ORIGINAL ARTICLE

Examine the Treatment Outcomes of Decompressive Craniectomy in patients with Traumatic Brain Injury

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ABSTRACT

Aim: To determine the outcomes of decompressive craniectomy in patients presented with traumatic brain injury.
Study Design: Prospective/Observational study
Place and Duration of Study: Department of Neurosurgery, Bahawal Victoria Hospital, Bahawalpur from 1st July 2019 to 31st December 2019.
Methods: Sixty two patients of both genders presented with traumatic brain injury undergoing decompressive craniectomy were included. Patient's detailed demographics including age, gender, cause of injury and site were recorded. Preoperatively Glasgow coma scale was used to examine the severity. Final outcomes were examined by Glasgow outcome scale. Follow-up was taken at postoperatively 3 months.
Results: Forty two (67.74%) were males while 20(32.26%) were females. Mean age of patients was 34.26±13.57 years (ranges 12 to 65 years). Fifty one (82.26%) patients had severe, 9(14.51%) had moderate and 2(3.23%) had mild injury as Glasgow coma scale. Thirty eight (61.29%) patients had favorable outcomes while 15(24.19%) had unfavorable outcomes and mortality found in 9 (14.52%) patients. Complications found in 7(11.29%) patients.
Conclusion: Decompressive craniectomy is safe and effective treatment modality for traumatic brain injury with high rate of favorable outcomes. Also it is very helpful for reducing the intracranial pressure.
Keywords: Traumatic brain injury, Decompressive craniectomy, Recovery, Disability, Mortality

INTRODUCTION

Traumatic brain injury (TBI) which is a huge reason for bleakness and mortality is related with high financial expenses to the human services framework[1-3]. The brain harm prompted by TBI is partitioned into essential and auxiliary wounds. Essential injury results from direct horrible effect. Auxiliary injury happens because of a course of biochemical occasions that initiate cerebrum edema and expanded intracranial weight[2,3]. The significant point to spare patients with serious TBI is counteraction as well as diminishing optional cerebrum harms by clinical and careful treatments[4,5].

Clinical treatment for cerebrum edema and raised intracranial pressure (ICP) comprises of absence of pain, sedation, head height, cerebrospinal liquid waste by means of a ventricular catheter, and streamlining of ventilation to forestall cerebral vasodilation optional to hypercarbia, organization of hyperosmolar arrangements, for example, manitol, moderate hypothermia, and barbiturate extreme lethargies[6,7].

Around 10-15% of patients with TBI and raised ICP, maximal clinical treatment fizzled[8,9]. In these patients that are obstinate to clinical treatment, decompressive craniectomy could be performed[10,11]. Decompressive craniectomy could be life-putting something aside for these patients, as indicated by an investigation led in 2009. Guess and result in decompressive craniectomy bunch were better than those in the benchmark group that got just clinical treatment. decompressive craniectomy initiated decline in mortality[12]. However numerous inquiries including perfect application, signs, timing, procedure, and even the meaning of accomplishment of decompressive craniectomy stayed muddled. The present study was conducted aimed to examine the outcomes of decompressive craniectomy in patients with traumatic brain injury.

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MATERIALS AND METHODS

This prospective/observational study was conducted at Department of Neurosurgery, Bahawal Victoria Hospital, Bahawalpur from 1st July 2019 to 31st December 2019. Sixty two patients of both gender presented with traumatic brain injury undergoing decompressive craniectomy were included in this study. Patient's detailed demographics including age, gender, cause of injury and site were recorded after taking written consent from patients/attendants. Patients with extradural hematoma, patients with no consent and patients with severe infectious diseases were excluded.

Brain CT, complete blood picture and medical examination were done at the time of admission. Severity of injury was examined by Glasgow coma scale score (GCS), score ≤8 consider severe, 9 to 13 moderate and >13 mild severity. Craniectomy was done under general anesthesia. Pre and post-operatively intracranial pressure was examined. Final outcomes were examined by Glasgow outcome scale (GOS), score 5 as good, 4 as moderate, 3 as severe disability, 2 as vegetative and score 1 death. Complications such as wound infection, CSF leak, hydrocephalus, and contusion expansion were examined. Follow-up was taken at 3 months postoperatively. Data was analyzed by SPSS 24.

RESULTS

Forty two (67.74%) were male while 20(32.26%) were females. Mean age of patients was 34.26±13.57 years (ranges 12 to 65 years). Causes of injury included RTA in 39(62.90%), fall from height in 13(20.96%), assault in 7(11.29%) and 3(4.84%) had others. 48(77.42%) patients had unilateral site while 14(22.58%) had bilateral. 36(58.06%) patients had midline shift <10 mm while 26 (41.94%) patients had >10 mm. 34(54.84%) had time since injury to surgery ≤24 hours and 28(45.16%) had >24 hours (Table 1).

According to the GCS score, 51(82.26%) patients had severe (score ≤8), 9(14.51%) had moderate (score 9-12) and 2(3.23%) had mild injury (score >12) (Table 2). According to Glasgow outcome scale, 38 (61.29%) patients had favorable outcomes (score 1-2) while 15(24.19%) had unfavorable (score3-4) outcomes and mortality found in 9(14.52%) patients (score 5) (Fig. 1). Complications found in 7(11.29%) patients in which 4(6.45%) had cerebral contusion, 2(3.23%) patients had hydrocephalus and 1 (1.61%) had wound infection (Fig. 2).

