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PROSPECTIVE STUDY ON CONSERVATIVE MANAGEMENT OF SUPRATENTORIAL EPIDURAL HEMATOMAS AT CALCUTTA NATIONAL MEDICAL COLLEGE

Neurosurgery

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ABSTRACT

- An Acute EDH develops between the dura mater and the inner table of the skull and is reported in 2.5% to 5% of head injuries. Usually occurs in young adults and is rare before age of 2 and after age 60. Although several recent reports have described successful conservative management of epidural hematoma, surgical evacuation constitutes definitive treatment of this condition. Other studies have also reported few cases of conservatively managed EDHs requiring surgical conversion as a result of deteriorating neurological status
- **AIMS AND OBJECTIVES** To study the outcomes of patients treated conservatively with initial presentation of Supratentorial Epidural Hematomas and to study the scope and pitfalls of such treatment for improving our future results
- **MATERIALS AND METHODS-** Our study is a prospective analysis of patients treated by conservative method who had presented to us with supratentorial Epidural Hematoma from May 2018 till March 2019 in the Department of Neurosurgery, Calcutta National Medical College and Hospital (CNMC &H).
- **RESULTS-** A Total of 85 patients were registered in this study. Male: Female ratio was 4.3:1.Average Age of the patients was found to 33.25 years. Most Common Mode of injury was found to be Motor Vehicular accidents which accounted for 68.25%.. The Most Common complaint at Presentation was Severe headache seen in 82.35%(70 patients). The Mean GCS at Admission was 14.2, at 1 week post admission was 14.9 and at 1 month Follow up was 15. The Average Thickness of Hematoma was 13.2mm ,volume was 18.4ml and the average midline shift was found to 3.1 mm at admission. The average Duration of Stay in Neurosurgical ICU was 3.2 days and average over all stay was 10.4 days. The Mean GCS on follow up was 15.. There were no Mortalities noted in the study
- **CONCLUSION-** Supratentorial Extradural Hematomas when carefully chosen can be managed conservatively which is significant considering it prevents the patient from the pain and morbidities associated with a neurosurgical procedure and leads to optimum utilization of operative resources.

KEYWORDS

INTRODUCTION

An Acute EDH develops between the dura mater and the inner table of the skull and is reported in 2.5% to 5% of head injuries[1].EDH adopts a lens shaped or biconvex morphology as the periosteal layer of Dura mater is stripped from the inner table of the skull by the bleeding.

Usually occurs in young adults and is rare before age of 2 and after age 60(perhaps because the dura mater is more adherent to the inner table in these groups)[2] The classic and most lethal type of EDH is caused by a skull fracture crossing the groove in the temporal bone containing the middle meningeal artery.These haematomas generally accumulate rapidly, although a delayed stepwise progression over hours may also occur. EDHs may have also a venous origin, either from the diploic veins or bridging veins torn along their course in the venous sinuses.

The imaging standard for the diagnosis of EDH is the ComputedTomography (CT) scan[3,4].Although several recent reports have described successful conservative management of epidural hematoma, surgical evacuation constitutes definitive treatment of this condition.[5] The percentage of patients managed non-operatively in clinical series since the 1960s has progressively increased from less than 1% to more than 60%[6] Other studies have also reported few cases of conservatively managed EDHs requiring surgical conversion as a result of deteriorating neurological status[7,8].

OBJECTIVES

Overzealous Surgical interventions are known to increase morbidity and and Mortality and thus came the commonly accepted dictum of masterful inactivity in treatment of a number of conditions. The Aims and Objectives of this study were to study the outcomes of patients treated conservatively with initial presentation of Supratentorial Epidural Hematomas and to study the scope and pitfalls of such treatment for improving our future results

MATERIALS AND METHODS

Our study is a prospective analysis of patients treated by conservative method who had presented to us with supratentorial Epidural Hematoma from May 2018 till March 2019 in the Department of Neurosurgery, Calcutta National Medical College and Hospital (CNMC &H). Ethical Committee clearance was taken and an informed consent was taken from the patients at the time of admission.

Patient included in the study were 1) Glasgow Coma Scale 13-15 2) a hematoma thickness<= 20mm 3)a hematoma volume <= 30 ml 4)midline shift <= 5 mm. Patients excluded from the study were 1) Presence of Neurological deficit 2)Other associated Neurological injuries 3)Hematoma thickness>20mm 4)Hematoma volume>30ml 5) Midline shift>5mm 6)Neurological deterioration with treatment eventually requiring surgery 7)posterior Fossa EDH 8)hemodynamic instability9)Patients lost to Follow up 10)Temporal Extradural Hematomas Data were obtained from the patients at admission to neurosurgery department at Calcutta National Medical College.Data were entered into a master chart containing proforma that included demographic information ,GCS Score at admission ,one week after admission and at 1 month, Details on CT Scan(hematoma thickness,volume and midline shift) at admission, repeat CT scan at 72 hours/as per need and at 1 month follow up were noted . All patients were intitally admitted in Neurosurgical ICU at CNMCH and were shifted to Neurosurgical Ward depending on the Neurological status and CT scans. At Discharge ,all patients were asked to Follow-up after a duration of 1 month/SOS(in case of Seizures,LOC,Increasing Headache,Vomitting,Neurological .

