

ETIOLOGY, TREATMENT AND ASSOCIATED SYMPTOMS WITH ZYGOMATIC BONE FRACTURE

Ahmad Shah, Muhammad Ilyas, Salman Khan

Sardar Begum Dental College, Peshawar, Pakistan

ABSTRACT

Objective: The aim of the study is to know the etiology, frequent age-group, male/female ratio, different approaches for reduction and associated symptoms of zygomatic bone fracture.

Material and Methods: This study was carried out in the Department of Oral & Maxillofacial Surgery, Khybar College of Dentistry, Peshawar from 2004 to 2007. A total of 122 male and female patients were selected with 101 (82.79%) male and 21 (17.21%) female patients. The age selected was >10 years with mean age 40 years. The data collected were analysed through SPSS 22.

Results: Male patients were 101 (82.79%) while female were 21 (17.21%). The most frequent age-group was 20-29 years. The most common cause of zygoma fracture was road traffic accidents (n=66 :54.09%) followed by inter personal violence (n=26: 21.31%), fall (n=17:13.93%), sports (n=09 :07.37%) and industrial (n=04:03.27%). Most of the reduction of zygoma was done by Keen approach (n=50 :40.98%). Paresthesia/ anesthesia of infra-orbital region was the most common symptom associated with zygoma fracture (n=65: 53.27%) followed by restricted mandibular movements (n=58: 47.54%), and diplopia (n=25: 20.49%).

Conclusions: The study revealed that the male patients aged 20-29 years more often sustained zygomatic bone fracture. Road traffic accident is the predominant cause, paresthesia, is the most common associated symptom and intra-oral approach is the leading approach for reduction of zygoma fracture.

Key words: Zygomatic bone, Road traffic accident, Keen approach, Gilli's approach.

INTRODUCTION

The facial skeleton is one of the most complex arrangements of bony structures in the body and consists of bones of the mandible, maxilla, zygoma, bony walls of the nasal cavities, paranasal sinuses, and orbit¹. These fractures have high clinical significance because of the anatomical specificity of face provides protection to important vital organs². Zygomatic fractures accounts 45% of all facial fractures³.

The etiology of zygomatic fracture as reported worldwide are interpersonal violence, traffic accidents, falls and sports injuries⁴. Injuries to this region can result in serious dysfunctions of sight, paresthesia, eating and talking which impact negatively on the victim's quality of life¹. Zygomatic bone fracture is

commonly treated by open reduction internal fixation through several incisions⁵. Several approaches are used namely lateral eyebrow, sub ciliary, temporal or intra-oral incisions for one or two or three point fixation of fracture⁶.

The incidence, patterns and etiology of maxillo-facial fractures are influenced by geographic location, socio economic status of the cohort, and the period of investigation⁷⁻¹⁰. In 1909, Keen was the first to describe intra oral gingivobuccal sulcus incision to reduce the depressed zygomatic arch¹¹. In a study done by Taiwo et al¹² showed the necessity of open reduction and internal fixation as a treatment module for zygomatic fracture and RTA as the most frequent cause of fracture. Back et al¹³ specifically investigated the non-surgically treated patients.

The aim of the study is to know the etiology, frequent age-group, male/female ratio, different approaches for reduction and associated symptoms of zygomatic bone fracture.

Correspondence:

Dr. Muhammad Ilyas

FCPS Resident

Sardar Begum Dental College Peshawar

Cell: 0302-8809637

Email address: ilyas_khan526@yahoo.com

METHODS AND MATERIALS

This study was carried out at the Department of Oral & Maxillofacial Surgery, Khybar College of Dentistry, Peshawar from 2004 to 2007. A total of 122 male and female patients were selected who has zygomatic fracture only and have radiographic analyses(e.g, plain radiographs or CT-scans). There were 101(82.79%)male and 21(17.21%)female patients.The age selected was >10 years with mean age 40 years. All those patients were excluded where initial clinical assessment was more than 1 week after the trauma and if radiographical analyses were not available.The data collected were analysed through SPSS 22.

RESULTS

Out of total 122 patients 101(82.79%) were male while 21(17.21%) were female. The mean age of patients was 40 (SD:±15.81)years.The male/female ratio is 4.80 and the most frequent age-group in both male and female patient is 20-29 years age-group. Detail is given in Table-1.

