

Analysis of Clinical Effects and Prognostic Factors of Acute Astrology Vertebrobasilar Artery Through Arterial Opening Therapy

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Abstract: Caused by the acute occlusion of vertebrobasilar artery, posterior circulation stroke is a serious symptom and develops rapidly, which can lead to severe disability, coma and death. However, there is no sufficient evidence to confirm the effectiveness of in-vascular therapy for posterior circulation cerebral ischemic stroke. With the development of multimode imaging technology, the study and understanding of its characteristics, pathogenesis and factors affecting prognosis will be further deepened.

Keywords: Acute occlusion of vertebrobasilar artery; Clinical effect; Factors affecting prognosis

1. Natural History of Acute Occlusion of Vertebrobasilar Artery

BAO accounts for about 3% of all ischemic strokes and its incidence is estimated about 100,000 person per year of which are mostly between the ages of 50 and 80 and the average age of women is older than that of men. Most of them are secondary atherosclerosis; heart or infection sources are part of BAO. A very small number of survivors usually survive close to persist vegetative states (locked-in syndrome), which not only bring extremely serious physical and psychological harm to the patient, but also brings great mental stress and heavy financial burden to the family and society. At the same time, the treatment of the disease is very difficult. It has been a difficult problem in the field of international neurology. Hypertension, diabetes, smoking, hyperlipidemia, coronary arteries and exovascular disease, and previous stroke are the main risk factors. It is still difficult to reach a consensus on whether the patient had a short-term isoemia attack before BAO. BAO has a high mortality rate of 80 to 90 per cent without active intervention. Clinical characteristics located in the brainstem or small brain, such as torso commodge disorders, eye tremors, eye movement disorders, hearing loss, may help distinguish posterior circulation isoemia from other clinical diagnoses. The incidence of BAO is characterized by rapid onset and development. Throughout the current clinical data and literature, the thrombolytic prognosis BAO patients is better than natural course of disease. Therefore, thrombolytic treatment should be actively carried out.

In a retrospective multi-center study, 72 patients with acute posterior circulation cerebral ischemic stroke were

treated with in-vasovascular recirculation, of which 94.4% successfully re-opened. Logistic regression analysis confirmed that the treatment time from morbidity to vascular flow was an independent predictor of clinical prognosis of 30-90 days. Forty patients with BAO disease were studied, and 32 cases (80%) were treated with arterial thrombolysis, with an average time of 5.5 h from the symptom appearance to treatment. The conclusion was that the increased baseline NIHSS score was associated with an increased risk of complications in patients with ischemic stroke in the pre- and post-circulation.

2. A Diagnosis and Treatment Tool for Acute Occlusion of Vertebrobasilar Artery

2.1. Imaging check

CT and CTA, MRI and MRA, transcranial Doppler ultrasound and color Doppler ultrasound can be used to diagnose BAO in non-invasively or minimally invasively. Enhancing CT can greatly improve sensitivity and specificity. One of the disadvantages of these techniques is that it mainly conducts pre-circulation stroke research, and the application of post-circulation is not well verified. Patients with a high degree of suspicion of substrate artery occlusion can see dense substrate artery signs. Although CT has some advantages, the detection of the brainstem isoemia is still low. Dispersion-weighted imaging (DWI) has proven to be a useful tool for predicting the results of substrate artery occlusion. Compared with the pre-circulation, the post-circulation perfusion weighted imaging is not well verified.

2.2. Mechanical bolting

Stent angioplasty is often used in patients with sclerotic stenosis and occlusion of the base atherosclerosis, and stent angioplasty is carried out after thrombolysis. Unfortunately, there is no evidence to support the RCT study of acute post-circulatory ischaemia. Whether the mechanical hydrant post-circulation can benefit as much as the pre-circulation remains to be further studied. The most commonly used post-circulating embolism devices reported in the literature are Merci and penumbra suction catheters, as well as solitaire and trevo stents.

Merci thrombolysis system was used to assess the efficacy of mechanical thrombolysis (Merci) within 8 hours of the onset of acute ischaemic cerebral infarction. Although vertebral substrate artery thrombolysis was not included in the study, the rate of blood transport reconstruction was 70% and the mortality rate was 50% for 90 days. The mRS score of 36% patients with a prognosis of 90 days was less than 2. Compared with the 83% to 92% mortality rate from simple venous thrombolysis treatment, it is a significant improvement.

