

# Intravenous Thrombolysis and Mechanical Thrombectomy in Patients with Stroke after TAVI: A Report of Two Cases

Lucio D'Anna, MD, PhD,<sup>\*†</sup> Ozan Demir, MD,<sup>‡</sup> Soma Banerjee, MD,<sup>\*</sup> and Iqbal Malik, MD<sup>‡</sup>

---

Transcatheter Aortic Valve Implantation (TAVI) is an increasingly treatment modality for severe aortic stenosis, which is associated with a considerable peri-procedural risk of stroke. To date, the clinical safety and efficacy of Tissue plasminogen activator (tPA) and mechanical thrombectomy in stroke post-TAVI is not established. We describe 2 cases of patients with stroke after TAVI who received tPA therapy and mechanical thrombectomy.

**Key Words:** TAVI—Stroke—tPA—Thrombectomy

© 2019 Elsevier Inc. All rights reserved.

---

## Introduction

Transcatheter Aortic Valve Implantation (TAVI) is an increasingly used treatment modality for patients with severe aortic stenosis with high or intermediate surgical risk<sup>1</sup> with a considerable risk of peri-procedural cerebrovascular embolic events.<sup>2,3</sup> Despite the fact that the tissue plasminogen activator (tPA) and mechanical thrombectomy represent the standard of care for acute ischemic stroke in selected patients, their efficacy and safety in TAVI patients have limited evidence in the literature. We describe 2 cases of patients with stroke after TAVI who received tPA therapy and mechanical thrombectomy.

---

From the <sup>\*</sup>Department of Stroke and Neuroscience, Charing Cross Hospital, Imperial College London NHS Healthcare Trust, London, United Kingdom; <sup>†</sup>Division of Brain Sciences, Department of Medicine, Hammersmith Campus, Imperial College London, London, United Kingdom; and <sup>‡</sup>Department of Cardiology, Imperial College Healthcare NHS Trust, London, United Kingdom.

Received May 30, 2019; accepted June 27, 2019.

Financial Disclosure: No grant was received for this case report.

Address corresponding to Lucio D'Anna MD, PhD, Stroke Centre, Department of Stroke & Neurosciences, Charing Cross Hospital, Imperial College Healthcare NHS Trust, Fulham Palace Road, London W6 8RF, United Kingdom. E-mail: [l.danna@imperial.ac.uk](mailto:l.danna@imperial.ac.uk).

1052-3057/\$ - see front matter

© 2019 Elsevier Inc. All rights reserved.

