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Research Article

EXTRADURAL HEMATOMA...AN EXPERIENCE OF SERIES OF CASES IN A TERTIARY CARE CENTRE IN ASIA

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ABSTRACT

Aim: Acute traumatic extradural hematoma (EDH) is a life threatening problem and requires quick intervention. This is a retrospective study of incidence and outcome of consecutive patients with EDH managed in a tertiary care hospital in Asia.

Materials and Methods: We retrospectively examined all consecutive trauma cases managed between Jan 2014 and Dec 2016 and analyzed patients with acute traumatic extradural hematoma. These EDH patients had EDH in isolation or in combination with other intra cranial lesions. Cause of injury, time of presentation, age, sex, Glasgow Coma Score (GCS), pupil reactivity, treatment and clinical outcomes were also determined. Small thin rim EDH in patients whose GCS score was 15 were managed in conservative category. Those of the conservative category who did not behave well were operated upon and included in the operated category.

Results: Of 1971 head injuries, 81(7.5) had EDH, a mean of 27 patients per year. Males were 65 (80 percent) and females 16(20 percent). Peak age incidences were the second and third decades of life, with a mean age of 27 years. Causes were road traffic accidents in 55 (67.9%), falls in 11 (12.3%) assault in 8 (9.8%), cricket ball injury in 5 (6.1%) and unstated in (2.4%). In our series 70 (86.4%) patients presented within 24 h of injury. The average time interval before presentation was 9 hours. At presentation 22(27%) patients had GCS of 13-15, 36 (44.4%) had GCS 9-12 and 23 (28 %) had GCS less than 8. The most common location of hematoma was temporal (27.5%). 56 (69.1%) patients were managed by surgery. 25 (30.8%) patients were managed conservatively. In our series 3 patients (3.7%) died.

Conclusion: We conclude that early appropriate treatment of EDH results in good high quality survival. Low GCS. (Glasgow coma Score 4 or 5) should not be an absolute contraindication for surgery. The patients who have thin rim EDH in non-dangerous zone and in whom the GCS is 15 can be managed conservatively. Seizure prophylaxis should be considered in patients with GCS <8.

INTRODUCTION

Acute EDH is a collection of blood in the epidural space. It is a life threatening condition. Acute (EDH) occurs in about 1-3% of patients with head injuries and in 5 to 15% of patients with severe head injuries(1). There is a male to female ratio of about 4:1. Computerised tomography (CT) scan remains the imaging modality of choice for diagnosis of this condition (2,3). There are many factors that influence the decision and timing for treatment of EDH. The decision has to be made individually in each case depending on patient's age, hematoma size, location, patient's neurological status and course (4). It is an established fact that acute extradural hematoma (EDH) is a neurosurgical emergency and timely surgical intervention for significant EDH is the accepted standard for treatment. The accepted recommendation for symptomatic patients is surgical intervention within the golden hours (5). Early diagnosis and treatment reduces mortality and improves outcome. Mortality in cases of EDH was 20-55% in the pre- CT period but this has decreased to about 12-20% (6). Many factors affect the outcome in patients with acute traumatic EDH. It has been seen that Glasgow Coma Score (GCS) and the presence of associated intracranial lesions appear to be the most important predictors of outcome (7,8). Other important factors that determine outcome include time from injury to treatment the age of the patient, whether there was immediate coma or there was a lucid interval, presence of pupillary abnormalities, CT Head findings (e,g hematoma volume, degree of midline shift, associated intradural lesion) and post-operative intracranial pressure (7).

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It is being thought that other co-morbidities and other injuries in cases of polytrauma may also affect the final outcome in EDH patients. It is being believed that a very low mortality from acute extradural hematoma is a goal for a modern, health care system for head-injured patients that need prompt referral and adequate hospital facilities for emergency neurosurgery(9). This is a study of incidence and outcome of consecutive patients with traumatic EDH managed in a major Government-controlled multispeciality center in Asia.

