Case 12714

Internal carotid and middle cerebral artery \"tandem\" occlusion: endovascular approach and clinical outcome

Published on 20.05.2015

DOI: 10.1594/EURORAD/CASE.12714
ISSN: 1563-4086
Section: Interventional radiology
Area of Interest: Cardiovascular system Arteries / Aorta
Procedure: Catheters
Imaging Technique: Fluoroscopy
Imaging Technique: CT-Angiography
Special Focus: Embolism / Thrombosis Obstruction / Occlusion Case Type: Clinical Cases

Patient: 59 years, male

Clinical History:
A 59-year-old male patient was rushed to our emergency room aphasic and unresponsive with a NIHSS evaluation of 22. The patient was under medical treatment for chronic atrial fibrillation. After a CT angiography, required by the neurologist, the patient was brought to the angiography suite immediately.

Imaging Findings:
The emergency CT angiography showed a long thrombus occlusion at the proximal left internal carotid artery (ICA), with absence of blood flow up to the ipsilateral middle cerebral artery (MCA) (Fig. 1). In the angiography suite, catheterization of the left common carotid artery was performed and the occlusion of ICA was confirmed (Fig. 2). We proceeded with the approach of ICA with a 0.0035 guidewire and, after engaging the proximal occlusion, the Penumbra MAX ACE thrombo-aspiration system was placed in continuous aspiration for 120 seconds at that level; this to allow a complete removal of the proximal thrombus. Then, maintaining the aspiration, we reached the distal part of MCA with a co-axial system of neuro 0.0014 guidewire (Transend, Stryker-Neurovascular) and MAX ACE (Fig. 3). MAX ACE is a very handy and atraumatic system, and these features allow proper navigation through arteries with minimal risk of dissection. The angiographic control after the procedure confirmed the complete recanalization (Fig. 4).

Discussion:
Patients with tandem lesions, where internal carotid artery (ICA) lesion is associated with thrombosis of an intracranial artery, represent a subgroup of stroke patients with poor clinical outcome: 90% chance of mortality in the absence of treatment and 80% overall rate of 3-month follow-up severe disability or death after IV-rtPA therapy [1]. Multiple randomized, controlled trials have demonstrated the efficacy of IV-rtPA within 4.5 hours after acute ischaemic stroke symptoms onset [2, 3]. However, the success of this therapeutic approach is limited by the narrow time window (4.5 hours) available for treatment, and it is burdened by the high risk of symptomatic intra-cerebral haemorrhage. Lacking of clear guidelines, there is an ongoing debate on which technique is the most effective for reducing the morbidity and mortality of these patients. Recently, several devices have been developed to perform a
mechanical thrombectomy (MT) in order to obtain a safe and fast recanalization of long-tract occluded intracranial vessel [4-6]. In tandem occlusion, emergency stent placement and/or angioplasty of the occluded cervical ICA result in high rates of recanalization; they are also associated with an increased duration of the procedure, enabling the brain infarction to expand [7]. Additional concerns are the actual need of a double anti-aggregative therapy after stent deployment and the increased risk of hyperperfusion syndrome, resulting in brain haemorrhage [8].

Our case shows a long thrombotic tandem occlusion: the patient is suffering from atrial fibrillation, one of the most important cause of acute occlusion of cerebral arteries. This long thrombotic occlusion is the reason of our device choices: a thrombo-aspiration device with a large interior lumen such as MAX ACE, in our opinion, allows a higher and faster thrombotic clots removal than other devices, especially in large arteries. Although MT devices represent a major technical advance by improving substantially the rates of recanalization, we believe that, when considering the clinical outcome, other several predictors such as patient age, baseline NIHSS, presence of collateral circulation and time to recanalization, need to be considered and codified in order to optimize the results.

Our patient, five days after the procedure, had an NIHSS of 5, with a complete regression of aphasis symptoms and a good recovery motility. In conclusion, the endovascular approach to stroke by tandem lesion, if performed by experienced physicians, is effective and safe.

**Differential Diagnosis List:** Tandem occlusion of internal carotid and ipsilateral middle cerebral artery, Internal carotid stenosis, Head trauma, Carotid dissection

**Final Diagnosis:** Tandem occlusion of internal carotid and ipsilateral middle cerebral artery

**References:**


Figure 1

Description: Occlusion of proximal ICA
Origin: University of Rome Tor Vergata. Diagnostic and Interventional Radiology Department.
**Description:** Without guidewire we reached the distal part of the ICA, always in continuous aspiration.

**Origin:** University of Rome Tor Vergata, Diagnostic and Interventional Radiology Department.
Description: For middle cerebral artery catheterisation and to give more support to the device, we used a neuro 0.0014 guidewire. Origin: University of Rome Tor Vergata, Diagnostic and Interventional Radiology Department.
**Description:** Angiography after the procedure shows complete recanalization of cerebral circulation.

**Origin:** University of Rome Tor Vergata. Diagnostic and Interventional Radiology Department.
**Description:** Angiography after the procedure shows complete recanalization of cerebral circulation and internal carotid artery. **Origin:** University of Rome Tor Vergata. Diagnostic and Interventional Radiology Department.
**Description:** Axial view that confirms ipsilateral MCA occlusion. **Origin:** University of Rome Tor Vergata, Diagnostic and Interventional Radiologist Department.
Description: Sagittal image of left proximal ICA occlusion. Origin: University of Rome Tor Vergata, Diagnostic and Interventional Radiologist Department.