Spontaneous rupture of cerebral aneurysm after thrombectomy in a case of acute ischemic stroke with proximal occlusion

E. Levecque¹, D. Brisbois², O. Cornet², P. Reginster³, C. Ciobanu¹, P. Desfontaines¹
¹Centre Hospitalier Chrétien, Neurology- Comprehensive Stroke Center, LIEGE, Belgium
²Centre Hospitalier Chrétien, Interventional Neuroradiology, LIEGE, Belgium
³Centre Hospitalier Chrétien, Neuroradiology, LIEGE, Belgium

BACKGROUND & AIMS

Unruptured cerebral aneurysm may be hidden by a proximal occlusion in some cases of acute ischemic stroke.

Around 1%–5% of the adult population has an intracranial aneurysm and according to the International Study of Unruptured Intracranial Aneurysms 30% of these are middle cerebral artery (MCA) aneurysms. The major complication associated with intracranial aneurysms is aneurysm rupture resulting in subarachnoid haemorrhage.³

Treatment of patients with acute ischemic strokes using mechanical thrombectomy devices has yielded both higher rates of revascularization as well as superior clinical outcomes when compared with medical therapy with intravenous thrombolytics alone.²

METHOD & RESULTS

On December 20, 2017, a 78-year-old woman was transferred from a primary stroke care centre to our comprehensive stroke centre, because of sudden left hemiplegia and hemianopia. The initial obtained NIHSS was 14.

The CT angiography performed in the emergency department shows a cerebral thrombus in the right middle cerebral artery (M1) without ischemic injury and with good collaterals.

Since the onset of symptoms was less than 4.5h IV thrombolysis was performed, and she was immediately transferred to the arteriography room for thrombectomy. After two passes, partial recanalization was achieved (TICI 2a) and revealed an aneurysm of 5 mm expanding from the parietal branch (**fig 1 & 2**). During the thrombus extraction manoeuvre objectification of an extravasation of the product of contrast testifying to a rupture of the aneurysm and visualization of an important vasospasm with reocclusion of previously reopened branches (**fig 3**). A cerebral CT angiography performed in the arteriography room shows a significant subarachnoid haemorrhage (**fig 4**).

The procedure was interrupted and despite the installation of a drainage probe the patient will die in the following days.

DISCUSSION

In the literature, we identified 12 reported cases of intracranial aneurysms that were visualized after recanalization of the occluded vessel. Aneurysms were visualized after acute endovascular thrombolysis in 5 cases, after thrombectomy in 3 cases, after IV tPA in 1 case, and after spontaneous recanalization in 3 cases. Aneurysms ruptured during endovascular therapy in only 2 cases, one of which after thrombectomy.⁵

Aspiration systems have the advantage of minimizing distal embolization of the clot, first by fragmenting the clot and then by providing negative pressure to suction its small fragmented portions.³ Swarnkar et al.⁴ suggested that aspiration alone or in combination with thrombolysis would be more appropriate for intervention than the use of stent retrievers from the point of view of preventing aneurysm rupture during endovascular treatment, as no device passes through the occluded lesion or enters into a concealed aneurismal sac. Mechanism of rupture is not well known but in absence of direct perforation by the device of thrombectomy, abrupt reperfusion due to recanalization may be one explanation.

Finally, regarding the practical recommendations for the management of the aneurysm accidentally discovered during the procedure, Guillon et al.¹ suggest endovascular or surgical aneurysm exclusion should be considered as early as possible given the risk of recurrence of SAH or stroke in the following days. Medical treatment with aspirin or perhaps with heparin seems to be a reasonable alternative for patients who are not good candidates for endovascular/ surgical procedure or while waiting for this treatment. Surgical treatment of aneurysms in the presence of cerebral infarcts seems to be a high-risk procedure, with increased morbidity and mortality.

So, whenever possible, endovascular coiling should be offered as the first-line management to these patients and should be performed by experienced teams.

Conclusion

The presence of an aneurysm hidden by the proximal occlusion should be carefully assessed during the procedure of recanalization. At the light of this case and others reported in the literature, the recanalization may lead to an immediate rupture of the aneurysm.

In any case, catheters and devices have to be handled very carefully to minimize the risk of vessel rupture.