

Delayed presenting traumatic Extradural Haematoma- whether surgery always necessary? – An experience in a tertiary care hospital



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ABSTRACT

Background: Extradural haematoma (EDH), considered being the most serious preventable complication of head injury, requiring immediate diagnosis and surgical intervention. Though surgical evacuation constitutes the definitive treatment of this condition but many patients who presented late to emergency can be saved from craniotomy with watchful repeated neurological assessments. **Aims and Objectives:** To evaluate the role of surgical and non surgical management of delayed presenting traumatic EDH at a tertiary care Hospital. **Materials and Methods:** This study was conducted from December 2015 to February 2017 at Nil Ratan Sircar medical College, Kolkata. A total 100 cases of traumatic Extradural Haematoma were admitted with history of prior head injury of greater than 8 hours duration. All the patients were assessed clinically on admission and by NECT brain either prior to or immediately after admission. All patients with traumatic EDH were evaluated by dedicated trauma team and by Neurosurgeons, patients who came to hospital facility with more than 8 hours history of incident with haematoma <30 cm³, no associated midline shift and no signs of focal neurodeficits or papillary asymmetry with GCS 13-15, were initially managed conservatively, those who failed any of the chosen criteria treated by operative interventions. **Results:** Of all patients more 50% cases were associated with vehicular accident. Eighty percent cases were referred from primary or secondary care level hospitals and the remaining directly from accident site or scene of injury. Fifteen patients had post injury seizures, most of the cases were associated with additional intradural lesions like contusions or intracerebral haematoma. Approximately one fourth patients presented with GCS > 13, all these patients experiences positive outcomes. In this series of EDH location was temporoparietal region constitute 45% of the total, in 36 % of cases there were associated skull fracture. 55% of the patients in this series underwent operative intervention and 45% treated non operatively. Overall, 78% patients had good recovery, whereas 12% patients remained moderate to severe disabled at 6 weeks follow up period. **Conclusion:** Although surgical management is the treatment of choice in EDH, in selected delayed presenting EDH patients can be managed non-operatively with good outcome.

Key words: Head injury; Delayed presenting EDH; Management of EDH; Extradural Haematoma

INTRODUCTION

Extradural hematoma (EDH), considered to be the most serious preventable complication of head injury, requiring

immediate diagnosis and surgical intervention, encountered in 2% of patients with head injuries and 5–15% of patients with fatal head injuries, is a traumatic accumulation of blood in the potential space between the inner table of the

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skull and the stripped off dural membrane.¹ Prognosis is considered excellent if treated aggressively. EDH usually is stable, attaining maximum size within minutes of injury, a hypothesis some authors disagree.² However it may progress during first 24 hours after injury. Rebleeding or continuous oozing presumably causes this progression. Its pathological effects include raised intracranial pressure due to brain shift, swelling and ischemia.³ Occasionally EDH runs a chronic course and is detected only days after injury. A patient with small EDH may be treated conservatively though close observation is advised, as delayed, yet sudden neurological deterioration may occur. Though surgical evacuation constitutes the definitive treatment of this condition but many patients can be saved from craniotomy with watchful repeated neurological assessments.

Aims and objectives

Aim of our study was to study the role of conservative management and various reasons for conversion to operative intervention during the treatment of traumatic EDH and retrospectively determine the results of conservative management. EDH most often present between the ages of 10 to 60 years, affecting males approximately 4 times more than females⁴ Mortality rate varies from 10% to 40% and may be an index of alertness as well as the efficiency of the healthcare system.⁵

MATERIALS AND METHODS

This study was conducted from December 2015 to February 2017 at N.R.S Medical College, Kolkata. That includes total 100 cases of traumatic Extra Dural Haematoma, admitted with history of prior head injury of greater than 8 hrs duration. Study was done retrospectively analysing the patients between that period and their treatment and outcome assessed, so ethical clearance was not needed.

All the patients were assessed clinically on admission and by NECT scan brain either prior to or immediately after admission. Note was made of age, sex, mechanism of injury, associated symptoms and signs were documented includes headache, vomiting, seizures, Glasgow Coma Score (GCS), papillary abnormality, localizing neurodeficits, hemodynamic parameters and associated noncranial injury if any.

Radiological features noted including site and size of haematoma, degree of Midline shift, associated cranial injuries both intradural and those of vaults. Eventual outcome was noted as recovery or death of the patient on the basis of Glasgow Outcome Score (GOS) and divided into 5 categories as given below that measures at discharge from hospital and at 6 weeks interval.

