SURGICAL MANAGEMENT AND OUTCOME ANALYSIS OF EXTRADURAL HEMATOMA AT COMBINED MILITARY HOSPITAL RAWALPINDI

Muhammad Junaid Khan, *Anisa Shaukat, *Muhammad Khalid, **Muhammad Asif Aziz

Combined Military Hospital Quetta, *Military Hospital Rawalpindi, **Army Medical College, Rawalpindi

ABSTRACT

***Objective*:** The aim of this study is to see the frequency of extradural hematomas (EDH) at neurosurgical centre CMH Rawalpindi.

Study Design: Descriptive study

***Place and Duration of Study*:** Department of Neurosurgery CMH Rawalpindi over a period of 2 years (Jan 2001 to Jan 2003)

***Patients and Methods*:** All patients with head injury reporting to trauma center CMH Rawalpindi from 2001 to 2003 were reviewed. Using non-probability convenient sampling, patients with closed head trauma were included in the study.

Results: A total of 1215 patients were reviewed during the study period. Maximum patients were under 12 years of age. Extradural haematoma was found in 23 (2%) patients. Out of 23 patients, 18 (78%) were males and 5 (22%) were females, the male to female ratio was 3.5:1. Alteration of consciousness was the most common presentation (61%). Location of EDH was temporoparietal in majority of patients. Bilateral EDH was found in 1 patient only. At 6 months follow up, good recovery was observed in 15 (65%) patients.

Conclusion: Level of consciousness at the time of surgery is the single most important decisive factor in the outcome hence early diagnosis and surgical intervention is essential

Keywords: Edh, frequency, craniotomy/craniotomy, outcome.

INTRODUCTION

Head injury is one of the leading causes of severe disability and death in the modern world. Besides being a significant cause of emotional stumbling block, it is an imperative basis of heavy economic burden on the society as well. In United States only, the annual estimated expenditure is more than $100 billion. In the last two decades, the management of traumatic brain injury has evolved dramatically, as a result of thorough knowing of the physiologic events leading to secondary neuronal injury and advances in the care of critically ill patients [1]. Motor vehicle accidents are the most common cause of closed head injuries [2]. Focal brain injuries are approximately found in half of all patients with severe head injuries and are responsible for 2/3rd of deaths associated with head injury.

Correspondence: Major Mohammad Junaid Khan, Neurosurgeon, Combined Military Hospital, Quetta

Received: 30 June 2006: Accepted 06 April 2007

Epidural hematomas are relatively uncommon, being <1% of all head injured patients and in <10% of those who are comatose. In adults, the epidural hematomas are typically located in the temporal and frontal regions and are often associated with an overlying skull fracture. Usually they are unilateral, frequently occurring in the territory of middle meningeal artery. Bilateral hematomas are more commonly encountered in children and are typically bifrontal [3]. CT scan remains the investigation of choice in the initial screening and follow up [4]. Most of these cases require urgent surgical evacuation.

The aim of this study was to see the frequency of extradural hematomas at Neurosurgical Centre CMH Rawalpindi, and to emphasize the association of early diagnosis and surgery with outcome of extradural hematomas.

PATIENTS AND METHODS

All patients of head injury from January, 2001 to December, 2003 admitted to the

neurosurgical ward II Combined Military Hospital Rawalpindi were reviewed. Sampling was done using non-probability convenient technique.

Patients with concomitant spinal, thoracic and abdominal trauma requiring surgical intervention were excluded from the study. Only patients with closed head trauma were included in the study. After initial resuscitation, they were examined and the mechanism of head injury, presentation, Glasgow coma scale (GCS), pupillary size and other neurological deficits were recorded. Patients with GCS 13-15 were labeled as cases of mild head injury, GCS 9-12 as moderate head injury and patients having GCS below 8 were included in the category of severe head injury. Those patients who were brought to the hospital within 6 hours of injury were counted as early patients and the patients coming later than 6 hours of injury were included in the late patients category. CT scan head without contrast with bone windows was advised apart from base line investigations. Surgical intervention was done according to the size, site and mass effect of the hematoma in the form of craniotomy/ craniotomy. Fifteen patients were operated within 6 hours of the occurrence of trauma and 6 were operated later than 6 hrs. Follow up was done every month for 3 months and then after 6 months. Functional assessment was done by measuring the Glasgow Outcome Scale. The data was analyzed using SPSS version 10.0. Frequencies along with percentages were used to describe the data.

