

MAXILLOFACIAL INJURIES : A RETROSPECTIVE STUDY OF 576 CASES

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SUMMARY

The present study is a retrospective analysis of 576 cases of facial fractures involving the Mandible, Middle third and the Zygomatic complex. The high incidence of Road Traffic Accidents has been the commonest cause of facial fractures in the present series.

(Key Words : R. T. A. (Road Traffic Accident), Maxillofacial, LeFort, Zygomatic Complex, M/3-Middle Third)

With the increase in the incidence of road traffic accidents, there has been concomitant increase in the occurrence of facial fractures. The mandible is the commonest site involved in such fractures, however, fractures of the middle third of the face are not all that rare. The present study has been done to evaluate the etiology, incidence and the pattern of facial fractures.

Material and Methods

576 cases of facial fractures attending the Department of Burns, Plastic and Maxillofacial Surgery, Safdarjang Hospital, New Delhi, between 1-8-86 and 31-7-88 were taken up for this study. Detailed history was taken and thorough clinical examination was done to evaluate the fractures. This was followed by radiological examination to confirm the diagnosis and to know about the exact pattern of fractures. Isolated dentoalveolar and nasal fractures were not included in this study. Necessary management was done after the assessment.

Observations

In 576 cases there were 614 fractures in all (Tab. 1). 434 (70.6%) were due to road traffic accidents. This has been the commonest etiological factor. The number of riders (from areas outside Delhi) who were involved

Table 1. Etiological factors

Etiological factor	Mandible	Lefort	Zygomatic complex	Total	Percentage
R. T. A.	340	64	30	434	70.6
Assault	28	10	39	77	12.6
Fall	30	8	20	58	9.4
Sports	25	—	20	45	7.4

in two wheeler accidents were 164. The Helmet wearers were also involved in accidents and their number was 102. 12.6% fractures were due to assault. Out of these, all the LeFort fractures were as a result of robbery at one or other places. In this group all the LeFort fractures were associated with fractures of the zygoma and in 3 cases there was fracture of the mandible and in 2 cases fracture of the frontal bone was also present. Six cases of fracture mandible were reported to be due to gun shot injury. The remaining cases of fracture mandible and zygoma were reported to be due to day to day scuffles. 9.4% fractures were due to fall. In this group of fractures, 7 cases of LeFort fractures were in labourers involved in construction of buildings. One case of LeFort fracture was a result of fall from a tree. All these 8 cases were associated with fracture of zygoma. Twenty two cases of fracture mandible and twelve cases of fracture zygoma

Table 2. Incidence of facial fractures according to age group in numbers/percentage

Age group	Mandible		Le Fort		Zygomatic complex	
	No.	Percentage	No.	Percentage	No.	Percentage
0-5	13	2.26	—	—	1	0.17
6-12	60	10.42	4	0.73	5	0.87
13-20	71	12.33	8	1.39	16	2.78
21-30	158	27.43	25	4.39	46	7.99
31-40	78	13.55	25	4.39	19	3.29
41-50	40	7.30	15	2.6	16	2.78
51-above	40	7.30	5	0.87	6	1.04

were due to fall from lower heights. 7.4% fractures were due to sports. Boxing and Judo were responsible for fracture of zygoma in 14 and 1 case respectively. Hockey was responsible for fracture of mandible in 9 cases. Cricket was responsible for fracture of zygoma in 5 cases and mandible in 16 cases. According to our analysis, the R.T.A. was the commonest etiological factor for fractures of mandible and fractures of the middle third. The assault was the main etiological factor for zygomatic complex fractures.

A maximum of 158 (27.43%) fractures of mandible and 46 (7.99%) fractures of zygomatic complex were seen in the age group of 21 to 30 years, whereas 24 (4.39%) cases of middle third were observed each in the age group of 21 to 30 years and 31 to 40 years (Tab. 2). The male to female ratio was 7.7 : 1 while in the study of Gwyn et al. (1971) it was 2.5 : 1 and 8 : 1 in the study by Kapoor and Srivastava (1983). Out of 614 fractures 544 were found to be in males and 70 in females (Tab. 3).

Table 3. Incidence of facial fractures according to sex

Fracture	Male	Female	Total	Percentage
Mandible	369	54	423	69.05
Le Fort	74	8	82	13.30
Zygomatic complex	101	8	109	17.65

The most common site of fracture in the mandible was the angle region accounting for 173 out of 460 mandibular fractures (37.7%) which were seen in 413 patients. This was followed by 118 (27.5%) symphysis and parasymphysis fractures; 117 (25.4%) condylar fractures; 50 (10.9%) body fractures and only 2 (0.4%) ramus fractures (Tab. 4, 5). No case of coronoid fracture was encountered during the period of this study.

Table 4. Site of mandible fracture according to sex

Fracture	Male	Female	Total	Percentage
Angle	142	31	173	37.7
Symphysis & Parasymphysis	105	13	118	25.7
Condyle	97	20	117	25.5
Body	48	2	50	10.9
Ramus	2	—	2	.4
Coronoid	—	—	—	—

Out of 191 middle third facial fractures 82 were Le Fort type and 109 of the zygomatic complex. Total number of 57 Le Fort II and 25 Le Fort I fractures were encountered. However, no case of Le Fort III fracture was observed. (Tab. 6).

