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Commentary: There is more than one way to skin a cat

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The phrase “There is more than one way to skin a cat” comes from the English literature of the mid-1600s. Later appearing in a collection of English proverbs was the phrase “There are more ways to kill a dog than hanging.” In 1840, American humorist Seba Smith decisively turned against the poor kitten in her short story, “The Money Diggers,” when she wrote, “there are more ways than one to skin a cat, so there are more ways than one of digging for money.”¹ Many have assumed, in recent years, these refer to skinning a catfish, for example, from head-to-tail or tail-to-head. Unfortunately, the poor kitty hangs in the balance.

In a recent publication in the *Journal*, Alhussaini and his coauthors² at the University of Florida in Gainesville retrospectively evaluated their experience in descending thoracic aortic aneurysms (DTAAs) and Crawford extent I thoracoabdominal aortic aneurysms (TAAAs) in whom proximal clamping was not feasible and consequently required deep hypothermic circulatory arrest (DHCA). They describe 84 patients; DHCA was employed in 46 patients and withheld in 38 patients. The only significant difference between these 2 groups was that more DHCA patients had chronic aortic dissection (70% vs 34%, $P < .05$). The authors then compared the 2 groups for major adverse events—early mortality, stroke, permanent spinal cord deficit, and permanent renal failure necessitating dialysis—and found no major differences between the 2 groups. However, patients

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CENTRAL MESSAGE

Let's compare apples to apples
while we skin a cat.

who underwent DHCA had longer cardiopulmonary bypass and operative times. Of note, the early outcomes that the authors presented did not include subsets of complications, such as pneumonia, reintubation, respiratory failure requiring tracheostomy (forms of pulmonary complications), or self-limited acute kidney injury.

The authors should be commended for their excellent results in this group of patients undergoing repair using DHCA: operative mortality was 7%, stroke was 7%, permanent spinal cord deficit was 4%, permanent renal failure necessitating dialysis was 2%, and freedom from major adverse outcomes was 83%. The authors correctly point out that the low sample size and low incidence of adverse outcomes subject the study to type II error; this study may have failed to detect an actual difference between these 2 approaches to repair. In addition, the small number of patients effectively eliminates the possibility of more rigorous study, such as a propensity score analysis.

Despite concerns with long cardiopulmonary bypass times, increased pulmonary complications, coagulopathy, transfusion requirements, and other issues, the authors make the point that DHCA is a well-established method of organ and central nervous system protection in complex aortic surgery. Alhussaini and coauthors² appropriately point to Kouchoukos and colleagues³ excellent rates of 30-day mortality (7.8%), stroke (3.7%), and spinal cord deficit (5.3%) in 243 patients who underwent DTAA and TAAA repairs using DHCA as the main protective strategy in a primarily elective cohort (93% of these repairs were elective). However, Alhussaini and coauthors also point out that such repair relying on DHCA may also be associated with high rates of postoperative complications. In doing so, they cite my report of 111 patients, which was

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published in 2008; here, we report elevated rates of complications, including operative mortality (28%), stroke (10%), and renal failure (15%) in patients undergoing DTAA or TAAA repair using DHCA.⁴ It is important to note that in the current manuscript by Alhussaini and colleagues,² the overwhelming majority of patients were operated upon electively (74%), whereas in my report, only 8% of repairs were elective cases.⁴ This is because my standard operative technique for DTAA/TAAAA repair does not rely on the use of DHCA but instead relies on a multimodal strategy of protective adjuncts.⁵ It is well established that elective repair is less risky. Within elective patients in my aforementioned study,⁴ there was only 1 patient death, and no strokes or paraplegia occurred. In recent years (January 2010 to December 2020), we have treated 44 patients with DTAA and TAAA using DHCA, and roughly one half of these repairs were elective. As one might expect with fewer emergencies, our outcomes were better: 30-day mortality was 7%, the paraplegia rate was 0%, and the stroke rate was 2% (J. S. Coselli, unpublished data, 2021).

The fact is that for patients with DTAA, and many patients with extent I TAAA, endovascular aortic repair has become the designated treatment of choice compared with standard open repair, with a well-deserved and

well-established reduction in morbidity and mortality. However, there will undoubtedly be cases that continue to require open reconstruction, such as patients with heritable thoracic aortic diseases like Marfan syndrome, those with mycotic aneurysm, or those with symptomatic expansion from failed endografts. The excellent results reported in the current article by Alhussaini and colleagues² provide a benchmark for comparing the results to alternate endovascular approaches. Just as there may be more than one way to skin a cat, maintaining open operative skills in the armamentarium of the cardiovascular surgeon will remain critical for the foreseeable future.

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