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Retrospective study of depressed skull fractures at tertiary care centre

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ABSTRACT

Aims: The aim of the study was to retrospectively analyse the patient data at our institute who underwent treatment for depressed skull fractures over a period of 3 years.
Materials and Methods: 300 patients who had depressed skull fractures due to various modes of injury were studied. Patients with multiple injuries were not included in this study. Age was no bar for enrollment in our study
Results: Factors which seemed to affect recovery of patients include Cause of injury, Duration of impact, gcs at admission and discharge, underlying brain contusions and brain edema affected recovery. Demographic factors did not seem to affect recovery
Conclusions: Patients without compound fracture and better gcs during initial resuscitation without brain contusion and edema fared better in our study.

1. Introduction

Most of the head injury cases in India are of depressed skull fracture, where road traffic accidents in bikers not using a helmet is common. It also occurs due to falls and physical assault. Depressed fracture is defined when outer table of skull bone lies below the level of inner table.[1] Sudden and severe impact on a particular part of skull bone causes depressed fracture. Depressed fracture may cause rise in intracranial pressure and brain lacerations. The outcome depends on various factors. This retrospective study is our attempt to highlight various factors affecting prognosis in depressed skull fracture patients.

2. Materials and Methods

This is a retrospective study of about 300 depressed fracture patients at our institute for the past three years. A total of 300 cases who underwent operative management were studied. Patients who had polytrauma and associated other comorbidities were excluded. Case records were studied for various factors on a case to case basis. Glasgow outcome scale was used to assess outcome from records. Various factors studied to see the outcome which include: Demographic factors, Cause of depressed fracture, location of fracture, simple or compound fracture, brain injury, GCS at admission and discharge and GOS. Statistical tests used to asses outcome

3. Results

A total of 300 patients who underwent treatment for depressed skull fracture were studied. 254 patients (84.7%) had GOS 5 and 46 (15.4%) had a GOS of <5. All these patient records were assessed with respect to the different factors and the results were analyzed to draw inference.

1. Age and sex: 26% patients were <20 years and 58.7% of 20–40 years and 15.3% were >40 years . 13.3% patients were female and 86.7% were male. Age and Sex did not seem to affect outcome in our patients.
2. Cause of injury: RTA caused most of our cases i.e.,66.7%. Other causes constituted 33.33%. Cause of Injury had its influence on outcome ($P < 0.05$). Road

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traffic accidents caused more of dismal prognosis

3. GCS during initial resuscitation: 74% patients had a GCS of 13–15, and 14% had a GCS 9–12 and 12% had GCS <9 during initial resuscitation. Good Gcs during initial resuscitation had its impact on better outcome
4. Location of fracture: 59.4% patients had fracture of frontal region 5.3%, temporal 20.7%, parietal 2%, other regions had mixed region involvement. Location of fracture did not seem to affect outcome in this study
5. Other Injuries: 30% patients had brain contusions, and 17.3% had EDH, 1.3% patients had SDH and 4% patiens had SAH. Brain contusions, lacerations and edema had its significant effect on outcome, patient without these injuries fared better in our study
6. Simple or compound fracture: Type of fracture did not seem to affect outcome on statistical tests
7. Dural tear: It did not affect outcome statistically i.e., P value > 0.05

4. Discussion

Road Traffic Accidents and other modes of injury cause major burden on health care specially trauma care. Road traffic accidents are on rise owing to increased standard of living and affordability of population. Substance abuse is also a major contributing factor. In DSFs, the outer table of one or more of the fracture edges lies below the normal anatomical level of the inner table.[2] CT is helpful for initial screening.[3] According to Heary et al. injuries due to RTA and Assault do not differ in their morphological appearance. Treatment of depressed fractures can either be surgical or conservative management. We have considered 300 cases of depressed fractures who underwent treatment at our institute. Various demographic factors, GCSduring initial resuscitation, Location of fracture, other brain injuries like contusion, laceration, brain edema, increased intracranial pressure were studied.

In this study mean age was 27.9 yrs. 58.7% patients were of 20–40 years. Road traffic accidents was the most common cause of injury in our study. Afflunence in metropolices and increased vehicular traffic in these cities may the reason for increase in road traffic accidents. According to Jagger et al[4] increasing age has its bearing on outcome.i.e old population showed not good outcome. Though we did not found any correlation between age and outcome. However many other investigators like Jamieson and Yelland[5] have found correlation between increasing age and prognosis, with younger population faring better

We did not found any difference of outcome between males and females though females were only 13.33% in our study. Mumtaz et al.,[6] also found similar results inspite of females been more in their study i.e., females were 35.71% in their study.