RESULTS

A total of 23 cases were diagnosed to have extradural hematoma on CT scan head plain with bone windows, comprising 2% of total 1215 cases of head injury during study period (fig. 1). These patients were ranged from 8-60 years of age 16 (70%) patients were aged less than 30 year. Eighteen (78%) were males and 5 (22%) were females with a clear male dominance. Fourteen (61%) patients had mild head injury, 7 (30%) patients had moderate head injury and 2 (9%) patients were found to have severe head injury (fig. 2). Fifteen (65%) patients were brought within 6 hours of injury. RTA (road traffic accidents) was the most common mechanism of injury in our study and inflicted 12 (52%) patients followed by falls. Fourteen (61%) patients presented with alteration of consciousness (fig. 3). The site of hematoma was temporoparietal in 15 (65%) patients according to CT scan findings. Single patient had bifrontal hematoma. Majority of our 15 (65%) patients belonged to low socioeconomic group. The pupillary status of 16 (70%) patients was abnormal. Surgery was performed in 21 (91%) patients while 2 (9%) were treated conservatively. Surgical modality was craniotomy in 18 patients and craniectomy in 3 patients (fig 4). Ventilatory support was given to 2 patients. Glasgow Outcome Scale is shown in (fig.5)

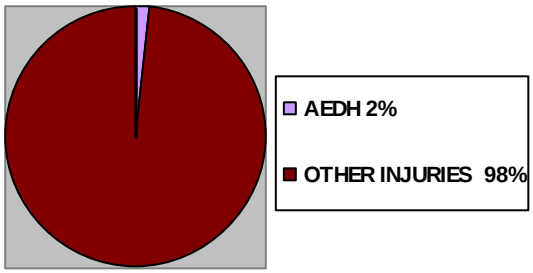

Fig. 1: Frequency of Extradura Haematoma

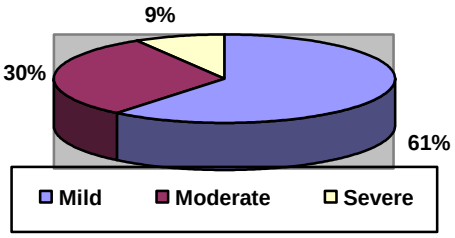

Fig. 2: Severity of head injury

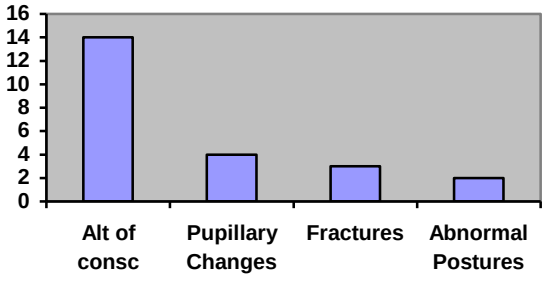

Fig. 3: Presentation of patients

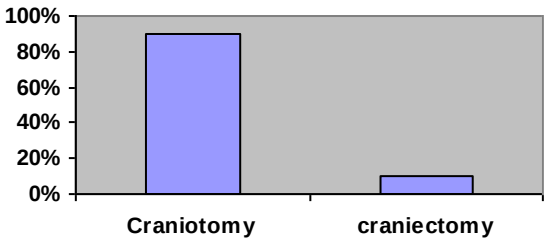

Fig. 4: Surgical Procedures

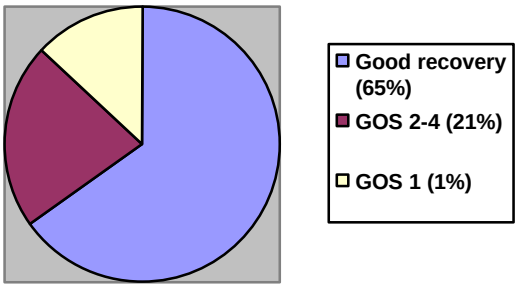

Fig. 5: Glasgow Outcome Score

DISCUSSION

This study has evaluated the frequency of extradural hematomas. The frequency of extradural hematomas has been variably reported in various studies i.e. ranging from 2% to 25%. In present study it was 2% during the period of study.

Various theories have been put forward regarding the mechanism of extradural hematomas .It has been suggested that dura is detached from by the offending force. Striping of dura can occur at site of impact by in bending or out bending of skull or due to motion of skull, further aggravated by the negative intracranial pressure found at the antipode of compressive force. In bilateral hematomas direction of force tends to be anteroposterior rather than lateral, besides it can occur due to extension of fracture line across the midline leading to bilateral extradural hematomas under the fracture line. It has also been suggested that the mechanism is same as in the coup and countercoup injuries.

