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Intravenous Thrombolysis in Acute Branch Retinal Artery Occlusion Based on the Stroke Green Channel: A Case Report

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ABSTRACT

Retinal artery occlusion is an acute-onset eye disease that seriously impairs vision, and is a critical condition in ophthalmology. The effect of traditional ophthalmology treatment methods are not ideal. It is difficult to recanalize blocked blood vessels early, but thrombolysis can be given within an effective time window to dissolve the thrombus, improve retinal blood perfusion and restore the function of the retinal inner layer cells. Under the protection of the green channel for stroke, we performed intravenous thrombolysis for patients with branch retinal artery obstruction, and achieved satisfactory results, and the patients were cured.

Keywords

Intravenous thrombolytic therapy, Stroke Green Channel, Acute branch retinal artery occlusion.

Introduction

Retinal artery occlusion (RAO) is an acute-onset eye disease that seriously impairs vision [1], and is a critical condition in ophthalmology. There are different types of retinal artery occlusion, such as central retinal artery occlusion(CRAO), branch retinal artery occlusion (BRAO), ciliary retinal artery occlusion, anterior retinal arteriole occlusion and central retinal artery chronic insufficiency [1]. The causes of RAO are complicated, mainly due to arterial spasm, embolism, endarteritis, or atherosclerosis, which cause retinal artery blood flow to be interrupted, and lead to diseases such as hypoxia, degeneration and necrosis of retinal tissue. If it cannot be rescued in time, vision will be permanently and irreversibly lost. If the retinal blood supply is restored by active rescue, the function of retinal nerve cells may be restored. But the effect of traditional ophthalmology treatment methods, such as anterior chamber puncture, lowering intraocular pressure, eyeball massage, blood circulation, anti-platelet aggregation, etc., are not effective[2,3]. It is difficult to recanalize blocked blood vessels early, but thrombolysis can be given within an effective time window to dissolve the thrombus, improve retinal blood perfusion and restore the function of the retinal inner layer cells. Under the protection of the green channel for stroke, we performed intravenous thrombolysis for patients with branch retinal artery obstruction, and achieved satisfactory results, and the patients were cured. Reported as follows:

Case Data

The patient Shao, female, 19 years old, was admitted to the ophthalmology department of our hospital on June 8, 2017 because of "repetitive transient vision in the left eye for 1 month, and increased by 2 hours" (Hospital number: 011720174).

History of present illness: The patient suddenly lost sight of the left eye before 1 month without any obvious cause, and improved on her own after about 10 minutes. 2 hours before the onset, the left eye lost sight again, which lasted for 40 minutes and gradually improved, but felt the upper left eye Obvious occlusion of vision, no eye pain, ocular foreign body sensation, fearless light, tearing and other discomforts, immediately went to our hospital for medical treatment. The outpatient department was admitted to the emergency department with "left eye infratemporal branch artery occlusion".

Past medical history: The patient suffered a comminuted fracture of the left hand humerus due to a car accident 10 months ago, a

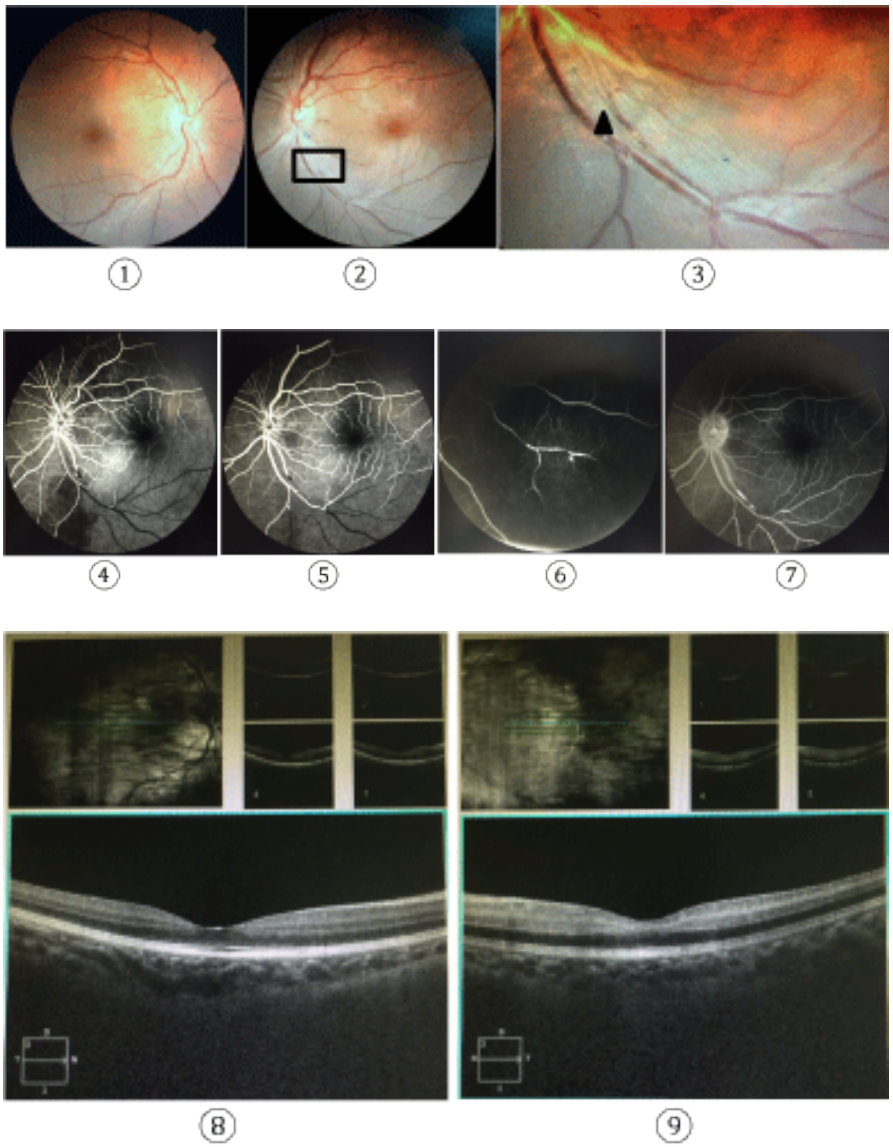
fracture of the axillary segment of the left 7th rib, a fracture of the 4th left anterior rib, and a ruptured spleen. She has been cured by surgical treatment. Denies the history of hypertension, diabetes, cerebrovascular disease, heart disease, etc.

