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“Risk Stratification for Serious Ocular Injury in Orbital Fractures: A Single Institutional Retrospective Study”

Background: Orbital fractures involve breaks in one or more bones surrounding the eye, thus having the potential to impair vision, facial structure, or eye movement. They account for 10-25% of all facial fractures and are most commonly caused by trauma. The type and severity of the fracture can influence the likelihood of associated ocular injuries, resulting in an increased rate of cooccurrence. While orbital fracture repair can be delayed, serious ocular injury requires urgent attention and ophthalmic evaluation. Therefore, a bedside risk stratification tool that can direct well timed and appropriate triage is lacking. Quick recognition of these injuries is necessary to preserve vision and prevent any long-term consequences from occurring. In this study we aimed to improve outcomes for high-risk patients by developing a tool for reducing unnecessary consultations and increasing predictive capability of ocular injury by non-ophthalmologists.

Objectives: The purpose of this study is to identify clinical and radiographic predictors of serious ocular injury in patients with orbital fractures and create a risk stratification tool that can be used at the bedside to guide triage by non-ophthalmologists.

Methods: The study was a retrospective cohort study and medical chart review. An initial search for subjects with an orbital fracture and consultation by ophthalmology within 24 hours of arrival was conducted using slicer dicer. The patient population was identified to be individuals 18 years or older that presented to the LOL emergency department or inpatient services between January 2016 through December 2024. Once the list of patients was determined, data was abstracted from their electronic medical records (EMR) on Epic. Data variables extracted included demographics, clinical presentation, imaging findings, and outcome. Both descriptive and correlational analyses were used to evaluate for associations with serious ocular injury.

Results: We observed that the study’s major limitation was its retrospective design. The retrospective design of the study depends on the validity and completeness of EMR which were lacking in some subjects. Systemic error such as missing or incomplete data, increases the chance of bias occurring and production of misleading results. Missing data alternatively, reduces sample size and decreases statistical power of the analysis, where the smaller a sample size is the less likely that the study is representative of the general population. Therefore, the single centered scope of LOL may not be generalizable to other medical centers.

Conclusion: Despite limitations in its retrospective and single center design, this study offers valuable insights into the identification of risk factors for serious ocular injuries.