In a forward-looking, multi-center, single-group study, 9 patients with occlusion of vertebrobasilar artery had a mortality rate of 38% within 8 hours after symptoms, significantly lower than the expected mortality rate 88% in previous literature. These early data suggest that the penumbra suction catheter device is a potentially effective device for treating occlusion of vertebrobasilar artery, but there have been no separate reports of the application of penumbra suction catheterization devices in substrate artery clenching.

Trevo stent is a device that captures blood clots by radial pullback after releasing the stents. The micro-conductor is placed at the far end of the thrombolysis and the stent is pulled back through the micro-conductive. The stent moves radially toward the wall of the blood vessel, and the blood clot penetrates into the stent strut. The results of open, randomized and controlled trials showed that the trevo group had 76 cases (86%), the MERCI group 54 cases (60%), and the trevo group was more effective than the MERCI group in opening the bolt.

3. Comprehensive Treatment of Acute Occlusion of Vertebrobasilar Artery

3.1. In-vascular treatment

Acute stroke is the primary cause of disability and death in China, and the mortality and disability rate of vertebral substrate artery occlusive stroke is as high as 70%. For patients with vertebral substrate artery occlusion, in-vascular treatment is better. However, there are no clinical trials to confirm the efficacy of in vitro treatment of post-cyclical stroke caused by vertebral substrate artery occlusion. Patients with acute substrate arterial thrombolysis within 8 hours were randomly divided into in-vascular treatment groups (intervention groups) and drug treat-

ment groups (control groups). In terms of mortality, drug treatment alone has a mortality rate of close to 50 per cent, while in-vascular regeneration has reduced mortality. The results show that in-vascular therapy is a good method to treat arterial occlusion of the vertebral substrate.

Compared with pre-circulation, acute substrate arterial atherosclerosis can lead to severe nerve damage and functional defects. High mortality and disability rates seriously affect human health and life, and bring heavy financial burden to families. Acute ischaemic stroke is the main cause of disability in humans. The narrow time window of venous thrombolysis and the low rate of large vascular recanalization limit the clinical application to a certain extent. In-vascular therapy has been widely used in clinical practice and recommended by the guidelines. At present, two major foreign studies have expanded the time window for acute ischaemic stroke from 6 hours to 16-24 hours.

Recently, a number of randomized clinical trials have confirmed the safety and effectiveness of in-vascular therapy in patients with acute pre-circulation ischaemic stroke. The purpose of the foundation study is to evaluate the safety and effectiveness of in-cavity transplantation in the treatment of acute BAO clotting. In a multi-center randomized controlled trial in Australia, 16 patients were treated at random, 8 patients were treated with thrombolysis and 4 patients died. Survivor of four-month improving Rankin scale (MRS) scored 1. There were 4 deaths in the control group and mRS scores 3 for the survivors of 4 months. Although the sample size is too small to draw statistical conclusions, the results suggest that arterial thrombolysis may be beneficial to BAO. In clinical practice, for some BAO patients, in-vascular treatment should also be considered in addition to standardized treatment.

3.2. Interventional treatment of acute occlusion of vertebrobasilar artery

Clinical studies of vertebral substrate arterial occlusive stroke have confirmed that interventional therapy combined with drug therapy is effective. Acute substrate arterial thrombolysis is a critical cerebrovascular disease. Clinical prognosis is extremely bad with mortality rate as high as 60% to 90%. Some patients may experience incomplete blood supply to the vertebral substrate arteries even if they are temporarily out of danger. In order to reduce the mortality rate of such patients, the closed blood vessels must be opened in a timely manner. Clinical experience has shown that patients often have dizziness, vision, movement disorders and sensory disorders. Neither medication nor bridge surgery can be ideal treatment for such diseases. In the late stage of occlusion, the reconstruction methods such as maximum density projection and multiplane 3D reconstruction are more objective, and the section micro-conductive low-pressure

angiogram is also helpful to the accurate diagnosis of lesions.

The opening of the closed artery is different from that of stenosis is angioforming, and the direction of blood vessels cannot be clearly defined during surgery. Therefore, interventional physicians should carefully read the patient's imaging data before surgery. MRI, CT and other cross-sectional images of blood vessel traces help to infer the axial direction of blood vessels, avoid single-angle projection, and timely judge whether the direction of the guide wire and vascular axial is consistent.