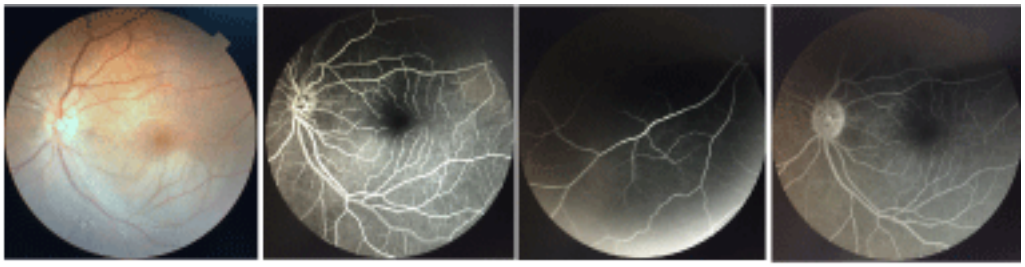
Personal history, marriage and childbirth history, family history have no characteristics

Ophthalmology specialist examination: Binocular vision correction 1.0. The pupil of the right eye is round, with a diameter of about 0.25cm, sensitive to light reflection, and the fundus of the right eye is normal; the pupil of the left eye is round, with a diameter of about 0.3cm, the left eye is directly insensitive to light reflection, indirectly sensitive to light reflection, and the fundus is seen below the temporal Gray and edema of the retina, the rest were negative. No positive signs in the heart, lungs and abdomen. Ophthalmology specialist auxiliary examination (picture ① to picture ⑨). Diagnosis: Infratemporal branch retinal artery occlusion of left eye.

Picture ① show the result of fundus of the right eye. Picture ② show the result of fundus of the left eye. Picture ③ is an enlarged view of Picture ②, the vessel segment of the lesion appears “compartment partition” (Black triangle).

Picture ④ show the FFA result of the left eye, at 11seconds of angiography, the patient's left eye inferior temporal branch artery began to have arterial occlusion after secondary branch, the blood vessel was "broken", the branch artery was not filled, the capillaries were atresia, and the inferior temporal retina had no fluorescence. Picture ⑤ show the FFA result of the left eye, at 19 seconds of angiography, "retrograde filling" appeared at the distal end of the branch of the inferior temporal artery in the left eye, corresponding to venous return delay. Picture ⑥ show the FFA result of the left eye, at 3 minutes and 43 seconds in the late stage of the angiography, the distal end wall of the inferior temporal artery in the left eye can be stained. Picture ⑦ show the FFA result of the left eye, at 10 minutes in the late stage of angiography, "segmental filling" of the inferior temporal artery branch in the left eye.





⑩ ⑪ ⑫ ⑬

Picture ⑧ show the OCT result of the right eye. Picture ⑨ show the OCT result of the left eye. And the retina at the bottom of the fovea is significantly thicker than the retina on the temporal side. The structure of the outer retina is normal, but the inner retina shows a striped reflection.

