

## Article

# Department-Specific Distribution of Facial Trauma Cases Managed by Oral and Maxillofacial Surgery and Plastic Surgery: A Ten-Year Single-Center Retrospective Observational Study

Woo-Seok Kang <sup>1</sup>, Hyo-Joon Kim <sup>2</sup>, Ji-Su Oh <sup>2</sup> and Seong-Yong Moon <sup>2,\*</sup><sup>1</sup> Department of Oral and Maxillofacial Surgery, Chosun University Dental Hospital, Gwangju 61452, Republic of Korea; dntjr1316@naver.com<sup>2</sup> Department of Oral and Maxillofacial Surgery, College of Dentistry, Chosun University, Gwangju 61452, Republic of Korea; hyojoonkim@chosun.ac.kr (H.-J.K.); jsch@chosun.ac.kr (J.-S.O.)

\* Correspondence: msygood@chosun.ac.kr

## Abstract

**Background:** Facial trauma is frequently managed by multiple surgical specialties, but department-specific case distribution within a single institution has not been well characterized. This study aimed to describe the distribution of facial trauma cases managed by Oral and Maxillofacial Surgery (OMFS) and Plastic Surgery (PS) from 2016 to May 2025 and to evaluate department-specific patterns according to injury type, anatomical site, demographic characteristics, and temporal changes during the COVID-19 period.

**Methods:** This single-center retrospective observational study included facial trauma cases managed by OMFS or PS after presentation to the emergency department at Chosun University Hospital between 1 January 2016 and 31 May 2025. Aggregated count data on demographic characteristics, fracture sites, laceration sites, injury mechanisms, dental trauma diagnoses, and annual case numbers were analyzed using cross-tabulation and chi-square tests. **Results:** A total of 6611 facial fracture patients and 17,133 facial laceration cases were analyzed. PS managed a larger number of facial fracture and laceration cases overall, whereas OMFS-managed cases were more concentrated in mandibular fractures and dental trauma. Sex distribution did not differ significantly between departments ( $p = 0.126$ ), whereas age distribution differed significantly ( $p < 0.001$ ). The annual distributions of facial fracture and laceration cases also differed between departments ( $p = 0.003$  and  $p < 0.001$ , respectively). Zygomatic arch fractures represented the largest midfacial fracture-site category managed by PS, whereas condylar and angle fractures were the two most frequently recorded mandibular fracture-site categories managed by OMFS.

**Conclusions:** This study describes department-specific distributions of facial trauma cases in a single tertiary institution. The findings should be interpreted as reflecting institutional case routing and documentation patterns rather than intrinsic differences between specialties. These data may support local audit of department-managed case distributions and generate hypotheses for future multicenter research.

**Keywords:** facial trauma; department-specific distribution; oral and maxillofacial surgery; plastic surgery; emergency department; retrospective study



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## 1. Introduction

Facial trauma is commonly managed by more than one surgical specialty, and both Oral and Maxillofacial Surgery (OMFS) and Plastic Surgery (PS) are frequently involved in

its treatment [1]. Facial fractures frequently result in cosmetic, functional, and psychological impairment. Because the face is closely related to mastication, speech, facial expression, sensation, and appearance, facial injuries can affect both function and quality of life [2]. Reported fracture patterns vary across populations and institutions, with mandibular, nasal, zygomatic, and other midfacial sites predominating in different cohorts [3,4]. Regional studies also highlight distinct patterns in midfacial and mandibular involvement [4], while long-term international analyses indicate evolving incidence and prevalence across decades [5]. Recent Global Burden of Disease data additionally reveal considerable geographic variability in facial fracture burden [6]. Large-scale investigations have also shown that the distribution of facial fractures varies by region and injury mechanism [7,8], emphasizing the need for accurate assessment and appropriate referral [9].

