

# Integrated Ophthalmic Trauma Units: Adopting an Orphan Discipline in Ophthalmology

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Ocular and ophthalmic trauma has increased tremendously in this world of modernization due to road traffic accidents and many other day to day mishaps. The World Health Organisation (WHO) had reported an annual occurrence of approximately 55 million eye injuries with incapacitation for more than one day. There are more than 1.6 million blind people secondary to ocular trauma with an additional 2.3 million having bilateral visual morbidity. 19 million people experience unilateral blindness or low vision from preventable injury<sup>1</sup>. Moreover, there is a global annual incidence rate of 3.5 open globe injuries per 100,000 persons, resulting in approximately 203,000 open globe injuries annually worldwide<sup>2</sup>.

Globally, males are more prone to sustain open globe injuries (80%) than females, most commonly from projectile objects at work or home settings, while females and elderly patients are more likely to experience globe rupture, most often from falls. Generally, work-related injuries result from foreign matter striking or being rubbed into the eye, and hence, manual labourers in production industries are most at risk. Other mechanisms of injury include assault, sports, traffic accidents, fireworks and gunshot wounds. The majority of intraocular foreign bodies (IOFB) are small projectiles from metal and glass<sup>3-5</sup>.

A similar demographic pattern is seen in children—the majority of them being boys aged 3 – 6 years experiencing pointed metallic objects such as scissors, knives, writing instruments at home or school settings. Other causative objects include wooden objects, toys, fire crackers. Scenes of injury include streets, daycare centres and playgrounds<sup>6-8</sup>.

Predisposing and associated factors to globe rupture include rural residence, alcohol consumption, cigarette smoking, previous ocular procedures such as cataract surgery, penetrating keratoplasty and LASIK (laser-assisted in situ keratomileusis)<sup>9-12</sup>.

Ocular trauma thus has a significant socioeconomic impact on the individual, family and society in general. In the era of super specialization where we are uncomfortable managing disorders outside our ophthalmic sub-specialty, it is imperative that we as ophthalmologists and even non-ophthalmologists are formally trained in the emergency and primary management of Ocular trauma before referral to an appropriate institution with specialist for advanced management. Trauma thus cuts across all specialties where broad principles with specific practice patterns should be enforced.

Ocular trauma is an important component of ophthalmic trauma. Ophthalmic trauma is a term hardly if ever used in literature, but in its true sense constitutes both ocular and adnexal trauma. While the literature is rife with terminology in ocular trauma, adnexal trauma is often not taken into consideration as they are poorly addressed by the ophthalmologist and sometimes delegated to non-ophthalmic specialties. We would therefore like to propose use of the term Ophthalmic trauma in lieu of ocular trauma to encompass all aspects of trauma that involve the globe and the surrounding adnexal tissue. The Asia Pacific Ophthalmic Trauma Society (APOTS) was thus constituted to promote the awareness about ophthalmic trauma in the Asia-Pacific region, where the incidence of ophthalmic trauma is significantly higher. Rest of the editorial will particularly emphasize on use of term “**Ophthalmic trauma**”.

Optimal care of a patient with ophthalmic trauma is only possible if there is a well-orchestrated team and care system to manage complex ocular and adnexal injuries. We herewith propose an integrated pathway and care design to optimize outcome in a patient with ophthalmic trauma. An interesting and poorly acknowledged entity is iatrogenic ocular and adnexal injury which constitutes a significant cause of morbidity caused and managed by the ophthalmologist and other related head and neck surgical specialties. "Iatrogenic trauma" constitutes all the postoperative surgical cases with surgically induced trauma and poorly managed open globe injury cases. Most scientific ophthalmic conferences appear to address the various intraoperative complications and their management, without addressing them as 'Iatrogenic ophthalmic trauma'. Dineen et al reported >12% of blindness due to the sequelae of cataract surgery constituting iatrogenic (surgical) and avoidable trauma<sup>13</sup>.

The model proposed below is about strategic planning of the existing resources available at tertiary eye care centres. With the kind of polytrauma load handled by all the tertiary eye care hospitals, heads of all the tertiary eye care institutes/hospitals should set the tone for exclusive dedicated ophthalmic trauma centres. These centres will not only serve the patients and community but can also impart training to young ophthalmologists and physicians from accident and emergency departments in the field of ophthalmic trauma. We propose that dedicated ophthalmic trauma specialist team will triage, work up & manage all the patients with history of ophthalmic trauma and will subsequently manage the complex cases with help of their subspecialty colleagues (vitreo-retina, cornea, glaucoma, vitreo-retinal, oculoplasty and neuro-ophthalmology colleagues). Complex adnexal trauma involving the upper and mid face may also benefit from collaboration between the ophthalmologist / oculoplastic surgeon and craniomaxillofacial teams.