Table 1: Study of Various variables of Study Population

Patient profile	No. of Patients	GOS 4, 5)	GOS 1, 2, 3)
Age group (years)			
<20	78	78	Nil
20-40	176	160	16
>40	46	46	Nil
Sex			
Male	260	242	18
Female	40	40	Nil
Mode of injury			
RTA	200	184	16
Non-RTA	100	98	2
GCS at admission			
13-15	222	220	2
9-12	42	40	2
<9	36	22	14
Site of fracture			
Frontal	178	168	10
Temporal	16	16	Nil
Parietal	62	60	2
Frontotemporal	6	6	Nil
Temporoparietal	10	10	Nil
Parietooccipital	10	8	2
Frontoparietal	8	4	4
Occipital	10	10	Nil
Associated brain injuries			
Contusion	90	78	12
EDH	52	48	4
SDH	4	4	Nil
SAH	12	12	Nil
Type of fracture			
Simple	44	42	2
Compound	256	240	16
Dural tear Present	166	156	10
Absent	134	126	8
Pneumocephalus			
Present	56	52	4
Absent	244	230	14
GCS at discharge			
13-15	282	280	2
9-12	14	8	6
<9	4	Nil	4

In our study fractures due to RTA had more unfavouable outcome compared to non RTA group. Jagger et al[4] and Jamieson and Yelland[5] also found similar results in their study where non-RTA group fared better. However Swann et al., found assault as the common cause of injury and these patients outcome was not good compared to RTA and other causes.[7] Al Derazi et al. found industrial causes as the most common causes of injury like fall of objects while working.[1]

Patients with good GCS during initial resuscitation i.e 13-15 (74%) had better outcome. 42 patients had GCS 9-

Table 2: Effects of Gos Score

Patient Profile	GOS 5	GOS <5	Total	P Value
Male	218	42	260	0.4
Female	36	4	40	
RTA	154	42	196	0.004
Non-RTA	100	4	104	
Simple	42	2	44	0.1
Compound	212	44	256	
Dural tear	138	28	166	0.5
No dural tear	116	18	134	
Pneumocephalus	50	6	56	0.4
No pneumocephalus	204	40	244	
Internal bleed present	118	34	156	0.005
Internal bleed absent	136	12	148	
Total	254	46	300	

12 and 40 of them recovered better. 36 patients had GCS below 9 most of whom did not have good outcome. At the time of discharge 284 patients had GCS 13-15. 14 patients had GCS 9-12 and 4 patients had GCS <9. GCS at discharge strongly affect prognosis From these findings it can be concluded that GCS during initial resuscitation and discharge strongly affect the outcome. Hossain et al ., found similar correlation with gcs during initial resuscitation and discharge with outcome in their study

In our study frontal fracture were most common, next in sequence was parietal followed by temporal. There were also more than one bone fracture. There was no significant correlation between location of fracture and prognosis except if it is involving the underlying dural sinus region. Al Derazi et al., found similar association in their study[1]

In this study most common associated injury with depressed fracture were brain contusions followed by edh, sdh, and traumatic sah in descending order. SDH and SAH did not affect much on outcome but patients with brain contusions had poor outcome. While patients with EDH had poor prognosis probably due to injury to dural venous sinuses, these patients also had poor GCS during initial reuscitation. Hossain et al., found similar pattern of associated injuries in their study[8] Pneumocephalus did not have much bearing on outcome in this study. However Satardey et al[6] found poor prognosis with Pneumocephalus and tears in dura also there was poor outcome with compound type of fracture compared with simple fractures which is not found in this study. Lee et al.,[9] found seizures with low GCS.

5. Conclusions

Our study comprised 300 cases of depressed skull fracture who were treated over a period of 3 years at our institute. We found association between GCS during initial resuscitation and discharge with Oucome with patients having good gcs faring better Other brain injuries along with depressed fracture increases morbidity and cause prolonged or poor recovery. Demographic factors do not affect outcome. The inference drawn from this study is depressed fractures due to other causes than RTA, with good GCS during initial resuscitation and discharge with no other injuries had good outcome.

6. Source of funding

None.

7. Conflict of interest

None.

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