Although the clinical scope of OMFS and PS may overlap in facial trauma, the types of injuries managed by each department may differ according to anatomical site and treatment goals. OMFS primarily manages mandibular and dentoalveolar injuries requiring occlusal stability and functional reconstruction, whereas PS frequently treats midfacial fractures and a broad range of soft-tissue injuries [1,10]. The COVID-19 pandemic also influenced trauma epidemiology by reducing mobility and altering injury mechanisms, with studies reporting changes in departmental caseloads and overall trauma volume [11–13]. Recent reviews have emphasized demographic and etiologic variability during this period, including changes in domestic-setting injuries, interpersonal violence, and fall-related fractures [14,15]. Existing epidemiological studies have largely focused on overall facial trauma patterns, whereas department-specific case distributions within the same institution have received less attention. In emergency department settings, the department responsible for initial management may be influenced not only by injury type but also by institutional routing systems, staffing patterns, department availability, historical referral pathways, and local treatment protocols [1]. Therefore, department-managed case distributions should be interpreted as real-world institutional patterns rather than direct indicators of specialty competence or overall trauma epidemiology. Characterizing these institution-specific patterns may support local audit and identify questions for prospective evaluation of interdepartmental coordination.

We hypothesized that OMFS-managed cases would be more concentrated in mandibular fractures and dental trauma, whereas PS-managed cases would be more concentrated in midfacial fractures and extraoral soft-tissue injuries. We also hypothesized that annual case distributions would show department-specific changes during the COVID-19 period. The primary objective of this study was to describe department-specific distributions of facial trauma cases managed by OMFS and PS in a single tertiary institution. The secondary objectives were to: (1) compare demographic distributions of department-managed facial fracture patients; (2) describe anatomical distributions of midfacial and mandibular fracture sites; (3) evaluate annual changes in fracture and laceration case counts before, during, and after the COVID-19 period; and (4) summarize laceration mechanisms and dental trauma patterns within this institutional dataset.

## 2. Materials and Methods

### 2.1. Study Design and Setting

This single-center retrospective observational study analyzed anonymized aggregated count data of facial trauma patients who presented to the emergency department of Chosun University Hospital and were managed by either OMFS or PS between 1 January 2016 and 31 May 2025. The study was approved by the Institutional Review Board of Chosun University Dental Hospital (CUDHIRB 2601 002), and the requirement for informed consent was waived owing to the retrospective design. Department-specific records and diagnosis

labels were retrieved from the shared hospital EMR. A standardized ICD-10 or KCD code set was not available in the aggregated dataset used for this study. The study team received the resulting data as anonymized aggregated counts for OMFS- and PS-managed cases. Inclusion criteria were: (1) cases involving patients of any age who presented to Chosun University Hospital with facial trauma; (2) availability of the demographic and diagnostic variables required for the prespecified aggregated analyses; and (3) recorded management by either OMFS or PS. Exclusion criteria were: (1) incomplete or duplicated records; (2) trauma limited to areas outside the maxillofacial region; and (3) patients transferred to other institutions before definitive treatment. Because the dataset was provided as aggregated count data, detailed verification of follow-up visits, reoperations, or repeated consultations for the same trauma episode was not possible. This limitation was considered when interpreting the results.

## 2.2. Data Collection and Variables

Data were extracted from electronic medical records, including sex, age, injury type, fracture classification (mandibular and midfacial fracture sites), laceration site, etiology, and treating department. Fracture sites were categorized as midfacial fracture sites or mandibular fracture sites according to the anatomical classification recorded in the EMR. Midfacial categories included Le Fort I, Le Fort II, Le Fort III, nasal bone, zygomatic arch, and zygomatic complex fractures. Mandibular categories included condyle, subcondyle, coronoid process, angle, symphysis, parasymphysis, and ramus fractures. Injury mechanisms were categorized according to the recorded clinical description as slip down, blunt trauma, traffic accident, cut and stab injury, or fall. These categories were retained as documented in the source records, and the distinction between slip down and fall could not be independently reclassified from the aggregated dataset. Dental injuries in this study were further categorized into tooth fracture, subluxation, avulsion, and tooth displacement, with tooth fractures encompassing crown fractures (with or without pulp exposure), crown-root fractures, and root fractures. These diagnostic categories were broadly aligned with the International Association of Dental Traumatology classification of traumatic dental injuries [16,17]. Anatomical subcategories were retained as recorded in the source EMR. Because patient-level imaging was not available in the aggregated dataset, independent radiographic reclassification of fracture subtypes was not performed.

