

COMPLEX MAXILLO-FACIAL INJURIES IN SINGAPORE

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SYNOPSIS

This is the study of 50 cases of complex maxillo-facial injuries seen in the Department of Plastic Surgery, Singapore General Hospital. Simple isolated fractures of the nose, malar bone or the mandible are not included in this study. The pattern of injuries showed that the majority of them were caused by road traffic accidents, mainly involving motor-cyclists. There were 32 cases of Le Fort II fracture, 7 cases of Le Fort I fracture, 4 cases of Le Fort III fracture and 7 cases had a combination of various facial fractures. Orbital injuries occurred in 9 cases, three of whom lost vision in the affected eyes. The commonest associated injuries were head injuries and upper limb injuries. The surgical management of these complex maxillo-facial injuries comprised early reduction and external immobilisation which was maintained on average for 17 days. Joint management with the oral surgeon as well as a multi-disciplinary approach in the presence of associated injuries are emphasised. Satisfactory results were obtained in over 80% of cases.

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INTRODUCTION

Complex maxillo-facial trauma is seen increasingly in Singapore. In order to study the patterns of injury and the results of treatment, we have reviewed 50 cases of such injuries seen in the Department of Plastic Surgery, Singapore General Hospital. Isolated fractures of the nasal, malar and mandibular bones have been excluded from the study.

MATERIALS AND METHODS

There has been a rising trend in the number of cases seen each year and cases seen from January to April 1982 have already equalled that seen for the whole of 1981 (Table 1). These injuries usually involved males and only 4 cases were females. Of the 50 cases, 35 were due to road traffic accidents and of these, 21 involved motorcyclists. Assaults resulting in complex fractures were not uncommon (Table 2) while industrial accidents took the form of falls from a height or blunt trauma to the face. A similar pattern has been reported (1), but most of the cases were due to road traffic accidents. The majority of cases occurred in the young adult, 80% within the 20—40 year age group (Table 3). Complex facial fractures in children are rare (2) and only two cases below 10 years of age were seen in this series.

There were 32 cases of Le Fort II fracture, 7 cases of Le Fort I fracture and 4 cases of Le Fort III fracture while the rest of the cases presented with various combinations of malar, nasal, mandibular and orbital fractures (Table 4). Malar fractures were found frequently in association with Le Fort II fractures. Injuries involving the eye and orbit occurred in 9 cases, three of whom lost vision in the affected eye. In all cases an ophthalmological opinion was obtained. Six cases had exploration of the orbit and silastic implant for support of the orbital floor.

The most commonly associated injury was head injury and 15 patients sustained various degrees of injury from concussion and skull fracture to intracranial hemorrhage. All suspected cases of intracranial injury were referred to the neurosurgeon and CAT scans were done when indicated. Upper limb fractures occurred in 11 cases, lower limb injuries in 5 cases and chest injuries in 4 cases (table 5).

All patients were operated on as soon as allowed. The oral surgeon collaborating with us prepared the necessary dental casts and splints. We favour rigid craniomaxillary fixation by means of supraorbital pins and cap splints connected by universal joints and vertical bars (fig 1). In the event of a fracture of the frontal bone, a skull cap of plaster of Paris was used. Mandibular fractures were fixed by wiring at the same operation and the mandible kept in occlusion with intermaxillary fixation. Anaesthesia was administered via a nasal endotracheal tube and it was sometimes necessary to change to an oral tube before adequate manipulation and reduction of the nasal fracture could be done.

RESULTS

The average hospital stay was 23.6 days, varying from 13 to 48 days depending on the patient's injuries. The external splint devices were left on for an average of 16.8 days and removed when the fracture had united clinically. We gave all our patients prophylactic antibiotics and the drugs of choice were a combination of ampicillin and cloxacillin. Sulphadiazine was added when there was an associated skull fracture or cerebrospinal fluid rhinorrhea or otorrhea.

Associated cranial nerve injuries were found in 7 patients. Two had anosmia, three had optic atrophy and two had lower motor neurone facial nerve palsy. In only one case of facial nerve palsy was there partial recovery of function. Infraorbital anaesthesias associated with malar fractures was usually temporary except in four patients who complained of persistent numbness over the cheek.

Six patients with nasal deformities required second-

dary surgery. They presented with contour defects, inadequately reduced fractures, septal deviation and asymmetry. Corrective rhinoplasty was done some 4 to 6 months after injury.

Other secondary corrections included facial scar revision, supraorbital rim correction, re-exploration of orbital floor and insertion of silastic floor implant, and cheek augmentation (table 6).

Dental occlusion was satisfactory in all except 5 patients where malocclusion was noted (cross bite, anterior open bite). All cases were treated conservatively. Gape was found to be satisfactory in all cases. Persistent diplopia was noted in the patient who needed re-exploration of the orbital floor; fortunately the patient has learned to cope with this deficit.

DISCUSSION

Complex maxillofacial injuries are commonly produced by high or low velocity trauma (3). Those due to high velocity trauma are associated with the more serious injuries. Ocular injuries complicating orbital fractures are common in our experience, a finding also by Jabaley et al (4) who reported an incidence of 11 to 29% in their series. As they have stated, the true incidence often depends on how often these injuries are carefully looked for.

Naso-ethmoid orbital fractures (5) have not been dealt with selectively by us and should be suspected in the presence of cerebrospinal fluid rhinorrhea or anosmia. We have however not found any traumatic telecanthus following such injuries in our series.

