

Case Report

Treating Monocular Diplopia with Acupuncture: A Case Report

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Background

Diplopia is a type of vision disturbance that when people see an object, of which the image falls on the excessively large non-corresponding point of the retina, so that the retina is stimulated asymmetrically, inducing impulse of two objects in the visual area of cortex, and thus the true and false vision occurs. In the clinical practice, various reasons that may cause the disturbance of nerves that control the movement of the eye muscles (including: abducens nerve -CN VI, trochlear nerve - CN IV or oculomotor nerve - CN III), or ocular muscle derived dysfunction, which will possibly lead to binocular or monocular diplopia, also commonly known as double vision [1]. Despite the complex and varied reasons, the causes of diplopia can be divided into myogenic, mechanical, and neurogenic, among which neurogenic is an important influencing factor. For example, hypertension leads to cerebrovascular sclerosis and peripheral artery nerve compression, resulting in extraocular muscle paralysis in patients, and then diplopia appears [1,2].

Case Report

The patient we reported was a 69-year-old male, he came to visit us on June 1, 2022, due to “double and blurry vision in the right eye for 21 days”. Past medical history: The patient was diagnosed as hypertension in 2012, with the highest blood pressure of 220/120mmHg. He took lacidipine 4mg qd for hypotension management for a long time and did not regularly monitor blood pressure in daily life. He was diagnosed with cerebral hemorrhage in 2020 and underwent

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“sphenotresia drainage” in a different hospital, without special discomfort or sequelae of cerebral hemorrhage after surgery. History of present illness: 21 days ago, the patient developed double and blurred vision in the right eye when he got up in the morning without obvious inducement. When he came to the hospital, he complained that he had double vision in the right eye. Physical Examination: The physician sat opposite to the patient, then asked the patient to gaze following his moving fingers while head was fixed, the patient showed limited right-lateral movement of the right eyeball. When the doctor's finger moved to the right temporal side of the patient, whose right eyeball still fixated to the center, was not able to move abductively, however, the patient's left eye movement is not restricted. Patient reported that he had double vision when looked straight ahead and to the right, to the upper right quadrant, or to the lower right quadrant, he also complained defect of vision in the right lateral direction, his vision was normal in the other directions, and no dry or sore eyes, pupils were symmetric and circular, yet the right pupil responded slow to direct light. Convergence reaction was sensitive, and there were no eyelids ptosis. Head MRI: T2W/FLAIR showed bilateral ventricular with speckle-like distributed, slightly high to high-intensity signals, suggesting grade1 white matter demyelination in Fazekas. As this disease affected the patient's daily work and life, so he came to our ophthalmology outpatient clinic for treatment.

Acupuncture Treatment

Acupuncture is performed by an acupuncturist with more than 30 years of clinical experience. After the use of 75% alcohol to disinfect acupoint, stainless steel acupuncture needles (Size: diameter 0.25mm, length 25mm) were chosen to apply treatment. Acupoints selected: BL 1(Jing Ming), ST 1(Cheng Qi), EX-HN 7(Qiu Hou), extra point “Shang Ming” (from the Handbook of Commonly Used New Medical Therapies), SJ 23(Si Zhu Kong), GB 1(Tong Zi Liao), SP 6(San Yin Jiao), Scalp Acupuncture (MS 6: lower 2/5 of the Parietotemporal Anterior Oblique Line, head and facial movement area), Auricular acupuncture (Liver, Kidney, Eye), (Eye acupuncture (Liver area, Upper-jiao area). When needling BL1, the patient was told to close his eyes, the doctor pushes the eyeball to the right side with left hand and inserted the needle vertically to a depth of 0.5 to 1.0 cun with right hand, all selected acupoints were brought about the desired sensation (De Qi). The needles were kept in place for 30 minutes. The treatment course was administered three times a week, lasted from June 1, 2022, to August 10, 2022, and the patient received 24 treatments in total.

Treatment Response

After 8 weeks of treatment, the patient reported that his vision in the right eye was clear and not blurry, and there's no diplopia in the close-range vision. Physical examination showed that his eye movement was bilaterally coordinated, light response became normal, convergence reaction was sensitive. The patient reported good vision in the right eye and no recurrence of diplopia symptoms in one month follow up. Before and after photographs are presented in figures 1 and 2, respectively.



Figure 1: Before treatment (limited right-lateral movement of the right eyeball. When the doctor's finger moved to the temporal side of the patient's right eye, the right eyeball was still fixated to the center and was not able to move abductively, his double vision was obvious in the right lateral direction).



Figure 2: After treatment (normal abductive movement of right eyeball, patient reported he had no double vision).

Discussion

Diplopia is a symptom with double vision. The patient in this case showed abducens nerve dysfunction, but the cranial MRI results showed no lesions of the corresponding cranial nerve origin, so the space occupying pathological changes can be ruled out. Combined with the patient's previous medical history, it can be inferred that the occurrence of diplopia may be closely related to hypertensive vascular disease. The patient had a long history of hypertension, and

arteriosclerosis occurred due to poor blood pressure control in daily life. On this basis, the impaired blood supply to the abducens nerve (CN VI), together with the hardened artery compressed the nerve trunk, resulting in paralysis of the extraocular muscle innervated by abducens nerve, and diplopia appeared. What we found in this case was consistent with the results reported by Gan Shibin et al., [3], that the most involved nerve in diplopia, was abducens nerve. In addition, since the patient had a history of cerebral hemorrhage two years ago, the patient reported no obvious sequelae after cerebral hemorrhage. Meanwhile, after the occurrence of diplopia this time, the results of head MRI also ruled out the possibility of cerebrovascular disease-causing diplopia. However, some researchers [4] believed that in many diseases caused by brain trauma or brain injury, patients can compensate for eye dysfunction within a certain period. As a result, diplopia symptoms may not be noticed for several years until the compensatory adaptation mechanism is out of balance. Therefore, combined with the specific conditions of this patient, it can be inferred that the reasons for his diplopia may involve the nerve blood supply disorder caused by hypertension and the history of cerebral hemorrhage. At present, the treatment protocol of diplopia mainly focuses on medicines for nerve nutrition or blood vessels dilation, and primary disease management. In this case, acupuncture therapy has achieved excellent curative effect, suggesting that acupuncture is feasible in administering diplopia. Large-scale, randomized clinical studies and long-term follow-up are still needed in the future, to verify our research results and identify the effectiveness and safety of acupuncture in the management of vascular diplopia.

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