The study period was divided into pre-pandemic (2016–2019), pandemic (2020–2021), and post-pandemic (2022–May 2025) phases. These phases were operationally defined to distinguish the period before the emergence of COVID-19, the period with major pandemic-related changes in healthcare utilization, and the subsequent period. Data for 2025 included cases through 31 May and were not annualized. Although 2025 represented a partial year, the raw counts were retained in the department-by-year cross-tabulations to preserve the observed institutional timeline. Results involving 2025 were therefore interpreted descriptively and not as annualized rates.

## 2.3. Unit of Analysis and Case Counting

The unit of analysis differed according to the type of variable analyzed. For sex, age, and annual facial fracture case counts, the unit of analysis was the patient. For anatomical fracture-site analyses, the unit of analysis was the documented fracture site; therefore, patients with multiple fractures could contribute to more than one anatomical fracture category. For laceration-site analyses, counts represented cases with a documented anatomical site. For injury-mechanism analyses, counts represented cases with a documented mechanism. Dental trauma analyses were based on aggregated diagnostic-event counts rather than unique patient counts.

Percentages were calculated using the relevant department-specific denominator for each table, and table footnotes specify the denominator used for each analysis.

#### 2.4. Statistical Analysis

Categorical variables are presented as frequencies and percentages. Cross-tabulation was used to summarize distributions according to treating department, year, anatomical site, injury mechanism, and dental trauma diagnosis. Percentages were calculated using department-specific denominators unless otherwise specified. The Pearson chi-square test was used to compare categorical distributions. The Fisher–Freeman–Halton exact test with Monte Carlo estimation was used when expected cell counts were sparse. For significant contingency tables, post hoc cell comparisons were performed using adjusted standardized residuals with Bonferroni correction. Effect sizes for categorical comparisons were summarized using Cramér’s V. Because multiple comparisons were performed in this retrospective descriptive study, the results were interpreted as exploratory. No normality testing was performed because the primary analyses involved categorical count data. Cross-tabulation and Pearson chi-square tests were performed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Additional exact tests, Cramér’s V estimates, and post hoc residual analyses were performed using Python version 3.13.5 with SciPy version 1.17.0 and NumPy version 2.3.5. Statistical significance was set at  $p < 0.05$ .

### 3. Results

#### 3.1. Departmental Distribution

A total of 6611 patients with facial fractures were included during the study period; 5934 (89.7%) were managed by PS and 677 (10.3%) by OMFS. Male patients predominated in both departments, but sex distribution did not differ significantly ( $p = 0.126$ ; Table 1). Age distribution differed significantly between departments ( $p < 0.001$ ; Table 2). The 20–29-year age group was most common in OMFS (26.7%), whereas the 50–59-year age group was most common in PS (18.8%).

**Table 1.** Sex distribution of facial fracture patients by department.

| Sex                   | OMFS ( $n = 677$ ) | PS ( $n = 5934$ ) |
|-----------------------|--------------------|-------------------|
| Male ( $n = 5096$ )   | 506 (74.7%)        | 4590 (77.4%)      |
| Female ( $n = 1515$ ) | 171 (25.3%)        | 1344 (22.6%)      |

Note: Percentages were calculated using the total number of facial fracture patients within each department as the denominator. Pearson chi-square test,  $p = 0.126$ ; Cramér’s V = 0.019.

**Table 2.** Age distribution of facial fracture patients by department.

| Age   | OMFS ( $n = 677$ )       | PS ( $n = 5934$ )        |
|-------|--------------------------|--------------------------|
| 0–9   | 5 (0.7%)                 | 12 (0.2%)                |
| 10–19 | 131 (19.4%) <sup>a</sup> | 453 (7.6%)               |
| 20–29 | 181 (26.7%) <sup>a</sup> | 1016 (17.1%)             |
| 30–39 | 95 (14.0%)               | 728 (12.3%)              |
| 40–49 | 69 (10.2%)               | 957 (16.1%) <sup>a</sup> |
| 50–59 | 97 (14.3%)               | 1114 (18.8%)             |
| 60–69 | 48 (7.1%)                | 864 (14.6%) <sup>a</sup> |
| 70+   | 51 (7.5%)                | 790 (13.3%) <sup>a</sup> |

Note: Percentages were calculated using the total number of facial fracture patients within each department as the denominator. Pearson chi-square test,  $p < 0.001$ ; Cramér’s V = 0.172. <sup>a</sup> Significantly higher than expected based on adjusted standardized residuals with Bonferroni correction.