The etiology of zygoma fracture is listed in figure.1. The most common cause of zygoma fracture is road traffic accidents (n=66 :54.09%) followed by inter personal violence (n=26: 21.31%), fall (n=17:13.93%), sports(n=09 :07.37%) and industrial(n=04:03.27%).

Most of the reduction of zygoma was done by Keen approach (n=50 :40.98%). Details of treatment modalaties is given in Table-2.

Paresthesia/anesthesia of infra-orbital region was the most common symptom associated with zygoma fracture (n=65: 53.27%) followed by restricted mandibular movements (n=58: 47.54%), diplopia(n=25:

Table.1.Total number of male and female patients with age-group, male/female ratio and standard deviation of patients.

Age in years	Total No. of Male(n)	%	Total No. of Female(n)	%
10-19	8	6.55	1	0.081
20-29	45	36.88	7	5.74
30-39	25	20.49	3	2.45
40-49	13	10.66	5	4.10
>50	10	8.19	5	4.10
Total	101	82.79	21	17.21

20.49%). However there were n=07: 5.74% which have no associated symptoms.

DISCUSSION

This study was done on the zygomatic bone fracture at the the deparment of Oral & Maxillofacial surgery, Khyber College of Dentistry, Peshawar to show the etiology,frequent age-group, male/female ratio, different approaches done for reduction and associated symptoms with zygoma.

The current study revealed that predominance gender is male. The male outnumbered the female with ratio of 4.80:1 which is very low as compared to a study done by Ahmed et al¹⁴ reported higher ratio of male to female (11:1) and in approximate agreement with the study by Septa et al¹⁵ with male female ratio 3.16:1 and Zaleckas et al¹⁶ 4.4:1. The most frequent age-group is 20-29 years age group in both male and female patients and is supported by Zaleckas et al¹⁶ with predominance in the 15–34-year-old group.

In our study the most common cause of zygomatic bone fracture is RTA with 54.09% which contradicts the study done by Septa et al¹⁵ showing with 64% of cause of zygoma fracture is RTA. Back

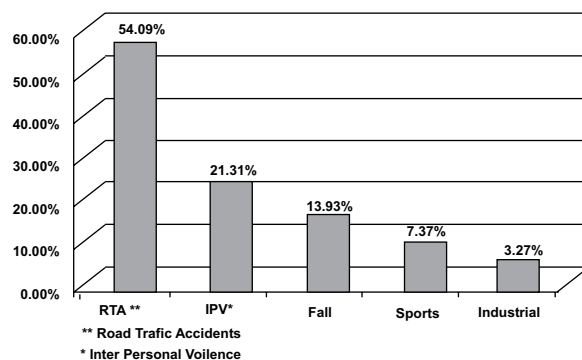


Fig.1.Etiology of Zygoma Fracture.

Table.2.Method of reduction and associated symptoms with zygoma fracture.

Reduction Method	n	%
Intra-oral (Keen) approach	50	40.98
Extra-oral (Gilli's) approach	28	22.95
Open approach	22	18.03
Direct (Paswell, Hook) approach	03	02.46
Antral packing	12	09.83
Conservative Treatment (No. Treatment)	07	05.74
Total	122	100

et al¹³ reported high incidence of IPV (46%) as the most common cause of zygoma fracture which contradicts our study(21.31%) and fall (20%) which is in approximate agreement with our study(13.93%).

Marhino et al¹⁷ showed that the surgical approaches used for fracture reduction as well as the type, number, and location of the fixation will be determined by the pattern of the fracture and the surgeon's preference. The most prevalent approach in the present study is intra-oral(Keen)approach. Kim et al¹⁸ successfully reduced body of zygoma through intraoral approach which agrees with our study as most of the body of zygoma was done by intraoral approach. Paresthesia (53.27%) is the dominant associated symptom with zygoma fracture supported by Vriens et al¹⁹ reported 58-94% paresthesia. Al-Qurainy et al²⁰, who found that 19.8 % of patients with zygomatic bone fractures had diplopia which strongly agree with the present study (20.49%).

Due to the severity and complexity of facial trauma, treatment management requires close cooperation of maxillofacial surgeons, neurologists, ophthalmologists and also continued publicity on the importance of preventive strategies. Preventive health care programs should seek measures in the reduction of aggression and violence in close future involving family, school and community institutions

CONCLUSIONS

The study revealed that the male patients aged 20-29 years more often sustain zygomatic bone fracture. Road traffic accidents is the predominant cause of zygoma fracture with increase chances of paresthesia in the infra-orbital region. Intra-oral approach is the uppermost approach for redction of fractured zygoma.