MATERIALS AND METHODS

The study is a retrospective analysis of data for all EDH cases recieved in our hospital from Jan 2014 to Dec 2016. Acute EDH was diagnosed by CT scan in all cases. Patients with EDH only or in combination with other intracranial injuries treated in the SMHS Hospital were studied. Age, sex, cause of injury, time of presentation, Glasgow Coma Scale, pupil reactivity, treatment and clinical outcomes were determined. The patients with a very thin rim of EDH with a GCS score of 15 were not operated. Operated patients were kept in ward till discharge. Most of the patients were followed after the discharge also.

RESULTS

There were 1971 head injuries of which 81 (4.1percent) had EDH, with a mean of 27 EDH patients per year. There were 65 (80%) males and 16 (20%) females. The peak age incidence was in the second and third decades of life, with a mean age of 27 years (Table 1) Causes of EDH were RTA in 55 (67.9%), fall in 11(12.3) assault in 8 (9.8%) , cricket ball injury in 5(6.1%) and it was unstated in 2(2.4%) (table2) In our series 72 (90%) patients presented within 24 h of injury. The average time period before presentation was 9 hour. 35 patients (68 percent) of the operated patients were operated within 4 hours from surgery. At presentation 22 patients (27%) had a GCS of 13-15, 36 patients (44%) had a GCS 9-12 and 23 patients (28%) had GCS 3-8 (Table 3).

Table 1 showing age group distribution of patients of EDH

Age group in years	Number of patients	Percentage
0-10	9	11.1
11-20	22	27.1
21-30	21	25.9
31-40	15	18.5
41-50	3	3.7
51-60	5	6.1
61-70	3	3.7
71-80	3	3.7
TOTAL	81	100

Table 2 showing mechanism of injury

Mechanism of injury	Number of patients
Rta	55
Fall	11
Assault	8
Cricket ball injury	5
Unstated	2
Total	81

Table 3 Showing Glasgow coma scale of patients at presentation

GCS score	Number of patients
Less than 8	23
9-12	36
12-15	22
Total	81

Fifty six patients (69.1%) had surgery while twenty five (30.8%) were managed conservatively. In terms of findings at presentation there was varied presentation also. Some (63 patients=77 percent) had decreased GCS, some had papillary dialation (15patients=18 percent), some(10 patients=12%) had had a seizure. 8 patients (9 percent) presented with hemi paresis of varying grades and were managed surgically with complete recovery in 6 patients. The remaining 2 patients showed improvement in power slowly later. All 3 patients with speech impairment on presentation had surgery and had recovered speech fully at discharge. Of the 5 patients that presented with pupillary dilatation, one patient died post-operatively.

Overall, 3 patients (3.7) died after surgery. In those managed conservatively no patient died. All those who died after surgery had a GCS of less than eight. (table4).

Some (10 patients) had seizures as presentation. Among those who had a seizure as part of their presentation 2 died. The overall frequency of seizure was 12%. 20 of 23 patients admitted with a GCS of less than 8 survived. Pediatric patients and the elderly are more likely to die (table 5).

Table 4 showing relation of GCS with mortality

GCS	Number of Survived Patients	Number of Dead Patients
Less Than 8	23	3
9-12	36	0
12-15	22	0

Table 5 showing relation of age to death

Age in years	Number of patients who died
Less than 8	2
Age 8-60	0
More than 60	1
Total	3

DISCUSSION

This study has similar profile with results from other studies in the literature with few peculiarities. In our series EDH represents 4.1 % of all head injuries that we managed. The percentage is 1-3% reported in some other studies (10-12) although a study in one series showed a higher rate (13). The reason for higher rate in our centre is probably that our centre is placed in the area where the violence is more due to certain reasons which need no mention here. This may also represent a selection bias in that many patients with mild head injury may not come to a higher center like ours for neurosurgery consultation, unlike those with more acutely symptomatic and potentially life threatening condition such as EDH. In addition, it has been reported that up to 9% of patients in coma have EDH requiring surgery (14,15).