Statistical evaluation was performed. Clinical data for participants was presented as Mean for Continuous Variables and Absolute numbers and Percentages for categorical variables

RESULTS

We had a Total of 85 patients registered in our study with a definite male Preponderance. Male: Female ratio was 4.3:1(69 males and 16 females(Table 1). Average Age of the patients was found to 33.25 years(Range 7-58years)(Table 2). Most Common Mode of injury was found to be Motor Vehicular accidents which accounted for 68.25%(58 patients). Other causes were Fall from height in 15.2% (13 patients) assault in 9.4%(8 patients) and fall of heavy object on head in 7.05%(6 patients)(Table 3). The Most Common complaint at Presentation was Severe headache seen in 82.35%(70 patients). Other Complaints included LOC in 8.2%(7 patients) ,Vomitting in 8.2%(7 patients) and seizures in 1.1%(1 patient)(Table 4). The Mean GCS at Admission was

14.2, at 1 week post admission was 14.9 and at 1 month Follow up was 15. The Average Thickness of Hematoma was 13.2mm ,volume was 18.4ml and the average midline shift was found to 3.1 mm at admission. The average Duration of Stay in Neurosurgical ICU was 3.2 days and average over all stay was 10.4 days. The Mean GCS on follow up was 15. There were 8 patients who deteriorated neurologically during stay at hospital/noted to have CT scan findings which indicated surgical intervention.These patients were eventually taken up for surgery and excluded from the study. There were no Mortalities noted in the study

Demographics data

Table 1

Sex M:F-4.3:1	Number of patients	percentage
Male	69	81.18
Female	16	18.82

Table 2

Average age-33.25

Age	Number of patients	percentage
0-19 years	9	10.59
20-39 years	65	76.47
40-59 years	11	12.94
60-80 years	0	0

Table 3 Mode of Injury

Mode of injury	Number of patients	Percentage
Motor Vehicular accident	58	68.25
Fall from height	13	15.2%
Physical Assault	8	9.4%
Fall of heavy object on head	6	7.05%

Table 4 Clinical Features

Chief complaints	Number of patients	percentage
Severe headache	70	82.35
Loss of consciousness	7	8.2
Vomiting	7	8.2
seizures	1	1.1

DISCUSSION

EDH is an infrequent sequel of head injury seen in less than 2% of patients admitted with craniocerebral trauma[9] . McLaurin et al in their study in 1989 stated that surgical management is definitive treatment of Extradural Hematomas and the surgery should not be delayed once the diagnosis is established[10]. Prior to the invention of the CT scan, there had been a reported case of chronic epidural haematoma which was managed conservatively[11] .Earlier surgical intervention was the dictum but this has changed over the past few years. Various Studies have indicated that Conservative management of Extradural Hematomas may be tried in selected cases with good results.[12,13]

In our Study , there was a significant Male Preponderance with M:F ratio being 4.3:1 which is similar to findings by Sullivan et al[14] and Thomas et al[15] .This may be due to the fact that majority of the drivers especially on highways are males. Motor Vehicular Accident was the leading cause of trauma in our patients constituting 68.25% of the patients. Average Age of our patients was 33.25 years. Ndoumbe et al in their study found the most common age group affected was 29-30 years[16]. The major Complaint of our patients was severe headache which resolved over the next 1-2 weeks

The indications for conservative management of extradural haematoma differ amongst different authors. Many consider GCS as the most important criteria. Bullock et al. [17] suggested operative intervention in patients with GCS<9 with anisocoria .We had chosen Glasgow Coma Scale score 13-15 without presence of anisocoria Some authors considered Volume to be the most important determinant with Dubey et al.[18] recommending volume <30ml for conservative management. We had kept a similar volume as our cutoff. Servadei et al. [19] suggested Extradural Hematomas with thickness<10mm and midline shift <5mm be managed conservatively . Bullock et al have managed patients with a thickness 12-38mm conservatively[17]. We had kept 20mm thickness and 5 mm midline shift as our cutoff criteria. Conscious patients generally have a good outcome with conservative management[20] and those with loss of consciousness or neurological deficit have a poor outcome[21] hence we prefer operative intervention for such patients. As per our past experience we have noted patients with Temporal extradural haemotoma and posterior fossa extradural hematoma to decompensate rapidly hence we prefer operating on such patient although Ahmad A. Moussa et al[22] reported good results with conservative management even in such patients.

The average Duration of Stay in Neurosurgical ICU was 3.2 days where continuous vitals monitoring and 1 hourly neurological status check was done and average over all stay in hospital was 10.4 days.In the ward, 2 hourly vitals and neurological status check was done.

There were 8 patients who deteriorated neurologically during stay at hospital/noted to have CT scan findings which indicated surgical intervention. These patients were eventually taken up for surgery and excluded from the study.

The Average GCS on follow up after 1 month was 15. There were no Mortalities noted in the study. We would like to add that apart from the mentioned criteria, close observations and critical clinical observations of our seniors and team was a crucial factor.

CONCLUSION

Supratentorial Extradural Hematomas when carefully chosen can be managed conservatively which is significant considering it prevents the patient from the pain and morbidities associated with a neurosurgical procedure and leads to optimum utilization of operative resources. Close neurological monitoring forms the basis of such management and additional Radiological facilities adds to the surgeons armamentarium. Excellent results can be obtained with careful patient selections, close clinical and radiological montoring

Conflicts of interest

The authors declare that they have no competing interests.

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