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Assessment of Pattern and Aetiology of LeFort Fractures among 100 Patients - A Clinical Study

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ABSTRACT

Introduction: Maxillofacial fractures are a challenge for oral and maxillofacial surgeons. LeFort fractures comprised of LeFort I, II and III fractures. The management of these fractures demands careful evaluation which depends on the skill and experience of the surgeon.

Objectives: To determine LeFort fractures among patients admitted to the oral and maxillofacial department.

Methods: This study was conducted on 100 patients of midfacial fractures of both genders. A thorough clinical examination was done. Radiographic evaluation with panoramic radiographs and CT scan was done. In all patients, the type of fracture and aetiology of fracture was recorded. Results: Males were 65 (65 %) and females were 35 (35 %). Maximum cases were seen in age group 21- 30 years (male- 31, female- 17) followed by 31-40 years (male- 18, female- 10). LeFort, I was seen in 57 (57 %) followed by LeFort II in 31 (31 %) and LeFort III in 12 (12 %). Maximum cases of LeFort I fracture were seen in the age group 21-30 in 32 cases, LeFort II in the age group 21-30 in 12 cases and LeFort III in the age group 31-40 in 6 cases. Maximum cases were of RTA seen in 48 (48 %) followed by violence in 22 (22 %), fall in 13 (13 %), sports injury in 10 (10 %), workplace injury in 4 (4 %) and assault in 3 (3 %). The difference was significant ($P < 0.05$).

Conclusion: Authors found that maximum cases were of LeFort I fracture. Maximum cases were seen in the younger age group 21-30 years. There was a male predominance.

Key Words: Fall, LeFort fracture, Road traffic accident

INTRODUCTION

There is wide range of type, severity, and etiology of facial fractures depending on the population. Maxillofacial fractures are challenge for oral and maxillofacial surgeons.¹ Daily large number of traumatized patients visits to emergency department with considerable amount of facial bone fractures. The prevalence of mid- facial fractures is variable, may occur isolated or in combination with other serious injuries such as cranial, spinal, upper and lower body injuries etc.²

Socioeconomic, environmental and cultural factors are the cause of variability of mid-facial fractures. The reason of mid-facial fractures can be domestic and interpersonal violence, fall, road traffic accidents, gunshot wounds, workplace injury, assault and sports injuries.³ There has been a

considerable rise in interpersonal violence in the last few years leading to mid-facial fractures. The underlying insult is largely prognostic of fracture pattern, with road traffic accidents and gunshot wounds leading to a higher proportion of pan facial fractures whereas sports accidents leading to upper midface fractures. With the significant rise in the aged population has led to a higher proportion of facial fractures resulting from falls.⁴

LeFort fractures comprised of LeFort I, II and III fractures. The management of these fractures demands careful evaluation which depends on the skill and experience of the surgeon. The aim is to restore the occlusion, the restoration of the medial and lateral maxillary buttresses, the mid-face height and projection, nose, orbits and maxillary arch width.⁵ The present study was conducted to determine LeFort fractures among patients admitted to the oral and maxillofacial department.

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MATERIALS AND METHODS

This prospective study consisted of 100 patients of midfacial fractures of both genders. Ethical approval was obtained from the institutional ethics committee. The study was done from October 2018 to November 2020 in the department of Oral and maxillofacial surgery, Kalinaga Institute of Dental Sciences, Bhubaneswar. Inclusion criteria were all patients with midfacial fractures and exclusion criteria were patients not giving consent. All patients were informed regarding the study and written consent was obtained.

Data related to patients such as name, age, gender etc. was recorded. A thorough clinical examination was done. Radiographic evaluation with panoramic radiographs and CT scan was done. In all patients, the type of fracture and aetiology of fracture was recorded.

Data thus obtained were entered in MS Excel sheet. Statistical analysis was performed using SPSS version 10.0 statistical software package (SPSS Inc., Chicago, IL, USA). Descriptive statistics and the chi-square test were used. P-value < 0.05 was considered significant.

