See Article page 190.

Commentary: Preoperative cerebral malperfusion in aortic dissection: Symptoms may be deceivers

Michele Di Mauro, MD, PhD, MSc,[a] and Antonio M. Calafiore, MD[b]

Michele Di Mauro, MD, PhD, MSc, and Antonio M. Calafiore, MD

CENTRAL MESSAGE

The cases do not trace definitive conclusions, but open the door a crack and see a chance to improve the outcomes of patients with aortic dissection by assessing cerebral perfusion with CT perfusion.

Neurological injuries are a noteworthy issue in aortic dissection because the frequency of both preoperative and postoperative cerebral events is high, with negative influence on prognosis.[1] In particular, preoperative cerebral malperfusion is estimated at 3.3% and 21%.[2-5]

Frequently, patients undergo emergency surgery and, despite the lack of clear evidence of cerebral malperfusion, they may develop neurological symptoms during the postoperative course.[1] The opposite is also true: Even less frequently, patients with clear signs of cerebral malperfusion do not develop permanent neurological deficits postoperatively.[1]

We should wonder about the reasons underlying these different behaviors, and the answer can be only that we don't know really know how much malperfusion has already impaired neurological functions at the time of surgery. Symptoms may be deceivers, and whereas computed tomography perfusion (CTP) is an imaging technique enabling evaluation of both rapid qualitative and quantitative cerebral perfusion and providing some important information on parameters such as cerebral blood flow and blood volume as well as mean transit time. Different imaging modalities have been used to assess cerebral perfusion, such as magnetic resonance perfusion, xenon CT, positron emission tomography, and single photon emission computed tomography.[6] However, CTP seems to be the easiest and fastest imaging approach to obtain information about cerebral perfusion before an emergent surgical procedure such as the one for aortic dissection and this information can be useful for a surgeon to assess the prognosis and to adopt any surgical and medical procedures aimed at improving brain protection. The 2 cases reported by Inoue and colleagues[7] are not sufficient to trace definitive conclusions but open the door a crack, and let us glimpse the chance to improve the outcomes of patients with aortic dissection, by preoperatively assessing cerebral perfusion.

From the [a]Cardio-Thoracic Surgery Unit, Heart and Vascular Centre, Maastricht University Medical Centre, Maastricht, The Netherlands; and [b]Department of Cardiac Surgery, Anthea Hospital, GVM Medical and Research, Bari, Italy.

Disclosures: The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Oct 8, 2021; revisions received Oct 8, 2021; accepted for publication Oct 13, 2021; available ahead of print Oct 19, 2021.

Address for reprints: Michele Di Mauro, MD, PhD, MSc, Cardio-Thoracic Surgery Unit, Heart and Vascular Centre, Maastricht University Medical Centre, P. Debyelaan 25, Maastricht, 6202, The Netherlands (E-mail: mdimauro1973@gmail.com).

JTCVS Techniques 2021;10:196-7

2666-2507

https://doi.org/10.1016/j.xjtc.2021.10.024

References

1. Pacini D, Murana G, Di Marco L, Berardi M, Mariani C, Coppola G, et al. Cerebral perfusion issues in type A aortic dissection. *J Vis Surg*. 2018;4:77.
2. Omura A, Miyahara S, Yamanaka K, Sakamoto T, Matsumorei M, Okada K, et al. Early and late outcome of repaired acute DeBakey type I aortic dissection after graft replacement. *J Thorac Cardiovasc Surg*. 2016;151:341-8.
3. Preventza O, Simpson KH, Cooley DA, Cornwell L, Bakaeen FG, Omer S, et al. Unilateral versus bilateral cerebral perfusion for acute type A aortic dissection. *Ann Thorac Surg*. 2015;99:80-7.
4. Bossone E, Corteville DC, Harris KM, Suzuki T, Fattori R, Hutchinson S, et al. Stroke and outcomes in patients with acute type A aortic dissection. *Circulation*. 2013;128:S175-9.
5. Kruger T, Weigang E, Hoffmann I, Bletner M, Aebert H, GERAADA Investigators. Cerebral protection during surgery for acute aortic dissection type A: results

of the German Registry for Acute Aortic Dissection Type A (GERAADA). *Circulation*. 2011;124:434-43.
6. Hoeffner EG, Case I, Jain R, Gujar SK, Shah GV, Deveikis JP, et al. Cerebral perfusion CT: technique and clinical applications. *Radiology*. 2004;231:632-44.
7. Inoue Y, Inoue M, Koga M, Matsuda H. Preoperative brain computed tomographic perfusion for quantitative evaluation of cerebral malperfusion caused by acute type A aortic dissection. *J Thorac Cardiovasc Surg Tech*. 2021;10:190-5.