The Incidence of Ocular Injuries in Isolated Orbital Fractures

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Abstract

Background: Orbital fractures are common and have the potential for an associated ocular globe injury. Prompt identification of significant ocular injuries is important to prevent any potential long-term visual sequelae, however, their true incidence in this patient population has not been determined due to the sub-optimal design of previously conducted studies (1-4). As a consequence, most surgeons choose to have all such patients formally evaluated by an ophthalmologist. The objective of this specifically-designed study is to conclusively identify the incidence of significant ocular injuries in patients with isolated orbital fractures and to determine their predictors in order to guide a more efficient patient care.

Methods: A prospective, cohort study, powered to detect a 15% incidence of ocular injuries was designed. All patients presenting to our regional level-1 trauma center with computed tomography findings of an isolated orbital fracture were included and followed a strict evaluation protocol. Plastic Surgery examination included: visual acuity, pupillary reactivity, ocular range-of-motion, and presence of visible injuries. Ophthalmology evaluation also included intra-ocular pressure, formal anterior chamber and posterior chamber exams. Significant ocular injury was defined as that requiring ophthalmologic intervention, in attempt to preserve or restore vision. Patients were followed for a minimum of one week to identify any delayed injuries.

Results: Eighty patients were enrolled from 2012 to 2014. There were 46 males and 34 females with a mean age of 42.8 years. Assault was the most common mechanism of injury. There were eight ocular injuries (10%): ruptured globe (1), uveal prolapse (1), retrobulbar hemorrhage (2), hyphema (3), and scleral tear (1). Four of the injuries were considered significant. Predictors for significant ocular injuries were: grossly abnormal visual acuity and obvious lack of pupillary reactivity of the affected eye.

Conclusions: The incidence of significant ocular injuries in isolated orbital fractures is much lower than previously reported. Therefore, not all patients with isolated orbital fractures require formal ophthalmologic evaluation. However, patients presenting with grossly abnormal visual acuity or abnormal pupillary reactivity are at high risk and likely require urgent ocular intervention.

References

1. Al-Quarainy, I.A, Stassen, L.F., Dutton, G.N., el-Attar A. The characteristics of midfacial fractures and the association with ocular injury: a prospective study. *Br J Oral Maxillofac Surg* 29: 291-301, 1991.
2. Gossman, M.D., Roberts, D.M., Barr, C.C. Ophthalmic aspects of orbital injury: a comprehensive diagnostic and management approach. *Clin Plast Surg* 19:71-85, 1992.
3. Jabaley, M.E., Lerman, M., Sanders, H.J. Ocular injuries in orbital fractures. *Plast Reconstr Surg* 56:410-418, 1975.
4. Cook, T. Ocular and periocular injuries from orbital fractures. *J Am Coll Surg* 195:831-834, 2002.

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