Editorial

Maxillofacial Trauma: The Burden of Injury

The burden of trauma and its related effects on society, despite the many advances in medical and surgical care, remains one of the great public health issues facing the world today. In the United States alone, the Institute of Medicine¹ commissioned a report focused on trauma and noted the following annual statistics:

- Fifty-nine million episodes of injury were reported.
- A total of 147,891 individuals died as a result of injury.
- A total of 77% of all deaths and 10% of all hospitalizations among 15 to 24-year-old were the result of injury.
- A total of 52% of all deaths and 17% of all hospitalizations among 5 to 14-year-old were caused by injury.
- Trauma and its consequences were responsible for 12% of all medical spending.
- The cost of trauma on an annual basis was estimated to be 260 billion dollars.

A tremendous burden indeed! Trauma must be regarded as a disease and not just an ‘accident.’ A change in the light by which we view the burden of trauma refocuses our attention on wider issues, which must be considered as with any other human pathologic process, such as diabetes or cardiovascular disease. It includes efforts directed at populace education, clinical and basic science research and prevention. However, trauma is different than other disease processes as it can be positively affected by regional care coordination and legislative efforts. It requires advocacy by us as healthcare providers to achieve.

Trauma center designation and care coordination is a concept and practice that remains an important cornerstone globally for the care of the injured patient. The rationing of appropriate resources in a step-wise fashion to deal with trauma patients is a well-practiced approach to clinical management. The concept of a shock trauma center was developed at the University of Maryland, Baltimore, in the years 1950 and 1960, by thoracic surgeon and shock researcher R Adams Cowley, who founded what became the Shock Trauma Center in Baltimore, Maryland, in 1960. The R Adams Cowley Shock Trauma Center is the first and longest running shock trauma center in the world. In the United States, trauma centers are ranked by the American College of Surgeons (ACS), from Level I (comprehensive service) to Level III (limited-care). The different levels refer to the kinds of resources available in a trauma center and the number of patients admitted yearly. These are categories that define national standards for trauma care in hospitals. Level I and II designations are also given adult and or pediatric designations. This has allowed for the development of the Trauma Information Exchange Program (TIEP). This is a program of the American Trauma Society in collaboration with the Johns Hopkins Center for Injury Research and Policy and is funded by the Centers for Disease Control and Prevention (CDC). The TIEP maintains an inventory of trauma centers in the US, collects data and develops information related to the causes, treatment and outcomes of injury and facilitates the exchange of information among trauma care institutions, care providers, researchers, payers and policy makers which bring us to the point of advocacy.

The true cost of human affliction as the result of trauma is borne by the trauma surgeon, the patient and the patient’s family. The often under appreciated secondary cost arises from the burden which society must bear for the rehabilitation and reintegration of the severely injured patient back into a productive and useful life. Here, it is where we as healthcare providers must reach beyond the borders of our hospitals and clinics and engage with policy makers. Whether on the state or national level, advocacy can positively effect change to reduce the burden of injury. The development and enforcement of laws directed at public safety, such as child restraints in vehicles or the manufacturing standards for buildings to prevent collapse or reduce the risk of fire, are critical components of this effort which must be spearheaded in a concentrated fashion.

In the United States, the verified Level I Trauma Center² is a comprehensive regional resource that is a tertiary care facility central to the trauma system. A Level I Trauma Center is capable of providing total care for every aspect of injury—from prevention through rehabilitation. Elements of Level I Trauma Centers include the following:

- 24-hour in-house coverage by general surgeons and prompt availability of care in specialties of orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology, internal medicine, plastic surgery, oral and maxillofacial surgery, pediatric surgery (if designated pediatric Level I) and critical care.
- Referral resource for communities in nearby regions.
- Provide leadership in prevention, public education to surrounding communities.
- Provide continuing education of the trauma team members.
- Incorporate a comprehensive quality assessment program.
- Operate an organized teaching and research effort to help to direct new innovations in trauma care.
- Program for substance abuse screening and patient intervention.
- Meet minimum requirement for annual volume of severely injured patients.

My recent stay as a Visiting Professor in the Unit of Oral and Maxillofacial Surgery, Department of Oral Health Sciences, left no doubt in my mind that PGI is the nucleus of such a facility. A true ‘Level I’ trauma facility that serves the needs of its community and region with a team of dedicated and skilled surgeons, nurses and staff with the resources to make a positive difference.

While injury patterns and incidence can vary by region, country and the presence of military or political conflicts, the incidence of civilian facial trauma has been estimated to represent approximately 10% of all visits for acute care to hospital emergency departments. The human face is our window to the world and the most complex region of the body from an anatomical and functional standpoint. It is how people perceive our emotions and thoughts and how we as humans express ourselves to others. As such, maxillofacial trauma can have devastating consequences far beyond the scars that are left behind from wound healing. Simple actions of everyday life taken for granted like mastication, deglutition, speech, vision, smell and taste maybe lost permanently. In addition, as might be expected, facial disfigurement secondary to trauma can be a tremendous hurdle for patients as they attempt reintegration back into society at large. There is a very clear case for the direct involvement of the maxillofacial trauma surgeon for head and neck injuries as a part of the overall Level I trauma team.

The forefront of maxillofacial trauma research and clinical development now includes digital-based computer planning and design to improve the accuracy of facial reconstruction, investigation of new techniques and materials in the use of rigid internal fixation of the facial skeleton to assist patients with function during convalescence, and use of wound/bone healing factors, such as rh-BMP2, for the reconstruction of traumatic facial defects. All directed at returning our patients to pretraumatic function and form.

The maxillofacial trauma surgeon plays a critical role in reducing the burden of trauma injury for patients, their families and society at large. The future of the research in this area is bright and making a difference positively for patients as it is translated to the bedside and the operating theater.

REFERENCES

1. Reducing the burden of injury—advancing prevention and treatment. In: Bonnie RJ, et al. editor. Committee on injury prevention and control division of health promotion and disease promotion. Institute of Medicine, National Academy Press, Washington DC, 1999.
2. American College of Surgeons. Consultation/Verification Program, Reference Guide of Suggested Classification. American College of Surgeons, 2006.

Paul S Tiwana DDS, MD, MS, FACS

Associate Professor and Program Director

Department of Oral and Maxillofacial Surgery

University of Texas Southwestern Medical School

Dallas, Texas

Medical Director, Department of Oral and Maxillofacial Surgery

Parkland Memorial Hospital, Dallas, Texas

Chief, Department of Pediatric Oral and Maxillofacial Surgery

Children's Medical Center, Dallas, Texas