



## بررسی فراوانی و علل کسر استخوان گونه (زیگوما) در مراجعین بخش ستوماتولوژی شفاخانه حوزوی هرات طی شش ماه نخست سال ۱۴۰۳

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### چکیده

**زمینه/مقدمه:** استخوان زیگوما یا گونه یک استخوان پیچیده دو طرفه صورت است که به زیبایی و عملکرد کمک می کند. شکستگی کمپلکس زیگوما یک نوع رایج شکستگی استخوان صورت بخصوص در مردان جوان است که کبودی اطراف چشمی به عنوان شایع ترین علامه کلینیکی و تصادفات ترافیکی (RTA) به عنوان علت رایج آن است.

**هدف:** تعیین فراوانی ZBF، علت، تاریخ ثبت نام مریض ارجاع شده به تفکیک ماه، تظاهرات کلینیکی، نوع بیهوشی و روش تدای انجام شده.

**معرفی موضوع:** تمام دوسیه مریضان بستری شده در بخش ستوماتولوژی شفاخانه حوزوی هرات افغانستان بررسی شد و تمام موارد تشخیص داده شده با ZBF (Zygomatic Bone Fracture) در این مطالعه گنجانده شد. داده های مطالعه به صورت گذشته نگر از سوابق کلینیکی و جراحی طی یک دوره ۶ ماهه از مارس تا آگوست ۲۰۲۴ به دست آمد. نتایج به صورت تعداد و درصد ساده ارائه شد. داده ها ذخیره و با استفاده از نرم افزار SPSS (نسخه ۲۷،۰؛ SPSS) مورد تجزیه و تحلیل آماری قرار گرفت.

**نتیجه گیری:** کسر استخوان زیگوما در بیشترین نسبت در گروه سنی ۳۰ سال مشاهده شد و در مردان، علت اصلی شکستگی استخوان زیگوما به دلیل تصادفات ترافیکی بود، زیرا رانندگی با سرعت بالا توسط رانندگان جوان و بی تجربه اغلب با نادیده گرفتن قوانین راهنمایی و رانندگی یا نادیده گرفتن عمدی قوانین ترافیکی می تواند به افزایش تعداد تصادفات ترافیکی منجر شود. ماه های مارچ، اپریل و جولای با بیشترین تعداد موارد ZBF مرتبط بودند، درد و اذیما (پنیدگی) علائم کلینیکی رایج ZBF در شفاخانه بودند، بیهوشی عمومی نوع رایج بیهوشی مورد استفاده برای ۲۹ مریض بود. روش درمان انجام شده برای مریضان تثبیت با (Mini Plate Fixation) بود.

**واژه های کلیدی:** فراوانی، علل، شکستگی (کسر)، استخوان گونه (زیگوما)، شفاخانه حوزوی هرات.

ارجاع به این مقاله:

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## Investigation of the frequency and etiology of cheek bone (zygomatic) fracture in patients referred to the Stomatology Department of Herat Regional Hospital during March till August months of 2024

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Article Information	Abstract
<p>Type: Original</p> <p><b>Received:</b> 15/ 11/ 2024  <b>Accepted:</b> 16/ 03/ 2025  <b>Published:</b> 19/ 04/ 2025</p> <p><b>*Present address and corresponding author:</b>            Abu Ali Latif.            Lecturer at Operative Dentistry            Department, Stomatology Faculty,            Herat University, Herat,            Afghanistan.</p> <p> <a href="mailto:alisina4344@gmail.com">alisina4344@gmail.com</a></p> <p>DOI:  <a href="https://doi.org/10.58342/ghalibMj.V.2.I.1.10">https://doi.org/10.58342/ghalibMj.V.2.I.1.10</a></p>	<p><b>Background/ introduction:</b> The zygomatic bone is a complex bilateral facial bone that contributes to both aesthetics and function. Zygomatic complex fracture is a common type of facial bone fracture in young men with periorbital ecchymosis as the common clinical presentation and road traffic accidents (RTA) being the common cause.</p> <p><b>Aim:</b> To determine the frequency of ZBF (Zygomatic Bone Fracture), the cause, the date of registration of the referred patient by month, clinical manifestations, type of anesthesia, and the treatment method performed.</p> <p><b>Case presentation:</b> The medical records of all cases admitted to the Oral and Maxillofacial Surgery Department of the Regional Hospital of Herat, Afghanistan were reviewed and all cases diagnosed with ZBF were included in this study. The study data were obtained retrospectively from clinical and surgical records over a 6-month period from March to August 2024. The results were presented as simple frequencies and percentages. Data were stored and statistically analyzed using SPSS (ver. 27.0; SPSS).</p> <p><b>Conclusion:</b> Zygomatic bone fracture was observed in the highest proportion in the age group of 30 years and in men the main cause of zygomatic bone fracture was due to road accidents, because high-speed driving by young and inexperienced drivers was often prone to ignoring. Or intentional ignoring of traffic rules can lead to an increase in the number of road accidents. March, April and July were associated with the highest number of ZBF cases, pain and edema were the common clinical manifestations of ZBF in the hospital, general anesthesia was the most common type of anesthesia used for 29 patients. The treatment method performed for the patients was Mini Plate Fixation.</p>

