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Case Report

Scalp Acupuncture Management for 4th Cranial Nerve Damage Induced Visual Complication for an Age-Old Patient: Case Report

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Abstract

Traumatic brain injury (TBI) globally has a significant prevalence. TBI causes significant mortality and morbidity especially among elderly population. Despite of significant prevalence visual impairment followed by TBI; the association is less considered for scientific studies. The pharmacological and surgical intervention for visual impairment followed by TBI has only very less scientific evidence. Amidst of lack of clear bio medical treatment guideline, the traditional Chinese medicine (TCM) which has the long history of presence and practice may offer significant contributions in these conditions. There are already published case documentation evaluating effectiveness of acupuncture management in CN-damage, condition. In this case study an age old 70 year old female who was generally healthy had a fall and later developed blurred and double vision (diplopia). Further approaching to the western eye hospital it was diagnosed that the patient had CN-nerve palsy induced visual impairment. The second opinion from an Neuro ophthalmic expert also confirmed diagnosis and reported that the patient has only option of self-recovery considering limitation of available treatments. The patient who then undergone for scalp acupuncture (SA) had gradual and significant improvement with clarity and merging of vision. The patient was able to restore complete vision after 10 sessions of SA therapy. The SA therapy for an age old patient who had visual impairment (diplopia) due to CN nerve damage found to be effective and safe in this case. However well-designed clinical trials are required for establishing effectiveness of Acupuncture in the management of morbidities of CN damage.

Keywords: *Traumatic Brain Injury (TBI); Cranial Nerve Damage; Diplopia; Acupuncture Scalp Acupuncture*

Introduction

Traumatic brain injury (TBI) globally has a significant prevalence [1]. TBI causes significant mortality and morbidity especially among elderly population [2]. The raising number of Emergency Department visits in the hospitals associated with TBI is also major concern for public healthcare system [3]. Evidence suggest that geriatric population affected with TBI causes a greater number of hospitalisation and more care needs for rehabilitation in compared with other age groups [4]. The fall in elderly population can significantly cause TBI. The evidence suggest even mild TBI can result into cranial nerve (CN) damage [5]. CN damage can cause multiple morbidity and contributing significant loss of quality of life to the affected patients. Data suggests that more than half of individuals affected with head injury experience visual and ocular impairment [6]. Despite of significant prevalence visual impairment followed by TBI; the association is less considered for scientific studies [7]. The knowledge gap existing in the understanding of visual impairment also reflects with its management approach. The pharmacological and surgical intervention for visual impairment followed by TBI has only very less scientific evidence [8].

Thus, the understanding and management approach strongly requires alternative strategies which may can enhance scientific knowledge and helpful in-patient care. The traditional Chinese medicine (TCM) which has the long history of presence and practice may offer significant contributions in these conditions. Apart from empirical evidence there are multiple evidence available how TCM can be helpful in managing TBI and CN damage [9]. This case study observes clinical effectiveness of acupuncture management for vision impairment (diplopia) due to TBI for an age-old patient.

Case Presentation

The patient was 70+ years old female. Generally healthy individual with absence of previous significant medical history. The patient is neither hypertensive nor diabetic. There is no significant illness reported as running in family. The 70-year-old female patient fell at home and her frontal part of head had injury. On the day of fall the patient doesn't had bleeding. However, the patient suffered from mild-moderate headache and dizziness. The patient had consciousness and no symptoms of weakness and Nausea. On the next day of fall patient's vision started blurred and developed double vision. The patient was not able to see the bottom line when subjected for looking down. The patient then approached to A&E department. After primary evaluation and CT scan A&E department referred the patient to the Eye hospital. The initial diagnosis and observation from Western Eye hospital London reported following:

- 4/5/2021
- Western Eye hospital London
- BP 187/83 PR: 65
- Emergency Department at western eye hospital diagnosed patient's condition as "RE 4th cranial nerve palsy" and recommended further follow-up in other clinics.

