

Maxillofacial Injuries in Srinagarind Hospital

Bowornslip Chowchuen
Prayong Taksaphan
Ronachai Komthong

Department of Surgery, Faculty of Medicine,
Khon Kaen University

การบาดเจ็บกระดูกใบหน้าหักในโรงพยาบาลศรีนครินทร์

วารศิลป์ เชาว์นสิน พ.บ., ประยง ทักษพันธ์ พ.บ., รณชัย โคมทอง พ.บ.
ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น

รายงานผู้ป่วยที่ได้รับบาดเจ็บ กระดูกใบหน้าหัก 64 ราย ที่ได้รับการรักษา
ในโรงพยาบาลศรีนครินทร์ มหาวิทยาลัยขอนแก่น ตั้งแต่เดือนสิงหาคม 2527 ถึง
กรกฎาคม 2530 เป็นเวลา 3 ปี อัตราส่วนชายต่อหญิง เท่ากับ 7 ต่อ 1 อายุ
น้อยที่สุด 4 ปี สูงสุด 60 ปี อายุเฉลี่ย 28.5 ปี ผู้ป่วยส่วนใหญ่ (ร้อยละ 59.38)
มาโรงพยาบาลภายใน 1 วันหลังจากเกิดอุบัติเหตุ ระยะเวลาเฉลี่ยของการอยู่ใน
โรงพยาบาล 9.51 วัน สาเหตุของการบาดเจ็บส่วนใหญ่เกิดจากอุบัติเหตุรถจักรยานยนต์
(ร้อยละ 62.62) ผู้ป่วย 34 ราย (ร้อยละ 53.12) หมดสติทันทีหลังเกิดอุบัติเหตุ
และผู้ป่วย 13 ราย (ร้อยละ 20.31) มีประวัติดื่มสุราขณะได้รับอุบัติเหตุ การบาดเจ็บ
ร่วมที่ร้ายแรงต่อชีวิต พบได้ร้อยละ 18.75 และที่ไม่ร้ายแรงต่อชีวิต พบร้อยละ 20.3
ชนิดของกระดูกใบหน้าหักได้แก่ Mandible (ร้อยละ 49), Zygoma (ร้อยละ 26),
Maxilla (ร้อยละ 15), Nasal bone (ร้อยละ 6) และ Orbit (ร้อยละ 4) วิธีการ
ผ่าตัดส่วนใหญ่คือ Intermaxillary fixation และ Interosseous wiring ภาวะแทรก-
ซ้อนพบได้ในผู้ป่วย 24 ราย (ร้อยละ 37.5) และมีผู้ป่วยเสียชีวิต 2 ราย รายแรก
จากเลือดออกในช่องท้องและอีกรายเกิด diabetes insipidus ตามหลังการบาดเจ็บ
ต่อสมองและเสียชีวิตจากภาวะการหายใจล้มเหลว

A retrospective analysis of 64 patients who had sustained maxillofacial fractures and were treated in Srinagarind Hospital, Khon Kaen University from August 1984 to July 1987 was undertaken. Male to female ratio was 7:1. The ages ranged from 4 to 60 years with the mean of 28.5

years. Most patients (59.38%) were admitted to the hospital within 1 day following the injuries. The average hospital stay was 9.51 days. Motorcycle accidents accounted for the largest number of fractures (62.62%). There were 34 patients who lost consciousness immediately after the accidents and

13 patients had the history of alcohol consumption just before the accidents. Major and minor associated injuries occurred in 18.75% and 20.3% respectively. Types of facial fractures were mandible 49%, zygoma 26%, maxilla 15%, nasal bone 6% and orbit 4%. Most of the operative interventions were intermaxillary fixation and interosseous wiring. There were 24 morbidities and 2 mortalities in the series. One patient died from intraabdominal hemorrhage and another developed diabetes insipidus after head injury and finally died from respiratory failure.

INTRODUCTION

Maxillofacial injury is a significant clinical problem. As our society has become completely mobile, trauma has emerged as one of the leading health problem. Maxillofacial injuries are among the common injuries seen in emergency room. The goals of the treatment of facial injured patients are to preserve sight, speech and deglutition, to minimize deformity and to ensure proper dental occlusion. Although the correction of dysfunction and deformity is the major aim of the treatment, the initial care must include proper airway maintenance, control of hemorrhage, treatment of shock and associated injuries.

