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Brief Reports

ASSESSMENT OF EMERGENCY DEPARTMENT EYE EXAMINATIONS IN PATIENTS PRESENTING WITH MID-FACE INJURY

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□ **Abstract—Background: One-fifth of patients with severe facial trauma suffer ophthalmic injury. Currently, patients presenting with mid-face injury to the emergency department (ED) undergo visual examination and then further assessment by ophthalmologists and with computed tomography (CT) scanning. The utility of the initial visual examination in the ED, performed by non-ophthalmologists, remains unclear. Objective: We aimed to objectively identify whether a more thorough initial visual assessment, performed by nonophthalmologists in the ED, was associated with improved ophthalmic outcomes. Methods: Patients (n = 100) were retrospectively recruited from a tertiary craniomaxillofacial center. Visual examinations performed in the ED were scored objectively and measured against defined management and prognostic outcomes. Results: There was no significant difference between more thorough initial visual examination and reduced time to ophthalmology assessment or reduced visual complications. There was no correlation between more comprehensive examination and incidence of CT scanning. Conclusions: We identified no significant difference between a comprehensive visual examination performed by nonophthalmologists in the ED, and improved ophthalmic outcomes. Physicians assessing patients with mid-face trauma in the ED should rule out eye emergencies, including retrobulbar hemorrhage and penetrating globe injury, and initiate expeditious CT scan and assessment by specialist ophthalmologists.** © **2016 Elsevier Inc.**

□ **Keywords—eye examination; mid-face injury; facial trauma; visual complications; ophthalmology assessment**

INTRODUCTION

The exposed location and thin bones of the orbit result in a heightened susceptibility to fractures from external impact (1). As a result, orbital floor fractures are common in mid-face injury, with 22%–29% accompanied by visual complications, including diplopia, entrapment of ocular muscles, infraorbital numbness, enophthalmos, and reduced vision (1–3). The earlier these patients are identified and managed, the better the visual prognosis (4).

Patients presenting to the emergency department (ED) with mid-face injury should receive a computed tomography (CT) scan to aid diagnosis of bone involvement and ocular damage, in addition to aiding decisions on subsequent management (5). These patients should also be referred for mandatory ophthalmology assessment due to the high risk of ocular insult in order to allow early detection and specialist treatment (6,7). The urgency of

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referrals for CT scan and ophthalmology assessment is judged on external and visual examination by the attending clinician in the ED.

It has been recommended that a comprehensive visual examination be performed on presentation to the ED when an ocular injury is strongly suspected. Such an examination should include evaluation of visual acuity, extraocular movements, external examination, optic nerve function (using red color saturation and white light intensity), pupil evaluation, visual field determination, penlight examination of the anterior aspect of the eye, intraocular pressure measurement, and fundus examination (6). Despite these suggestions, the completion of comprehensive visual examinations in the ED is limited by the availability of specialist equipment and the diagnostic difficulty caused by the condition of the patient, where pain, reduced consciousness, and associated soft-tissue damage often prevent adequate assessment (8). As a result, visual complications might be inadequately assessed on initial presentation after facial trauma. The aim of the current study is to determine whether a more comprehensive visual examination in the ED is associated with more streamlined management and improved visual outcomes.

MATERIALS AND METHODS

Patients

One hundred consecutive patients with mid-face injuries were retrospectively recruited between March 2009 and February 2011 from a tertiary craniomaxillofacial center. Mid-face injuries were defined as the area between the superior orbital rim and the maxillary dental occlussal surface. Patients with isolated maxillary dentoalveolar fractures were excluded.

Assessment Criteria

The patient notes were analyzed and the initial documented visual examination performed in the ED was compared against defined criteria suggested by Soparkar and Patrinely (6). The parameters assessed included visual acuity, external examination for soft-tissue injury, extraocular movements, optic nerve function (using red color saturation and white light intensity), light reflex, pupil evaluation (shape and size), visual field determination (including diplopia in primary gaze position), penlight examination of the anterior aspect of the eye, intraocular pressure measurement, and fundus examination.

Pattern of Injury and Ophthalmic Outcomes

Patient notes, radiology reports, and electronic discharge summaries were analyzed. The pattern of injury, use of CT scan, visual complications, and the number of days to ophthalmic assessment were recorded. These were then investigated to identify whether patients who had received a more comprehensive examination in the ED had a faster time to ophthalmology assessment and CT scan, and a lower frequency of residual visual complications.

RESULTS

From the 100 patients recruited, complete data were available from 71. These included 46 male (65%) and 25 female (35%) patients. Mean patient age was 40 years.

Pattern of Injury

Mechanisms of injury in descending order included falls (n = 27), assault (n = 25), sport (n = 8), miscellaneous (n = 6), and traffic accidents (n = 5). Thirty-seven percent of patients were under the influence of alcohol at presentation. One or more fractures were identified in 77% of patients, with 78% of these involving the orbit. Forty-one percent of patients were treated surgically. Surgical management varied from wound washout and debridement to open reduction and internal fixation of orbital floor, medial wall, zygomatic, and maxillary fractures.

Initial Eye Examination

Clinicians from the subspecialties of emergency medicine, plastic surgery, and oral and maxillofacial surgery performed the initial eye examinations in the ED. Of the 71 initial examinations analyzed, none included assessment of all the defined visual examination criteria. External examination was found to be the parameter most frequently documented (Figure 1), with 70% of examinations (n = 50) inclusive of this criterion.

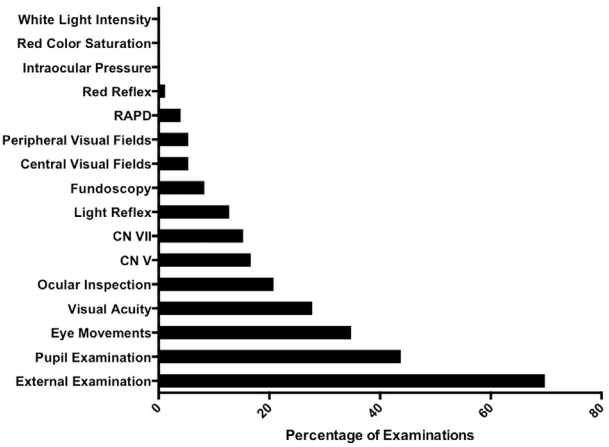

Figure 1. Parameters assessed in the initial eye examination. CN V = cranial nerve five; CN VII = cranial nerve seven; RAPD = relative afferent pupillary defect.