Need to actively rescue patients' vision. Because our hospital has a green channel for stroke, the stroke team was immediately invited for consultation to rule out any contraindications to thrombolytic therapy. Before waiting for the results of related auxiliary examinations, we also give patients traditional treatment. Such as inhaling high-flow oxygen to improve choroidal hypoxia and relieve retinal hypoxia; oral niacin, nitroglycerin, and retro bulbar injection of atropine to dilate blood vessels Vasospasm; oral aspirin to prevent platelet aggregation to reduce blood viscosity; eye massage to lower intraocular pressure. The patient's head CT, blood routine, coagulation complete set, biochemical complete set, electrocardiogram and other examinations showed no abnormalities. After the patient's family members signed and agreed, she was given a rapid intravenous drip of 1 million U of urokinase (the drip was completed within half an hour, and the patient's door to needle time was 60 minutes). During the thrombolytic treatment, actively observe the bleeding of the patient's skin, mucosa, sublingual, and oral cavity.

Two hours after the thrombolytic treatment, the patient complained of disappearance of the occlusion in the upper left eye and no discomfort. Perform ophthalmology-related specialized auxiliary examinations on patients (picture ⑩ to picture ⑬. After 2 hours of intravenous thrombolytic therapy, the patient's clinical symptoms disappeared. The auxiliary examination showed that the blood vessel was recanalized and the patient recovered. 6 hours and 24 hours after thrombolytic therapy, blood routine, coagulation full set, and head CT showed no abnormalities. In order to further clarify the cause of the patient, a head and neck CTA examination showed that the right ophthalmic artery opening was unobstructed, and the left ophthalmic artery showed slender and lighter appearance than the contralateral side; cardiac color Doppler ultrasound, dynamic electrocardiogram, autoimmune antibodies, and C-reactive protein were not found abnormal. Combined with the medical history and auxiliary examinations, we speculate that the patient's branch retinal artery occlusion was related to the fracture and dysplasia of the left ophthalmic artery in a car accident 10 months before the onset (may be other factors). Due to an ischemic vascular event, the patient was discharged from the hospital for secondary prevention of ischemic stroke. Follow-up for nearly 4 years, the patient showed no symptoms.

Picture ⑩ is the fundus photograph of the left eye after thrombolytic therapy. Picture ⑪ show the FFA result of the left eye after thrombolytic therapy, at 11seconds of angiography, the patient's left eye inferior temporal branch artery was normal after secondary branch. Picture ⑫ show the FFA result of the left eye after thrombolytic therapy, at 1 minute and 10 seconds of angiography, peripheral branch arteries are filled. Picture ⑬ is a 5-minute image in the late stage of angiography after thrombolysis in the left eye.

Discussion

The central retinal artery and its branch arteries are the terminal arteries, which are supplied by the internal carotid artery. Any occlusion from the internal carotid artery to the intraretinal arterioles will cause acute ischemia and hypoxia of the retina in the corresponding blood supply area and edema, visual cell died quickly, causing varying degrees of visual impairment. [4] Experimental studies in primates [5] found that if the central retinal artery were blocked for more than 97 minutes, the sensory layer of the retina would be irreversibly damaged. CRAO is more serious than BRAO, both of which are retinal artery vascular occlusion, and all treatments are emergency treatment [1]. The curative effect of the traditional treatment method of RAO is not ideal, and there is a lack of non-treatment controlled studies to confirm whether the visual prognosis after treatment is better than the natural course [4]. With the rapid development of medical technology, the current treatment methods for RAO include intravenous thrombolytic therapy, super-selective ophthalmic artery thrombolytic interventional therapy, laser thrombolysis therapy, sub fascial collagen sponge perfusion therapy, and stellate ganglion block therapy. [6-13] since the central retinal artery and its branch arteries supply blood to the internal carotid artery, the treatment of RAO should be equivalent to the treatment of acute ischemic stroke, that is, intravenous thrombolysis within 6 hours of onset, and intravascular bridging treatment as necessary.

The patient in this case went to see a doctor 2 hours after onset. After admission, she actively perform relevant specialist examinations after admission to confirm the diagnosis. The patient belonged to BRAO. After the stroke team assessed and excluded contraindications to thrombolytic therapy, she was treated with standard dose of urokinase intravenous thrombolysis. The patient's

door to needle time (DNT) time was 60 minutes. Taking acute ischemic stroke intravenous thrombolytic DNT time (DNT time no more than 60 minutes) as the standard, the patient's DNT time reached the standard this time. Use the only examination method (FFA examination) that can directly display the state of the retinal circulation to determine the outcome of RAO. The patient's clinical symptoms disappeared after 2 hours of intravenous thrombolytic therapy, and the auxiliary examination showed vascular recanalization, which further proved the importance of intravenous thrombolytic therapy in acute ischemic fundus diseases. However, due to the strict time window, the limitation of ophthalmologist's knowledge, and the public's cognition, these are the main reasons for the delay in the treatment of acute ischemic fundus disease. At present, intravenous thrombolysis and endovascular treatment of acute ischemic stroke have been widely known by the public. Therefore, in order to ensure the timeliness of the treatment of acute ischemic fundus diseases. Firstly, public education must be strengthened. Secondly, we should strengthen the professional knowledge of ophthalmologists, especially in neuro-ophthalmology. At the same time, it is necessary to strengthen communication and learning with the stroke team when encountering similar cases.

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