#### **Distinct role of ophthalmic trauma care unit:**

1. Streamlining, triaging the patients with ophthalmic trauma.
2. Emergency attendance and management of patients with ophthalmic trauma. Adopt strict guidelines including Do's & Don'ts.
3. Sharing/reducing the work-load of other subspecialty colleagues.
4. Improving the quality of care and monitoring outcomes of ophthalmic trauma patients.

5. Database for research, which will help propose guidelines for prevention of ocular and adnexal trauma to reduce the incidence of preventable ophthalmic trauma.
6. Central office for Ophthalmic Trauma Registry.
7. Impart training and fellowship to young ophthalmologists and emergency room physicians.
8. Conduct public forum / CME for awareness about ophthalmic trauma
9. Foster collaboration and ties in field of ophthalmic trauma between national and international organizations and societies of related surgical subspecialties.

All the above listed objectives can be attained by setting the proposed Ophthalmic trauma care centres at the internationally established tertiary eye and multispecialty institutions.

We suggest that the proposed dedicated ophthalmic trauma care units can seek guidance and collaborate with national, regional and international professional societies dedicated to Ophthalmic trauma. Some of these include the International Society of Ocular trauma (ISOT), Asia Pacific Ophthalmic Trauma Society (APOTS), American Society of Ocular Trauma (ASOT), Ocular Trauma Society of India (OTSI) and Chinese Ocular Trauma Society (COTS). Working with international organizations will foster knowledge, research and collaboration. As open globe injuries present with management dilemmas with many unresolved controversies, the proposed multidisciplinary dedicated unit can setup guidelines and an algorithmic approach to manage those complex injuries and to prevent ocular morbidity and optimize outcome by preventing iatrogenic trauma. The unit could work in close coordination with primary and secondary care units and will recognize and guide the junior ophthalmologists in management of ophthalmic injuries, thereby aiding streamlining of management of affected patients.

We have come a long way in the field of ophthalmology from intracapsular cataract surgery to femtosecond laser assisted surgery and from subjective macular assessment to non-invasive assessment of retinal vasculature using optical coherence tomography angiography. The outcome of globe injuries have improved with better understanding of complications and improvement in surgical techniques. Despite numerous advances in

technology and knowledge, a considerable number of eyes still end up getting enucleated or eviscerated following unsuccessful primary or secondary surgical repair. Factors that lead to such unfortunate outcomes are manifold.

1. Ophthalmic trauma is still being managed by the junior most 'residents in training' with inadequate training and supervision. This results from the fact that ophthalmic traumatology is yet to become an recognized discipline within Ophthalmology.
2. Inadequate and incomplete evaluation and scoring to assess prognosis often results in acceptance of suboptimal or even poor outcomes. Most ophthalmologists are unfamiliar with the terminology of ophthalmic trauma and consider Ocular Trauma Score (OTS) purely as just a research tool rather than a great scale for prognostication.
3. Poor communication between various disciplines of ophthalmology, and lack of timely referrals to appropriate specialists or higher centres with subspecialty expertise compound the problem.
4. Lastly, there are no attempts to maintain an eye injury registry. All of the above can be easily addressed and justified based on scientific and evidence based outcomes, socioeconomic benefits but needs leadership amongst heads of Ophthalmic units with political will as well.

We can prevent significant ocular morbidity due to this devastating entity. The concept of a traumatic repair and prevention of iatrogenic trauma needs to be ingrained into the strategic planning in ophthalmic trauma management to achieve optimal outcome. Specialty training of the fellow ophthalmologists with focused structured training in ophthalmic trauma at one of the recognized centres in each country can be one of the steps forward in optimizing the outcome in afflicted patients and further streamline the care of traumatized eyes. Medico-legal litigation can be minimized by good documentation, establishing rapport with the patient and family and following the basic principles in management of ophthalmic trauma.

Dedicated efforts need to be put in to buildup trauma registry and get the real life epidemiological data on ophthalmic trauma. One of the most neglected parts in ophthalmic trauma is very weak epidemiological data. Concentrated efforts should be made by the national societies to mandate the reporting of eyes with all open globe and other severe globe injuries in coordination with one of the

international societies of ophthalmic trauma. The epidemiologic data hence generated will guide the regulatory agencies about the impact and burden of this problem and in terms of health economics research will pave the way for boosting-up healthcare policy and resources to prevent this gigantic but preventable cause of blindness. The data generated will also highlight any obvious regional and national causes and safety tools than need to be devised accordingly.

In summary, let us, each one of us, recognize, treat and further develop Ophthalmic Trauma as a distinct subspecialty and become the torch bearers to serve our patients even better.

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