Traumatic Optic Neuropathy: An 8 Year Experience of Management and Outcomes Analysis

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Abstract

Background
Traumatic Optic Neuropathy (TON) is a rare and sudden loss of vision following facial trauma, which leads to variable visual deficits. TON studies are limited by low incidence, variability of the pathophysiological basis of visual changes among patients, and unclear treatment standards.(1,2) The purpose of this study is to report an update in our experience in managing TON and to compare the outcomes of varying treatment strategies.

Methods
All patients diagnosed with TON from 2004-2012 at the R. Adams Cowley Shock Trauma Center were retrospectively reviewed. Pre-treatment and post-treatment visual acuities were compared using quantitative analysis of a standard ophthalmologic conversion via light perception, hand motion, finger recognition, and 20/800 down to 20/15 visual acuity to a logarithm of the minimum angle of resolution (log MAR).

Results
A total of 132 patients met inclusion criteria (71.9% male and 28.1% female), with a mean age of 36.9 years (range 8-82). Etiology of TON included: motor vehicle accidents (31.8%), assault (25.7%), ballistic injury (7.6%), pedestrian struck (7.6%), and other (10.6%). Management of TON was surgery in 37.1%, corticosteroid administration in 14.4%, and observation in 48.5% of patients. Mean Glasgow coma scale value was 12.4 +/- 3.9. 73.5% of patients were found to have a facial fracture, and 62.1% had an orbital fracture. Only 16% of patients returned for a follow-up exam. Follow-up visual acuity improved in 47.6% of patients with a mean follow-up of 12.9 weeks. Mean improvement score was 2.05 +/- 1.6 logMAR units. Patients under 50 years of age had higher rates of visual improvement than those that did not show signs of improvement, 90% vs. 44% (p=0.03). Sex, mechanism of injury, absence of TBI, absence of facial fracture or orbital fracture, and type of intervention were not associated with improved visual exams.

Conclusion
The incidence is more common in males than females and is often the result of blunt injury to the face. The majority of TON patients are unlikely to return for a visual acuity exam. Surgical interventions to repair facial fractures do not impair or improve vision. Corticosteroid administration did not improve vision scores, which was comparable to observation alone. Patients over 50 years old are less likely to show improvement in vision following injury.

References
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2. Levin LA, Beck RW, Joseph MP, Seiff S, Kraker R. The treatment of traumatic optic neuropathy: the International Optic Nerve Trauma Study. Ophthalmology;106):1268-1277,1999.