

ORIGINAL ARTICLE

Early Decompressive Craniectomy: A Life Saving Option in Closed Head Trauma

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ABSTRACT

Aim: To determine outcome and factors associated with outcome among patients with closed head injury who underwent decompressive craniectomy.

Methodology: Cross sectional analytical study conducted in Neurosurgery Department of teaching hospital Dera Ghazi Khan from January, 2021 to June, 2021. Total 105 patients fulfilling the inclusion criteria were enrolled in the study.

Approval of ethical review committee was obtained. All the patients with closed head injury which underwent decompressive craniectomy were included. Socio demographic profile, mode of injury, Glasgow Coma Scale (GCS) at admission time, pupillary reaction and timing from hospital admission to surgery, duration of surgery, length of hospital stay and occurrence of CSF leakage was noted. SPSS version 22 was used for data entry and analysis.

Results: Head injury was more common in males. 43.8% cases admitted with GCS score between 3-8 and with head injury by road traffic accident. Leakage of CSF was recorded in 13.3% patients. Mortality was recorded in 18.1% patients. GCS at time of admission, time elapsed between admission and surgery and duration of surgery was significantly associated with the outcome.

Conclusion: Early decompressive craniectomy significantly reduce death rate in patients with closed head injury.

Keywords: Craniectomy, Outcome, Glasgow coma scale

INTRODUCTION

Traumatic brain injuries will be major cause of mortality in future globally. In decompressive craniotomy, portion of skull is removed thus relieving the pressure on brain tissue. A drill is used by the surgeon along with bone saw to cut it.¹ Traumatic brain injury is the leading cause of decompressive craniectomy but brain surgery is also associated with various complications. People who undergo a decompressive craniectomy are already in critical condition due to traumatic brain injury.² Rehabilitation can help people regain as much brain function as possible. This might include speech therapy, physical therapy, and exercise therapy³.

METHODOLOGY

This cross sectional analytical study was conducted in Neurosurgery department of teaching hospital Dera Ghazi Khan from January, 2021 to June, 2021. Total 105 patients fulfilling the inclusion criteria were enrolled in the study. Approval from ethical review committee of institute was obtained. All the patients above the age of 14 years with closed head injury which underwent decompressive craniectomy were included in the study. Patients who had neurological deficits before the traumatic event and those having surgical lesions in other organs or systems were excluded from the study.

All the patients with traumatic brain injury were assessed by neurosurgeon. Socio demographic profile, mode of injury, Glasgow Coma Scale (GCS) score at the time of admission, pupillary reaction, lesions on computed

tomography (CT) of the head, timing from hospital admission to surgery, duration of the surgery, post-surgical length of stay in hospital and CSF leakage was noted. The data was analyzed by using SPSS version 22. The outcome of patients was determined according to the Glasgow Outcome Scale (GOS) score at the time of discharge. Unfavorable outcome comprised of group 2 and 3 on Glasgow outcome score (GOS) and group 4 and 5 on GOS comprised of favorable outcome.

RESULTS

The detail of results is given in tables 1,2,3,4

Table 1: Socio demographic profile of patient underwent decompressive craniectomy

Variables	n=	%age
Age (years)		
15-30	61	58.1%
31-45	25	23.8%
>45	19	18.1%
Gender		
Male	93	88.6%
Female	12	11.4%
Causes of injury		
Roadside accident	69	65.7%
Fall	19	18.1%
Assault	17	16.2%
GCS at admission		
13-15	26	24.8%
09-12	33	31.4%
03-08	46	43.8%
Pupil examination		
Symmetric and reactive	70	66.7%
One reactive	24	22.8%
Both Non-reactive	11	10.4%
Time of admission and surgery		
1-5 hours	49	46.7%
6-12 hours	21	20.0%

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>12 hours	35	33.3%
Duration of surgery		
<3 hours	31	29.5%
3-6 hours	62	59.1%
> 6 hours	12	11.4%
Hospital stay		
<10 days	46	43.8%
10-20 days	27	25.7%
> 20 days	32	30.5%
CSF leakage		
Yes	14	13.3%
No	91	86.7%