Road traffic accident and social violence are the predominant predisposing factors in our study, accounting for 78% of patients. This reflects the serious impact of road traffic accident and violence in our society. Since these two factors are eminently preventable by proper enforcement of driving regulations and security measures, other efforts may reduce the rate of head trauma generally. Studies in pediatric populations show a high incidence of falls(16). In our series the incidence of EDH due to falls is 9.8 percent. The percentage in our series being low probably due to our

different architectural designing in our area(pracutions taken while building houses).

The key factors influencing the management strategy and clinical outcome are EDH Volume, location of EDH and GCS at the time of admission. A patient with EDH should not be considered for conservative management if EDH Volume is more than 30 ml and GCS is 13 or less (17).

The recommended surgical intervention for EDH is craniotomy and evacuation of hematoma. In certain emergency situations where less facilities are available and the patient is unstable, use of this procedure may not be feasible, so in those cases one can opt for burr hole with extended craniotomy. All of our patients had formal craniotomy. Burr hole evacuation followed by drainage under negative pressure has been shown as a safe and effective method for emergency management of a pure acute traumatic epidural hematoma (18). In such patients however, craniotomy should be performed if consciousness does not improve within several hours(18). In such patients daily CT Scan should be done at least for first few days (18). We were able to manage 25 of our patients conservatively. Conservative management has been advocated in patients in good clinical state, with small sized collections located in non-dangerous areas and when serial CT facility is available (19). Some patients managed conservatively will subsequently deteriorate and require surgical intervention(4) we found that 25 patients in our series were managed conservatively.

The decision to manage conservatively should be undertaken where close surveillance and prompt neurosurgical intervention is available.In the posterior fossa EDH there is a special case. Wong found that with posterior fosa EDH volume of no more than 10 ml, a thickness of no more than 15 mm, a midline shift of no more than 5 mm, and in the absence of a significant intracranial haematoma elsewhere on computed tomography (CT) scans, the patients undergoing conservative treatment achieved the same excellent outcome as those undergoing early surgery(20). It is strongly recommended that patients with an acute EDH in coma (GCS score < 9) with anisocoria undergo surgical evacuation as soon as possible(14). An epidural hematoma (EDH) greater than 30- cubic cm should be surgically evacuated regardless of the patient's Glasgow Coma Scale (GCS) score. An EDH less than 30 cubic cm and with less than a 15-mm thickness and with less than a 5-mm midline shift (MLS) in patients with a GCS score greater than 8 without focal deficit can be managed nonoperatively with serial computed tomographic (CT) scanning and close neurological observation in a neurosurgical center(14). Delayed developing EDH imply worse outcome and make adequate surveillance of high-risk patients mandatory(4).

In our series only 27% of the lesion in this study was in the temporal region and the classical presentation of lucid interval and other clinical features was seen in only 25% of cases. This is consistent with other reports suggesting that the classical description of a lucid interval is observed in only 10 to 27 % of the patients(2). Also it has been seen that paediatric extradural dural hematoma presents both age-related and atypical features when compared with epidural hematoma in adults(8).

There is a clear relationship between outcome of patients and the time taken between injury and surgical intervention (9,21,22). Guidelines from the Royal College of Surgeons of England recommends that surgical decompression should be carried out within 240 min (4 hours) of the onset of significant symptoms in order to ensure good result.(5) This was not achievable in our series in all patients, where only 90 percent of patients presented within the first 24 h of injury and the average time interval between injury and presentation was 9 hours. But most of our patients 36 (64 percent) of the operated group were operated within the period of 4 hours. In fact transportation facility to our hospital is good which is reason that most our patients reached early to hospital.