RESULTS

Males were 65 (65 %) and females were 35 (35 %) (Table 1). Maximum cases were seen in age group 21- 30 years (male- 31, female- 17) followed by 31-40 years (male- 18, female- 10) (Table 2).

LeFort, I was seen in 57 (57 %) followed by LeFort II in 31 (31 %) and LeFort III in 12 (12 %). Maximum cases of LeFort I fracture were seen in the age group 21-30 in 32 cases, LeFort II in the age group 21-30 in 12 cases and LeFort III in the age group 31-40 in 6 cases. Maximum cases were of RTA seen in 48 (48 %) followed by violence in 22 (22 %), fall in 13 (13 %), sports injury in 10 (10 %), workplace injury in 4 (4 %) and assault in 3 (3 %). The difference was significant (P< 0.05) (Figure 1).

DISCUSSION

Midface fracture accounts for more than 50% of facial bone fractures. The pterygoid processes of the sphenoid bones are affected in all types of LeFort fractures. Le fort I fractures are the horizontal fractures.⁶ It occurs above the palate and alveolus and extends through the lateral nasal wall and the pterygoid plates. Displacement of the maxilla is more likely to be seen when the fracture extends beyond both the medial and lateral maxillary buttresses.⁷ Le Fort II fractures are pyramidal extend from one lateral maxillary buttress through the maxilla into the infra-orbital rim and nasofrontal junction and are aptly described as pyramidal fractures. Le Fort III

fractures involve the nasal bones, medial, inferior, and lateral orbital walls, pterygoid processes, and zygomatic arches.⁸ The present study was conducted to determine LeFort fractures among patients admitted to the oral and maxillofacial department. In the present study, there were 100 cases of LeFort fractures reported to our department. LeFort I fracture was predominant in our study.

Zaleckas et al. in their study, assessed 799 patients and found the male-to-female ratio was 4.4:1. The mean age of the patients was 33.16 years. Zygomatic fractures were involved in 68.8% of injuries, maxillary in 27.9% and isolated orbital floor in 3.3%. In 64% of cases, the cause for injury was interpersonal violence, fall in 16.3% and traffic accidents in 8.3%. It was found that 65.3% occurred between April and October, 58.2% on weekends and 62.0% at night. In 14%, trauma reports indicated the abuse of alcohol. More often such persons received more than one mid-facial bone fracture (P < 0.05) concurrently.^{9,10}

Airway maintenance is a foremost requirement during treatment of midfacial fractures as maxillary fractures tend to be posteriorly and inferiorly placed, the airway may be obstructed.¹⁰ In addition to it, there is soft tissue oedema and swelling of the structures in the oral cavity. Nasotracheal intubation is preferred or oral-nasal endotracheal tube exchange. If there are cranial base or additional facial fractures that may require the patient to remain in inter-maxillary fixation (IMF), tracheostomy may be required.¹¹

Chandra et al. evaluated the prevalence, type, aetiology, site of fractures, and management in patients with maxillofacial trauma in the Delhi-NCR area. Out of 2250 maxillofacial trauma cases, road traffic accident (RTA) (80.5%) was the greatest cause for trauma followed by physical assault (12.3%). Treatment option was the closed reduction, conservative management, and open reduction.¹² Phillips and Turco have done a Collective Review on LeFort Fractures from studies published between 1980 and 2016 and found that Le Fort fractures are most commonly due to high-velocity MVC and there is in general lack of reported studies on the management of Level I, Level II, and Level III Le Fort fracture.¹ Le Roux et al. evaluated connotation of Le Fort midfacial fractures with frontonasal injuries and found that Among 652 patients with frontonasal fractures, 125 (19.1%) were associated with a Le Fort fracture. 59 (9%) were associated with Le Fort III fracture, 51 (7.8%) with Le Fort II fracture and 15 (2.3%) with Le Fort I fracture.¹⁴

A road traffic accident is the leading cause of fractures in our study. There is a lack of education regarding traffic rules among youth. Modernization, fast life and social media play a major role. The shortcoming of the study is that seasonal variation was not assessed. The type of treatment given was not discussed. Involvement of the younger age group is a matter of concern as there is a need for creating awareness

among youth regarding road safety measures which was the main cause of fractures.

