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Kasuistika | Case report

Acute stroke in a young healthy woman with hormonal contraception: Direct percutaneous thrombectomy with stent-retriever followed by full neurologic recovery

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INFORMACE O ČLÁNKU

Historie článku:
Došel do redakce: 29. 11. 2012
Přepracován: 30. 1. 2013
Přijat: 1. 2. 2013
Dostupný online: 6. 2. 2013

Keywords:
Acute ischemic stroke
Complications of hormonal contraception
Direct thrombectomy
Medial cerebral artery
Stent-retriever

Klíčová slova:
Akutní ischemická cévní mozková příhoda
Arteria cerebri media
Komplikace hormonální antikoncepce
Přímá trombektomie
Stent-retriever

ABSTRACT

Healthy 46-year old woman with hormonal contraception suffered from severe acute hemispheral stroke caused by occlusion of medial cerebral artery. Percutaneous intervention using Solitaire® stent-retriever was started within 30 min of arrival. Complete thrombectomy was followed by full recovery of neurological deficit within several hours. Neither thrombolysis nor general anesthesia was used.

SOUHRN

V naší práci prezentujeme kasuistiku 46leté pacientky užívající hormonální antikoncepci s akutním hemisferálním iktem způsobeným okluzí střední mozkové tepny. Po 30 minutách od příjmu byla započata katetrizace pomocí stent-retrieveru Solitaire®. Do několika hodin po trombektomii měla pacientka již téměř normální neurologický nález. Nebyla použita trombolýza ani celková anestezie.

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DOI: 10.1016/j.crvasa.2013.02.001

Tento článek prosím citujte takto: P. Vaško, et al., Acute stroke in a young healthy woman with hormonal contraception: Direct percutaneous thrombectomy with stent-retriever followed by full neurologic recovery, Cor et Vasa 55 (2013) e107–e110, jak vyšel v online verzi *Cor et Vasa* na http://www.sciencedirect.com/science/article/pii/S0010865013000143

Fig. 1 – Dense sign of the right MCA (above black arrow).

Introduction

Stroke is the third most frequent cause of mortality in developed countries and the most common cause of disability. Acute hemispheral stroke is usually caused by medial cerebral artery occlusion and with conservative treatment 60–70% of patients are either dead or severely disabled after 3 months. Early recanalization is the most effective treatment if performed within initial 3–6 h from symptom onset [1,2]. Thrombolysis is the most frequently used method of recanalization, however, it has two serious limitations: 1. only 40–45% recanalization rates (compared to 20–25% spontaneous recanalization rates) and 2. serious bleeding complications (intra- and extracranial). Combination of thrombolysis and percutaneous intervention was not shown to be beneficial in a recently prematurely stopped IMS-3 trial (results not yet published). Thus, several centers worldwide use direct percutaneous cerebral thrombectomy with modern stent-retrievers as the first line treatment whenever it can be initiated without delay compared to thrombolysis. This program was recently started in our hospital and we describe here a successful case with unusual cause for cerebral artery thrombosis.

Case story

Forty-six-year old woman, non-smoker, with no vascular risk factors except estrogen releasing intrauterine device. At 11:25 she suddenly fainted and subsequently she got left sided hemiplegia. At 12:30 she was transferred by an ambulance to the Neurological Department of Vinohrady Hospital following a dispatcher's announcement. Somnolence was a prominent feature in the neurological examination, she responded in a one-word and slurry way, tended to gaze right and neglected left side. There was a slight left sided facial paresis and atonic hemiplegia on left sided limbs with left sided hemihypesthesia. According to NIHSS [3] her score on admission was 18.

Fig. 2 – Occlusion of the right M2 (MCA).