5 of our patients (6.1 percent) presented after 24 hours of injury. We assume that presentation with acute EDH in most of these patients represent delayed onset EDH, which has an incidence of 13-30% (4,23). The frequency of delayed onset EDH could not be determined with certainty in this study since earlier brain scans were not available and patients were only scanned on presentation. It has been postulated that delayed EDH results in worse outcome (4). So it is mandatory that adequate surveillance of high-risk patient is essential. The barriers to achieving the target time are varied but include, time taken to make a formal referral to a neurosurgical center, and the time taken to transfer the patient to the neurosurgical center. Financial limitations are also a significant factor in many Asian countries.

We found that 28 % of our patients came with GCS less than 8. Admission GCS is one of the most important predictors of eventual patient prognosis, outcome being better when the initial GCS is high (9,11). In our study, no patient with GCS ≥8 died following hematoma evacuation.

Among the 3 EDH cases that died 2 has had seizures at presentataion. That means sixty six percent of all patients that died had seizure as a part of their presentation suggesting that seizures may be a poor prognostic factor in outcome of EDH. The influence of seizures on observed mortality in these patients may be explained by additional brain swelling (due to seizure) on already critically raised intracranial pressure. In nutshell it is recommended that seizure prophylaxis should be considered in all patients with EDH who present late or with a GCS less than 8.

Mortality rate vary from 10-40% and is an index of alertness and efficiency of health care and hospital setup in a country (19). The overall mortality rate from this study was 3.7 percent which is lesser than some other studies.(9,24,25) This finding could largely be explained by early presentation to our neurosurgical center. Among the patients that died, 100% had a GCS <8 at presentation. However, of the 23 patients admitted with a GCS of less than 8, in our study 20 patients survived. This emphasizes the high proportion of good outcome with prompt intervention in patients presenting with EDH compared with other types of severe head injury. It has been seen that in the last 30 years, mortality from severe traumatic brain injury for those patients who reach to the hospital has been reduced by half from nearly 50% to about 25% (25). People with EDH and a GCS as low as 3 may still have good outcome if they can are taken for surgery promptly (13). Low GCS at presentation adversely affect outcome but should not be an absolute contraindication for surgery. In our series we found that pediatric patients and the elderly are

more likely to die which means that while treating elderly and paediatric patients we have to have separate guidelines (like low threshold for surgery, etc). This aspect of EDH in children has to be taken special care of in future.

CONCLUSION

EDH of the head is a serious complication of head injury, requiring immediate diagnosis and surgical intervention. Survival from traumatic EDH was 96.2%. Low GCS adversely affected outcome but should not be an absolute contraindication for surgery. Early referral of suspected cases of EDH for CT would further improve the outcome. It is also advocated that seizure prophylaxis in patients with EDH presenting with a GCS less than 8 should be started.