Age must be considered as an independent factor in outcome production in the elderly with moderate and severe traumatic brain injuries. A more conservative approach in the management of an elderly patient with severe head injury may be reasonable given its dismal outcomes after careful dialogue with the relatives as we treated two of our patients conservatively who were above 60 years and had GCS<8. None of our cases were associated with coagulopathies. The number of minor head injuries admitted for hospital care remains high and can be significantly reduced with better use of CT scan in adults whenever possible [5].

Residing in a more deprived area is not associated with increased mortality from head injury among adults [6], but we did not study this association. Written as well as oral discourse should be assessed after closed head injury (CHI) [7].

Increased therapy intensity, particularly physical and psychological therapies, enhances functional outcomes [8], we offered physical and psychological therapies to our patients where required.

There remains a relative high rate of re-hospitalization in the long term after traumatic brain injury [9]. The costs of re-hospitalization should be considered when evaluating long-term consequences of injury [10]. The rate of rehospitalization and costs associated with it were not studied in our patients.

Penetrating head injuries are associated with higher rate of certain medical complications, especially to pulmonary and central nervous system. Acute care physician and psychiatrist must be prepared to treat these complications more often in patient with penetrating injuries.

Although hypertonic saline is proposed to be effective in traumatic brain injury (TBI) it is not often being used in clinical setting [11] and we used normal saline in our head trauma patients.

Severity of head injuries most commonly is classified by the initial postresussitation GCS which generates numerical summed score for eye, motor, and verbal abilities .A sum of 13-15 indicates mild injury, a sum of 9-12 indicates moderate injury, and a sum of 8 or less indicates severe injury. Concussion and mild injury are synonymous.

After TBI, the brain is bathed with potentially toxic neurochemicals. Catecholamine surges have been determined in both plasma and in CSF after TBI.

Hypotention and hypoxia cause the most prominent secondary trauma induced brain insults.

CONCLUSION

Level of consciousness just before the surgery and the timing of surgery were the two most important decisive factor in the management outcome of acute extra dural haematoma. The management of patients with severe head injury is complex and requires a coordinated, comprehensive, and multidisciplinary approach. Central to the management of the head injured patient is the prevention of secondary neuronal injury by avoiding hypoxia and hypotension. Considering the enormous costs to society, we need to invest greater resources in prevention of this pandemic. Use of helmets for the motorcyclists, seatbelts and airbags are mandatory. Organizing public awareness campaign and provision of safe pedestrian crossings as well as provision of high quality emergency medical services can save many precious lives.

REFERENCES

1. Buki A, Okonkwo DO, Wang KKW, et al Cytochrome c releases and caspase activation in traumatic axonal injury. J Neurosci 2000;20:2825-34.
2. Gorski TF, Gorski YC, Mcload G, Sun D, Cordero R, Essien F, Berry D et al. Patterns of injury and outcomes associated with motocross accidents. Am surg. 2003; 69: 10: 895- 8
3. Ramzan A, Wani A, Malik AH, Kirmani A, Wani M. acute bilateral extradural Hematomas. Neurol India 2002; 50:217-9.
4. Stiell IG, Wells GA, Vandemheen K et al. The Canadian CT head rule for patients with minor head injury. Lancet 2001; 357: 1391-96.
5. Munro PT, Smith RD, Parker TR. Effects of patient's age on management of acute head injury.
6. Dunn L, Henry J, Beard D. Social deprivation and adult head injury: a national study. J Neurol Neurosurg psychiatry. 2003; 74: 8: 1060- 4.
7. Wilson BM, Proctor A. Written discourse of adolescents with closed head injury. Brain Inj.2002; 16: 11: 1011-24.
8. Cifu DX, Kreutzer JS, Marwitz JH, Miller M, Hsu GM, Seel RT et al. Etiology and incidence of rehospitalization after traumatic brain injury: a multicentre analysis. Arch phys Rehabil.1999; 80: 1: 85-90.
9. Marwitz JH, Cifu DX, Englander J, High WM jr. A multicentre analysis of re hospitalization five years after brain injury. J Head Trauma Rehabil. 2001; 16: 4: 307-17.
10. Thurman, Guerrero, J Trends in hospitalization associated with brain injury. JAMA 1999; 282,954-7.
11. Black KL, Hankl RA, Wood DL, Zafonte RD, Cullen N, Cifu DX et al. Blunt versus penetrating violent traumatic brain injury: frequency and factors associated with secondary condition and complications Head Trauma Rehabil. 2002; 17: 6: 489-96.