**Keywords:** Frequency, Cause, Fracture, Cheekbone (zygomatic), Herat Regional Hospital.

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## Introduction

The facial skeleton is one of the most complex arrangements of bony structures in the body and is composed of the mandible, maxilla, zygomatic, bony walls of the nasal cavities, paranasal sinuses, and orbit. These fractures are of great clinical importance because the anatomical feature of the face protects important vital organs. Zygomatic fractures account for 45% of all facial fractures (1). The zygomatic bone, the malar bone, is the most prominent of the two facial bones in terms of number and contributes to the strength and stability of the midface (2). Facial fractures generally depend on the study population. However, fractures of the zygomatic complex are the second most common midface fracture after the nasal bones (4). Most fractures of the zygomatico-orbito-faxillary complex are caused by violent assaults followed by motor vehicle accidents. The majority of patients reported in the literatures have been young men in their thirties (5). The zygomatic bone is a complex bilateral facial bone that contributes to both aesthetics and function. Zygomatic complex fracture is a common type of facial fracture in young men with periorbital ecchymosis, the most common clinical presentation and road traffic accident (RTA) is the most common cause. Its treatment depends on various factors such as demographics, clinical findings, socioeconomic status, fracture type and available resources. The aim of the present study was to investigate the different clinical and other preoperative ranges of ZMC fractures (6).

## Patients and methods

The medical records of all cases admitted to the Oral and Maxillofacial Surgery Department of the Regional Hospital of Herat, Afghanistan were reviewed and all cases diagnosed with ZBF were included in this study. The study data were obtained retrospectively from clinical case sheets and surgical records during a 6-month period from March to August 2024. Patient gender, age, frequency of ZBF, etiology, date of referral by month, clinical presentation, type of anesthesia, and treatment method performed were recorded. Inclusion criteria included all patients clinically and radiographically diagnosed with ZBF who presented from March to August 2024. Exclusion criteria included patients with maxillofacial injuries or physical injuries that is not related to ZB involvement, patients admitted under other specialties such as neurosurgery and orthopedics. Incorrect maxillofacial diagnostic records in these departments, incomplete or unclear patient records, and cases where computed tomography did not show evidence of fracture. Data were stored and statistically analyzed using SPSS software (version 27.0; SPSS). Results were presented as simple frequencies and percentages.

## Result

A total of 576 patients were admitted for maxillofacial injuries, out of which 44 were treated for ZBF. This represents about 7.63% of the total cases of maxillofacial trauma during the study. 39 patients (88.6%) were male and 5 (11.4%) were female with a male to female ratio of 7.7:1 [Table-1]. The mean age was 28.36 years, with the age group of 30 years having the highest number of fractures (n=6, 13.6%), while patients aged 65 and over had the lowest number of fractures (n=2, 4.6%) [Table-2]. Road traffic accidents (RTA) remained the main cause of ZBF in the hospital (n=30, 68.2%), followed by physical conflict (n=8, 18.2%), with the lowest number of fractures due to other causes (n=2, 4.5%). [Table-3]. It is observed that March, April and July are associated with the highest number of ZBF cases (n=27, 61.5%) and June (n=7, 15.9%). August recorded the lowest number of ZBF (n=3, 6.8%) [Table-4]. Pain and edema were the main complications before treatment of ZBF in the hospital (n=20, 46.5%), bleeding, ecchymosis, pain or tenderness, Trismus were the most common complications before treatment of ZBF in the hospital (n=2, 4.7%) [Table-

5]. General anesthesia was the most common type of anesthesia used for 29 patients (65.9%) and local anesthesia for 5 patients (11.4%) [Table-6]. The treatment method performed for the patients was mini-plate fixation (n=29, 65.9%), intermaxillary fixation (n=3, 6.8%), and intermaxillary fixation and mini-plate (n=2, 4.5%) [Table-7].

