

**SHORT ABSTRACT**

# Acute Stroke and Thrombectomy: The Essentials for the Radiologist

Denis Brisbois

**Keywords:** Stroke; thrombectomy

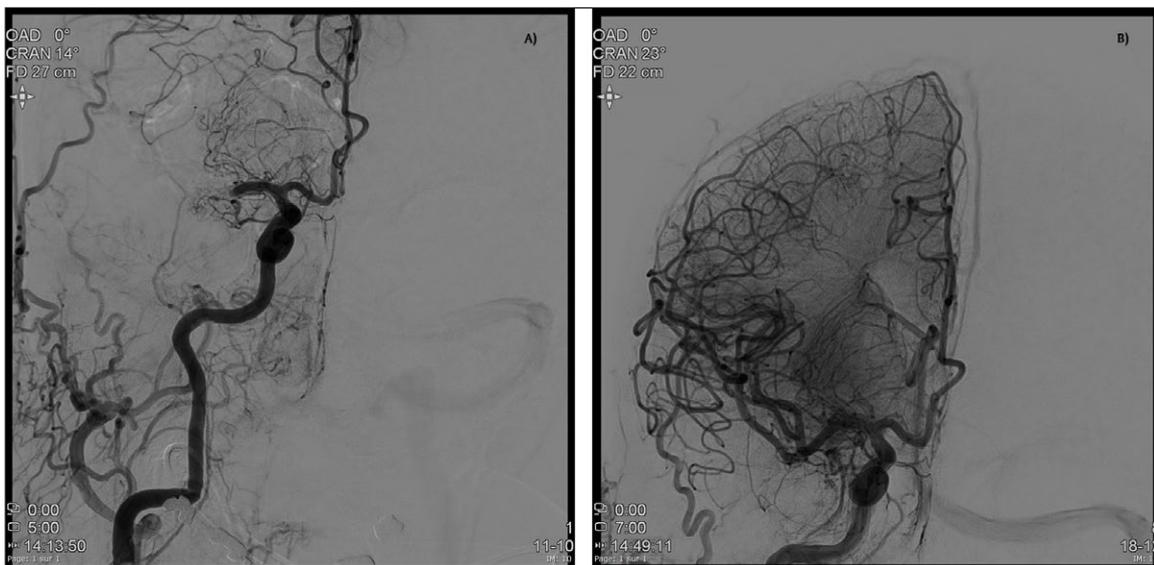
Mechanical thrombectomy is establishing itself as a crucial tool for the treatment in some patients with acute stroke. However, it is just a part of a chain from the neurological deficit to the final treatment in this common and potentially devastating disease. The radiologist on duty plays a crucial role in this chain along with the neurologist, as and they address important questions in the process of selecting the patients that could benefit from mechanical thrombectomy.

Based on the initial radiological examination, the following questions should be addressed diligently: i) Is there bleeding? ii) Can the site of arterial occlusion be identified (e.g. distal internal carotid artery, middle cerebral artery (M1, M2)? iii) Can a large necrosis brain necrosis be identified? iv) What is the cause of the vascular occlusion (e.g.: dissection)? v) Are the cervical vessels patent (stenosis, occlusion, dissection?).

The most suitable examination (computed tomography (CT) versus magnetic resonance (MR)) in the setting of acute stroke is a matter for debate, with both examinations

having strong assets. MR has the capability of identifying hemorrhage and the thrombus in most cases and is more sensitive for necrosis (diffusion-weighted imaging); it is able to perform perfusion studies without increasing the radiation burden and is capable of evaluating the vascular structures via time-of-flight (TOF) MR angiography. CT is available everywhere. It is a fast, easy and robust technique with similar assets to MR, though with lower value regarding specific questions such as the thrombus age and the acute necrosis. Using the ASPECT score helps estimate the necrosis via indirect CT signs. CT angiography allows imaging from the arch to the circle of Willis rapidly and estimating the collaterals. The final choice often depends on the local skills, availability, and the delay.

In our institution, the choice is a rapid work-up with CT and CT angiography with the following working chart: In a case of stroke with symptoms lasting less than 8 hours, CT and CT angiography are performed within 30 minutes of admission. When no hemorrhage is shown, intravenous



**Figure 1:** Proximal middle cerebral artery occlusion on catheter angiography (A). Optimal patency restoration after thrombectomy (B).

thrombolysis is started immediately in all patients with symptoms lasting less than 4.5 hours, except patients with basilar artery occlusion. When an large vessel occlusion is identified: the interventional neuroradiologist is immediately called to discuss the indication of thrombectomy (under general anesthesia in most of the cases) **Figure 1**.

Different thrombectomy techniques are discussed with clinical examples, from thrombi aspiration alone (manual or with a pump) to mechanical extraction with a retrievable stent (Stentriever) through a bi- or tri-axial technique depending on the thrombus location. About 50–60% of patients with a proximal thrombus had a good long term evolution (Rankin score 0–2), which is

better than intravenous thrombolysis alone. HERMES STUDY *Lancet* Volume 387, No. 10029, p1723–1731, 23 April 2016. However, some individual risk factors for unresponsiveness and side effects still have to be elucidated, as even when the delay is correct, some patients have no efficient collaterals and the brain necrosis is almost unpreventable. On the other hand, in some patients with good collaterals and a nice mismatch on imaging could still probably undergo this treatment up to 24 hours after the onset, with obvious benefits.

### Competing Interests

The author has no competing interests to declare.

**How to cite this article:** Brisbois, D 2017 Acute Stroke and Thrombectomy: The Essentials for the Radiologist. *Journal of the Belgian Society of Radiology*, 101(S1): 13, pp. 1–2, DOI: <https://doi.org/10.5334/jbr-btr.1428>

**Published:** 18 November 2017

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