ECG carried out in the ambulance displayed a sinus rhythm, glycemia was 6.4 mmol/l. Blood samples were taken immediately after her arrival, INR was measured by CoaguChek. Then she was transferred to a CT scan lab, accompanied by neurologist (P.V.). Non-contrast CT scan showed a dense artery sign on the right medial cerebral artery (MCA) (Fig. 1). Patient was then immediately transferred to cardiology department catheterization laboratory, where she arrived at 12:57. Antithrombotic therapy included 40 U/kg of heparin i.v. bolus upon cath-lab arrival and this dose was repeated during the clot retrieval (total heparin dose during the procedure was 80 U/kg). Digital subtraction angiography (DSA) was performed (B. K., P.W.) in mild analgosedation, patient ventilated spontaneously with no need of mechanical ventilation. DSA confirmed occlusion of M2 segment of the right MCA (Fig. 2). Guide-wire and microcatheter crossed the occlusion and thrombus was completely removed by 3 passages of

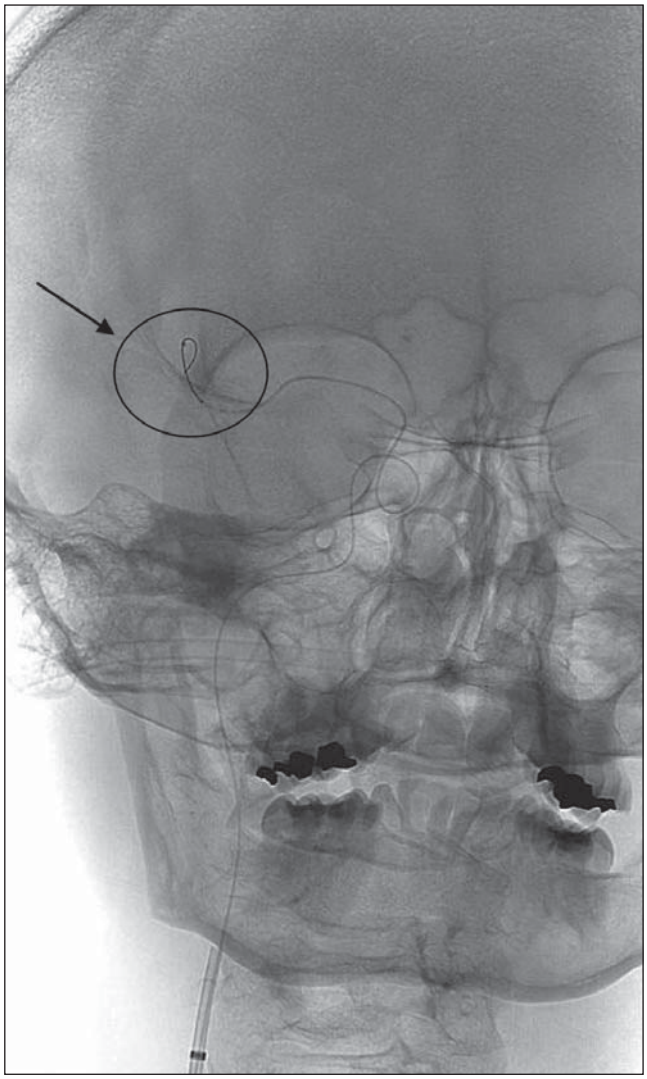

Fig. 3 – Mechanical recanalization of the right MCA.

Fig. 4 – Fully recanalized the right MCA (arrow pointed to previously occluded part).

Table 1 – Terminology and definition of TICI reperfusion scores [11].

0	No perfusion
1	Perfusion past the initial obstruction but limited distal branch filling with little or slow distal perfusion
2A	Perfusion of less than half of the vascular distribution of the occluded artery (e.g., filling and perfusion through 1 M2 division)
2B	Perfusion of half or greater of the vascular distribution of the occluded artery (e.g., filling and perfusion through 2 or more M2 divisions)
3	Full perfusion with filling of all distal branches

a Solitaire stent (Fig. 3). During the procedure 150 ml of non-ionic contrast agent was administered. The intervention resulted in full recanalization of the right MCA with TICI flow 2B (Fig. 4) (Table 1). Femoral artery puncture was closed by Angioseal®. Removed thrombus was red and fresh. Neurostatus got much better in the next two hours after sedation subsided. Mild left sided hemiparesis with hypesthesia of the left upper limb persisted, NIHSS decreased on 4 points. Control CT scan made 24 hours later demonstrated a small ischemic lesion in fronto-temporal cortico-subcortical region with a discret hyperdense string sign (Fig. 5). Clinical assessment showed subsequent improvement, leaving only mild sensimotor deficit in the distal part of the left upper limb. Secondary prevention by ASA in dose of 100 mg and atorvastatin in dose 20 mg were initiated. Transesophageal echocardiography excluded sources of cardioembolism. No cardiac arrhythmia was recorded while monitored continuously during 48 h. Ultrasound examination of carotid and vertebral arteries discovered only a small atherosclerotic plaque in the left carotid bifurcation. Screening of thrombophilic states