We have favoured external fixation with cranial pins where the patient is conscious and rational and has no associated skull fracture, as it provides good rigid fixation and the patients are comfortable. Minimal scars remain after removal of the pins (fig 2) and pin track infection was not seen in any of our cases. Box frames, malar pins and interosseous wiring (6) are also used where indicated. We have not noticed any post operative sinusitis in our patients from the maxillary sinus (7). Facial nerve palsy is an uncommon complication.

Complex maxillofacial injuries are often complicated by associated injuries and many surgeons may be involved in the management of these cases. A multi-disciplinary approach is therefore necessary. However, one surgeon should take overall charge of

TABLE 1

YEAR	1977	1978	1979	1980	1981	1982 (Apr)
No. (cases)	5	6	11	9	10	10

TABLE 2

	No. (cases)
Motorcyclist	21
Pedestrian	6
Car occupant	5
Other vehicle occupant	3
Others (assault, fall, industrial)	15

TABLE 3

Age (years)	10 & below	11 — 20	21 — 30	31 — 40	41 — 50	50 & above
No. (cases)	2	6	27	7	8	0

TABLE 4

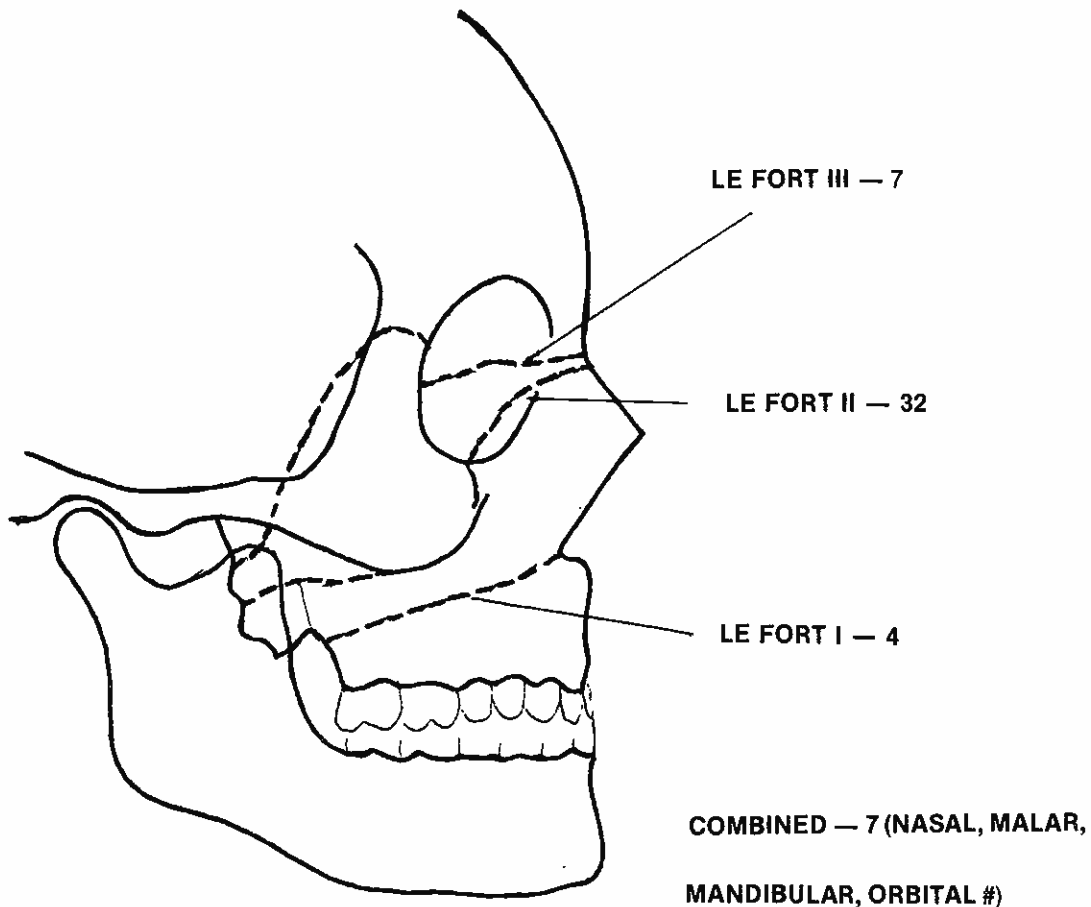


TABLE 5

Associated Injuries	No. (cases)
Head injury, (incl skull fracture & concussion)	15
Neck/spine injury	1
Chest (rib fracture, pneumothorax)	4
Abdomen	1
Upper limb	11
Lower limb	5
Pelvis	1

TABLE 6

Secondary Operations	No. (cases)
Corrective rhinoplasty	6
Orbital rim revision	1
Cheek augmentation	1
Facial scar revision	1
Orbital floor exploration	1

the patient with multiple injuries. The plastic surgeon, as a member of the team, deals with the bony and soft tissue trauma that is invariably associated with complex maxillo-facial trauma.

CONCLUSIONS

Our study of 50 cases of complex maxillo-facial trauma showed a rising incidence, the majority involving motorcyclists. Surgery was performed in all cases. External immobilisation was used and maintained for about 17 days and a prophylactic course of antibiotics given. Satisfactory results were obtained in over 80% of cases and only one surgical procedure was necessary in the majority of cases. Six cases required secondary rhinoplasty to be done. Further improvement in the care of complex maxillo-facial trauma should be directed at the prevention of associated deformities especially of the nose.

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Figure 1: Shows external fixator devices permitting rigid fixation of facial skeleton.



Figure 2: Post operative appearance after removal of external fixators showing minimal scars.

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