3.3. In-vascular therapy and drug therapy control

Patients with acute substrate arterial thrombosis within 8 hours were randomly divided into in-vascular treatment groups (intervention groups) and drug treatment groups (control groups). A total of 344 patients were admitted to the group: 131 cases were eventually admitted to the group due to high cross-rate, of which 66 cases were in the in-vascular treatment group and 65 were in the drug treatment group. The results showed that the 90-day prognostic good rate was higher than that of patients in the in-vasotherapy group (42.4% vs 32.3%). Taking into account the cross-group effect of the trial, the good prognosis rate of the intervention group and the control group was 44.4% and 25.5%, respectively, and the difference between the good prognosis rate of the intervention group and the control group was greater than 22.7% (46.8% vs. 24.1%). In terms of complications, there was no significant difference in the incidence of intracranial bleeding between the two groups. Early symptoms of circulatory ischaemia, such as blurred vision and colorless vision, recurring in patients. Because the head MRI, CTA did not see obvious abnormalities, it did not obtain enough attention. Patients with progressive stroke should have a DSA test as early as possible. Early intervention can avoid severe cerebrovascular events and greatly reduce the risk and cost of treatment.

4. The Prognostic Effect of Acute Occlusion of the Vertebral Substrate Artery

4.1. Choice of time window

Although some patients can benefit from venous thrombosis, the retracing rate of large vascular thrombosis is low and the time window of venous thrombosis is narrow. So, clinical application is limited. In recent years, in-vascular treatment of acute ischemic stroke has made a breakthrough. It is very important to shorten the treatment time.

4.2. Early assessment

Core infarction is a brain tissue with irreversible damage, which refers to an area where cerebral blood flow is lower than normal brain tissue more than 30%, and is a low-

density area on NCCT, where the infarction core may be negatively related to the prognosis. Early CT aspects are one of the indicators that reflect early cerebral ischaemia. In addition, the Glasgow Scale (GCS) was used to assess the extent of consciousness disturbance. The more severe the consciousness disorder, the lower the GCS score. ABCD2 scores can also help identify high-risk patients. The ratio of vertigo patients with a score above 6 or 7 who are more likely to be diagnosed with stroke were about 27 percent. The lower the score, the less likely you are to have a stroke.

4.3. Brain Indices in the Brain Bridge

Pontine midbrain index (PMI) is a simple, reliable and systematic way to evaluate early ischemic changes in the brain bridge and middle brain in patients with acute ischemic stroke. However, PMI is not widely used in therapeutic decisions. At present, there is very little research on PMI. Studies abroad have used NCCT or CTA-SI to evaluate PMI before surgery. In the absence of samples and retrospective studies, these results need to be validated through randomized controlled trials.

4.4. Post-circular anatomy

Post-circulation is responsible for the blood supply at the back of the brain, including the brain trunk, the pons, the small brain, and the pillow leaf. The bi-sided vertebral artery originates from the artery under the collarbone and forms a substrate artery at the bridge myelin connection. BA can be divided into near, middle, and far segments. A two-sided back-of-the-brain artery is sent from the farthest end of the substrate artery, supplying the pillow and lower temporal lobes. The inner temporal lobe is supplied by a larger branch of the artery, and the upper part of the hypothalamus and middle brain is supplied with blood by a perforated artery.

4.5. Substrate arterial thrombosis syndrome

The most common pre-symptoms of substrate arterial thrombosis syndrome include dizziness and nausea, followed by headache and neck pain. Dizziness are the most common early symptoms of BAO, but they are non-specific and need to be distinguished from perititan vertigo. Vertigo patients with at least one other neurological condition are more likely to be diagnosed with stroke than simply vertigo patients. Eye palsy, dysfunction of the mouth and pharynx, dissonance and weakness of the limbs are the most common symptoms. Other symptoms include abnormal eye movement, pupil asymmetry, respiratory disorders, poor discernment and changes in consciousness levels. This substrate artery top syndrome can cause ischemia in the middle, hypothalamus, lower temporal lobes, and pillow lobes.

5. Summary

After acute substrate artery occlusion, only a few patients can endure no obvious symptoms, and these patients often have adequate compensation through the rear traffic artery or soft membrane blood vessels. Most patients experience symptoms of post-circulatory isoemia, with poor prognosis, which is poor even after active medication. If it fails to be dealt with it in a timely, standardized and effective manner, it can lead to rapid deterioration or death, with a huge impact on patients, families and even society.

Although there is insufficient evidence of evidence-based medicine on post-vascular circulation, there are many patients in clinical need; In the absence of sufficient evidence-based medical evidence, physicians re-open blood vessels based on individual clinical experience and existing retrospective analysis results. According to the difference of the cause and illness machine, to use various

materials and techniques reasonably and to open blood vessels as soon as possible are good prognosis guarantee for patient.

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