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COMBINED THERAPY IN ACUTE ISCHEMIC CEREBRAL STROKE - CASE REPORT

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BACKGROUND AND PURPOSE: Stroke remains the third most common cause of death in industrialized nations, and the single most common reason for permanent disability. Intravenous thrombolysis with recombinant tissue plasminogen activator (rtPA, Alteplase) for the treatment of acute ischemic stroke within 3 hours of onset become, a worldwide conventional standard of care. Thrombolytic stroke therapy is based on the "recanalization hypothesis," that reopening of occluded vessels improves clinical outcome in acute ischemic stroke through regional reperfusion and salvage of threatened tissues. However, intravenous thrombolysis is successful in approximately one third of patients. Thromboaspiration through either a microcatheter, or a guiding catheter may be an option for a fresh nonadhesive clot. The use of mechanical thrombectomy devices in patients experiencing ischemic stroke and reocclusion after intravenous thrombolysis can now gain approval on the basis of recanalization. CASE DESCRIPTION: We describe a case of a 51-year-old man who presented with ischemic stroke (right-sided hemiparesis and sensomotor aphasia) and sudden onset on 06.50h. He was hospitalised in Neuro intensive Care Unit on 08.10h with NIHSS 8 points. The CT of the head was normal and on 8.40h. began a intravenous rtPa by protocol: body weight 70 kg x 0,9 mg rtPA- 63 mg ACTILYSE with 10% bolus and i.v infusion for 60 min. After beginning it was a significant improvement with neurological deficite NIHSS 5 points. After the end of the fibrinolysis the patient was with severe deterioration of the symtoms (right-sided hemiplegia and aphasia) - NIHSS 15 points. The patient underwent control CT of the head to exclude intracerebral haemorrhage - was normal. On the digital subtraction angiography there was total thrombosis of the left internal carotid artery. Through a guiding catheter was done thrombo aspiration with effective reperfusion with reversal of neurological deficits - NIHSS 3 points. CONCLUSIONS: This case represents a valuable example of two recanalization therapies in acute ischemic stroke to improve clinical outcome by restoring anterograde perfusion and salvaging ischemic brain.

Key words: ischemic cerebral stroke, thrombolysis, thromboaspiration, stent

Ischemia in the brain may result from diverse mechanisms, although blockage of an artery with a clot or progressive narrowing due to atherosclerosis is the most common. Such occlusions in proximal arteries at the base of the brain may be targeted with numerous revascularization approaches, from systemic thrombolysis to endovascular clot manipulation, in order to restore perfusion. Revascularization remains the most intuitive strategy to reverse ischemic injury associated with arterial occlusion in acute stroke.

Revascularization may lead to opening of an occluded artery, or recanalization, yet restoration of downstream flow, or reperfusion, may not ensue. The potential role of intravenous thrombolysis for recanalization of various occlusion sites has also been examined in depth (5). In the Echoplanar Imaging Thrombolytic Evaluation Trial, intravenous tissue plasminogen activator administered in the 3- to 6-hour time window showed poor recanalization of intracranial carotid artery (ICA) lesions and far better results with middle cerebral artery (MCA) occlusions (5). The treatment benefit of tissue plasminogen activator over placebo in limiting infarct evolution was greater for MCA than for ICA obstruction (P =0.060). Good clinical outcome was also more likely with MCA than with ICA occlusion (P =0.005). It should be noted that these definitions were based on noninvasive magnetic resonance angiography. This pattern of better recanalization in MCA lesions was observed in univariate analyses of another study that looked at occurrence and predictors of futile endovascular recanalization (6). Interestingly, however, the role of occlusion site disappeared in multivariate regression in which only age and baseline stroke severity were influential in predicting failed recanalization (6). Perhaps the extent of early ischemic changes in baseline imaging may be influential, as well (7). Patients with a baseline NIHSS score of 10-19 may in fact be ideal candidates for endovascular interventions if the patients have small cores with proximal occlusions.

Accurate predictors of recanalization may be important in endovascular procedures and knowing when to cease attempts at opening an artery. Such limitations with novel devices must

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be considered as new technology and methods are introduced. A recent report on the use of the Enterprise stent. Another study demonstrated appropriately defined reperfusion success, treated with the Solitaire stent (EV3 Inc., USA).

equivocally demonstrate that novel revascularization and prompt reperfusion impact outcome.