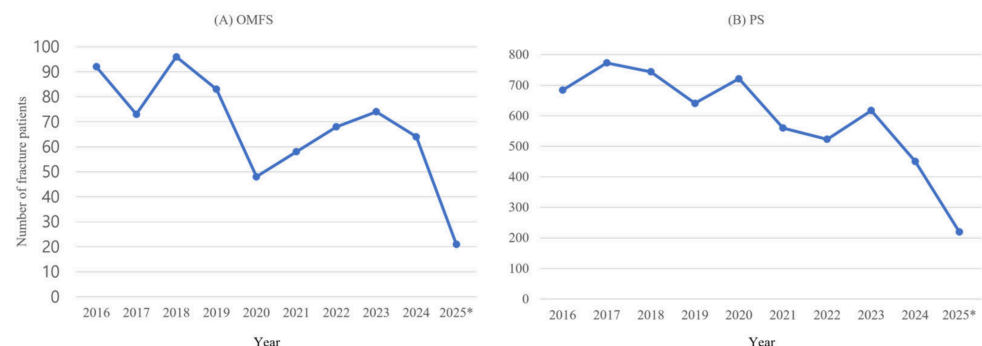
### 3.2. Annual Case Counts Across the Study Period

Annual fracture case counts showed department-specific temporal patterns (Table 3 and Figure 1). OMFS-managed fracture cases decreased in 2020 and remained below the pre-pandemic annual average of 86 cases, whereas PS-managed fracture cases increased in 2020 compared with 2019 and then decreased from 2021 onward. The annual distribution of fracture cases differed significantly between departments ( $p = 0.003$ ). These findings are based on absolute departmental case counts and were not adjusted for population-level incidence or changes in hospital access or referral pathways.

**Table 3.** Annual distribution of facial fracture patients by department.

| Year | OMFS ( $n = 677$ ) | PS ( $n = 5934$ )        |
|------|--------------------|--------------------------|
| 2016 | 92 (13.6%)         | 684 (11.5%)              |
| 2017 | 73 (10.8%)         | 773 (13.0%)              |
| 2018 | 96 (14.2%)         | 744 (12.5%)              |
| 2019 | 83 (12.3%)         | 641 (10.8%)              |
| 2020 | 48 (7.1%)          | 721 (12.2%) <sup>a</sup> |
| 2021 | 58 (8.6%)          | 560 (9.4%)               |
| 2022 | 68 (10.0%)         | 523 (8.8%)               |
| 2023 | 74 (10.9%)         | 617 (10.4%)              |
| 2024 | 64 (9.5%)          | 451 (7.6%)               |
| 2025 | 21 (3.1%)          | 220 (3.7%)               |

Note: Percentages were calculated using the total number of facial fracture patients within each department as the denominator. Pearson chi-square test,  $p = 0.003$ ; Cramér's  $V = 0.062$ . Data for 2025 include cases up to 31 May 2025 only. <sup>a</sup> Significantly higher than expected based on adjusted standardized residuals with Bonferroni correction.



**Figure 1.** Annual number of facial fracture patients managed by (A) OMFS and (B) PS from 2016 to May 2025. Panels use independent y-axis scales to improve visualization of within-department temporal trends. \* Data for 2025 include cases up to 31 May 2025 only.