REFERENCES

- Sing G, Mohammad S, Pal US, Hariram, Malkunje LR, Sing N. Pediatric facial injuries: It's management. *Natl J Maxillofac Surg.* 2011;2:156-62.
- Haug RH, Prather J, Indresano AT. An epidemiologic survey of facial fractures and concomitant injuries. *J Oral Maxillofac Surg.* 1990;48:926-32.
- Manson PN, Crawley WA, Yaremchuk MJ, Rochman GM, Hoopes JE, French JH. Midface fractures: Advantages of immediate extended open reduction and bone grafting. *Plast Reconstr Surg.* 1985;76:1-12.
- Qudah MA, Bataneh AB. A retrospective study of selected oral and maxillofacial fractures in a group of Jordanian children. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2002;94(3): 310-14.
- Yonehara Y, Hirabayashi S, Tachi M, Ishii H. Treatment of zygomatic fractures without inferior orbital rim fixation. *J Craniofac Surg.* 2005;16:481-5.
- Mavili ME, Canter HI, Tuncbilek G. Treatment of noncomminuted zygomatic fractures with percutaneous screw reduction and fixation. *J Craniofac Surg.* 2007;18:67-73.
- Cavalcanti AL, Bezerra PKM, D. Moraes de Oliveira DM, Granville-Garcia AF. Maxillofacial injuries and dental trauma in patients aged 19-80 years, Recife, Brazil. *Rev Esp Cir Oral Maxilofac* 2010;32:11-16.
- Erol B, Tanrikulu R, Görgün B. Analysis of demographic distribution and treatment in 2,901 patients (25-year experience) *J Craniomaxillofac Surg.* 2004;32:308-13.
- Iida S, Kogo M, Sugiura T, Mima T, Matsuya T. Retrospective analysis of 1,502 patients with facial fractures. *Int J Oral Maxillofac Surg.* 2001;30:286-90.
- Subhashraj K, Ramkumar S, Ravindran C. Pattern of mandibular fractures in Chennai, India. *Br J Oral Maxillofac Surg.* 2008;46:126-27.
- Keen WW. *Surgery: Its Principles and Practice.* Philadelphia: WB Saunders; 1909.
- Taiwo AO, Soyele OO, Godwin NU, Ibikunle AA. Facial Fracture Management in Northwest Nigeria. *J Surg Tech Case Rep.* 2013; 5(2):65-71.
- Back CP, McLean NR, Anderson PJ, David DJ. The conservative management of facial fractures: Indications and outcomes. *J Plast Reconstr Aesthet Surg.* 2007;60:146-51.
- Al Ahmed HE, Jaber MA, Salem H, Karas M. The pattern of maxillofacial fractures in Sharjah, United Arab Emirates: a review of 230 cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2004;98(2):166-70.
- Septa D, Newaskar VP, Agrawal D, Tibra S. Etiology, Incidence and Patterns of Mid-Face Fractures and Associated Ocular Injuries. *J Maxillofac Oral Surg.* 2014 ; 13(2): 115-19.
- Zalckas L, Peciuliene V, Gendviliene L, Purieni A, Rimkuvieni J. Prevalence and etiology of midfacial fractures: A study of 799 cases. *Medicina.* 2015;51(4):222-27.
- Marhino RO, Fereira-Maia B. Management of fractures of the zygomaticomaxillary complex. *Oral Maxillofac Surg Clin North Am.* 2013 ;25(4):617-36.
- Kim JH, Lee JH, Hong SM, Park CH. The effectiveness of 1-point fixation for zygomaticomaxillary complex fractures. *Arch Otolaryngol Head Neck Surg.* 2012;138:828-32.
- Vriens JPM, Glas HW, Bosman F, Moos KF, Koole R. Information on infraorbital nerve damage from multi testing of sensory function. *Int J Oral Maxillofac Surg.* 1998;27:20-26.
- Al-Qurainy IA, Stassen LF, Dutton GN, Moos KF, el-Attar A. Diplopia following midfacial fractures. *Br J Oral Maxillofac Surg.* 1991;29(5):291-301.