Table [1]. Selection based on the gender of the participants.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	39	88.6	88.6	88.6
	Famale	5	11.4	11.4	100.0
	Total	44	100.0	100.0	

Table [2]. Etiology of Fracture.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Traffic Accident	30	68.2	68.2	68.2
	Falling from a height	4	9.1	9.1	77.3
	Physical Fight	8	18.2	18.2	95.5
	Other	2	4.5	4.5	100.0
	Total	44	100.0	100.0	

Table [3]. Age of the participants.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	8	1	2.3	2.3	2.3
	11	1	2.3	2.3	4.5
	13	2	4.5	4.5	9.1
	16	1	2.3	2.3	11.4
	18	1	2.3	2.3	13.6
	19	1	2.3	2.3	15.9
	20	2	4.5	4.5	20.5
	21	1	2.3	2.3	22.7
	22	4	9.1	9.1	31.8
	23	4	9.1	9.1	40.9
	24	1	2.3	2.3	43.2
	25	2	4.5	4.5	47.7
	26	1	2.3	2.3	50.0
	27	1	2.3	2.3	52.3
	28	2	4.5	4.5	56.8
	30	6	13.6	13.6	70.5
	32	1	2.3	2.3	72.7
	34	1	2.3	2.3	75.0
	35	4	9.1	9.1	84.1
	36	1	2.3	2.3	86.4
	38	1	2.3	2.3	88.6
	48	1	2.3	2.3	90.9
	50	2	4.5	4.5	95.5
	53	1	2.3	2.3	97.7
	65	1	2.3	2.3	100.0
	Total	44	100.0	100.0	

Table [4]. Date of registration of the referred patient by month.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	March	9	20.5	21.4	21.4
	April	9	20.5	21.4	42.9
	May	5	11.4	11.9	54.8
	June	7	15.9	16.7	71.4
	July	9	20.5	21.4	92.9
	August	3	6.8	7.1	100.0
	Total	42	95.5	100.0	
Missing	System	2	4.5		
Total		44	100.0		

## Discussion

In line with the results of other studies, zygomatic bone fractures were highest in the 30-year-old age group (7-11). This is because during this period of life, people are more socially, culturally and physically active, exposing them to more risk factors through their actions (10, 11). Another contributing factor that cannot be overlooked and is specific to this age group is alcohol consumption (12). In addition, high-speed driving by young and inexperienced drivers, who are often prone to ignoring or deliberately disregarding traffic rules, can lead to a higher number of road traffic accidents (13, 14). The present study shows a low prevalence of zygomatic bone fractures in the first decade of life. This result is confirmed by other studies and is explained by the fact that at this age, parental supervision is greater and the anatomical features of children, such as the stretching of bone sutures and the incomplete pneumatization of the paranasal sinuses, make the bone more flexible and allow it to better absorb traumatic injuries (14-16). The male predominance in patients with zygomatic bone fractures has also been observed in other studies (5, 9-11, 17-21), from a behavioral point of view, it has been found that men are more aggressive and conflictual than women, and as a result they are more prone to trauma (22). Professionally and socially, men are more likely to be involved in physically demanding sports and agricultural workers (14, 20). In this context, they are more susceptible than women to maxillofacial fractures following work accidents, sports injuries, or animal attacks (14, 16, 20-22), which is why the increased male:female ratio is notable in areas such as Saudi Arabia [7.7:1(5) or 8:1(23)], where women are prohibited from participating in many social activities, including driving (24), in contrast to countries such as Norway (18) or Switzerland (11), where women are not prohibited from participating in social activities, so the sex ratio for zygomatic bone fractures is altered.

In other European countries, such as France, Netherlands and Croatia, the main etiology of zygomatic bone fractures is represented by falls. This etiology is also found in other regions, such as Switzerland (9), Brazil, Sao Paulo area (25, 26) and Israel (27). The incidence of zygomatic bone fractures through falls can be attributed to population aging (7, 8, 17). In contrast, zygomatic bone fractures due to road traffic accidents are predominant in other regions: Saudi Arabia (5, 28) Malaysia (16), South Korea (19, 29), India (30), China (8), Iran (12), Nigeria (31), Uganda (29). This result is also confirmed by our study. Periorbital ecchymosis, being common clinical presentation (6), but in our study Pain and Edema were dominant clinical presentation of ZBF in the hospital.

