

Management and Outcome of Compound Depressed Skull Fracture

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ABSTRACT

Objectives: To determine the clinical presentation, management and outcome of patients presenting with compound depressed skull fracture.

Study Design: Descriptive study.

Place and Duration of Study: Bolan Medical Complex Hospital Duration from May 2003 to March 2006.

Materials and Methods: Study conducted on sixty patients with compound depressed skull fracture. Patients of both gender and all age group were included in the study, those with major life threatening injuries to other organs were excluded.

Results: Out of total of 60 patients, 42 (70%) patients were male and 18 (30%) were female. Majority were in the first (33%) second (25%) decade of life (child and young patients). Most of patients were injured as a result of road traffic accidents 32 (53%), fall from height in 16 patients (27%) and assault in 12 (20%). Seventy percent of patients in fall group fell from roof while 30% from electric pool. Patients presented with various signs and symptoms like headache, vomiting (70%), loss of consciousness (33%), ear, nose and throat bleed (40%), CSF rhinorrhea (17%) and fits. Seventy percent of patients in this study presented with signs of raised intracranial pressure. Temporal region was the most frequently affected area in 30 (50%) cases. Twelve (20%) cases involved frontal region and 10 (70%) cases involved parietal region, only 4 patients involved occipital region. Four patients involved more than one area. Majority 40 (67%) patients had GCS between 8 – 12 labeled as moderate head injury. Thirty nine (64.4%) patients have no associated pathology. Ten (17%) patients had associated extradural haematoma, 1 (1.6%) had acute subdural and 10 (17%) patients had underlying brain contusion. Management was operative in 56 patients cases and conservative in 4 patients. Those 4 patients were put on ventilator and managed conservatively due to severe head injury. Outcome was calculated on the basis of Glasgow outcome scale. Thirty two (53.33%) patients recovered fully, 12 (20%) patients had moderate disability, 8 (13%) had severe disability and 8 (13.33%) patients died.

Conclusion: Children and young adults and males are most commonly affected. Road traffic accidents and falls from height are the most common modes of head injury. If treated properly most cases of compound depressed fracture will reveal good results.

Key Words: Depressed skull fracture, Mortality.

INTRODUCTION

Skull fractures are classified by pattern into linear, comminuted and depressed, by anatomic location into convexity and base and by type into open and closed.¹

Compound depressed fracture is the one in which there is a scalp laceration at the site of depressed fragment of bone.² A skull fracture is regarded as depressed when outer table of skull lies below the level of the

inner table of the surrounding bone.³ It may involve skull base or vault.⁴ Most of the patients with depressed skull fracture experience loss of consciousness and neurological damage. However 25% of patients do not experience loss of consciousness.⁵ Although depressed skull fracture are demonstrated on skull X-ray but CT scan is diagnostic method of choice because it allows assessment of the underlying brain for contusion or haematoma.⁶ Compound depressed fracture is a medical emergency because of risk of bacterial infection of cranial cavity. The major objectives of surgery are to remove contaminated bone fragments and foreign materials and to debride devitalized tissue with water tight closure of dura (Figures 1 and 2).

OBJECTIVE

The objective of the study was to determine the clinical presentation, management and outcome of patients presenting with compound depressed skull fracture.

MATERIAL AND METHODS

This is a prospective study conducted in the Department of Neurosurgery of Bolan Medical Complex Hospital, Quetta from May 2003 to March 2006.

Sixty patients of both genders were included in the study. Complete history, physical examination and routine investigations of blood and urine were carried out. Both Antero-posterior and lateral views of skull X-ray were done. To look for associated brain pathology, CT scan was also done in all patients. All patients with depressed fracture were included in the study except those with major life threatening injuries to other organs. Associated injuries were managed in the concerned departments after dealing with neurological problem. Glasgow outcome scale was used to measure the outcome of patients.⁷

RESULTS

Sex Incidence

42 (70%) patients were male while 18 (30%) were female.

Age Incidence

Majority were in the first (33%) second (25%) decade of life (child and young patients) as shown in (table 1).

Mode of Injury

Most of patients were injured as a result of road traffic

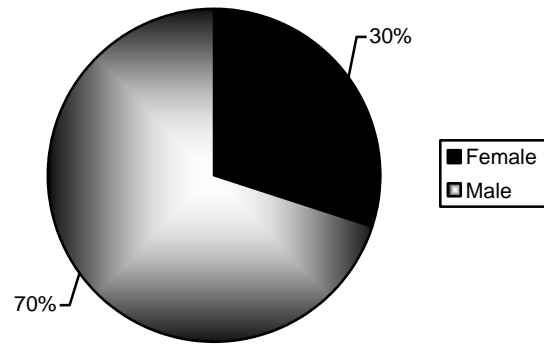


Figure A: Sex Incidence.

