by the cannula rather than cut by a knife. In our experience the size of the wound is similar to that when an apical vent is used for conventional aortic valve replacement. Because of the small wound size, we do not routinely use pledgets for repair but place a horizontal mattress 4-0 polypropylene suture with an over-and-over running suture.

To date we have encountered no technical difficulty with the repair site.

In conclusion, our experience supports the use of transapical cannulation as the method of choice for arterial inflow in type A dissection. We strongly advocate its routine use and are grateful to Dr Wada and colleagues for confirming it in their large series.

Rajwinder S. Jutley, MD, MRCS
Nicola Masala, MD
A. W. Sosnowski, MD, FRCS
Department of Cardiac Surgery
Glenfield Hospital
Leicester, United Kingdom

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Reply to the Editor:

We appreciate the comments of Dr Jutley and colleagues concerning our recent article.¹ As they said, transapical aortic cannulation is the most physiologic approach to establish cardiopulmonary bypass in type A aortic dissection.

We would like to give some additional explanation related to their comments. Our cannula is long enough to traverse the aortic valve in patients with cardiomegaly (Figure 1, A). It is necessary that our stab

incision, which measures approximately 1 cm, be full-thickness myocardium because the tip of this cannula is not sharp (Figure 1, B). As a result, we routinely close the incision with a few (usually 3) 4-0 polyvinylidene fluoride interrupted sutures with felt pledgets. There were no bleeding problems after performing stab-wound cannulation and closing the incision with this technique.

Shinichi Wada, MD
Shin Yamamoto, MD, PhD
Yasuyuki Hosoda, MD
Aortic Center
Kawasaki Saiwai Hospital
Kanagawa, Japan

Reference

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Off-pump coronary artery bypass sacrifices graft patency

To the Editor:

We are grateful to Dr Gardner¹ for his editorial regarding our meta-analysis² of randomized controlled trials of off-pump coronary artery bypass (OPCAB) versus conventional coronary artery bypass grafting (CABG), and we absolutely agree with his statement: “the choice of which technique (of OPCAB or CABG) to use should remain the surgeon’s option.” However, we, in the era of evidence-based medicine, are convinced that the surgeon’s option should be based on the best evidence, such as a meta-analysis of randomized controlled trials (type Ia evidence recommended by the Agency for Health Care Policy and Research).

The meta-analysis of 37 randomized trials (3369 patients) of OPCAB versus CABG by Cheng and associates,³ published in 2005, demonstrated that no significant differences were found for 30-day mortality, myocardial infarction, stroke, renal dysfunction, intraaortic balloon pump, wound infection, rethoracotomy, or reintervention. However, OPCAB significantly decreased arterial fibrillation, transfusion, inotrope requirements, respiratory infections, ventilation time, intensive care unit stay, and hospital stay.³ Therefore, OPCAB

Figure 1. Sarns Soft-flow Extended Aortic Cannula (Terumo Cardiovascular Systems, Corp, Ann Arbor, Mich).