Clinical Research. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2007:97-108.

4. Pannucci CJ, Wilkins EG. Identifying and avoiding bias in research. *Plast Reconstr Surg*. 2010;126:619-25.

<http://dx.doi.org/10.1016/j.jtcvs.2015.12.038>

THE EVIDENCE IS SUSPECT

Reply to the Editor:

I have read the letter to the Editor from Almassi and colleagues with great interest.¹ They have attempted to provide additional clarity to their recently published article² and its accompanying editorial.³ There is no question that the authors of this study “remain educators first and foremost...” However, the shortcomings of this study, which is no reflection on the authors’ commitment to education, are not ameliorated by their comments.

If this study is analyzed according to the Zwisch Model⁴ (supervision is characterized as “show and tell,” “smart help,” “dumb help,” and “no help”), the role of the resident is unclear. The authors state that “attendings generally permitted the resident to perform all of the sutures for each distal placed.” This scenario is certainly not “show and tell,” but it does not discriminate among “smart,” “dumb,” and “no help.” Similarly, the comment that “target vessel sizes were documented to be either similar or larger...” does not demonstrate the resident’s role in choosing the target, assessing its suitability and quality, or even opening the vessel. The most surprising statement comes later: “In surgical education, the successful completion of a case clearly documents that the trainee’s roles and responsibilities were fulfilled and adequately supervised by their attending surgeon.” Certainly, completion of an operation is a mandate, with or without residents present; demonstration of surgical education, by any standard, is not met simply because a resident was in the operating room.

Ultimately, we are all invested in resident education, and the authors deserve credit for their attempt at measuring resident involvement. However, this study highlights the challenges inherent in documenting resident role in an operation; unfortunately, the evidence is not sufficient to support their conclusions.

Nahush A. Mokadam, MD
Division of Cardiothoracic Surgery
University of Washington
Seattle, Wash

References

1. Almassi GH, Shroyer LW, Bakaeen FG. A victory for all Halsteadians: evidence supporting cardiac surgical residents training. *J Thorac Cardiovasc Surg*. 2016; 151:1215.

Author has nothing to disclose with regard to commercial support.

2. Almassi GH, Carr BM, Bishawi M, Shroyer AL, Quin JA, Hattler B, et al; Veterans Affairs #517 Randomized On/Off Bypass (ROOBY) Study Group. Resident versus attending surgeon graft patency and clinical outcomes in on- versus off-pump coronary artery bypass surgery. *J Thorac Cardiovasc Surg*. 2015;150:1428-37.e1.
3. Mokadam NA. A victory for the Halsteadians? *J Thorac Cardiovasc Surg*. 2015; 150:1438-9.
4. DaRosa DA, Zwischenberger JB, Meyerson SL, George BC, Teitelbaum EN, Soper NJ, et al. A theory-based model for teaching and assessing residents in the operating room. *J Surg Educ*. 2013;70:24-30.

<http://dx.doi.org/10.1016/j.jtcvs.2016.01.013>

FROZEN ELEPHANT TRUNK VERSUS SINGLE-STAGE OPEN REPAIR FOR EXTENSIVE THORACIC AORTIC DISEASE

Reply to the Editor:

We thank Kouchoukos for commenting on our recent article, “The Elephant Trunk Is Freezing: The Hannover Experience.”¹ He pointed out that the alternative to both the conventional and frozen elephant trunk (FET) technique to treat complex aortic arch pathology is an extended open single-stage operation.²⁻⁴ Our group compliments Kouchoukos for his outstanding role in thoracic aortic surgery in general and specifically for his pioneering work with the single-stage approach.

As was pointed out by Kouchoukos, patients with acute aortic dissection have infrequently undergone extended one-stage open repair. A comparison between patients with chronic aortic dissection undergoing extended one-stage repair and those alternatively undergoing a FET procedure was suggested. The complexity of the extended one-stage technique, however, as well as its invasiveness for the patient, seems to discourage the less experienced thoracic aortic surgeon, because only a few groups have actually adopted the concept as yet.

Our group of 51 patients with chronic aortic dissection who had undergone a FET procedure within the study period (August 2001–March 2013) comprised the complete learning curve of this procedure, from the first prefabricated FET grafts⁵ to the novel branched FET grafts first introduced in 2010.⁶ Indications and surgical techniques have changed markedly with increasing experience and the use of branched grafts.⁷ We recently completed a risk analysis of our contemporary techniques (presented at the annual meeting of the European Association for Cardio-Thoracic Surgery in October 2015). It included 18 patients with chronic aortic dissection treated between April 2013 and April 2015 with complete aortic arch repair by means of the FET technique (67% male; mean age, 56 ± 13 years; 22% with Marfan disease;

78% reoperations). Surgical technique included the use of a branched hybrid graft (Vascutek Thoraflex; Vascutek Ltd a Terumo Company, Inchinnan, UK) and noncardioplegic continuous myocardial blood perfusion during aortic arch repair (beating heart aortic arch surgery).⁷ Although patient characteristics were similar to the group treated between 2001 and 2013, operative mortality was 0% and the stroke rate was 0%. Reoperation for bleeding occurred in 6% (n = 1). This is a remarkable improvement relative to our initial experience with the FET technique in patients with chronic dissection. Nevertheless, the value of the FET approach in patients with chronic dissection has yet to be clarified. Renal failure requiring dialysis occurred in 22% (n = 4). As a consequence, we have started to use lower body perfusion during aortic arch repair on a routine basis through a catheter advanced antegradely into the descending aorta, which has a similar effect to femoral perfusion used by Kouchoukos. Temporary spinal cord injury occurred in 11% (n = 2), and both affected patients are ambulatory. Three patients (17%) underwent distal aortic treatment (1 with thoracic endovascular aortic repair, 1 with open thoracic aortic aneurysm repair, and 1 with open infrarenal repair) after 294 ± 69 days. Hence, distal extension was comparable to the classical ET technique.