Table 2: Outcome of patients underwent decompressive craniectomy

Outcome	n=	%age
Favorable	51	48.6%
Not favorable	35	33.3%
Death	19	18.1%
Total	105	100%

Table 3: Association of Socio demographic profile underwent decompressive craniectomy with outcome

Variables	Outcome			P value
	Favorable	Not favorable	Death	
Age (years)				<0.01
15-30	38 (74.5%)	13 (37.1%)	10 (52.6%)	
31-45	08 (15.6%)	13 (37.1%)	04 (21.1%)	
>45	05 (09.8%)	09 (25.8%)	05 (26.3%)	
Gender				0.40
Male	47 (92.2%)	29 (82.9%)	17 (89.5%)	
Female	04 (07.8%)	06 (17.1%)	02 (10.5%)	
Causes of injury				<0.01
Roadside accident	45 (88.3%)	23 (65.7%)	01 (05.3%)	
Fall	04 (07.8%)	07 (20.0%)	08 (42.1%)	
Assault	02 (03.9%)	05 (14.3%)	10 (52.6%)	
GCS at admission				0.02
13-15	19 (37.3%)	04 (11.4%)	03 (15.8%)	
09-12	10 (19.6%)	14 (40.0%)	09 (47.4%)	
03-08	22 (43.1%)	17 (48.6%)	07 (36.8%)	
Pupils				0.05
Symmetric and reactive	37 (72.5%)	20 (57.1%)	13 (68.4%)	
One reactive	13 (25.5%)	09 (25.7%)	02 (10.5%)	
Both Non-reactive	01 (02.0%)	06 (17.2%)	04 (21.1%)	
Time of admission and surgery				0.01
1-5 hours	30 (58.8%)	13 (37.1%)	06 (31.5%)	
6-12 hours	12 (23.5%)	07 (20.0%)	02 (10.5%)	
>12 hours	09 (17.7%)	15 (42.9%)	11 (58.0%)	
Duration of surgery				<0.01
<3 hours	19 (37.2%)	03 (08.6%)	09 (47.4%)	
3-6 hours	26 (51.0%)	29 (82.8%)	07 (36.8%)	
> 6 hours	06 (11.8%)	03 (08.6%)	03 (15.8%)	

DISCUSSION

Mean age of the patients was 32 ± 16.4 years and 58.1% were between 15-30 years of age which indicates that young people are mostly affected in traumatic brain injuries. In contrast to these findings, Skansar O et al⁴ revealed that mean age of patients with traumatic brain injury was 52 ± 13.8 years which is higher. This difference in age of the patients may be due to social norms. Our findings are similar with the results of Ullah S et al⁵ in which majority of the patients with traumatic head injury were in young age group. Our study findings showed that males are mostly involved in road traffic accidents which are in agreement with results of Bhatti JA et al⁶ in which most of the patients with head injury were males. 43.8% of the patients admitted in the hospital with GCS score between 3 to 8 which is similar to the findings of Siddiqui E et al⁷ in which GCS score of 42% patients with head injury was <8 at the time of admission. The most common cause of head injury in our study was road traffic accident which is in accordance with the findings of Junaid M et al⁸. Leakage of CSF was recorded in only 13.3% patients.

Our study findings revealed that outcome was favorable in almost half of the patients with closed head injury who underwent decompressive craniectomy and mortality was recorded in 18.1% patients. The fatality rate

in our study is much lower than study conducted by Silva AC et al⁹ in which 35.1% patient with closed head injury died.

GCS at the time of admission, time elapsed between admission and surgery and duration of surgery was found to be significantly associated with the outcome among patients of closed head injury. Our findings are in agreement with findings of Saade N et al¹⁰ in which socio demographic profile of patients was similar.

CONCLUSION

It is concluded that early decompressive craniectomy significantly reduce death rate in patients with closed head injury.

Conflict of interest: Nil

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