<https://doi.org/10.1016/j.jstrokecerebrovasdis.2019.06.035>

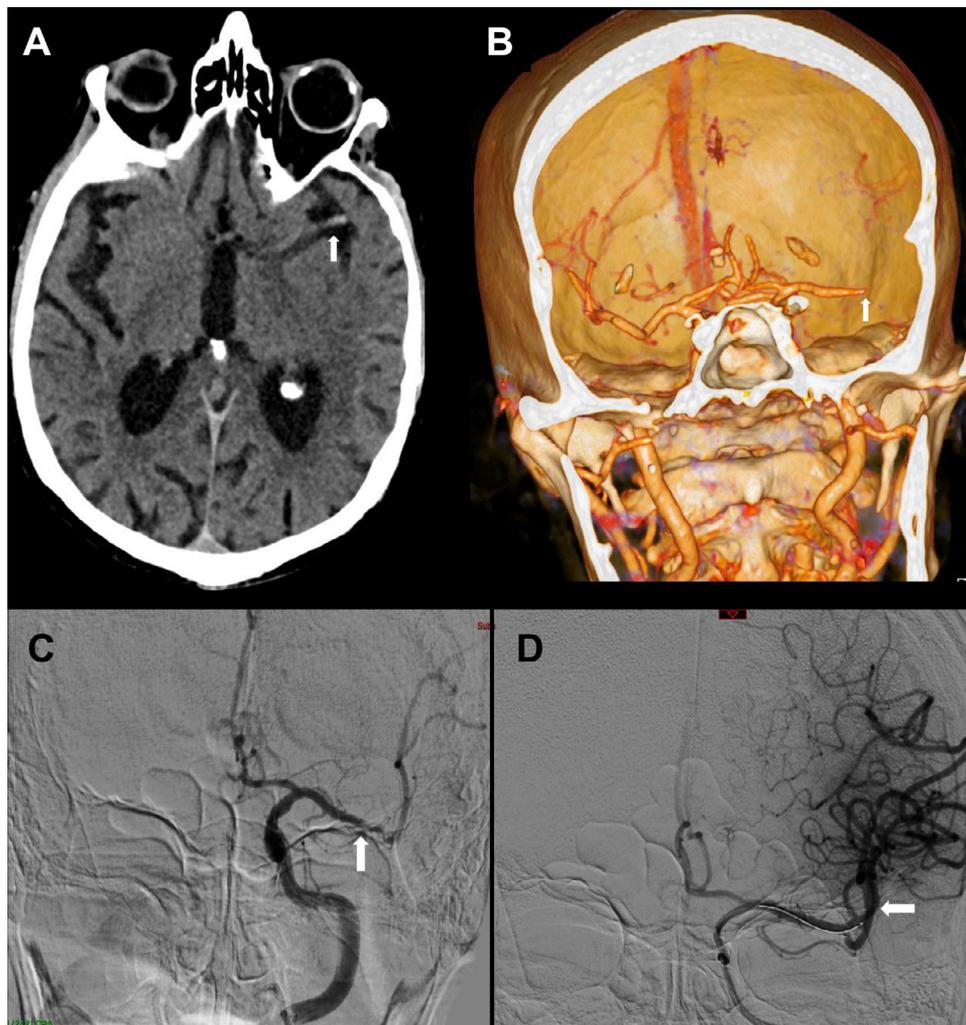
## Case Reports

### Case 1

An 83-year-old man developed dysarthria, left upper motor neuron VII nerve palsy, right third nerve palsy, and left upper limb ataxia post-TAVI for severe aortic stenosis, and his National Institutes of Health Stroke Scale (NIHSS) was 5. Computed tomography (CT) head and CT cerebral angiogram showed no acute infarcts and no vessel target for thrombectomy. This patient received tPA at 2 hours and 40 minutes after the onset of his symptoms, but it was stopped after 61 ml out of 81 ml of the total infusion due to copious bleeding the patient developed from the femoral TAVI access site. Consequently, his blood pressure dropped to 88/52 mmHg and his hemoglobin level to 72 g/L. Patient required treatment with intravenous colloid and transfusion of two units of blood. After 24 hours, his NIHSS was 3.

### Case 2

A 98-year-old man immediately after the procedure developed right-sided weakness and aphasia, and his NIHSS was 18. CT head scan showed subtle loss of gray-white matter differentiation within the left inferior lentiform nucleus and posterior insula and hyperdensity within the distal left middle cerebral artery in keeping with an intravascular thrombus. The CT cerebral angiogram demonstrated an abrupt cut-off of contrast within



**Figure 1.** Case 2. (A) Axial CT head demonstrates hyperdense left middle cerebral artery (arrow) suggestive of intravascular thrombus. (B) CT angiography Volume Rendered Technique demonstrates abrupt cut-off of the left middle cerebral artery (arrow) confirming the presence of intravascular thrombus. (C) Angiography confirmed an occlusion of the left middle cerebral artery. (D) Post-angiographic images demonstrate the restoration of flow in the left middle cerebral artery following successful thrombectomy.

the left middle cerebral artery confirming the presence of an intravascular thrombus (Fig. 1). Thrombectomy of the left middle cerebral artery was performed under local anesthetic. TIC1 flow pre-thrombectomy was 0 while post-thrombectomy was 3. At 24 hours, his NIHSS was 5 while the CT head showed an acute infarct with petechial hemorrhage within the left frontal lobe.

## Discussion

To date, the use of tPA and mechanical thrombectomy for ischemic stroke after TAVI has only been documented in a few case reports in the literature.<sup>4-6</sup> The severe bleeding from the TAVI access developed during the tPA infusion suggested that the use of the tPA in patients with acute stroke after TAVI should be considered on a case-by-case basis only. Mechanical thrombectomy should be the standard of care in patients if there is a documented large vessel occlusion

## Patient Consent and Confidentiality

Details have been removed from these case descriptions to ensure anonymity.

## References

1. Smith CR, Leon MB, Mack MJ, et al. Transcatheter versus surgical aortic-valve replacement in high-risk patients. *N Engl J Med* 2011;364:2187-2198. <https://doi.org/10.1056/NEJMoa1103510>.
2. Wendler O, Schymik G, Treede H, et al. SOURCE 3: 1-year outcomes post-transcatheter aortic valve implantation using the latest generation of the balloon-expandable transcatheter heart valve. *Eur Heart J* 2017. <https://doi.org/10.1093/eurheartj/ehx294>.
3. Amrane H, Porta F, Van Boven AV, et al. A meta-analysis on clinical outcomes after transaortic transcatheter aortic valve implantation by the Heart Team. *EuroIntervention* 2017;13:e168-e176. <https://doi.org/10.4244/EIJ-D-16-00103>.

4. Coughlan JJ, Fleck R, O'Connor C, et al. Mechanical thrombectomy of embolised native aortic valve post-TAVI. *BMJ Case Rep* 2017. <https://doi.org/10.1136/bcr-2016-218787>.
5. Montarello NJ, Nelson AJ, Sidharta SL, et al. Intravenous recombinant tissue plasminogen activator therapy for acute basilar artery ischemic stroke following transfemoral transcatheter aortic valve implantation. *J Heart Valve Dis* 2016;25:14-17.
6. Gülker J-E, Schott P, Katoh M, et al. Case report: cerebral stent retriever thrombectomy of an embolized valve fragment after valve in valve TAVI. *Clin Res Cardiol* 2016;105:372-375. <https://doi.org/10.1007/s00392-015-0935-z>.