Glasgow outcome score

Scale	Description
5 (Good outcome)	Resumption of normal life; there may be minor neurological and/or psychological deficits
4 (Moderately disabled)	Able to work in a sheltered environment and travel by public transportation
3 (Severely disabled)	Dependent for daily support by reason of mental or physical disability or both
2 (Persistent vegetative state)	Unresponsive and speechless for weeks or months or until death
1 (Death)	Not applicable

Patients' management

All patients with traumatic EDH were evaluated by dedicated trauma team and by Neurosurgeons, patients who come to that hospital facility with more than 8 hours history of incident with haematoma <30 cm³, no associated midline shift and no signs of focal neurodeficits or pupillary asymmetry with GCS 13-15, were initially managed conservatively, those who failed any of the chosen criteria treated by operative interventions.⁶

Patients chosen for conservative management were closely observed at emergency department or in Intensive Therapy Unit (ITU) for at least first 24 hours, CT scan routinely done one at presentation and another on 24 hours to 72 hours time span and whenever neurological deterioration occurs.

RESULTS

There were 85 males and 15 female patients in this study, youngest patient being 13 years and oldest 68 years (Table 1).

More than half of the cases were found to be associated with vehicular accident, 80% cases referred from primary or secondary care level hospitals, the rest directly presenting from accident site or scene of injury (Table 2).

Fifteen patients had history of post injury seizures, most of the cases were associated with additional intradural lesions like contusions or intracerebral haematoma.

Approximately one fourth patient presented with GCS >13, all these patients experiences positive outcomes. Patients presenting with GCS 3-8 showed increased morbidity and mortality (Table 3).

A lucid interval, defined as period of normal neurological functioning between the movement of impact and development of signs of an expanding haematoma, in that series it was seen in 30% of cases (Table 4).

Seventy percent of the patients having normal papillary reaction, asymmetrical reaction was noted in 20%, 8% patients presented with unilateral fixed pupil whereas 2% patients who were deeply comatose and had bilateral dilated non reacting pupils (Table 5).

All patients had no pre injury neurological deficits. One patient had coexisting cerebral tumour, and one had prior history of seizure disorder. Post injury no lateralizing signs were detected in 70% patients (Table 6).

In this series of EDH location is temporoparietal region constitutes 45% of the total, in 36% of cases there were associated skull fracture (Table 7).

25 patient had associated intradural lesions of variable severity, of these 6 died, 12 recovered well (GOS 5), 6 remained intellectually impaired (GOS 4), 1 patient remained severely disabled at 6 weeks follow up (GOS 3).

NECT scan of brain of 3 patients who died showed widespread diffuse cerebral contusion as well as intracerebral haematomas, 1 patient who died showed associated acute subdural haematoma.

Fifty-five percent of the patient in this series underwent operative intervention and 45% treated non operatively. Among the operatively treated patients 9 patients died, of the 55 patient operated 35 showed good recovery whereas 9 had moderate to severe disability in upto 6 weeks post discharge follow up.

45 patients underwent non operative management and among them there was 1 mortality due to development of aspiration pneumonia, other 44 showed good recovery and no neurodeficit in 6 weeks follow up after discharge, average hospital stay in non operatively treated patients were 3 weeks (Figure 1 and Figure 2).

Overall, 78% patient had good recovery, whereas 12% patient remained moderate to severe disabled at 6 week follow up period. Among 10 cases of death 8 had only cranial injury, 2 had associated other noncranial injury and 9 among them underwent definitive treatment (Table 8).

Table 1: Age distribution of the patients with EDH

Age Group	Number
11-20 years	06
21-30 years	38
31-40 years	30
41-50 years	20
51-60 years	3
61-68 years	3

Table 2: Mode of Injury in 100 patients with EDH

Mode of injury	Numbers
Vehicular accident	55
Fall from height	24
Assault	15
Miscellaneous	6

Table 3: GCS on admission and GOS of the patients with EDH

GCS	Number	GOS 5	GOS 4	GOS 3	GOS 2	GOS 1
13-15	36	36	0	0	0	0
9-12	34	32	1	1	0	0
3-8	30	10	8	2	0	10

Table 4: State of consciousness on admission of patients with EDH

State of consciousness	Numbers	Operated	Not operated	Deaths
No unconsciousness	30	5	25	0
Primary but no secondary unconsciousness	25	12	13	0
Lucid interval	30	25	5	0
Unconscious throughout	12	12	0	10
No reliable information to primary unconsciousness	3	1	2	0

DISCUSSION

Jamieson⁵ in 1970 emphasized that a lower mortality from EDH in any society reflects the social and medical awareness of that community and the level of care for accident victims. The standard of care presently available in our country is far from satisfactory and may explain the relatively high mortality figures quoted by local authors regards results of treatment of EDH. Primitive methods of first aid and transport of polytrauma patients are still in practice. It is regrettable that lack of awareness regarding the importance of early intervention in EDH patient is still widespread. Minor adjustments in attitude towards patients