Table 1: Demographics of the patients

Variable	No.	%
Age (years)	34.26±13.57	
Gender		
Male	42	67.74
Female	20	32.26
Etiology		
RTA	39	62.9
Fall	13	20.96
Assault	7	11.29
Others	3	4.84
Midline Shift		
<10mm	36	58.06
>10mm	26	41.94
Time since injury to surgery		
<24 hours	34	54.84
>24 hours	28	45.16

Table 2: Glasgow coma scale score preoperatively

GCS	No.	%
Mild (>12)	2	3.23
Moderate (9-12)	9	14.51
Severe (≤8)	51	82.26

Fig. 1: Final outcomes according to GOS

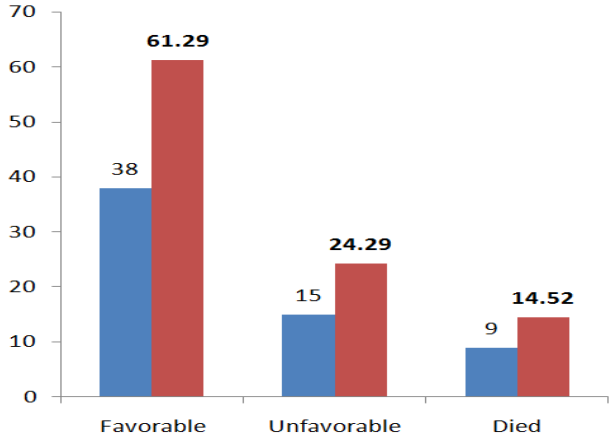
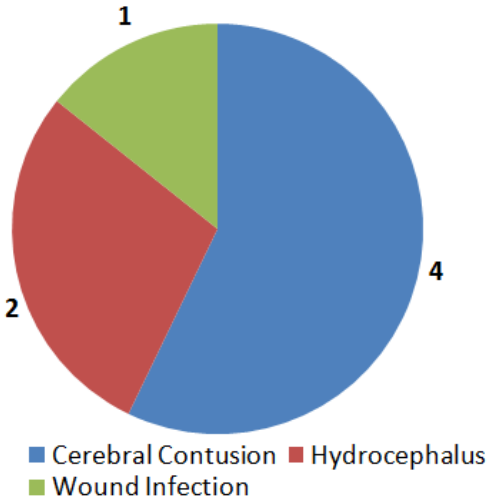


Fig. 2: Complications associated with decompressive craniectomy



DISCUSSION

Traumatic brain injury is one of the most common clinical presentations in neurological settings and associated with high rate of mortality and morbidity.[13] Many of studies have been conducted to control the elevated intracranial pressure in patients with traumatic brain injury by using different treatment modalities. However, decompressive craniectomy considers very useful treatment modality for reducing the intracranial pressure and ratio of adverse outcomes[14,15]. In the present study, 42 (67.74%) were male while 20 (32.26%) were females. Mean age of patients was 34.26±13.57 years. These results showed similarity to previous studies in which male patients were high in numbers 60-80% as compared to females and average age of patients was 36 year[16,17].

We found that road traffic accidents was the most frequent cause of traumatic brain injury in 62.9% patients followed by fall and assault. A study conducted by Timofeev et al[18] reported similarity to our findings in which RTA was the major cause of traumatic brain injury. Some other studies demonstrated that road traffic accident was the most frequent cause of traumatic brain injury[19,20].

In present study we found according to the GCS score preoperatively, 51 (82.26%) patients had severe (score ≤8), 9 (14.51%) had moderate (score 9-12) and 2(3.23%) had mild injury (score >12). A study conducted by Ahmad et al[21] reported that 53.7% patients had GCS score 3-8, 35.71% had 9-12 and 10.71% had above 12.

At final follow-up, according to Glasgow outcome scale, 38(61.29%) patients had favorable outcomes (score 1-2) while 15(24.19%) had unfavorable (score 3-4) outcomes and mortality found in 9(14.52%) patients (score 5). A study conducted by Nawaz et al[22] reported that 18 (36%) showed a complete recovery, mild disability was found in 10(20%) patients. The percentage of severe disability was observed in 7(14%) patients asexual condition existed in 5(12%) patients and the mortality rate was 6(12%) patients. Another study conducted by Bagheri et al[23] reported that 54.09% patients had favorable outcomes while 45.9% had unfavorable outcomes associated with decompressive craniectomy. Dhakre et al[24]

reported that postoperatively GCS score same in 16.1% patients, improved in 61.3% and worsened in 22.6% patients.

In present study complications found in 7(11.29%) patients in which 4(6.45%) had cerebral contusion, 2(3.23%) patients had hydrocephalus and 1(1.61%) had wound infection. These results were comparable to some other studies[25,26].

CONCLUSION

Elevated intracranial pressure is the major cause of morbidity and mortality in patients with traumatic brain injury. We concluded that decompressive craniectomy is safe and effective treatment modality for traumatic brain injury with high rate of favorable outcomes. Also it is very helpful for reducing the intracranial pressure.

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