References

1. Mishra A, Mohanty S. Contre-coup extradural haematoma: A short report. *Neurology* India. 2001; 49:94-5.
2. Servadei F, Nanni A, Nasi MT, Zappi D, Vergoni G, Giuliana G, *et al*. Evolving brain lesions in the first 12 hours after head injury: Analysis of 37 comatose patients. *Neurosurgery*. 1995; 37:899-907.
3. Lobato RD, Alen JF, Perez-Nunez A, Alday R, Gomez PA, Pascual B, *et al*. Value of serial CT scanning and intracranial pressure monitoring for detecting new intracranial mass effect in severe head injury patients showing lesions type I-II in the initial CT scan. *Neurocirugia* (Astur) 2005; 16:217-34.
4. Korinth M, Weinzieri M, Gilsbach JM. Treatment options in traumatic extradural haematomas. *Unfallchirurg*. 2002; 105:224-30.
5. Royal College of Surgeons of England Trauma Committee. The Royal College of Surgeons of England: A Position Paper on the Acute Management of Patients with Head Injury. *Annals of Royal College of Surgeons of England*, 2005; 87:323-5.
6. Sanders MJ, McKenna K. Head and Facial Trauma. 2nd revised ed. Missouri: Mosby; 2001. Mosby's Paramedic Textbook. Ch. 22.
7. Servadei F. Prognostic factors in severely head injured adult patients with epidural haematomas. *Acta Neurochirgica (Wien)* 1997; 139:273-8.
8. Rocchi G, Caroli E, Raco A, Salvati M, Delfini R. Traumatic epidural haematoma in children. *Journal of Child Neurology.* 2005; 20:569-72.
9. Bricolo AP, Pasut LM. Extradural hematoma: Toward zero mortality. A prospective study. *Neurosurgery*. 1984; 14:8-12.
10. Rehman L, Khattak A, Naseer A, Mushtaq; Outcome of acute traumatic extradural hematoma. Journal of the College of Physicians and Surgeons of Pakistan. 2008; 18:759-62.
11. Hooper R. Observation on extradural haemorrhage. *British Journal of Surgery*. 1959;47:71-87
12. Emejulu JK, Shokunbi MT, Malomo AO. Determinants of outcome in operative treatment of traumatic extradural haematoma. *West African Journal of Medicine.* 2008; 27:32-6.
13. Cheung PS, Lam JM, Yeung JH, Graham CA, Rainer TH. Outcome of traumatic extradural haematoma in Hong Kong. Injury. 2007; 38:76-80.
14. 14. Bullock MR, Chesnut R, Ghajar J, Gordon D, Hartl R, Newell DW, *et al*. Surgical management of acute epidural haematomas. Neurosurgery. 2006 March; 58 (3 suppl) : S7-15. discussion Si-iv.
15. 15. Seelig JM, Marshall LF, Toutant SM, Toole BM, Klauber MR, Bowers, *et al*. Traumatic acute epidural haematoma; unrecognized high lethality in comatose patients. Neurosurgery. 1984; 15:617-20.
16. 16. Gerlach R, Dittrich S, Schneider W, Ackermann H, Seifert V, Kieslich M. Traumatic epidural hematomas in children and adolescents: Outcome analysis in 39 consecutive unselected cases. Pediatric Emergency Care. 2009; 25:164-9
17. Dubey A, Pillai SV, Kolluri SV. Does volume of extradural hematoma influence management strategy and outcome?. *Neurology India* 2004;52:443-5
18. Liu JT, Tyan YS, Lee YK, Wang JT. Emergency management of epidural haematoma through burr hole evacuation and drainage. A preliminary report. Acta Neurochirgica (Wien) 2006; 148:313-7. discussion 317.
19. Babu ML, Bhasin SK, Kumar A. Extradural haematoma-an experience of 300 cases. *J K Science*. 2005; 7:205-7.
20. Wong CW. The CT criteria for conservative treatment-but under close clinical observation-of posterior fossa epidural haematomas. *Acta Neurochirgica (Wien)* 1994; 126:124-7.
21. Deverill JO, Aitken LM. Treatment of extradural haemorrhage in Queensland: Interhospital transfer, preoperative delay and clinical outcome. Emergency Medicine Australasia. 2007; 19:325-32.
22. Leach P, Childs C, Evans J, Johnston N, Protheroe R, King A. Transfer times for patients with extradural and subdural haematomas to neurosurgery in Greater Manchester. *British Journal of Neurosurgery*. 2007; 21:11-5.
23. Domenicucci M, Signorini P, Strzelcki J, Delfini R. Delayed post-traumatic epidural hematoma. A review. *Neurosurgical Review.* 1995; 18:109-22.
24. Servadei E, Piazza G, Seracchioli A, Acchiarri N, Pozzati E, Gaist G. Extradural haematomas: An analysis of the changing characteristics of patients admitted from 1980 to 1986. Diagnostic and therapeutic implications in 158 cases. *Brain Injury* 1998; 2:87-100.
25. Zink BJ. Traumatic brain injury outcome: Concepts for emergency care. *Annals of Emergency Medicine*. 2001; 37:318-32.

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