Table 1:

Age	Number	%
6 months to 1 year	5	8.88
1 – 10 years	20	33.33
11 – 20 years	15	25
21 – 30 years	10	6
31 – 40 years	5	8.33
41 – 50 years	3	5
Above 50 years	2	3.33

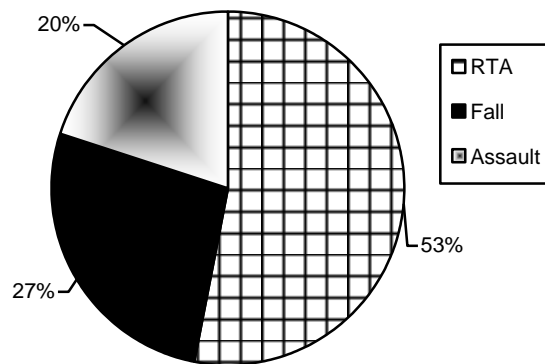


Figure B: Mode of Injury.

accidents 32 (53%) (Figure B). Falls were responsible for injury in 16 patients (27%) and assault in 12 (20%). 70% of patients in fall group fell from roof while 30% from electric pool.

Clinical Presentation

Patients presented with various signs and symptoms

like headache, vomiting (70%), loss of consciousness (33%), ear, nose and throat bleed (40%), CSF rhinorrhea (17%) and fits (Figure B). Seventy percent of patients in this study presented with sings of raised intracranial pressure.

Table 2: *Clinical presentation.*

Clinical Feature	Number	%
Headache and Vomiting	42	70
Loss of Consciousness	20	33.33
ENT bleed	24	40
CSF Rhinorrhea	10	16.66
Fits	6	10

Glasgow Coma Scale

Majority 40 (67%) patients had GCS between 8 – 12 labeled as moderate head injury (Table 3).

Table 3: *Glasgow Coma Scale.*

GCS	Number	Percentage
3 – 7	12	20%
8 – 12	40	67%
13 – 15	8	13%

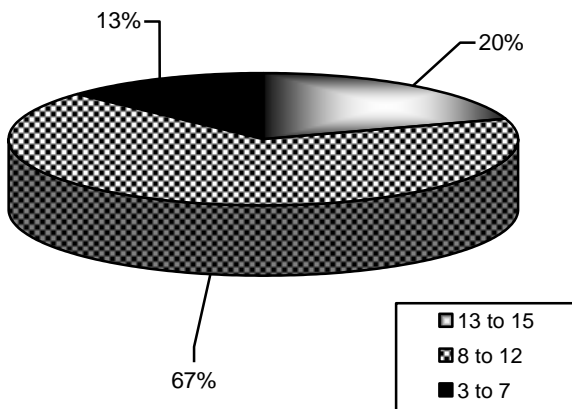


Figure C: *GCS at Presentation.*

Regional Distribution

Temporal region was the most frequently affected area

in 30 (50%) cases. Twelve (20%) cases involved frontal region and 10 (70%) cases involved parietal region, only 4 patients involved occipital region. Four patients involved more than one area (Figure D).

Associate Intracranial Pathology

Thirty nine (64.4%) patients have no associated pathology. Ten (17%) patients had associated extradural haematoma, 1 (1.6%) had acute subdural and 10 (17%) patients had underlying brain contusion (Figure E).