It remains to be elucidated whether patients with chronic dissection are suitable candidates for FET repair. We believe that treatment of these patients has to be highly individualized. For chronic dissections not extending to the abdominal aorta, we recommend FET repair and secondary thoracic endovascular aortic repair (if needed) for most patients. The 1-stage extended surgical technique proposed by Kouchoukos theoretically would be an alternative in this situation; with our current results, however, we prefer a 2-stage approach that is based on elephant trunk or FET principles. We usually opt for an open second-stage repair in young and patients and those with Marfan syndrome.

As with most complex surgical procedures, outcome in aortic arch repair improves with case load and standardization. Our highly standardized technique can be used as a universal approach to patients at low risk as well as those at high risk (including those with acute DeBakey type I aortic dissections) with very good results. New organ protection methods (whole body perfusion including beating heart aortic arch repair) should further improve outcomes despite an aging patient population. Around 40 of these cases are performed each year in our clinic, and a number of foreign visiting surgeons have adopted the technique in their home institutions.

Malakh Shrestha, MBBS, PhD

Axel Haverich, MD, PhD

Andreas Martens, MD

Clinic for Cardiothoracic, Transplantation, and Vascular
Surgery

Hannover Medical School

Hannover, Germany

References

1. Shrestha M, Beckmann E, Krueger H, Fleissner F, Kaufeld T, Koigeldiyev N, et al. The elephant trunk is freezing: the Hannover experience. *J Thorac Cardiovasc Surg.* 2015;149:1286-93.
2. Kouchoukos NT, Kulik A, Castner CF. Clinical outcomes and fate of the distal aorta following 1-stage repair of extensive chronic thoracic aortic dissection. *J Thorac Cardiovasc Surg.* 2013;146:1086-91.
3. Minale C, Splittgerber FH, Wendt G, Messmer BJ. One-stage intrathoracic repair of extended aortic aneurysms. *J Card Surg.* 1994;9:604-13.
4. Sun XG, Zhang L, Yu CT, Qian XY, Chang Q. One-stage repair of extensive aortic aneurysms: mid-term results with total or subtotal aortic replacement. *Interact Cardiovasc Thorac Surg.* 2014;18:278-82.
5. Karck M, Chavan A, Hagl C, Friedrich H, Galanski M, Haverich A. The frozen elephant trunk technique: a new treatment for thoracic aortic aneurysms. *J Thorac Cardiovasc Surg.* 2003;125:1550-3.
6. Shrestha M, Pichlmaier M, Martens A, Hagl C, Khaladj N, Haverich A. Total aortic arch replacement with a novel four-branched frozen elephant trunk graft: first-in-man results. *Eur J Cardiothorac Surg.* 2013;43:406-10.
7. Martens A, Koigeldiyev N, Beckmann E, Fleissner F, Kaufeld T, Krueger H, et al. Do not leave the heart arrested. Non-cardioplegic continuous myocardial perfusion during complex aortic arch repair improves cardiac outcome. *Eur J Cardiothorac Surg.* 2016;49:141-8.

<http://dx.doi.org/10.1016/j.jtcvs.2015.11.067>

EXTRACORPOREAL CARDIOPULMONARY RESUSCITATION FOR OUT-OF-HOSPITAL REFRACTORY CARDIAC ARREST: A WORD OF CAUTION

To the Editor:

We read with great pleasure Bednarczyk and Singal's recent editorial¹ on our article concerning the role of extracorporeal cardiopulmonary resuscitation (E-CPR) for the treatment of refractory cardiac arrest.² Outcomes assessment represents a key element in an institution's extracorporeal life support program because of the extreme complexity and variability of these patients. Prospective data collection for all extracorporeal life support recipients at our center has proved to be an effective tool to "make every variable count" in the effort of improving the practice and decision making. We thank Bednarczyk and Singal¹ for having emphasized the importance of late outcomes reporting in the most challenging subgroup, patients undergoing E-CPR. We completely agree about the opportunity to include systematically a description of long-term return to active life and social functioning of these patients after prolonged hospitalization in intensive care units.

As the evidence implies, E-CPR is a useful tool for highly selected patients with refractory cardiac arrest (36.7% survival rate in our 2005-2013 series).² In the population depicted, no more than 12% of the E-CPR recipients had suffered refractory out-of-hospital cardiac arrest (OHCA). This low figure was due to selection bias in accepting patients with OHCA for E-CPR. On the basis of