Table [5]. Type of Anesthesia.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	General Anesthesia	29	65.9	85.3	85.3
	Local Anesthesia	5	11.4	14.7	100.0
	Total	34	77.3	100.0	
Missing	System	10	22.7		
Total		44	100.0		

Table [6]. Clinical Presentation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pain, Edema, Bleeding	6	13.6	14.0	14.0
	Pain, Edema	20	45.5	46.5	60.5
	Bleeding, Ecchymosis, Pain	2	4.5	4.7	65.1
	Pain, Trismus	2	4.5	4.7	69.8
	Pain, Ecchymosis	9	20.5	20.9	90.7
	Other	4	9.1	9.3	100.0
	Total	43	97.7	100.0	
Missing	System	1	2.3		
Total		44	100.0		

Table [7]. Treatment Method Performed.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mini Plate Fixation	29	65.9	85.3	85.3
	Intermaxillary Fixation	3	6.8	8.8	94.1
	Intermaxillary fixation and Mini plate	2	4.5	5.9	100.0
	Total	34	77.3	100.0	
Missing	System	10	22.7		
Total		44	100.0		

## Limitations

The present study has a number of limitations: The most important limitation is the retrospective nature of the study, with data collected from medical records subject to the accuracy of their recording and the standard provided at the time. Another limitation is the ability or willingness of patients to report inaccurate data in order to avoid legal consequences.


## Conclusion

Zygomatic bone fracture was observed in the highest proportion in the age group of 30 years and in men the main cause of zygomatic bone fracture was due to road accidents, because high-speed driving by young and inexperienced drivers was often prone to ignoring. Or intentional ignoring of traffic rules can lead to an increase in the number of road accidents. March, April and July were associated with the highest number of ZBF cases, pain and edema were the main complications before treatment of ZBF in the hospital, general anesthesia was the most common type of anesthesia used for 29 patients. The treatment method performed for the patients was Mini Plate Fixation.




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## References

1. Shah A, Ilyas M, Khan S. ETIOLOGY, TREATMENT AND ASSOCIATED SYMPTOMS WITH ZYGOMATIC BONE FRACTURE. *Journal of Khyber College of Dentistry*. 2015;6(1):17-9.
2. Dhungel S, Roy P, Thapa N, Devkota K. Prevalence and Pattern of Zygomatic Complex Fracture in a Tertiary Care Hospital of Central Nepal. *Journal of College of Medical Sciences-Nepal*. 2024;20(1):39-44.
3. Khan A, Jamal M, Javed A, Asim M, Sardar H. Frequency and etiology of zygomatic complex fractures in oral and maxillofacial trauma patients, a study done at ayub teaching hospital, abbotabad. *Pakistan Oral & Dental Journal*. 2017;37(4):543-6.
4. Ungari C, Filiaci F, Riccardi E, Rinna C, Iannetti G. Etiology and incidence of zygomatic fracture: a retrospective study related to a series of 642 patients. *Eur Rev Med Pharmacol Sci*. 2012;16(11):1559-62.
5. Ali-Alsuliman D, Ibrahim E-H, Braimah RO. Patterns of zygomatic complex bone fracture in Saudi Arabia. *Journal of emergencies, trauma, and shock*. 2018;11(3):170-4.
6. Gautam S, Shah AK, Chaurasia N. Spectrum of zygomatic complex fracture at a tertiary care center of Nepal. *Journal of Chitwan Medical College*. 2024;14(1):10-3.
7. Boffano P, Rocchia F, Zavattero E, Dediol E, Uglešić V, Kovačič Ž, et al. Assault-related maxillofacial injuries: the results from the European Maxillofacial Trauma (EURMAT) multicenter and prospective collaboration. *Oral surgery, oral medicine, oral pathology and oral radiology*. 2015;119(4):385-91.
8. Mijiti A, Ling W, Tuerdi M, Maimaiti A, Tuerxun J, Tao YZ, et al. Epidemiological analysis of maxillofacial fractures treated at a university hospital, Xinjiang, China: a 5-year retrospective study. *Journal of Cranio-Maxillofacial Surgery*. 2014;42(3):227-33.
9. Blumer M, Kumalic S, Gander T, Lanzer M, Rostetter C, Rücker M, et al. Retrospective analysis of 471 surgically treated zygomaticomaxillary complex fractures. *Journal of Cranio-Maxillofacial Surgery*. 2018;46(2):269-73.
10. Abdullah WA, Al-Mutairi K, Al-Ali Y, Al-Soghier A, Al-Shnwani A. Patterns and etiology of maxillofacial fractures in Riyadh City, Saudi Arabia. *The Saudi dental journal*. 2013;25(1):33-8.
11. Motamedi MHK, Dadgar E, Ebrahimi A, Shirani G, Haghighat A, Jamalpour MR. Pattern of maxillofacial fractures: a 5-year analysis of 8,818 patients. *Journal of trauma and acute care surgery*. 2014;77(4):630-4.
12. Lee C, Foo Q, Wong L, Leung Y. An overview of maxillofacial trauma in oral and maxillofacial tertiary trauma centre, Queen Elizabeth Hospital, Kota Kinabalu, Sabah. *Cranio-maxillofacial trauma & reconstruction*. 2017;10(1):16-21.
13. Ţent PA, Juncar R-I, Juncar M. Epidemiological Analysis of Zygomatic Bone Fractures in North-Western Romanian Population: A 10-Year Retrospective Study. *in vivo*. 2020;34(4):2049-55.
14. Qing-Bin Z, Zhao-Qiang Z, Dan C, Yan Z. Epidemiology of maxillofacial injury in children under 15 years of age in southern China. *Oral surgery, oral medicine, oral pathology and oral radiology*. 2013;115(4):436-41.
15. Batista AM, Ferreira FdO, Marques LS, Ramos-Jorge ML, Ferreira MC. Risk factors associated with facial fractures. *Brazilian oral research*. 2012;26:119-25.
16. Abosadeh MM, Rahman SA, Saddki N. Association of traumatic head injuries and maxillofacial fractures: A retrospective study. *Dental Traumatology*. 2017;33(5):369-74.
17. Brucoli M, Boffano P, Broccardo E, Benech A, Corre P, Bertin H, et al. The "European zygomatic fracture" research project: the epidemiological results from a multicenter European collaboration. *Journal of Cranio-Maxillofacial Surgery*. 2019;47(4):616-21.
18. Helgeland E, Dahle I, Leira J, Loro L. Maxillofacial fractures surgically managed at Aalesund Hospital between 2002 and 2009. *Cranio-maxillofacial Trauma & Reconstruction*. 2015;8(4):321-5.
19. Jin K-S, Lee H, Sohn J-B, Han Y-S, Jung D-U, Sim H-Y, et al. Fracture patterns and causes in the craniofacial region: an 8-year review of 2076 patients. *Maxillofacial plastic and reconstructive surgery*. 2018;40:1-11.
20. Zerfowski M, Bremerich A. Facial trauma in children and adolescents. *Clinical oral investigations*. 1998;2:120-4.



