The Incidence and Characteristics of Facial Fractures
Secondary to Bicycle Trauma
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Objectives
1) Determine trends in the incidence of facial fractures secondary to bicycle-related trauma
2) Characterize the types of fractures and associated treatments

Background
1) Bicycles are widely used for both recreation and transportation throughout the world and the United States.1
2) The population using bicycles for both commuting and recreation has steadily increased over the last decade.2
3) There is currently limited information on the incidence, the characteristics, and the treatment of facial fractures resulting from bicycle-related trauma in the United States.

Methods
We completed a retrospective chart review of a cohort of patients treated within the Division of Otolaryngology – Head and Neck Surgery for facial fractures at a level I trauma center between 2000 and 2013.

Results

Mechanism of Injury: Ejection from the bicycle was the most common mechanism of injury (n=20/34, 59%), while collisions with either an object or another cyclist (n=5/34, 15%) and accidents involving a motor vehicle (n=5/34, 15%) occurred less frequently (Figure 2A). Nineteen patients were hospitalized (n=19/34, 56%) and 5 patients were admitted to the ICU (n=5/24, 15%). Figure 2B shows the proportion of patients requiring hospitalization by mechanism of injury. Figure 3 shows the proportion of individuals who suffered injuries to one or multiple sites.

Demographics: Of the 1309 patients treated for facial fractures, we identified 34 patients (2.6 %) who sustained injuries due to a bicycle-related accident. The majority of patients suffering facial fractures were male (n=29/34, 85%) (Figure 1A), and the median age was 27.5 with a range from 4 to 78 years. Males between the ages of 13 and 39 were the most likely to be injured (Figure 1B). The majority of accidents (n=22, 65%) occurred during the summer months, and an increase in the incidence of facial fractures occurred over the last four years of the study (Figure 1C).

Characterization of Injuries: Table 1 shows the distribution of facial fractures by region and subtype. Nasal fractures were the most common type of injury (n=16/34, 47%), with Le Fort-type fractures (n = 9/34, 26%) and tripod fractures (n=5/34, 33%) also occurring frequently. As shown in figure 3, a number of patients suffered injuries to multiple regions. As a result, the total percentages do not sum to 100%.

Discussion
Our results showed an increase in the incidence of facial fractures due to bicycle trauma that was in line with a growing population of cyclists over the period studied.1,2,3 We also found that the mid-face was the most common region injured. These results differed from those of previous studies, which found that the mandible was the most common facial fracture suffered by cyclists.4,5,6 This discrepancy may be due to differences in local geography altering the velocity at which crashes occur and ultimately influencing the types of injuries incurred.

Treatment of facial fractures required open surgery in fifty percent of cases. This is in contrast to previous studies showing treatment with ORIF in less than one fourth of patients.6,7 ORIF was used in combination with MMF for patients with more severe injuries. We found that MMF was used less frequently in this study than previously reported,7 possibly reflecting a variation in methods for managing facial fractures between different countries.

Conclusions
Bicycle-related traumas can result in severe facial injuries often requiring surgical treatment and hospitalization. We demonstrate an increase in the incidence of facial fractures secondary to bicycle trauma in recent years likely proportionate to the increase in bicycle use during the same time period. As the number of bicycle riders increases, proper education regarding bicycle safety and helmet use will play an important role in limiting and preventing craniofacial trauma suffered by cyclists.

References