Traumatic optic neuropathy

- Application of transcriptome sequencing to identify and explore biomarkers in a rat model of optic nerve crush
- Cell-based therapies for traumatic optic neuropathy: Recent advances, challenges, and perspectives
- Large-scale survey, animal models and computational modeling identify histological neurodegenerative biomarkers for traumatic optic neuropathy
- Automatic detection of optic canal fractures and recognition and segmentation of anatomical structures in the orbital apex based on artificial intelligence
- Tailoring UPS-to-autophagy transition to restore RGC prosperity and functionality in a rodent traumatic optic neuropathy model
- Optimized intraorbital optic nerve exposure: a translational surgical paradigm for neural regeneration in rat model
- Simple Scoring Model for Evaluation of Traumatic Optic Neuropathy in Unconscious Patients with Periorbital Facial Bone Fracture
- Effects of NGF-chitosan on alleviating secondary degeneration and repairing primary degeneration after expanded partial optic nerve transection

Traumatic optic neuropathy (TON) is a serious complication of craniofacial trauma that directly or indirectly damages the optic nerve and can cause severe vision loss. The incidence of TON has been gradually increasing in recent years. Research on the protection and regeneration of the optic nerve after the onset of TON is still at the level of laboratory studies and is insufficient to support the clinical treatment of TON. And, due to without clear guidelines, there is much ambiguity regarding its diagnosis and management. Clinical interventions for TON include observation only, treatment with corticosteroids alone, or optic canal decompression (with or without steroids). There is controversy in clinical practice concerning which treatment is the best [1)].

Treatment

Traumatic optic neuropathy treatment.

Case series

From April 2020 to September 2022, we enrolled patients who were diagnosed with TON and underwent endoscopic optic nerve decompression at our institution. Vision and pupil reflex tests were performed by an ophthalmologist before and after surgery.

Results: Seven patients were enrolled. Their ages ranged from 9 to 78 years and all were male. Among the 7 patients, the patient whose pupillary light reflex was 6mm with sluggish and 7mm with fixated pupil before surgery showed no improvement in vision. Patients with some response to direct reflex or contralateral indirect reflex testing preoperative showed vision improvement postoperatively.

Direct and indirect pupillary reflexes can be important factors in determining treatment for TON. In unconscious patients with a fracture involving the optic canal, timely surgical intervention based on

pupillary reflex can prevent permanent loss of vision [2)]

Case reports

A case of acute traumatic optic neuropathy in 54 year old male patient. The patient presented with acute loss of vision in the right eye due to a blunt trauma to the eye. Lid haematoma and subconjunctival hemorrhage were present. Fluorescein staining was negative, anterior chamber and lens was clear. Intraocular pressure was normal. Retina and optic nerve head appeared normal on fundoscopy. The vision was “counting fingers at 1 meter” in the right eye. Color test indicated color perception dysfunction of the right eye. Relative afferent pupillary defect (RAPD) was positive. Ocular ultrasound, orbital X ray and CT scan was normal, but visual evoked potentials test was pathologic. The consideration was made whether to treat a patient or not since there are no consensus on the treatment of traumatic optic neuropathy. We decided to treat the patient immediately with the megadoses of steroids following the protocol suggested by Cerovski. The patient responded well to the treatment and recovered vision to normal [3)].

1)
Chen B, Zhang H, Zhai Q, Li H, Wang C, Wang Y. Traumatic optic neuropathy: a review of current studies. Neurosurg Rev. 2022 Jan 16. doi: 10.1007/s10143-021-01717-9. Epub ahead of print. PMID: 35034261.
2)
Lee MH, Lee TK. Importance of Preoperative Pupillary Reflex in Traumatic Optic Neuropathy. J Korean Neurosurg Soc. 2024 Aug 13. doi: 10.3340/jkns.2024.0083. Epub ahead of print. PMID: 39136043.
3)
Samardzic K, Samardzic J, Janjetovic Z, Samardzic I, Sekelj S, Latic-Hodzic L. Traumatic optic neuropathy - to treat or to observe? Acta Inform Med. 2012 Jun;20(2):131-2. doi: 10.5455/aim.2012.20.131-132. PMID: 23322966; PMCID: PMC3544324.