CONCLUSION

Authors found that maximum cases were of LeFort I fracture and there was male predominance. Maximum cases were seen in the younger age group 21-30 years.

Conflict of interest: Nil

Financial support: Nil

Authors contribution

1. Dr. Srikar MV- Investigation
2. Dr. Swetha Vempalli- Analysis
3. Dr. Naveen Reddy- Manuscript writing
4. Dr. Kaushik Shetty B- Editing
5. Dr. Vidya KC- Data collection
6. Gaganndeeep Singh Dang- Review

REFERENCES

1. Phillips BJ, Turco LM. LeFort fractures: A collective review. *Bull Emer Traum* 2017;5(4):221-230.
2. Louis M, Agrawal N, Truong TA. Midface fractures II. *Sem Plast Surg* 2017; 31(2): 94-99.
3. Lee KC, Chuang SK, Eisig SB. The Characteristics and Cost of Le Fort Fractures: A Review of 519 Cases From a Nationwide Sample. *J Ora Maxill Surg* 2019;77(6):1218-1226.
4. Rajkumar GC, Ashwin DP, Singh R, Prashanth R, Rudresh KB. Ocular injuries associated with midface fractures: A 5-year survey. *J Maxill Ora Surg* 2015;14(4):925-929.
5. Ruslin M, Wolff J, Boffano P, Brand HS, Forouzanfar T. Dental trauma in association with maxillofacial fractures: An epidemiological study. *Dent Traum* 2015;31(4):318-323.
6. Abosadegh MM, Saddki N, Al-Tayar B, Rahman SA. Epidemiology of maxillofacial fractures at a teaching hospital in Malaysia: A retrospective study. *Bio-Med Res Int* 2019;9(2):47-63.
7. Abosadegh MM, Rahman SA, Saddki N. Association of traumatic head injuries and maxillofacial fractures: A retrospective study. *Dent Traum* 2017;33(5):369-374.
8. Samieirad E, Tohidi A, Shahidi-Payam MA, Abedini HA. Retrospective study maxillofacial fractures epidemiology and treatment plans in Southeast of Iran. *Med Ora Pathol Oral Circ Buc* 2015;20(6):729-736.
9. Zaleckas L, Pečiulienė V, Gendvilienė I, Pūrienė A, Rimkuviene J. Prevalence and aetiology of midfacial fractures: A study of 799 cases. *Medicine* 2015;51(4):222-227.
10. Singaram M, Sree VG, Udhayakumar RK. Prevalence, pattern, aetiology and management of maxillofacial trauma in a developing country: A retrospective study. *J Kor Ass Oral Maxill Surg* 2016;42:174-181.
11. Pandey S, Roychoudhary A. Study of the pattern of maxillofacial fractures seen at a tertiary care hospital in North India. *J Maxillofac Oral Surg* 2015;24:32-9.
12. Chandra L, Deepa D, Atri M, Pandey SM, Passi D, Goyal J, Sharma A, Gupta U. A retrospective cross-sectional study of maxillofacial trauma in Delhi-NCR Region. *J Fam Med Prim Care* 2019;8:1453-1459.
13. Le Roux MK, Thollon L, Godio-Raboutet Y, Carbonnel E, Guyot L, Graillon N, et al. The association of Le Fort midfacial fractures with frontonasal injuries: a 17-year review of 125 cases, reflections on biomechanics, classifications and treatment. *J Stom Oral Maxill Surg* 2020;6 (20):30229-30231.