### 3.3. Fracture Patterns

In the midfacial fracture-site analysis, zygomatic arch fractures accounted for the largest proportion of PS-managed midfacial fracture sites (94.4%). The overall midfacial fracture-site distribution did not differ significantly between departments (exact  $p = 0.057$ ; Table 4). However, because only eight OMFS-recorded midfacial fracture sites were available, this comparison was considered primarily descriptive, and the inferential results should be interpreted cautiously. In the mandibular fracture-site analysis, condylar and angle fracture sites were the two most frequently recorded categories among OMFS-managed mandibular fracture sites, accounting for 32.2% and 23.3%, respectively. The mandibular fracture-site distribution differed significantly between departments ( $p < 0.001$ ; Table 5). These analyses were based on fracture-site counts rather than patient-level counts.

**Table 4.** Distribution of midfacial fracture-site counts by department.

| Fracture Type     | OMFS ( <i>n</i> = 8 Sites) | PS ( <i>n</i> = 3472 Sites) |
|-------------------|----------------------------|-----------------------------|
| Le Fort I         | 1 (12.5%)                  | 89 (2.6%)                   |
| Le Fort II        | 1 (12.5%)                  | 35 (1.0%)                   |
| Le Fort III       | 0 (0.0%)                   | 16 (0.5%)                   |
| Nasal bone        | 0 (0.0%)                   | 36 (1.0%)                   |
| Zygomatic arch    | 6 (75.0%)                  | 3278 (94.4%)                |
| Zygomatic complex | 0 (0.0%)                   | 18 (0.5%)                   |

Note: Percentages were calculated using the total number of documented midfacial fracture-site counts within each department as the denominator. Because patients with multiple fractures could contribute to more than one anatomical category, these values represent fracture-site distributions rather than patient-level proportions. Fisher–Freeman–Halton exact test,  $p = 0.057$ ; Cramér’s  $V = 0.063$ . Given the very small number of OMFS-recorded midfacial fracture sites ( $n = 8$ ), this table should be interpreted primarily as a descriptive summary.

**Table 5.** Distribution of mandibular fracture-site counts by department.

| Fracture Type    | OMFS ( <i>n</i> = 658 Sites) | PS ( <i>n</i> = 1788 Sites) |
|------------------|------------------------------|-----------------------------|
| Condyle          | 212 (32.2%) <sup>a</sup>     | 376 (21.0%)                 |
| Subcondyle       | 62 (9.4%)                    | 156 (8.7%)                  |
| Coronoid process | 1 (0.2%)                     | 13 (0.7%)                   |
| Angle            | 153 (23.3%)                  | 351 (19.6%)                 |
| Symphysis        | 120 (18.2%)                  | 360 (20.1%)                 |
| Parasymphysis    | 76 (11.6%)                   | 260 (14.5%)                 |
| Ramus            | 34 (5.2%)                    | 272 (15.2%) <sup>a</sup>    |

Note: Percentages were calculated using the total number of documented mandibular fracture-site counts within each department as the denominator. These values represent fracture-site distributions rather than patient-level proportions. Pearson chi-square test,  $p < 0.001$ ; Cramér’s  $V = 0.174$ . <sup>a</sup> Significantly higher than expected based on adjusted standardized residuals with Bonferroni correction.

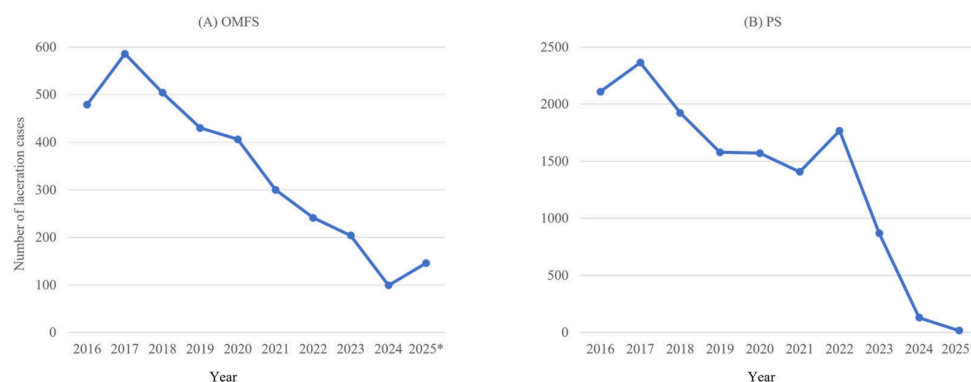
### 3.4. Laceration and Dental Trauma Patterns