Discussion

In this present study on maxillofacial trauma, road traffic accidents have been found to be the main etiological factor of maxillo-

Table 5. Site of mandible fracture according to age group out of 460 in number/percentage

Age group	Angle		Symphysis parasym.		Condyle		Body		Ramus		Coronoid	
	No.	Percen.	No.	Percen.	No.	Percen.	No.	Percen.	No.	Percen.	No.	Percen.
0-5	5	1.08	2	0.65	3	0.65	3	0.65	—	—	—	—
6-12	25	5.43	15	3.26	12	2.69	8	1.14	—	—	—	—
13-20	23	5.00	21	4.65	17	3.69	10	2.17	—	—	—	—
21-30	59	12.83	48	10.43	42	9.13	8	1.14	1	0.21	—	—
31-40	32	6.95	15	3.26	18	3.91	13	2.82	—	—	—	—
41-50	11	2.39	12	2.60	11	2.39	5	1.08	1	0.21	—	—
51-above	18	3.91	5	1.08	14	3.04	3	0.65	—	—	—	—
Total	173	37.7	118	25.7	117	25.5	50	10.9	2	0.41	—	—

Table 6. Division of LeFort fractures according to age group in number/percentage

Age group	LeFort I		LeFort II		LeFort III	
	No.	Percentage	No.	Percentage	No.	Percentage
0-5	—	—	—	—	—	—
6-12	—	—	2	2.41	—	—
13-20	6	7.23	7	8.43	—	—
21-30	7	8.9	18	21.67	—	—
31-40	9	10.84	14	16.87	—	—
41-50	3	3.61	12	14.46	—	—
51-above	—	—	4	4.82	—	—
Total	25	30.49	57	69.51	—	—

facial injuries (70.6%). Similar findings were observed by Karyouti (1987) who found 61.1% cases due to R. T. A. and 38.9% cases due to assault. Schultz (1970) observed auto-mobile accidents to be the most common cause (65%), while Nakamura and Gross (1973) attributed 59% cases to violence and only 17% to auto-mobile accidents. There were 22.1% fractures as a result of R. T. A. and 42.6% from assault in the study of McDade (1982). These findings showed the variation of etiological factor from city to city.

In this series as well as in the series of Rowe and Killey (1970), Nakamura and Gross (1973) and that of Karyouti (1987)

mandibular fractures were commonest followed by fractures of zygomatic complex and middle third. But in the study of Schultz (1970) and Brook and Wood (1983) zygomatic complex fracture was most common.

The most common age group involved in this series was 21-30 years followed by 31-40 years. This is similar to the study of Thorn (1986) where incidence of fractures was maximum in the age group of 20-29 years. In the series of Karyouti (1987) facial fractures were highest in the age group of 0-5 years.

Commonest mandibular fracture was at the angle region 37.7% followed by fracture of the symphysis and condyle 25.5% (Tab. 5).

In the study of Nakamura and Gross (1973) body fractures 27.1% were the most frequently occurring followed by fractures of angle (24.3%) and symphysis (21.4%). LeFort II was 69.5% which is similar to that observed by Kahnberg (1987) who found 94 LeFort II fractures out of 170 patients i.e. 55.2%.

Amongst the LeFort fractures incidence of

REFERENCES

1. BROOK, I. M. AND WOOD, N.: Aetiology and incidence of facial fractures in adults. *Int. J. Oral. Surg.* 1983 ; 12 : 293-298.
2. GWYN, P.P., GARRWAY, J.H., AND HOSTON, C.E. : Facial fractures, associated injuries and complications. *Plastic Reconst. Surg.* 1971; 47: 225.
3. KAHNBERG, K.E. AND GOTIBERG, K.A.T. : LeFort fractures. *Int. J. Oral. Maxillofac. Surg.* 1987; 16 : 154-159.
4. KAPOOR, A.K. AND SRIVASTAVA, A.B. : Maxillofacial trauma an international perspective. In: Ed. 1 Prager Publishers, New York, 1983.
5. KARYOUTI, S.H. : Maxillofacial injuries at Jordan University Hospital. *Int. J. Oral. M. Surg.* 1987; 16: 262-265.
6. MCDADE, A.M., MCNICOL, R.D., BOOTH, P.W., CHESWORTH, J. AND MOOS, K.F.: The aetiology of maxillofacial injuries with special reference to the abuse of alcohol. *Int. J. Oral Surg.* 1982; 11: 152-155.
7. NAKAMURA, T. AND GROSS, C.W. : Facial fractures: analysis of the five years of experience. *Arch. Otolaryngol.* 1973; 97 : 288.
8. ROWE, N. L. AND KILLEY, H. C. : Fractures of the facial skeleton. In. : Ed. 2 London, Livingstone, 1968.
9. SCHULTZ, R. C. : One thousand consecutive cases of major facial injury. *Rev. Surg.* 1970; 27 : 394.
10. THORN, J. J., MOGELTOFT, M. AND HANSEN, P. K. : Incidence and aetiological pattern of jaw fractures in Greenland. *Int. J. Oral. Maxillofac. Surg.* 1986; 15 : 372-379.

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