Management of Zygomatic Fractures: A National Survey

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Introduction: Repair of zygomatic fractures can be classified into the early closed reduction or the more recent open reduction and rigid internal fixation (ORIF) methods. Surgical training and literature advocate ORIF, but the actual frequency of the different techniques in clinical practice is unknown. The purpose of this study was to determine the current trends in the management of zygomatic fractures among US surgeons and elucidate their influences. Methods: A 10-question survey was developed and distributed to over 16,000 practicing US facial trauma surgeons, including plastic surgeons (PS), oral and maxillofacial surgeons (OMFS), and otorhinolaryngologists (ENT). The survey queried training background, zygoma fracture treatment preferences, and rationale. Responses were tabulated and both univariate and bivariate statistical analyses completed. Results: One thousand six hundred eleven (10%) total responses were received. Zygomatic fractures are treated most commonly by OMFS (61%), then PS (20%) and ENT (19%), with 71% of repairs being performed in private practice. Open reduction and rigid internal fixation is the most common treatment modality (81%), with most surgeons using 2 to 3 sites for exposure, reduction, and fixation with titanium miniplates (70%). Thirty-five percent of surgeons perform routine orbital floor exploration. Forty-three percent quoted training and 32% reported accuracy of repair as the primary reason for choosing ORIF. Conclusions: This is the largest reported survey on the repair of zygoma fractures. The response rate suggests dominance of OMFS in zygoma fracture care, an area pioneered by PS. Evolution of technique is also evident by predominance of ORIF with emphasis of multiple points of exposure, reduction, and fixation with rigid hardware. Key Words: Closed reduction, open reduction and rigid internal fixation, zygomatic fractures management (J Craniofac Surg 2016;27: 1571–1575)
commerce which averages 10% to 15% or industry where average rates drop to about 2%. Analysis revealed that, of respondents, zygomatic fractures are treated most commonly by OMFS (61%), PS (20%), and the ENT (19%) (Fig. 2). Seventy-one percent practice primarily in a private, 21% in an academic and, 8% in a community setting (Fig. 3). The average responder has been in practice for 21 years and performs 10 zygoma fracture repairs annually.

Respondents use ORIF (81%) most commonly, followed by CR without fixation (16%), and then CR with percutaneous fixation (3%) (Fig. 4). Access incisions used include lower eyelid (60% total, 33% trans-conjunctival, 27% trans-cutaneous), buccal sulcus (53%), lateral orbital rim (42%), and coronal (2%) (Fig. 5). Fixation interfaces include fronto-zygomatic (62%), zygomatico-maxillary (55%), infraorbital (52%), and zygomatic arch (3%) (Fig. 6). Titanium plates (70%), interfragmentary wires (7%), and resorbable plates (4%) are most often used for fixation (Fig. 7). Routine orbital exploration is performed 35% of the time (Fig. 8). Residency training (43%) and accuracy of repair (32%) are the reasons most commonly cited for technique selection (Fig. 9).

Bivariate analysis revealed that, with respect to repair modality and subspecialty, ORIF is the repair modality of choice for OMFS (84%) and PS (82%) versus ENT (70%); however, differences existed between the groups with respect to treatment technique chosen ($P < 0.001$) (Fig. 10). Bivariate analysis of repair modality and practice setting demonstrated ORIF is the repair method most commonly practiced across all practice settings (academic [85%], private [79%], and community [78%]) ($P = 0.709$). Our aim was for surgeons to list their main practice location. Private practice physicians would be those who practiced principally in a nonhospital private surgery center. Community hospital physicians would be those who practiced principally in a nonhospital private surgery center.
primarily in a nonacademic hospital. Decreased use of ORIF is found with increasing number of years in practice ($P < 0.001$). Among ENT, exposures through the lower eyelid (52%), buccal sulcus (39%), and lateral orbit (35%) predominate. Among OMFS, exposures through the lower eyelid (58%), buccal sulcus (57%), and lateral orbit (47%) predominate. Among PS, exposures through the lower eyelid (68%), buccal sulcus (51%), and lateral orbit (32%) predominate ($P < 0.001$) (Fig. 11). Among ENT, fixation at the infra-orbital rim (49%), fronto-zygomatic buttress (48%), and zygomatico-maxillary buttress (44%) are the most common. Among OMFS, fixation at the fronto-zygomatic buttress (65%), zygomatico-maxillary buttress (59%), and infra-orbital rim (49%) are the most common. Among PS, fixation at the infra-orbital rim (65%), fronto-zygomatic buttress (63%), and zygomatico-maxillary buttress (54%) are the most common ($P < 0.001$) (Fig. 12). All surgical specialties use titanium plates as the predominant means of fixation (ENT 58%, OMFS 75%, PS 69%). Orbital floor exploration is practiced by PS (62%) more routinely compared with OMFS (31%) and ENT (20%) ($P < 0.001$) (Fig. 13). Orbital floor exploration is performed more routinely in the academic setting (45%) compared with community (35%) and private (32%) ($P < 0.001$).

Further bivariate analysis indicated that surgeons in academic settings practice increased exposure and fixation ($P < 0.05$) and that PS and OMFS utilize increased exposure and fixation and titanium hardware compared with ENT ($P < 0.05$).

**DISCUSSION**

This is the largest reported survey on the repair of zygoma fractures in the literature, totaling 1611 responses. Of the respondents, the majority (980, 61%) were OMFS, representing 15% of their specialty. There were only 327 PS respondents (20%), representing just over 5% of their specialty. Otorhinolaryngologists made up 19% of respondents (303 individuals), representing just over 7% of their specialty. Although this may represent a response bias, it does suggest the predominance of OMFS in an area pioneered and
The importance of this organization in facial trauma.

Routine orbital floor exploration

J Trauma

Bivariate analysis of buttress fixation versus subspecialty (%)

Plast Reconstr Surg

It will be interesting to observe how this work,

Given relatively low postinjury

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Bivariate analysis of routine orbital floor exploration versus

Numerous authors have demonstrated the accuracy

due to thin overlying skin.

or canthal asymmetry, and hardware placed here may be palpable

poor indicator of reduction, its exposure may lead to visible scarring

favored by PS and OMFS. This buttress has been shown to provide

and 31% of OMFS. Previous work has shown that unless a

prereduction floor defect is present, zygoma realignment does not

enlarge the floor significantly and, thus, routine assessment

is not necessary, given its potential for complications.21

In summary, this survey demonstrates that zygoma fracture care

has undergone significant evolution over the last century. First, patients who suffer from this injury are now being treated not only by PS, but also OMFS and ENT. Second, 2 to 3 point exposure, reduction, and fixation has largely replaced closed reduction tech-

nique. Finally, titanium hardware has dominated as a method of stabilization.

REFERENCES


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