The annual distribution of facial laceration cases differed significantly between departments ( $p < 0.001$ ; Table 6 and Figure 2). A marked decline in PS-recorded laceration cases was observed in 2024 and the partial-year 2025 data; potential effects of documentation and case-capture changes are considered in Section 4.4. Among PS-managed cases with documented laceration sites, the cheek and forehead were the most frequently recorded sites (Table 7). Among cases with documented injury mechanisms, mechanism distribution differed significantly between departments ( $p < 0.001$ ), with slip-down accounting for a higher proportion of OMFS-managed cases (Table 8). A total of 1057 OMFS-managed dental trauma diagnostic events were recorded, with tooth fracture being the most frequent diagnostic category (Table 9). The number of recorded dental trauma diagnostic events was notably low in 2022 ( $n = 11$ ). Dental trauma categories showed significant year-to-year variation ( $p < 0.001$ ).

**Table 6.** Annual distribution of facial laceration cases by department.

| Year | OMFS ( <i>n</i> = 3395) | PS ( <i>n</i> = 13,738)   |
|------|-------------------------|---------------------------|
| 2016 | 479 (14.1%)             | 2110 (15.4%)              |
| 2017 | 586 (17.3%)             | 2364 (17.2%)              |
| 2018 | 504 (14.8%)             | 1924 (14.0%)              |
| 2019 | 430 (12.7%)             | 1579 (11.5%)              |
| 2020 | 406 (12.0%)             | 1570 (11.4%)              |
| 2021 | 300 (8.8%)              | 1408 (10.2%)              |
| 2022 | 241 (7.1%)              | 1767 (12.9%) <sup>a</sup> |
| 2023 | 204 (6.0%)              | 869 (6.3%)                |
| 2024 | 99 (2.9%) <sup>a</sup>  | 130 (0.9%)                |
| 2025 | 146 (4.3%) <sup>a</sup> | 17 (0.1%)                 |

Note: Percentages were calculated using the total number of facial laceration cases within each department as the denominator. Pearson chi-square test,  $p < 0.001$ ; Cramér’s  $V = 0.198$ . Data for 2025 include cases up to 31 May 2025 only. <sup>a</sup> Significantly higher than expected based on adjusted standardized residuals with Bonferroni correction.



**Figure 2.** Annual number of facial laceration cases managed by (A) OMFS and (B) PS from 2016 to May 2025. Panels use independent y-axis scales to improve visualization of within-department temporal trends. \* Data for 2025 include cases up to 31 May 2025 only.

**Table 7.** Distribution of documented facial laceration sites among PS-managed cases.

| Laceration Sites | PS Documented Site Count ( $n = 10,771$ ) |
|------------------|-------------------------------------------|
| Cheek            | 3169 (29.4%)                              |
| Forehead         | 2657 (24.7%)                              |
| Chin             | 1319 (12.2%)                              |
| Eyelid           | 1287 (11.9%)                              |
| Eyebrow          | 1230 (11.4%)                              |
| Nose             | 508 (4.7%)                                |
| Ear              | 329 (3.1%)                                |
| Lip              | 148 (1.4%)                                |
| Philtrum         | 124 (1.2%)                                |

Note: Percentages were calculated using the total number of PS-managed laceration cases with documented anatomical site information as the denominator. This table was analyzed descriptively because a comparable detailed site classification for OMFS-managed cases was not available in the aggregated dataset.

**Table 8.** Distribution of documented laceration mechanisms by department.

| Mechanism        | OMFS ( $n = 3395$ )       | PS ( $n = 12,905$ )       |
|------------------|---------------------------|---------------------------|
| Slip down        | 1630 (48.0%) <sup>a</sup> | 4723 (36.6%)              |
| Blunt trauma     | 893 (26.3%)               | 4259 (33.0%) <sup>a</sup> |
| Traffic accident | 516 (15.2%)               | 2310 (17.9%) <sup>a</sup> |
| Cut and stab     | 258 (7.6%)                | 981 (7.6%)                |
| Fall             | 98 (2.9%)                 | 632 (4.9%) <sup>a</sup>   |

Note: Only cases with clearly documented injury mechanisms were included. Percentages were calculated using the number of cases with documented mechanism information within each department as the denominator. Pearson chi-square test,  $p < 0.001$ ; Cramér's  $V = 0.100$ . <sup>a</sup> Significantly higher than expected based on adjusted standardized residuals with Bonferroni correction.