They have observed and reported to the patient that No intervention can possibly help the patient in improving the vision equating with its risk. The ophthalmology department suggested the patient to wait and observe condition to see for couple of months to evaluate any sign of improvement. Another Neuro ophthalmic consultant doctor in a reputed private clinic observed on 29/6/2021 following: the patient has Binocular vertical diplopia which is worsened in left gaze. History of right amblyopia and myopic refractive error. Patient had visual acuities of 6/9 in her amblyopic right eye and 6/7.5 in her left eye. The ocular examination revealed myopic changes in her fundi but no signs of any other ocular pathology. In primary position patient had hypertropia of the right eye which increases in left gaze and right tilt consistent with a right 4th the cranial nerve palsy. There is clear underreaction of the right superior oblique muscle, but no other ophthalmoplegia. The rest of the orbital and neuro ophthalmic examination was unremarkable. The ophthalmic doctor further suggested the patient a specific surgery, but patient refused it due to the possible risks. Since there was no improvement in the vision for the patient for more than 4 months, the patient's friend suggested the patient to approach the first author to avail the Acupuncture treatment. The TCM diagnosis considered the patient's main symptoms like: double vision which is particularly in lower view and side view. The patient had vague vision, and no line with downward view. The patient was unable to move her right eye to downward and lateral movements. The patient didn't have floaters and headache. The patient generally felt better if slept well and had less stress. The patient's tongue was pink, there were cracks around the middle line and dry with some purple spots. The patient's pulse was wiry on Guan and weak on Chi. The diagnosis of TCM was Brain qi deficiency and Brain collaterals stagnation.

The treatment was mainly scalp acupuncture (SA), Vision area (Figure 1), Motor area lower 2/5, Spirit-emotion area, Liver area, plus REN12 Zhongwan and another extra one on right side and 0.5 cm away from REN12, REN6 Qihai, SI6 Yanglao, etc. The needle on SA

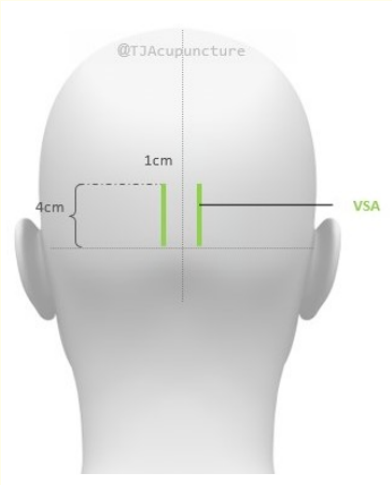

Figure 1: *Vision area (VSA).*

were 0.30X44 with rapid manipulations 150 - 200 per minute, other body acupuncture needle was 0.25X25 with even manipulation. The needle retention were 20 minutes, and the frequency of treatment was once per week.

A line 4 cm long which drawn upwards and parallel to the antero-posterior midline from a point 1 cm lateral to the external occipital protuberance.

The follow up and outcome of intervention is being assessed both with patient perspective and ophthalmic expert perspective. From the fourth session of SA (scalp Acupuncture), patient noticed there was some improvement about 10% in clarity of vision. The improvement as per patient initially was small but stable. From then, patient's vision was improving gradually, consistently in terms with merging of vision and clarity of vision. After in total ten sessions the patient felt her vision was almost back to normal about 95% (Table 1). On 21st January 2022, the patient received the repeated assessment from the same eye hospital and told by the ophthalmologist "her version returns to normal, and her eyes were in a very healthy condition". She was very excited to message me the great news immediately.