21. Raschke GF, Rieger UM, Bader R-D, Schaefer O, Guentsch A, Hagemeister C, et al. The zygomaticomaxillary complex fracture—an anthropometric appraisal of surgical outcomes. *Journal of Cranio-Maxillofacial Surgery*. 2013;41(4):331-7.
22. Kamath RA, Bharani S, Hammannavar R, Ingle SP, Shah AG. Maxillofacial trauma in central karnataka, India: an outcome of 95 cases in a regional trauma care centre. *Craniomaxillofacial trauma & reconstruction*. 2012;5(4):197-204.
23. Al-Bokhamseen M, Al-Bodbaij M. Patterns of maxillofacial fractures in Hofuf, Saudi Arabia: A 10-year retrospective case series. *The Saudi dental journal*. 2019;31(1):129-36.
24. Farias IPSE, Bernardino ÍDM, Nóbrega LMD, Gempel RG, D'AVILA S. Maxillofacial trauma, etiology and profile of patients: an exploratory study. *Acta ortopedica brasileira*. 2017;25(06):258-61.
25. Trivellato PFB, Arnez MFM, Sverzut CE, Trivellato AE. A retrospective study of zygomatico-orbital complex and/or zygomatic arch fractures over a 71-month period. *Dental traumatology*. 2011;27(2):135-42.
26. Gomes PP, Passeri LA, de Albergaria Barbosa JR. A 5-year retrospective study of zygomatico-orbital complex and zygomatic arch fractures in Sao Paulo State, Brazil. *Journal of oral and maxillofacial surgery*. 2006;64(1):63-7.
27. Agostini T, Sacco R, Bertolai R, Acocella A, Lazzeri D. Solitary plasmacytoma of the jaw. *Journal of Craniofacial Surgery*. 2011;22(6):e2-10.
28. İlgili Ö, Arda B, Munir K. Ethics in geriatric medicine research. *Türk geriatri dergisi*. 2014;17(2):188.
29. Kamulegeya A, Lakor F, Kabenge K. Oral maxillofacial fractures seen at a Ugandan tertiary hospital: a six-month prospective study. *Clinics*. 2009;64(9):843-8.
30. Kaul RP, Sagar S, Singhal M, Kumar A, Jaipuria J, Misra M. Burden of maxillofacial trauma at level 1 trauma center. *Craniomaxillofacial Trauma & Reconstruction*. 2014;7(2):126-30.
31. Ajike S, Adebayo E, Amanyiewe E, Ononiwu C. An epidemiologic survey of maxillofacial fractures and concomitant injuries in Kaduna, Nigeria. *Nigerian Journal of Surgical Research*. 2005;7(3):251-5.