**Table 9.** Annual distribution of OMFS-managed dental trauma diagnostic events.

| Trauma Year | Tooth Fracture           | Subluxation | Avulsion                | Tooth Displacement | Total Events |
|-------------|--------------------------|-------------|-------------------------|--------------------|--------------|
| 2016        | 80 (67.8%) <sup>a</sup>  | 20 (16.9%)  | 12 (10.2%)              | 6 (5.1%)           | 118          |
| 2017        | 164 (65.9%) <sup>a</sup> | 53 (21.3%)  | 13 (5.2%)               | 19 (7.6%)          | 249          |
| 2018        | 79 (54.9%)               | 17 (11.8%)  | 46 (31.9%)              | 2 (1.4%)           | 144          |
| 2019        | 67 (44.1%)               | 35 (23.0%)  | 47 (30.9%)              | 3 (2.0%)           | 152          |
| 2020        | 45 (45.0%)               | 25 (25.0%)  | 30 (30.0%)              | 0 (0.0%)           | 100          |
| 2021        | 33 (48.5%)               | 0 (0.0%)    | 32 (47.1%) <sup>a</sup> | 3 (4.4%)           | 68           |
| 2022        | 4 (36.4%)                | 0 (0.0%)    | 5 (45.5%)               | 2 (18.2%)          | 11           |
| 2023        | 32 (45.1%)               | 11 (15.5%)  | 18 (25.4%)              | 10 (14.1%)         | 71           |
| 2024        | 26 (35.1%)               | 3 (4.1%)    | 36 (48.6%) <sup>a</sup> | 9 (12.2%)          | 74           |

Table 9. *Cont.*

| Year \ Trauma | Tooth Fracture | Subluxation | Avulsion    | Tooth Displacement | Total Events |
|---------------|----------------|-------------|-------------|--------------------|--------------|
| 2025          | 34 (48.6%)     | 8 (11.4%)   | 22 (31.4%)  | 6 (8.6%)           | 70           |
| Total         | 564 (53.4%)    | 172 (16.3%) | 261 (24.7%) | 60 (5.7%)          | 1057         |

Note: Percentages in annual rows were calculated using the total number of dental trauma diagnostic events in the corresponding year as the denominator. Percentages in the total row were calculated using the total number of dental trauma diagnostic events during the study period. These values represent diagnostic-event counts rather than patient-level counts. Fisher–Freeman–Halton exact test,  $p < 0.001$ ; Cramér’s  $V = 0.239$ . <sup>a</sup> Significantly higher than expected based on adjusted standardized residuals with Bonferroni correction.

## 4. Discussion

### 4.1. Interpretation of Department-Specific Case Distribution

This ten-year retrospective observational study identified institution-specific differences in the types of facial trauma managed by OMFS and PS. The predominance of male patients in both departments and the concentration of OMFS-managed fracture cases in younger age groups were generally consistent with previous epidemiological reports [2,18,19]. Condylar and angle fractures were among the most frequently recorded mandibular fracture sites managed by OMFS, in line with patterns reported in previous mandibular fracture series [19,20]. Within this institution, OMFS-managed cases were more concentrated in mandibular fractures and dental trauma, whereas PS managed a larger number of midfacial fractures and extraoral soft-tissue lacerations. The frequent involvement of facial soft-tissue injuries in PS-managed cases is consistent with previous epidemiological and clinical reports on facial lacerations [21–23]. Although several associations were statistically significant, the corresponding Cramér’s  $V$  values were generally small to modest, indicating that statistical significance did not necessarily correspond to a large or clinically meaningful difference between departments. The large difference in case numbers between PS and OMFS likely reflects local staffing, emergency department routing, department availability, documentation practices, and referral pathways rather than intrinsic differences in specialty competence. Because staffing levels, on-call availability, and departmental resources were not included in the dataset, their independent contributions to the observed case imbalance could not be quantified.