This study was performed to analyse facial fractures in Srinagarind Hospital during the last 3-year period.

MATERIAL AND METHODS

A retrospective review was made from medical records of the patients treated as major maxillofacial injuries in surgical department in Srinagarind Hospital during August 1984 to July 1987. The data was obtained from the patient records and radiographic findings. The analysis was done with respect to age, sex, hospital stays, etiology, duration before admission, association with loss of consciousness and consumption of alcohol, the associated injuries, types of facial fractures, treatments and complications.

RESULTS

During the 3-year period of this study, 64 patients were evaluated. The majority were male (87.50%) with the male to female ratio of 7:1 (Fig.1). The ages ranged from 4 to 60 years with the highest incidence in the third decade (43.75%) and the mean age was 28.5 year (Fig.2).

Most patients were admitted to the hospital within 1 day after the injuries (59.38%). The hospital stays ranged from 1 to 60 days with the mean of 9.51 days (Table 1).

Motorcycle accidents accounted for the largest number of fractures (65.62%), followed by car accidents (Table 2). Association with loss of consciousness occurred in 34 patients (53.12%), and 13 patients had the history of alcohol consumption before the accidents (20.31%). There was no correlation between either loss of consciousness or history of alcohol consumption to other severe injuries.

Table 3 shows numbers of the associated injuries. Major injuries (life-threatening) occurred in 12 patients (18.75%) with the highest incidence in the cranial region. Severe head injuries included coma, skull fracture or intracranial hematoma. Severe chest injuries included hemothorax, pneumothorax or lung contusion that required ventilatory support. Intraabdominal injuries included all injuries that required immediate operative intervention. Minor injuries occurred in 13 patients (20.31%), the majority of them were ocular injuries and long bone fractures.

Types of facial fractures were presented in Table 4. There were 100 fractures in 64 patients. The fractures were mandible (49.00%), zygoma (26.00%), maxilla (15.00%), nasal bone (6.00%) and orbit (4.00%). The commonest area of mandibular fractures were body and parasymphiseal area.

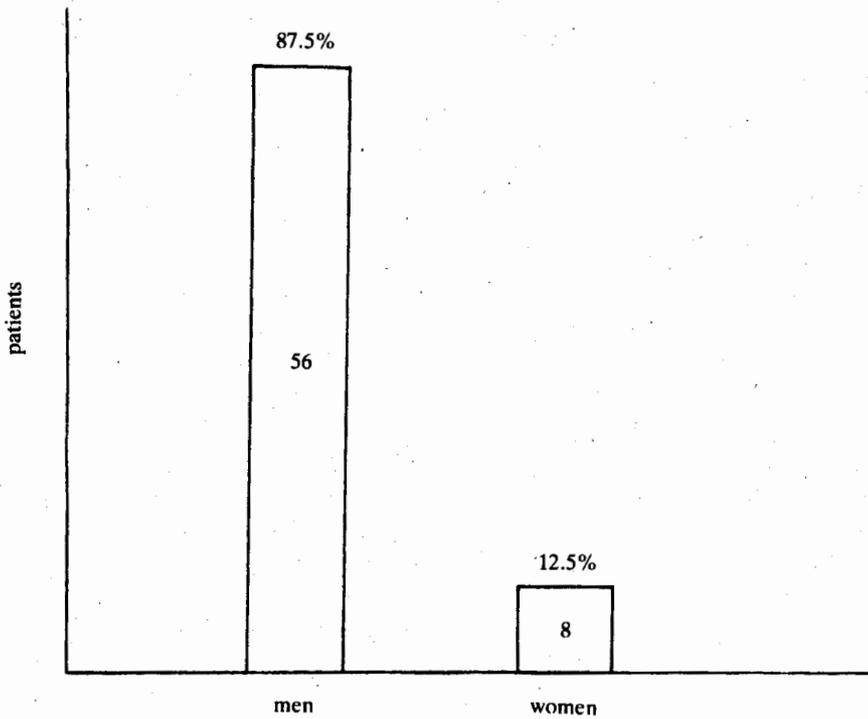


Fig 1 Distribution of maxillofacial injuries according to sex of patients.