Sessions	Date	Self evaluated improvement
1	21/09/21	Started treatment
3	07/10/21	Experienced little clarity in vision
5	04/11/21	Can look straight without difficulty
7	25/11/21	About 50% better in vision merging
10	16/12/21	95% better in vision merging
Follow-Up	27/01/22	100% recovered after another examination

Table 1: *Treatment timeline and self-evaluated improvement of patient.*

Follow up evaluation by medical expert:

- 19/1/2022
- Visual acuity right eye 6/12 best corrected (6/7.5 pinhole), left eye 6/7.5 best corrected 13 mmHg right eye, 13 mmHg left eye.
- Management plan/comments: "Right traumatic CN-IV and now asymptomatic and resolved. Seen by orthoptics but not assessed with normal glasses. Discharge from doctor's clinic but due to see orthoptics once more".
- 10-02-2022
- Diplopia has been disappeared.
- Vertical imbalance that has developed after fall and head injury observed on May 2021
- Near 0-2^ right hypertropia
- Distance 10^ right hypertrophic
- Now Near 1+2^ right hypertropia
- Distance 3^ right hypertrophic
- Interpretation: "As the vertical deviation is now within your fusional reserves (meaning that your brain. Can now join up the images). Patient now no longer require any prismatic incorporation to your spectacles".

Discussion and Conclusion

The fourth cranial nerve controls the actions of one of the external eye muscles, the superior oblique muscle. It passes through a loop of tissue near the nose known as the trochlea. It turns the eye inward and downward.

Diseases or injuries to the fourth cranial nerve can cause the superior oblique muscle to be paralyzed. The name for this condition is fourth nerve palsy [10]. Thus the 4th cranial nerve palsy can cause significant impairment to the vision. The current bio medical therapeutic approach in managing visual impairment associated with 4th cranial nerve damage has got significant limitation. Thus, the understanding and management approach strongly requires alternative strategies which may can enhance scientific knowledge and helpful in patient care.

Scalp acupuncture (SA) is one of the modern microsystem acupuncture techniques which combine Chinese acupuncture needling methods with western medical knowledge. Scalp acupuncture was originally invented in China and first published in 1971 as a separately acupuncture technique. It is widely practiced in not only in China but also worldwide [11].

SA vision area (VSA) is a line 4 cm long which drawn upwards and parallel to the antero-posterior midline from a point 1 cm lateral to the external occipital protuberance. VSA may vision collateral and stimulate 4th cranial nerve. Motor area (MTA) is a line connecting upper points which is situated on the antero-posterior midline, 0.5 cm behind its midpoint, and the lower points where the supercilia-occipital line intersects the anterior hairline. The whole MTA divided by five and the lower 2/5 is the area, which is used for face motor paralysis, including eyes. Spirit-emotion area (SEA) is 2 cm lateral to the point of 3.7 cm front of the middle point of midline, draw a 4 cm line to

front parallel to midline. Stimulate SEA could help to relax the stress and increase the brain qi. The earlier published case documentation evaluated effectiveness of Acupuncture in the management of CN-damage induced vision impairment [12]. In this case patient observed to resolve vision impairment (diplopia) after 10 sessions of SA therapy. The traumatic nerve damage in the aetiology and old age of the patient usually associated with bad prognosis in these conditions. The scope of bio medical therapeutic interventions in these case may be highly challenging due to the complexity of aetiology and uncertainty in evaluating risk-benefit of treatment. The observed effectiveness of the SA therapy in this case must be evaluated in these background. This case study documentation can be also considered as the practice-based evidence [13] of acupuncture management on morbidities resultant from CN-damage due to TBI.

The SA therapy for an age-old patient who had visual impairment (diplopia) due to CN nerve damage found to be effective and safe in this case. however further case series documentation and clinical trials are required for establishing ideal clinical guidelines and high-quality scientific evidence on Acupuncture management for morbidities of CN-damage.

Disclosure Statement

The authors has neither financial interests nor conflicts of interest to declare in relation to the material in the manuscript.

Author Contribution

Conceptualization: SL; Data curation: WT; Formal analysis: SL; Supervision: WT; Validation: SL; Writing - original draft: SL; Writing - review and editing: WT.

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