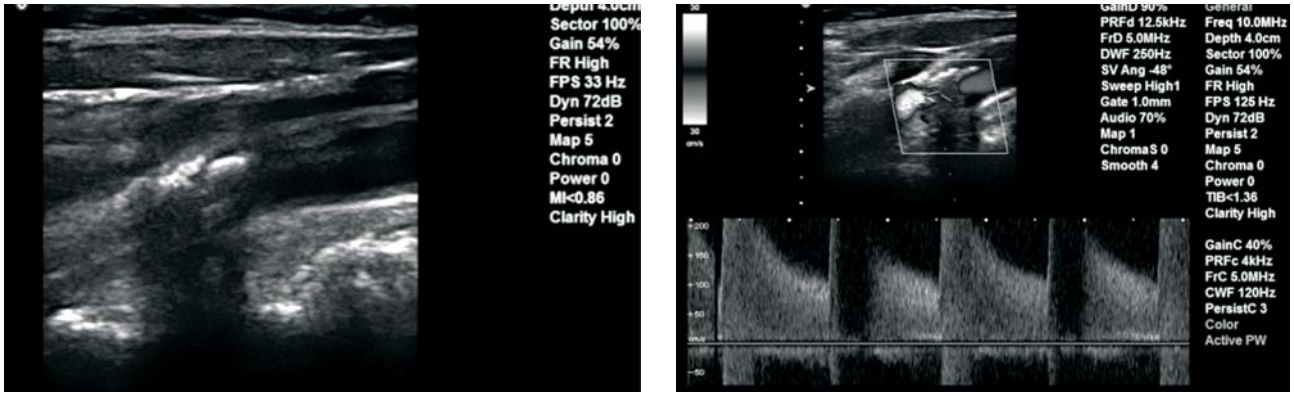

Fig. 1. Doppler sonography of left carotid artery – high grate stenosis

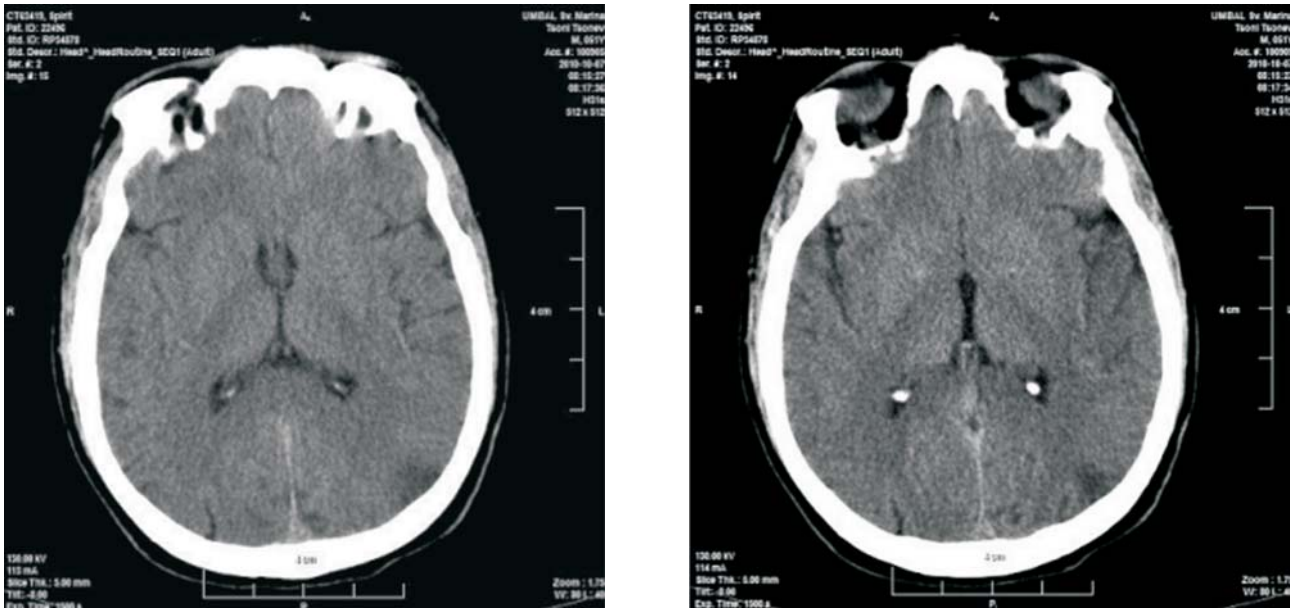

Fig. 2. CT of the head

Following revascularization, reperfusion more accurately predicts infarct growth than recanalization does (14). Future interventions, such as decompressive hemicraniectomy, may be used after failed reperfusion. This surgery is currently reserved for life-threatening massive infarcts, yet one group suggested that it may be used at an earlier stage or pre-emptively or as early as possible in cases of failed multimodal therapy. Revascularization strategies and novel devices continue to broaden options for the treatment of acute stroke, but it is increasingly apparent that selection criteria to identify ideal cases are needed to refine triage and minimize adverse events.. Finally, it should not be forgotten that clinical outcome is ultimately what matters most. Randomized controlled studies have yet to un-

Case Description

We describe a case of a 51-year-old man who presented with ischemic stroke (right-sided hemiparesis and sensomotor aphasia) and sudden onset on 06.50h. The patient has Dibetes mellitus type II from 5 years with good control without treatment and arterial hypertension, treated with ACE-inhibitor.