### 4.2. Temporal Patterns in Relation to the COVID-19 Period

The number of trauma cases changed during the pandemic period, although the pattern differed between departments [11–15]. OMFS cases decreased in 2020 and remained lower thereafter, whereas PS cases increased in 2020 compared with 2019 and decreased from 2021. The COVID-19 period findings should be interpreted cautiously because the analysis was based on absolute department-managed case counts rather than population-adjusted trauma incidence rates. Changes in annual case numbers may reflect not only changes in trauma occurrence but also hospital access, emergency department utilization, institutional referral pathways, and documentation practices. Mechanism-specific changes across the pre-pandemic, pandemic, and post-pandemic phases were not analyzed in the present dataset. These limitations preclude causal interpretation of the observed temporal patterns. Future patient-level studies should examine mechanism-specific changes across these periods.

### 4.3. Potential Institutional Implications

Because this study did not evaluate referral accuracy, consultation delays, cross-referrals, treatment outcomes, or the appropriateness of departmental allocation, the observed distributions cannot establish preferred referral criteria or clinical routing algorithms. Although the previous literature addresses maxillofacial trauma referral and dentoalveolar

injury management [24,25], the present dataset cannot evaluate the appropriateness or effectiveness of such pathways. The findings may help identify questions for prospective or multicenter evaluation.

#### 4.4. Limitations

Several limitations should be acknowledged. First, this was a single-center retrospective observational study based on routine emergency department and institutional EMR data. Therefore, the findings reflect department-managed case distributions within a specific institutional structure and may not be generalizable to hospitals with different staffing, referral pathways, or emergency routing systems. Second, the unit of analysis differed according to the table: demographic and annual fracture analyses were patient-based, whereas fracture-site, laceration-site, mechanism, and dental trauma analyses were based on documented sites, mechanisms, or diagnostic events. Therefore, patients with multiple injuries may have contributed to more than one anatomical or diagnostic category. Detailed anatomical laceration-site data were available only for PS, precluding a between-department comparison of laceration-site distributions. Mechanism-specific temporal analyses across the pre-pandemic, pandemic, and post-pandemic phases could not be performed using the available aggregated data. Third, the study did not evaluate injury severity, associated injuries, operative versus non-operative treatment, treatment timing, consultation delays, duplicated consultations, cross-referrals, complications, functional outcomes, esthetic outcomes, or mortality. Fourth, the COVID-19 period analysis was based on absolute annual case counts and did not adjust for population-level trauma incidence, hospital access, or changes in healthcare utilization. Fifth, routine documentation and coding variability, including possible changes in case capture after transition to the EMR system and the inclusion of partial-year data for 2025, may have influenced later-period laceration counts. Because patient-level source data were unavailable, the reason for the isolated decrease in recorded dental trauma diagnostic events in 2022 could not be independently verified. These limitations should be considered when interpreting the observed departmental distribution patterns.

## 5. Conclusions

This ten-year single-center retrospective observational study described department-specific distributions of facial trauma cases managed by OMFS and PS after emergency department presentation. Within this institution, PS managed a larger overall number of facial fracture and laceration cases, whereas OMFS-managed cases were more concentrated in mandibular fractures and dental trauma. Annual case distributions changed during the COVID-19 period, but these trends should be interpreted cautiously because they may reflect changes in trauma occurrence, hospital access, referral patterns, and documentation systems. These findings may be useful for local audit of department-managed case distributions and for generating hypotheses for multicenter research. They should not be interpreted as generalizable triage recommendations. Future multicenter studies incorporating injury severity, treatment timing, referral accuracy, and clinical outcomes are needed to determine whether department-specific routing patterns are associated with patient care.

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## Abbreviations

The following abbreviations are used in this manuscript:

|          |                                |
|----------|--------------------------------|
| OMFS     | Oral and Maxillofacial Surgery |
| PS       | Plastic Surgery                |
| EMR      | Electronic Medical Record      |
| COVID-19 | Coronavirus Disease 2019       |

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