JMS 2025; Vol 8 (1):114-118
UDC: :616.13-005.6-089.844
https://doi.org/10.55302/JMS2581114k

THROMBECTOMY OF A BASILAR ARTERY

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Abstract

Mechanical thrombectomy is a type of minimally invasive procedure in which an interventional radiologist uses specialized equipment to remove a clot from a patient's artery. Using fluoroscopy, or continuous x-ray, the doctor guides instruments through patient's arteries to the clot, extracting the clot all at once.

The radiologist starts the procedure by making a small incision in either the wrist or the abdomen, giving them an access to an artery. After making the incision, the doctor threads a catheter through the artery to the clot. Next, a tiny net-like device called a stent retriever is inserted into the catheter and guided to the blockage. Then, the stent retriever is pushed through the clot.

After the stent retriever is through, it expands to the size of the artery wall. At this point, the stent retriever has captured the clot, and the doctor is able to pull it out backwards, removing the clot entirely.

Keywords*:* thrombectomy**,** stroke, stent, interventional radiology.

Introduction

This procedure is used to treat arterial blockages caused by blood clots.

The basilar artery is part of the posterior cerebral circulation. It arises from the confluence of the left and right vertebral arteries at the base of the pons as they rise towards the base of the brain [1].

The basilar artery runs cranially in the central groove of the pons towards the midbrain within the pontine cistern. It travels within this groove from the lower pontine border adjacent to the exit of the abducens nerve to the upper pontine border and the appearance of the oculomotor nerve. It bifurcates at the upper pontine border [2].

Case report

A patient was hospitalized at the University Clinic for Cardiology due to an acute impairment of consciousness. At the time of examination, the patient was in a coma; mydriatic pupils were unresponsive to light. On the right bulb, a suspected Babinski reflex. Emergency CT and MR angiography were performed. In consultation with an interventional radiologist, a mechanical thrombectomy was indicated for the patient - it was realized in an orderly course.

A 55-year-old patient with an acute condition had a loss of consciousness on the day of admission, and he underwent a surgery - thrombectomy. From heteroanamnesis and previous documentation it was learned that the condition occurred after waking up, when it was noticed that the patient did not respond to his name and acted with reduced mobility.

The patient was initially examined at the University Clinic for Cardiology. A stroke was suspected; a consultation with a radiologist was made, and head CT was performed, after which the patient was referred to the University Institute of Radiology for mechanical thrombectomy.

In 2017, the patient had a myocardial infarction, arterial hypertension, coronary heart disease, with a LAD stent placed (aspirin 100 mg), with a diagnosis of diabetes mellitus (amaryl 3 mg, 2 x 1/2 and metformin 1000 mg 2x1), arterial hypertension (perindopril 4 mg 1x1), hyperlipidemia (atorvastatin 20 mg 1x1, in the evening).

In the last few months, he felt a pain on the left hemiabdomen, and hydronephrosis and calculi in the left ureter were noted, for which the patient was on pain therapy.

Personal history: The patient was 55 years old. He is married, the father of 6 children. He does not consume alcohol, but smokes 1 pack of cigarettes in two days. He is dominantly a right-handed person. Family history: his mother died from stroke.

Immunization: vaccinated with 2 doses against Covid-19. Allergological history. Pharmacological history: Th/ tbl. Amaryl 3 mg, 2x 1/2 tbl. Metformin 1000 mg, 2x1 tbl. Perindopril 4mg 1x1 tbl. Atorvastatin 20mg 1x1 navecer tbl. Aspirin 100mg 1.x1.

St. Somaticus

On admission, the patient was unconscious, afebrile, mobile; with a normosthenic constitution. Skin and visible mucous membranes neatly colored with normal turgor and elasticity. The lymph nodes in the regions available for palpation were not enlarged. Heart action rhythmic, tones clearly audible, pathological noises were not registered, on admission TA = 140 /80 mm Hg, pulse rhythmic with f = 78 /min.

St. neurologicus: Soporous patient, verbal contact was not established. A deviated eyeball was observed on the left, in exotropia. Pupils were anisocoric, with left asymmetry and mydriasis followed by horizontal nystagmus to the left, they did not react to light.

The right bulbus had a miotic pupil with present nystagmus to the right. When placing the arms and legs in an antigravity position, there was sinking of the right limbs, which were under the image of hemiplegia. Cutaneous plantar reflex - Babinski right, left suspicious response.

Computed tomography of the head: Cerebrum, cerebellum and brainstem were without signs of traumatic lesions. Ventricular system and subarachnoid spaces neatly wide free. No extra- or intra-axial hemorrhage was observed.

MRI

Cerebellum and brainstem are not followed MR signs for fresh focal changes, nor lesions of an expansive nature.

Bilateral thalamic paramedian showed restriction of diffusion and low signal on the ADC map were monitored in addition to subacute changes. Percheron ischemic changes were observed as well as perivascular spaces.

Ventricular system properly wide, free, that is, there was asymmetry of the lateral ventricles in favor of the right one. PCA free. Both optic nerves were tortuous with a prominent subarachnoid space around them. Both bulbs had a neat display.

On the TOF pulse sequence, an orderly display of both AKI in the distal extracranial segment as well as intracranially in all segments, with the supraclinoid branches, was observed.