He was hospitalised in Neuro intensive Care Unit of Second Clinic of Neurology on 08.10h with NIHSS 8 points. On Doppler sonography before the treatment it was high grate stenosis of the left internal carotid artery (fig. 1).

The CT of the head was normal and on 8.40h. began a intravenous rtPa by protocol: body weight 70 kg x 0,9 mg

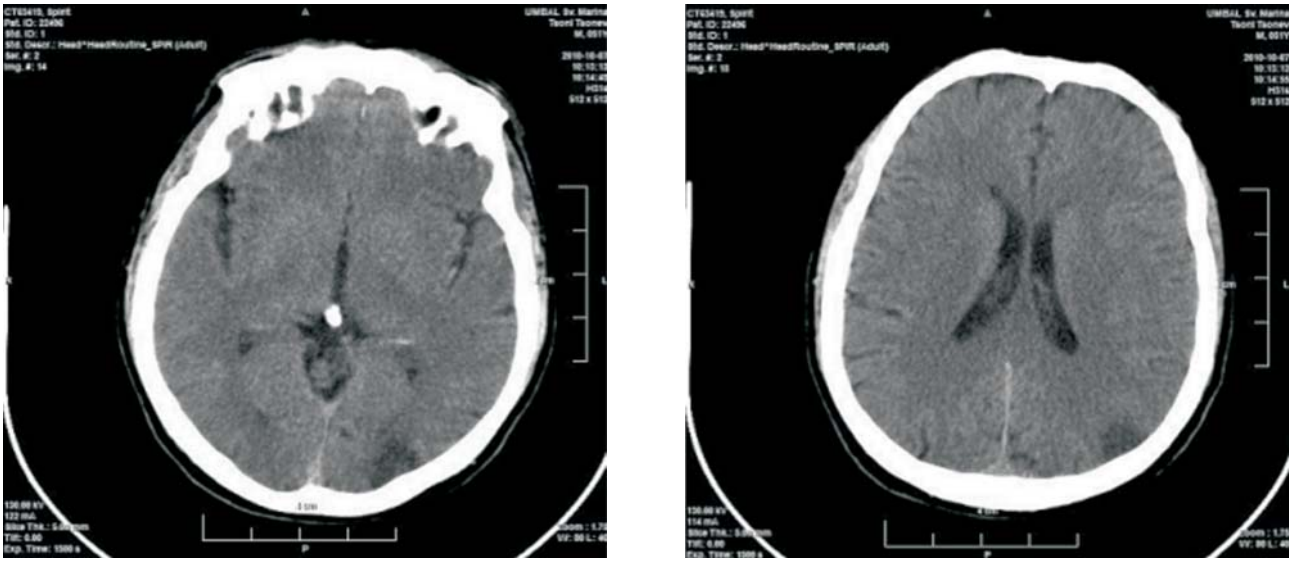

Fig. 3. Control CT (10.15 h) to exclude intracerebral haemorrhage NIHSS = 15

Fig. 4. Digital subtraction angiography A - thrombosis of the left internal carotid artery; B - after thromboaspiration and C - stent with effective reperfusion

Fig.5. Intracranial teritory of left carotid artery after fibrinolysis and stenting

rtPA- 63 mg ACTILYSE with 10% bolus and i.v infusion for 60min (fig. 2).

After beginning it was a significant improvement with neurological deficite NIHSS 5 points. After the end of the fibrinolysis the patient was with severe deterioration of the symtoms (right-sided hemiplegia and aphasia) - NIHSS 15 points. The patient underwent control CT of the head to exclude intracerebral haemorrhage - was normal (fig. 3).

On digital subtraction angiography, made on 10.40h it was total thrombosis of the stenotic segment of the left internal carotid artery (fig. 4A).

After aspiration of the thrombus trough the guiding catheter with 50 cc syringe and stanting on 11.32h, the flow was restorated (fig. 4A, 4C, fig.5).