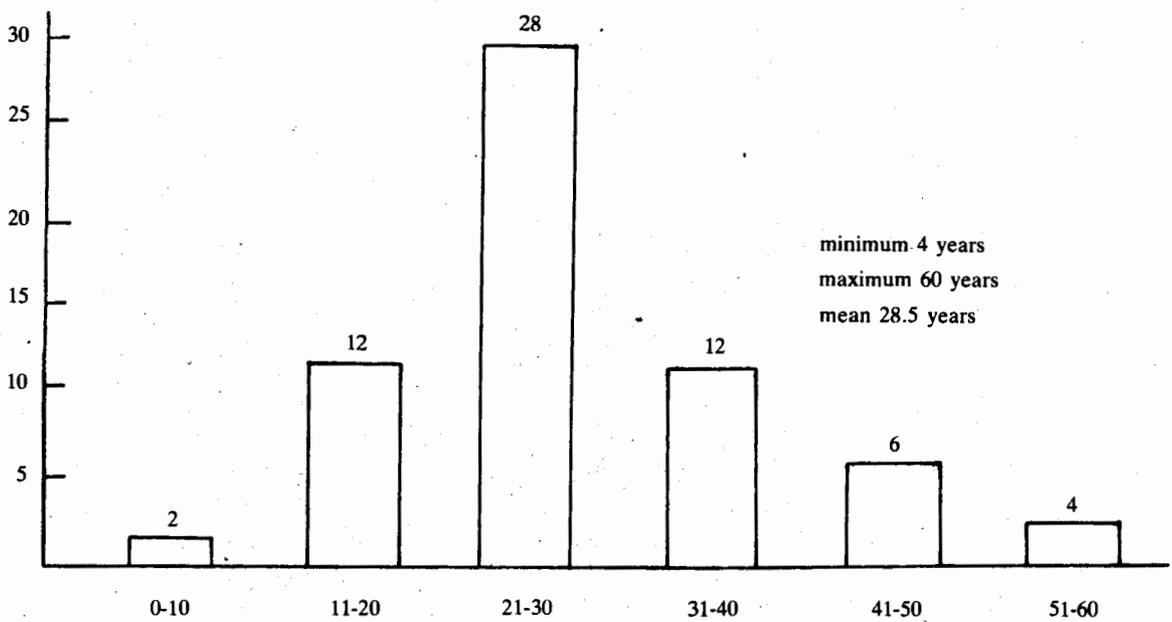


Fig. 2. Age distribution of patients with maxillofacial injuries

Table 1 Hospital stays.

	No. of patients
0-3 days	13
4-7 days	20
8-14 days	20
more than 14 days	11
Total	64

Table 2 Etiology of the injuries

	No. of patients
Motorcycle accident	42(65.62%)
Car accident	10
Assault	4
Bicycle accident	2
Falling injury	2
Pedestrian	1
Accidental hit	1
Sports	1
Not specified	1
Total	64

Table 4 Types of facial fractures

	No. of fractures
MANDIBLE	49
Body	20
Parasymphyseal	14
Condyle	6
Angle and ramus	6
Alveolar	3
ZYGOMA	26
MAXILLA	15
Le Fort I	2
Le Fort II	6
Le Fort III	0
Others	7
NASAL BONE	6
ORBIT	4
Superior orbital margin	3
Floor	1
Total	100

Table 3 Associated injuries

	No. of patients
MAJOR INJURIES	
(Life-treatening)	
Severe head injury	7
Severe chest or major airway injury	3
Intraabdominal injury	2
Carotid-cavernous sinus fistula	1
MINOR INJURIES	
Ocular injury	5
Long bone fracture and dislocation	5
Fracture clavicle	3
Minor fracture pelvis	2
Fracture rib	1
Fracture transverse process of spine	1
Brachial plexus injury	1

Table 5 Surgical procedure

	No. of operations
Intermaxillary fixation	39
Interosseous wiring	19
Craniofacial suspension	6
Open reduction alone	5
Antral packing	4
Plating	2
Silastic sheath insertion	2
Excision of mandibular condyle	1
Dental plate + circumferential wiring	1
Tracheostomy	6

Table 6 Complications of maxillofacial injuries.