Discontinuity of distal *a. basilaris* was visible, and the output of both P1 segments, i.e., left graceful view. On the SVI pulse sequence, a thromboembolic defect was detected on a distal *a. basilaris* and the output of the P1 segments. The other branches of the vertebrobasilar system had an orderly display.

Echocardiography: Increased dimensions of the left ventricle with reduced global left ventricular function. Hypokinesia of IVS and apex. Neat dimensions of left atrium and right heart cavities. Normal right ventricular function.

The valvular apparatus was morphologically changed in accordance with age; mild functional mitral and tricuspid regurgitation was observed. Tricuspid aortic valve with atheromatous changes, but proper function of the valves. Pericardium without effusion.

Control scan: Condition after endovascular treatment of *a. basilaris*. The find abounds with moving artifacts. Hypodensities in the posterior circulation, in the direction of ischemic lesions (bilateral occipital, in the region of the pons, mesencephalon and both thalamus) were noted on the sections available for examination.

Control scan: Right cerebellar ischemic lesion was registered in the cerebellum. Ischemic lesions were also registered cerebrally in the region of the pons, mesencephalon and both thalami.

Local finding: Lowered eyelids on both sides. Motility organic, there was only possibility of abduction of both eyes. Pupils on the right were more mydriatic, did not respond to SAC. Dg. *ptosis palp.sup.* Paresis *n.occulomotorius*.

Dg. Ptosis palpebrae sup. occulli bill. St. post CVI, St. post thrombectomy a. basilaris. St. post AMI, St. post PCI stenting LAD.

The patient was discharged from hospital in an improved somatoneurological condition. Regular control of glycemia and pressure at home is required! He was treated with roborant, diuretic, antiaggregation, antiedematous, antidiabetic, gastroprotective, antilipemic, cardioprotective, antithrombotic, antibiotic, and dopaminergic therapy.

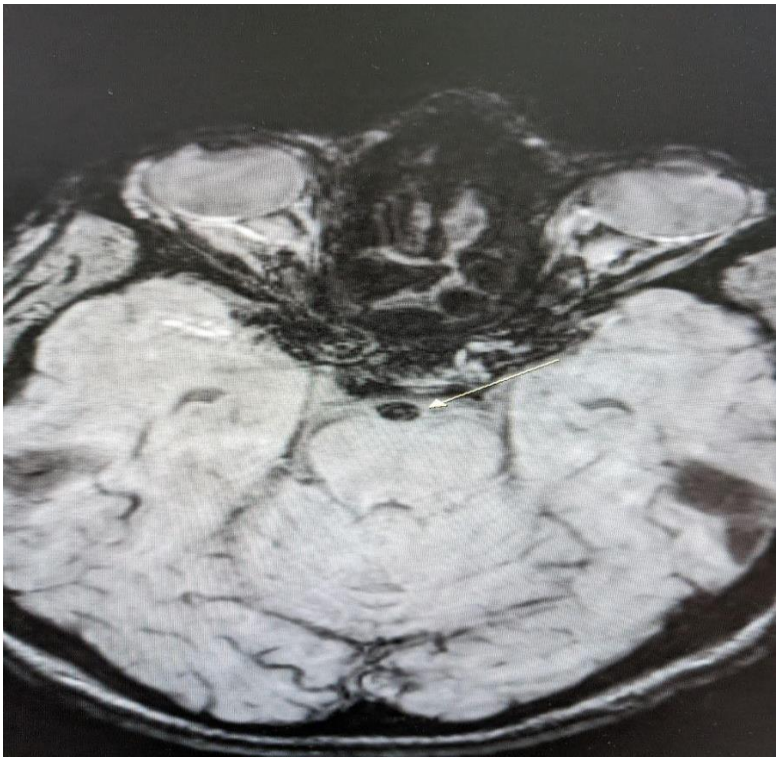

Figure 1. Hyperdense vessel sign of the basilar artery (the basilar artery equivalent to the hyperdense MCA sign), present in ~65%.

Figure 2 and 3. Images demonstrate a filling defect within the vessel.

Discussion

In the treatment of stroke, the main goal is to prevent a secondary injury and control tissue ischemia with different approaches. Nowadays, different pharmacological methods and surgical interventions are used to control and limit stroke injury. Mechanical thrombectomy is one of the invasive methods used in ischemic stroke that has been considered by researchers [3].

Numerous studies have shown the usefulness of mechanical thrombectomy in the treatment of ischemic strokes with thrombotic or embolic origins, and some studies indicate its superiority over the classical method of thrombolysis. The combined findings have demonstrated that endovascular treatment in cases of stroke reduces the morbidity and mortality of patients [4].

In conclusion, emergency mechanical thrombectomy leads to changes in patients' clinical course and reduces their general disability in the long term, in comparison to drug treatments.

Therefore, if the stroke patient's clinical condition would be favorable for invasive measures, it seems that mechanical thrombectomy can be an effective co-therapy to conventional drug treatments.

Conclusions

Undergoing mechanical thrombectomy gives a little less than fifty percent chance of regaining independence. The sooner it is performed the better the chance of recovery, including greater chance of functional independence and mobility.

More than four out of ten patients who undergo thrombectomy will benefit by having less disability over those who did not.

There is no assurance that everyone will completely recover after treatment because the severity of the damage depends on how long the clot blocked the blood supply in the brain. The sooner the clot is removed, the lesser injury is expected and the higher the chances of recovery.

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