CONCLUSIONS

Revascularization remains the most intuitive strategy to reverse ischemic injury associated with arterial occlusion in acute stroke. Revascularization may lead to opening of an

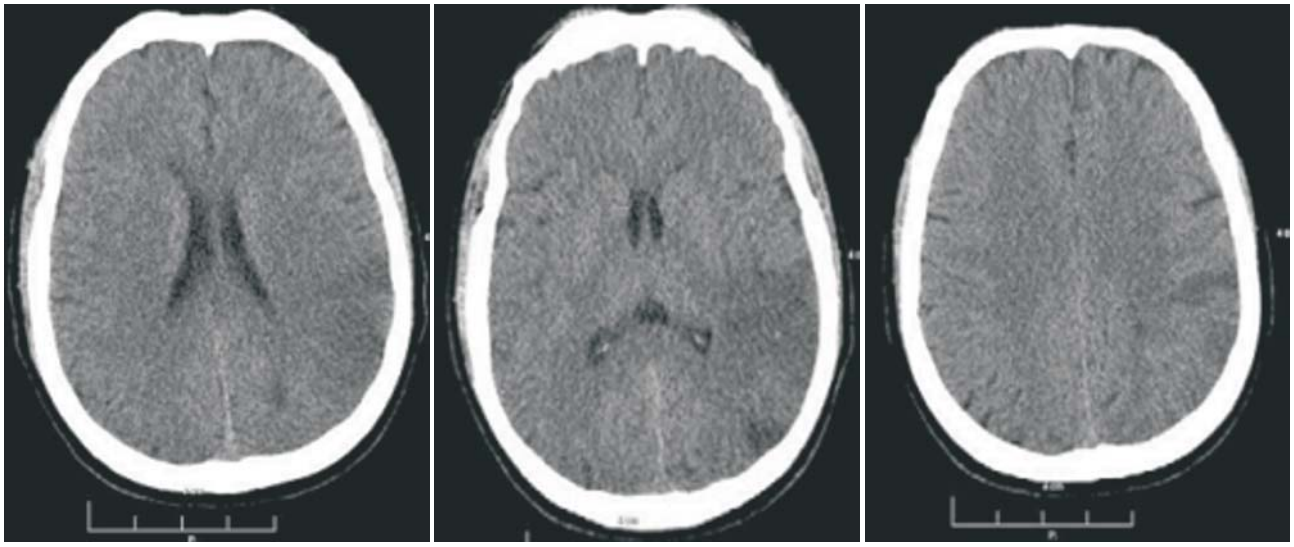

Fig. 6. Second control CT (24h after the onset) - ischemic zone in left parietal lobe; with reversal of neurological deficits - NIHSS 3 points

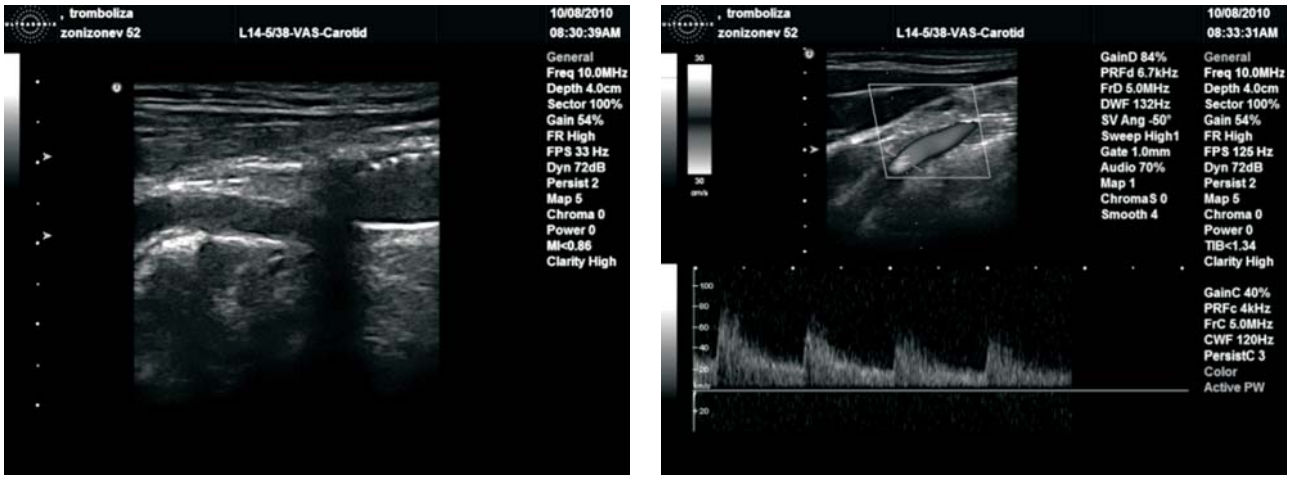

Fig. 7. Control Doppler sonography of left carotid artery after stent

occluded artery, or recanalization, yet restoration of downstream flow, or reperfusion, may not ensue. Revascularization strategies and novel devices continue to broaden options for the treatment of acute stroke, but it is increasingly apparent that selection criteria to identify ideal cases are needed to refine triage and minimize adverse events. The results of recent work on reperfusion may rapidly alter routine clinical practice for evolving ischemia in the brain.

This case represents a valuable example of two recanalization therapies in acute ischemic stroke to improve clinical outcome by restoring anterograde perfusion and salvaging ischemic brain.

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