	No. of patients
Malocclusion and limitation of jaw.	8
Ocular (blindness, optic nerve contusion, diplopia, ectropion, and dacryocystitis)	8
Paresthesia in area of infraorbital nerve	4
Non-union	1
Sinusitis	1
Conductive hearing loss	1
Gingivitis	1
Injury to inferior alveolar nerve	1
Slipping of silastic sheath	1

The majority of surgical procedures were intermaxillary fixation and interosseous wiring (Table 5). Most mandibular fractures were treated by intermaxillary fixation alone. Fractures which required open reduction were treated by interosseous wiring or plating. One case of subcondylar fracture required condylar excision. Maxillary fractures were treated by open reduction, interosseous wiring, craniofacial suspension or combined antral packing. Zygomatic fractures were treated by Gillies' procedure or open reduction with interosseous wiring. Silastic insertion was used in comminuted or depressed fractures of the floor of orbit. Tracheostomies were performed in 6 patients to ensure the maintenance of airway in emergency situation or during the course of the treatment.

Morbidities occurred in 24 patients (37.50%) including malocclusion and limitation of jaw movement, ocular complications, infraorbital nerve paresthesia, etc. (Table 6).

There were 2 mortalities. One patient died from intraabdominal hemorrhage and another developed diabetes insipidus after intracranial injuries and finally died from respiratory failure.

DISCUSSION

There was extreme preponderance for male in maxillofacial injuries and the definite peak incidence is in the third decade (20-30 years). Nearly all authors reported that the highest incidence was in this age group⁽¹⁻⁸⁾, reasonably explained by the high physical activity during these years. Road traffic accidents, especially caused from motorcycle accidents were the largest single factor for these injuries^(1,2,5-8).

About one-third of the patients had associated injuries. Many published papers emphasized for these injuries^(3,9-11). Major injuries included severe head injuries, pulmonary injuries and intraabdominal injuries which required operative interventions.

Minor injuries included long bone fractures, dislocations, and ocular injuries. Cervical spine injuries occurred in 1-3% in other reports^(9,11) but was not presented in our series. Most of life-threatening injuries occurred in high velocity traffic accidents and were caused by high impact force applied to the regions of supraorbital ridge, midface, and anterior part of the mandible^(3,11,12). The patients with upper facial fractures were at the greatest risk of serious closed head injuries⁽¹²⁾.

Twenty percents of the patients had history of alcohol consumption. We could not demonstrate the association between alcohol consumption and the major associated injuries in this study. In other reports, there was an increase in mortality and morbidity in patients who abused alcohol and presented with facial injuries^(7,13).

The majority of facial fractures were mandibular fractures. Most authors observed that fractures of this region were located at the weak bony region and in other reports the most common area for mandibular fractures were condylar fractures. In this study the most common sites of fractures were body and parasymphyseal fractures. The causes of these fractures were direct blow to anterior part of the mandible⁽²⁾. Probably the incidence of subcondylar fractures should be higher but some of them did not presented with obvious features and were not diagnosed.

Intermaxillary fixation with arch bars was the most common method employed to fix maxillofacial fractures. Most mandibular fractures were treated by this method alone⁽¹¹⁾. There were limited number of fractures which required open reduction. Example of these fractures were fractures which were not stable by closed reduction alone and fractures in edentulous patients^(11,14,17,21).

Of zygomatic fractures, some cases could be treated by Gillies' approach alone but maintenance in position with additional

interosseous wirings at frontozygomatic suture and infraorbital margin was undertaken in case that fractures were not stable after the reduction.

For middle third fractures of facial skeleton, the treatments by reduction and intermaxillary fixation combined with internal suspension wires, interosseous wiring or antral packing as indicated were employed.

Bone plates were used in limited numbers of mandibular fractures such as certain types of fractures, fractures in edentulous patients and patients with coma, disorientation or malnutrition^(17,18,22,23).