Table 5: Presenting Neurological signs in patients with EDH

Neurodeficit	Numbers
Monoplagia	2
Ipsilateral 3 rd nerve contralateral hemiparesis	2
Contralateral hemiparesis only	4
Ipsilateral 3 rd nerve palsy only	16
Dysphasia only	4
Contralateral 3 rd nerve palsy	2
No lateralizing signs	70

Table 6: Location of EDH and management

Location	Number	Operated	Not operated
Frontal	30	12	18
Temporal	10	6	4
Parietal	20	10	10
Occipital	1	0	1
Bilateral	2	2	0
Posterior Fossa	2	1	1
Temporoparietal	15	10	5
Parierooccipital	2	2	1
Frontoparietal	15	10	5
Frontotemporoparietal	2	2	0

Table 7: Time from injury to specific treatment with GOS in patient with EDH

Hours from injury to treatment	Number	GOS 5	GOS4	GOS3	GOS2	GOS1
8-16 Hrs	36	32	0	0	0	4
16-24 Hrs	7	5	1	0	0	1
24-48 Hrs	25	22	1	1	0	1
>48 Hrs	32	19	7	2	0	4

Table 8: Overall outcome of the patients with EDH

Glasgow outcome score (GOS)	Number
Good recovery (GOS 5)	78
Moderate Disabled (GOS 4)	9
Severely Disabled (GOS 3)	3
Persistent vegetative state (GOS 2)	0
Dead (GOS 1)	10

having this condition may go a long way in decreasing morbidity and improving outcome in this group of patients.

EDH is a condition primarily affecting young adult males who constitute society's economic backbone. In our series the mean age of presentation is 28 years and males presenting approximately 6 times more commonly than females. Male predominance may be due to lesser involvement of female in outdoor activities. Vehicular accidents were commonest cause of EDH in our study, accounting for more than half of the cases. Road traffic accidents and falls combined accounted for 79% of cases compared to 84.5% as reported by Sullivan et al in 1990.⁷

In our study, the number of patient presenting with a GCSS of 13-15 was 36%. This is in contrast to the 69.5%

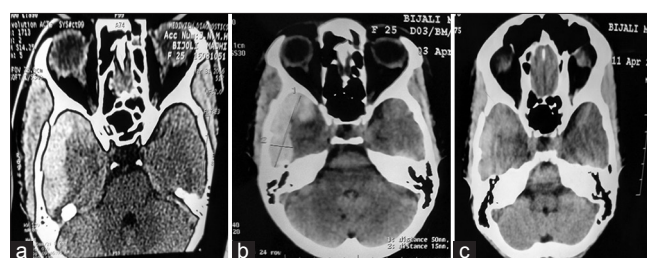


Figure 1: 25 year female with right temporal EDH CT Scan shows a) initial CT scan at admission, b) Scan image after 5days of trauma, c) shows complete resolution of Right temporal EDH on 13th day of trauma, GCS of the patient remain stable during course of management



Figure 2: 28 year old female patient with right Parietal EDH a) at initial CT, b) and c)

reported by Mohanty et al.⁸ This difference probably reflects the delayed presentation of our cases. Twelve percent patients remained moderate to severely disabled

and 10% died. All these patient presented with GCS less than 13. This suggests that GCS at admission has a linear relation with the outcome of the patients presenting with EDH as observed by Kudey et al.⁹

Only 30% of patients in our study had lateralising signs on presentation and a normal pupillary reaction was noted in 70% of the cases, observations are similar to those reported by Jamieson et al in 1968.¹⁰

CONCLUSION

In that present study we observed that so many patients come to our tertiary care institute more than 8 hours after the injury, either due to delayed referral or due to delayed presentation to health care system. But among those patients who present late a good outcome often can be expected and most of them showed good outcome (78% in our study) (GOS 5). By carefully selecting patients for individualised treatment planning for each of the patients can give best results.

As the patient treated by operative and non operatively were of completely different characteristics by means of GCS, Neurodeficit and other associated intracranial injuries, a comparison of outcome could not be made between that two group of patients. But non operative management in delayed presenting EDH patients may be an option.

In our present study we observe good outcome in selective patients with EDH who present late (>8 hours) to our

facility, and nonoperative management may be considered as a valid treatment option in patients with EDH with late presentation. But as the patient number was small in our study a large cohort study is necessary to determine the usefulness of nonoperative management of delayed presenting patient with Extradural Haematoma.

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Authors Contribution:

PG- Concept and design of the study, collected data and reviewed the literature, statistically analyzed and interpreted, manuscript preparation and critical revision of the manuscript; **KR**- Concept and helped in preparing first draft of manuscript; **SKS**- Conceptualized study, literature search, prepared first draft of manuscript and critical revision of the manuscript; **SD**- Collected data and review of study.

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