

## **An Analysis of 873 Facial Fractures treated at General Hospital, Kandy, with special reference to the relationship between cause and site of fracture.**

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**SUMMARY** 873 consecutive cases of facial fractures were analysed to determine the relationship between the cause and the site of the fractures. Fall from a height was a common cause resulting in condylar (48%) and zygomatic (40%) fractures. Road traffic accidents were mainly responsible for LeFort type Middle Third fractures (93%). These accidents also caused 54% of fractures at the angle of the mandible. Assault had caused 68% of fractures at the body of the mandible and 23% of zygomatic fractures.

### **INTRODUCTION**

An initial survey of maxillo-facial fractures in the District of Kandy had shown that this type of injury is on the increase (Amaratunga, 1983). The same study also revealed a possible relationship between the cause and the site of fracture which deserved a more detailed investigation.

The relationship between the cause and the site of facial fractures have been extensively studied in Europe (Hoof, Merckx and Stekelenburg, 1977). No studies on this aspect have been carried out in Sri Lanka.

### **MATERIAL AND METHOD**

873 consecutive cases of maxillo-facial fractures treated at General Hospital, Kandy, during the period January 1970 — December 1984 were analysed. Hospital records, treatment cards, and radiographs were examined to ascertain the site and cause of each fracture.

Facial fractures were divided into three broad categories; (1) Lower Third (2) Middle Third and (3) Pan - Facial (both middle and lower third). This enabled the analysis of distribution of fractures between lower third and middle-third of the facial skeleton in relation to the cause of the fractures.

Lower Third fractures were further categorised into (1) Condylar, (2) Ramus, (3) Angle, (4) Body, (5) Symphysis and (6) Combined (more than one of these sites).

Middle Third fractures were similarly subdivided into (1) Zygomatic (2) Nasal (3) LeFort I & II (4) LeFort III and (5) Combined.

The common causes of these fractures were identified and categorised as follows: (1) Fall from Height (2) Assault (3) Road Traffic Accidents (RTA) and (4) Miscellaneous. There were six pedestrians involved in RTA and these were included under "miscellaneous" as the mechanism of causation of fractures under these circumstances could be different from those of passenger victims. Industrial Accidents were also grouped under "miscellaneous" as there were only a few of these.

The "khi square" ( $\chi^2$ ) test was used to test the significance of the difference between frequencies.

### RESULTS

Table I gives the distribution of fractures between the three categories, Middle Third, Lower Third, and Pan-facial.

TABLE 1. Distribution of fractures between Middle Third, Lower Third and Pan-facial skeleton in relation to cause.

Site	Cause				Total
	Fall	Assault	RTA	Misc.	
Lower Third	191	166	152	35	544
Middle Third	64	46	163	13	286
Pan-facial	07	05	19	12	43
Total	262	217	334	60	873

The three major causes of facial fractures, Fall, Assault, and RTA had been responsible for 35%, 31%, and 28% of Lower Third fractures respectively. There was no significant difference between these proportions ( $p > 0.05$ ).

In the case of the Middle Third of the facial skeleton 57% of fractures had been caused by RTA which was significantly higher than the proportion due to Fall (22%), Assault (16%), and Miscellaneous causes (5%) ( $p < 0.001$ ).

44% of Pan-facial fractures were due to RTA and 28% due to Miscellaneous causes. These proportions are significantly greater than those due to Fall (16%) and Assault (12%) ( $p < 0.001$ ).

Table 2 reveals the distribution of fractures in the mandible (Lower Third of the facial skeleton). In this area the commonest site was the condylar region, and 48% of these had been caused by Fall, and 34% by Assault. These frequencies were significantly greater than those due to RTA (14%) and Miscellaneous (4%) ( $p < 0.001$ ).

TABLE 2. Distribution of fractures in the Lower Third of facial skeleton in relation to cause

Cause	Site						Total
	Condyle	Ramus	Angle	Body	Symphysis	Combined	
Fall	93	03	34	11	26	24	191
Assault	66	00	22	73	02	03	166
RTA	27	03	76	21	11	14	152
Misc.	07	02	08	02	00	16	35
Total	193	08	140	107	39	57	544

Next in order of frequency were the fractures at the angle, 54% of which had been caused by RTA. Fall had caused 24%, Assault 15%, and Miscellaneous 7%. The differences between these percentages were highly significant ( $p < 0.001$ ).

Assault had caused 68% of fractures at the body of the mandible, which is significantly higher than the frequencies due to RTA (20%), Fall (10%) and Miscellaneous causes (2%) ( $p < 0.001$ ).

TABLE 3. Distribution of fractures in the Middle Third of the facial skeleton in relation to cause

Cause	Site					Total
	Zygoma	Nasal	LeFort I&II	Le Fort III	Combined	
Fall	53	08	02	01	00	64
Assault	31	11	02	00	02	46
RTA	38	02	66	42	14	162
Misc.	09	01	01	00	03	14
Total	131	22	71	43	19	286

Distribution of fractures in the Middle Third of the facial skeleton is given in Table 3. Isolated fractures of the zygoma appear to be the commonest. A significantly higher percentage ( $p < 0.001$ ) of these have been caused by Fall (40%). 29% of zygomatic fractures were found in RTA victims and 23% in Assault victims.

Le Fort I and II types taken together form the next common category of fractures in this region. RTA had been responsible for 93% of these. RTA had also caused 98% of LeFort III type injuries. These frequencies are significantly higher than those due to other causes ( $p < 0.001$ ).

Only 22 nasal fractures and 19 combined fractures were seen in this series. These numbers were inadequate for statistical analysis.

#### DISCUSSION

It is seen that the main causes of facial fractures are road traffic accidents, assault and fall from a height, a pattern different from that in European countries where fall is not a common cause. Climbing trees is a common practice among peasants in Sri Lanka, being connected with their work, which may explain the high incidence of facial fractures due to fall from height. Victims of falls seem to fracture their mandibles more than any other facial bone, and often it is the condylar region that is fractured. Isolated fractures of the zygoma is also frequently found in victims of falls.

Road traffic accidents have risen very sharply over the past few years and is now the commonest cause of facial injuries in the District of Kandy. These accidents have altered the pattern of facial injuries in Europe (Lamberg, 1978), and they seem to have a similar effect in this country too, in that they have caused an increase in the frequencies of LeFort type mid-face fractures.

Assault too has increased alarmingly and is now a major cause of facial injuries in the District of Kandy. In Europe it is as common as RTA (Lamberg, 1978). Assault tends to cause fractures at the body of the mandible and also at the condyle more than at other regions of the mandible. These findings agree with those of studies done in Europe (van Hoof, Merckx, and Stekelenburg, 1977).

When assault results in midface fractures it is the zygoma that breaks more frequently. Although assault could be expected to cause a high incidence of nasal fractures only 22 cases had been seen in this series. A majority of these may have been treated by the Otorhinolaryngologist.

#### REFERENCES

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