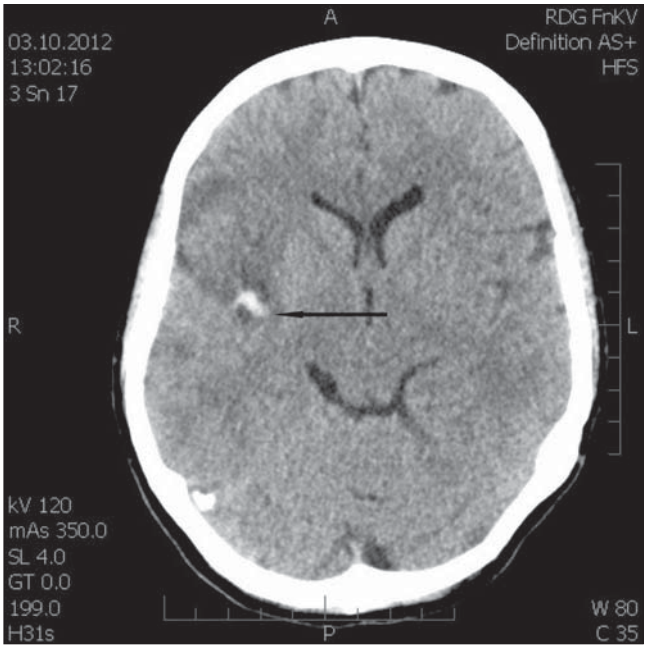

Fig. 5 – CT scan after 24 hours. Residual ischemic hypodense lesion with small hyperdensity at the right fronto-temporal part (see arrow).

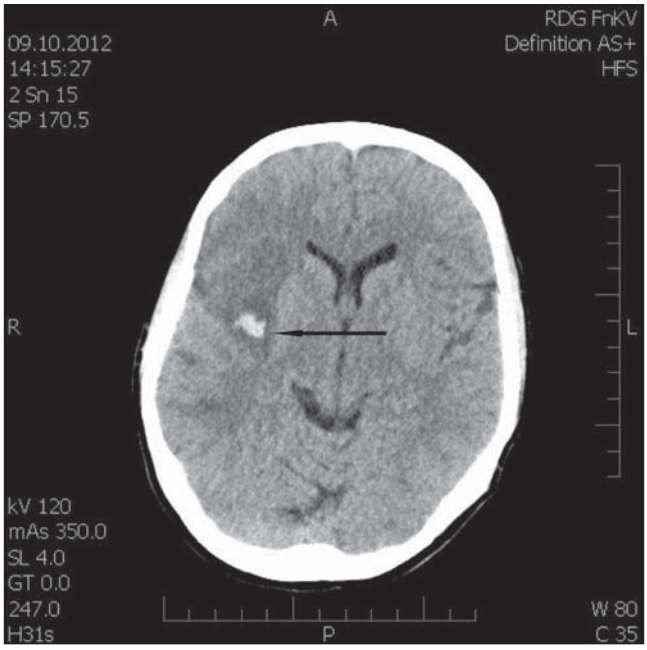

Fig. 6 – CT scan after 7 days. Residual ischemic hypodense lesion with small hyperdensity at the right fronto-temporal part (see arrow) without any change.

and systemic collagenosis markers as well as oncomarkers were negative. Extensive cardiological, neurological and hematological search for the cause of this stroke did not reveal any other risk besides the hormonal contraception. Thus, the patient was adviced to stop this contraception and the intrauterine device was removed. Next successive CT scan was carried out one week from the stroke onset, showing a steady finding of ischemic lesion in the right fronto-temporal region (Fig. 6).

Patient was dismissed with a mild distal paresis of the upper left limb (NIHSS 1). One month later there was a complete recovery.

Discussion

Urgent medical treatment is required in emergency case of stroke. Onset to treatment time is the most important predictor of good clinical outcome. Shortening that time means better chance for recovery (therefore "time is brain" slogan).