Table 1: Age wise distribution of cases

Age group	Males	Females	P value
21-30	31	17	0.06
31-40	18	10	0.15
41-50	9	5	0.82
50-60	5	2	0.04
>60	2	1	0.72
Total	65	35	

Chi Square test, Significant, $P < 0.05$

Table 2: Age group and type of fracture

Age group	Total	LeFort I	LeFort II	LeFort III	P value
21-30	48	32	12	4	0.001
31-40	28	17	5	6	0.12
41-50	14	10	3	1	0.001
50-60	7	4	2	1	0.04
>60	3	2	1	0	0.01
Total	100	57	31	12	

Chi Square test, Significant, $P < 0.05$

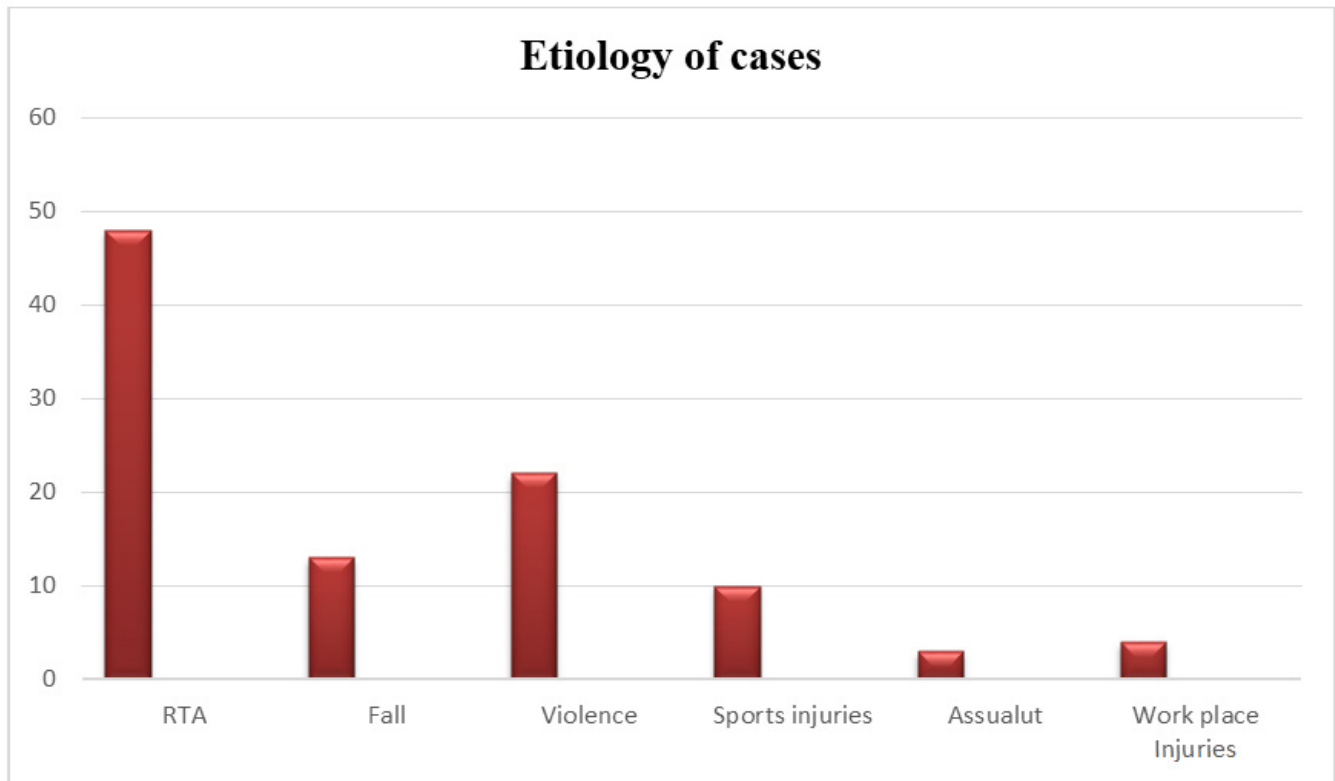


Figure 1: Etiology of cases.