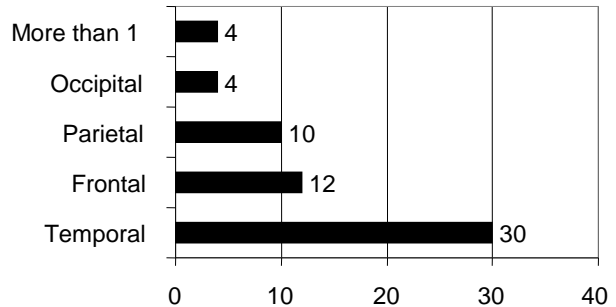


Figure D: *Regional Distribution (n = 60).*

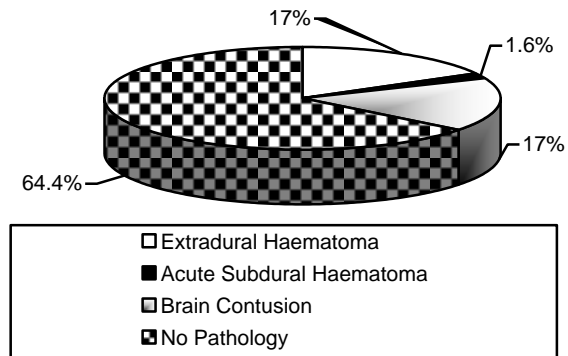


Figure E: *Associated Intracranial Pathology.*

Outcome

Management was operative in 56 patients cases and conservative in 4 patients. Those 4 patients were put on ventilator and managed conservatively due to severe head injury. Outcome was calculated on the basis of Glasgow outcome scale. Thirty two (53.33%) patients recovered fully, 12 (20%) patients had moderate disability, 8 (13%) had severe disability and 8 (13.33%) patients died (Figure F).

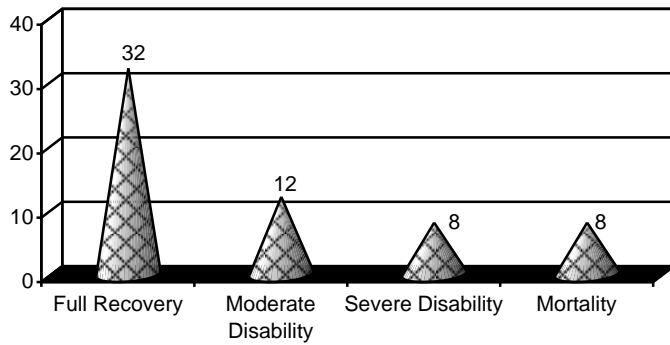


Figure F: Outcome by Glasgow outcome Scale.

Complications

Patients were followed for 8 months. Eight (13.33%) patients developed wound infection. It was superficial and patients were put on broad spectrum antibiotics while two patients needed surgery because they developed subdural empyema. Only four (6.66%) patients were managed conservatively. They presented with initial GCS of 3 – 4 and were put on ventilator. Three of them expired while one was alive but with severe disability as shown in table 4.

Table 4: Complications.

Complications	Number	Percentage
Wound infection	8	13%
Morbidity	1	1.6%
Mortality	3	5%

DISCUSSION

The pattern of a skull fractures is affected by two factors. The first factor is the force of impact. The second factor is the ratio of the impact. The ratio of impact even of high energy if dispersed over a large area, as in head injury to an individual wearing a motor cycle helmet often produces no skull fracture, however if the impact is of low energy in a small area will often produce skull fractures. Many patients with depressed skull fractures experience loss of consciousness and neurological damage. Physical examination is difficult because of scalp mobility and swelling. Majority of patients in our study were children (33%) in the range of 1 – 10 years. This correlates with other studies which show that patients suffering from depressed compound skull fracture are mainly young.^{8,9}

In most of other studies, patient present with Glasgow coma scale¹⁰ 12 – 15 while in our study majority of patients had GCS of 8 – 12.¹⁰ This could be due to delay in attending the hospital.

Most affected lobe was temporal i.e. in 50.5 of patients while least was occipital i.e. in only 6.66% of patients. In our study which is comparable to other studies.¹²

Glasgow outcome scale was used to see outcome of skull fracture and its management.

In our study mortality was 13.33% which was more than 10% as mentioned in most other studies.^{11,12} This could be because the patients are usually brought to the Hospital late. All these patients who expired presented with initial GCS of 3 – 8.

Depressed skull fracture is the fracture of skull where outer table of the skull lies below the level of the inner table of the surrounding bone. It is compound when it is associated with laceration of the scalp. Road traffic accidents and falls the commonest cause. A compound depressed fracture skull is neuro surgical emergency because of the risk of bacterial infection of cranial cavity. The initial surgery is performed as soon as possible. Surgery is done to remove foreign bodies, elevation of depressed fracture or removal of depressed bony pieces and dural repair. If there is associate haematoma, it is also evacuated. Outcome is related to surface area of force, velocity of force, point of impact, age of patient and initial presenting clinical condition of patient.

CONCLUSION

Children and young adults and males are most commonly affected. Road traffic accidents and falls from height are the most common modes of head injury. If treated properly most cases of compound depressed fracture will reveal good results.

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