Brain Injuries in Children Presenting with Facial Fractures

Aaron Grant, MD, Arjang Yazdani, MD, FRCSC

Objectives: Increasing attention is being paid to the importance of minor brain injuries in children and adolescents. Facial fractures in the pediatric population can result in brain injury via force transmission. Our goal was to identify the rate and characteristics of both minor and major brain injuries in children and adolescents presenting to a Plastic Surgery service for the treatment of facial fractures.

Methods: Over 9 months, pediatric patients presenting with facial fractures to the craniofacial service at a level 1 trauma centre were identified. A clinical questionnaire and checklist were completed from examination and chart review to identify and compare major, minor, and no brain injuries. Statistical methods were utilized to determine risk factors for brain injury.

Results: Twenty-seven patients were eligible, among whom 59.2% suffered a minor or major brain injury. All facial fractures due to motor vehicle accidents yielded at least minor brain injury, as compared to 67% for falls, 25% for assaults, and 14% for sports injuries. Facial fracture type was not found to predict brain injury, however, multiple fractures in the same patient ($p<0.05$) and associated non-cranial injuries ($p=0.004$) were correlated. Mechanism and patient age were strong predictors of brain injury.

Conclusions: Brain injuries are common sequelae of facial fractures in the pediatric population. High-energy trauma is frequently associated with both major and minor brain injury, even in the setting of protective headgear. Low-energy trauma may have associated minor brain injury which may be overlooked, possibly resulting in inappropriate management.