The multiple nature of the injuries sustained in high velocity traffic accident is necessary for a multidisciplinary approach in both primary assessment and definite care. Apart from maxillofacial injuries per se, priority in the management of these patients are the maintenance of airway, control of hemorrhage and the treatment of associated injuries⁽¹⁴⁻²⁰⁾. Two mortalities from associated conditions in this series can emphasize for the concerning of these priority.

CONCLUSION

Maxillofacial injuries are still one of the common problems in emergency room. We have presented a preliminary report of the pattern of the injuries, treatments and the complications of these injuries in our hospital. We hope that the incidence of morbidity and mortality of the patients will be lower by proper managements of the injuries and the associated conditions.

REFERENCES.

1. Abiose BO. Maxillofacial skeleton injuries in Western States of Nigeria. *Br J Oral Maxillofac Surg* 1986; 31:39.
2. Hagan EH, Huelke DF., An analysis of 319 case reports of mandibular fractures. *J Oral Surg, Anesth & Hosp D Surv* 1961; 19:93-104.
3. Luce EA, Tubb TB, Moor AM. Review of 1,000 major facial fractures and associated injuries. *Plast Reconstr Surg*. 1978; 63:26-30.
4. Nair KB, Paul G. Incidence and etiology of fracture of the faciomaxillary skelton in Trivandrum: A retrospective study. *Br J Oral Maxillofac Surg* 1986; 24:40-43.
5. Olson RA, Fonseca RJ, Zeitler DL, et al Fractures of the mandible: A review of 580 cases. *J Oral Maxillofac Surg* 1982; 40:23-8.
6. Taher AAY. Maxillofacial injuries due to road traffic accidents in Kuwait. *Br J Oral Maxillofac Surg* 1986; 24:146-48.
7. Voss R. The etiology of jaw ffractures in Norwagion patients. *J Maxillofac Surg* 1982; 10: 146-48.
8. Foo GC. Maxillo-facial fractures-A retrospective analysis of 285 cases. *Med J Malasia* 1983; 38: 178-181.
9. Busuiito MJ, Smith DJ, Robson MC. Mandibular fractures in an urban trauma center. *J Trauma* 1986; 26:826-29.
10. Eid K, Lynch DJ, Whitaker LA. Mandibular fractures: the problem patient. *J Trauma* 1976; 16: 658-61.
11. Luce EA. Maxillofacial trauma. *Curr Probl Surg* 1984; 21.
12. Lee KF. The impact-absorbing effects of facial fractures in closed-head injuries. *J Neurosurg* 1987; 66:542-47.
13. McDade AM, McNicol RD, Ward-booth P, et al. The etiology of maxillofacial injuries, with special reference to the abuse of alcohol. *Int J Oral Surg* 1982; 11:152-55.
14. Dingman RO, Converse JM. The clinical management of facial injuries and fracture of the facial bone. In: Converse JM, ed. *Reconstructive Plastic Surgery*, 2nd ed, Vol 2. Philadelphia: W.B. Saunders, 1977:599-747.
15. Grabb WC. Facial bone fracturtes. In: Grabb WC, Smith JW, ed. *Plastic Surgery*, 3rd ed. Boston: Little Brown and Company, 1979; 242-64.
16. Kulick MI, Vistnes LM. Maxillofacial injury: emergency priorities. *Hosp Med* 1985:199-233.
17. Langdon JD, Rapidis AD. Maxillofacial injuries. *Br J Hosp Med* 1982:589-99.
18. Rowe NL. Maxillofacial injuries-current trends and techniques. *Injury* 1985; 16:513-25.
19. Spiessel B. Maxillofacial injuries in poly trauma. *World J Surg* 1983; 7:96-100.
20. Walton RL, Hagan KF, Parry SH, et al. Maxillofacial trauma. *Surg Clin North Am* 1982; 62:73-96.
21. Chuong R, Donoff RB. Intraoral open reduction of mandibular fracture. *Int J Oral Surg* 1985; 14:22-28.
22. Kellman RM. Repair of mandibular fractures via compression plating and more traditional techniques: a comparison of results. *Laryngoscope* 1984; 94:1560-67.
23. Lopez EM, Jurgens AR. Use of dynamic mini-compression plate for the internal fixation of mandibular fractures. *Ann Plast Surg* 1981; 7:542-74.