Whereas formerly it was not necessary to have examinations results immediately on patients admission, nowadays in causal treatment era of various recanalization methods, it is essential. Change of accessibility and strategy of basic diagnostic methods in acute stroke medicine is obvious, as well as in published papers [4]. Thanks to better coordination with ambulance (incoming patient is reported to neurologist by phone) and also improving coordination among neurologist, cardiologist and radiologist, loss of time is reduced to minimum. As soon as possible early administration of intravenous thrombolysis (IVT) is standard in acute ischemic stroke therapy up to 4.5 h from onset [5]. The main goal is quick recanalization of occluded artery. Depending on country and region, 0–15% of acute stroke patients reach some kind of recanalization at the present time. Besides pharmacological methods (intra-venous, intra-arterial trombolysis and their combinations) various mechanical recanalization methods are largely used in last few years [6,7]. Low recanalization percentage (20–40%) by IVT remains significant problem in large extra- and intracranial brain arteries occlusion. These patients might profit from early mechanical recanalization, as procedure with significant higher recanalization rate. Success recanalization rate by modern "stent-retrievers" is 80–90% [8]. Solitaire® is distractable, selfexpanding and fully retractable stent. Originally developed to bridge aneurysm neck, is currently most widely used device in Europe in brain artery recanalization [9]. Solitaire® uniqueness is in his ability of thrombectomy and/or remaining in occluded artery, similar like in coronary arteries. Periprocedure risk of intracranial hemorrhage is around 2–9% depending on whether simultaneous thrombolysis was used or not [10].

Conclusion

Early mechanical recanalization with stent-retriever catheter is effective treatment modality of acute stroke, particularly in patients with large extra- and intracranial brain arteries occlusion with severe neurological deficit. Quick and efficient cooperation among neurologist, radiologist and cardiologist has a great potential to improve usually grim fate of stroke patients.

Acknowledgements

The acute stroke project is supported by the Charles University Prague research projects P34, P35 and 264706/SVV/2012.

References

[1] C. Fieschi, C. Argentino, G.L. Lenzi, et al., Clinical and instrumental evaluation of patient with ischemic stroke within the first six hours, Journal of the Neurological Sciences 91 (3) (1989) 311–321.

[2] J.H. Rha, J.L. Saver, The impact of recanalization on ischemic stroke outcome: a meta analysis, Stroke 38 (3) (2007) 967–973.

[3] D.F. Edwards, Y.W. Chen, M.N. Diringer, Unified Neurological Stroke Scale is valid in ischemic and hemorrhagic stroke, Stroke 26 (10) (1995) 1852–1858.

[4] Stroke Unit Trialists Collaboration, How do stroke units improve patient outcome? A collaborative systematic rewiev of the randomized trials, Stroke 28 (1997) 2139–2144.

[5] Tissue plasminogen activator for acute ischemic stroke. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group, The New England Journal of Medicine 333 (24) (1995) 1581–1588.

[6] T. Jonszta, M. Kuliha, M. Roubec, et al., Endovascular Treatment of Acute Ischemic Stroke, in: K.I. Sanders, A.M. Jackson (Eds), New Developments in Angiography Research. Nova Science Publishers, New York, 2012, pp. 1–40.

[7] D. Školoudík, M. Kuliha, T. Jonszta, R. Hercig, Endovaskulární léčba ischemické cévní mozkové příhody, Česká a slovenská neurologie a neurochirurgie 75/108 (6) (2012) 669–683.

[8] C. Roth, P. Papanagiotou, S. Behnke, et al., Stent-assisted mechanical recanalization for treatment of acute intracerebral artery occlusions, Stroke 41 (11) (2010) 2559–2567.

[9] P. Machi, V. Costalat, K. Lobotesis, et al., Solitaire FL thrombectomy system: immediate results in 56 consecutive acute ischemic stroke patients, Journal of Neurointerventional Surgery 4 (1) (2012) 62–66.

[10] V. Costalat, P. Machi, K. Lobotesis, et al., Rescue, combined and stand-alone thrombectomy in the management of large vessel occlusion stroke using the solitaire device: a prospective 50-patient single-center study: timing, safety and efficacy, Stroke 42 (7) (2011) 1929–1935.

[11] T. Tomsick, J. Broderick, J. Carrozella, et al., Revascularization results in the Interventional Management of Stroke II trial, American Journal of Neuroradiology 29 (2008) 582–587.