RESEARCH PAPER | Medical Science | Volume : 6 | Issue : 6 | June 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

Conservative Management in Extradural Hemorrhage

KEYWORDS: Conservative management, Extradural hematoma, Surgical intervention.

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ABSTRACT *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 surface of the skull and the outer layer of dura. Our study was to compare the role of conservative management and surgical intervention in 20 patients treated at our institute for traumatic extradural hematoma (EDH) and outcome and recovery was analysed.*

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 skull and the stripped off dural membrane [1], prognosis is considered excellent if treated immediately. EDH usually is stable, attaining maximum size within minutes of injury, a hypothesis some authors disagree with[2]. However it may progress during first 24 hours after injury. Re-bleeding or continuous oozing presumably causes this progression. Occasionally EDH runs a chronic course and is detected only days after injury. A patient with small EDH may be treated conservatively through 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 Objective
1. Aim of our study was to study the comparative role of conservative management and operative intervention during the management of traumatic EDH.
2. To study recovery and requirement of delayed surgery

Material and Methods:
Our study included only patients diagnosed as EDH after CT scan. Cases with associated cerebral lesions were also included, but only if the relevant lesion was the extradural hemorrhage. The first clinical assessment was made in our trauma unit at Dhiraj hospital on admission. Initial resuscitation efforts included ABC- assessment and stabilization of Airway patency, Breathing and Circulation. A thorough trauma evaluation was done. Detailed history especially about mode of injury, lucid interval and the physical examination included a thorough evaluation for evidence of traumatic sequelae and associated neurological deficits, skull fractures, hematoma, laceration, bradycardia, hypertension, CSF otorrhoea or rhinorrhoea, hemotympanum, GCS score, muscular weakness, aphasia, visual field defects, numbness, ataxia and level of consciousness. Repeated neurological examinations were done to assess the development of raised intracranial pressure. Apart from routine laboratory investigations relevant radiological imaging studies were done. This study was done by dividing patients with EDH into groups according to different clinical parameters and treatment modalities and neuro-radiological findings at the time of admission and hospital stay. Group-A: who required immediate surgical evacuation of the hematoma. Group-B: was further divided into two: B-l, patients who were treated conservatively. B-2, patients who were well with initial conservative treatment despite visible EDH on the first CT scan and who required surgery in the course of conservative management and delayed appearance of EDH on CT scan. Neurological evaluation was immediately undertaken following cardiopulmonary resuscitation, skull and chest X-ray. CT scan head was done in all patients. The dehydrating agent Mannitol, cerebro-protective agent Citecholine and anti-convulsive agent Phenytoin sodium were given through intravenous root,in certain cases that had associated brain injury, edema, convulsion, threatening to coma. Dexamethasone was administered for first few days and then gradually tapered off. Conservative management was immediately terminated and a craniotomy was performed if the patient showed signs of localized brain compression or herniation. Outcome was measured according to Glasgow outcome score by Jannett and Bonds criteria, which include death, vegetative state, severe disability, moderate disability and good recovery. A moderate disability who recovered independence (GOS-3, 2 and 1) were considered to have a good outcome, whilst patients who were severely disabled, vegetative, moribund or died were included together in the poor outcome group. The distribution of good and poor outcome with respect to each of the prognostic factors was examined statistically using a Chi-square test [3].

Results
Out of these 20 patients admitted, Group A had 10 patients which required immediate surgery, Group B-1 had 8 patients, Group B-2 had 2 patients which initially were conserved and later required surgery. Reasons for delayed operative inter-

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vention in 2 patients with neuro-deterioration being the commonest reason involving . Four located at temporoparietal, 2 in temporal and 2 in parietal, 2 in occipital region, 3 in frontal region. 8 patients were managed conservatively . All patients had GCS >12 except 2. all had associated intracranial lesions. There were 6 clots < 10 ml, of them were located in the temporoparietal region, occipital region and there were 4 clots >10 ml, were located at parietal region, frontal region

DISSCUSSION

The interval between injury and development of clinical signs is an important factor in determining the better prognosis than the acute. Most sub acute hematoma arises from venous, often combined, low tension sources of bleeding. The importance of recognizing gradual neurological deterioration and performing craniotomy in these patients is rewarding [4]. CT diagnosis of hematoma before the development of signs of depressed cerebral functions has reduced morbidity and mortality but disability is the greatest risk for a patient whose sub-acute hematoma is evacuated lately [5]. In the case of chronic EDH, there is membranes development and liquefaction of the clot. which may permit drainage of such collections through twist drills and burr holes. The time from development and the neuro-imaging changes on CT can suggest the age and nature of the clot and thus permit timing of surgery so that drainage may be accomplished with a minor procedure [6], In the present study 2 patients (20%) out of 10 deteriorated in course of conservative treatment (group B2) and required surgical interventions. Of these 10 patients only 2 had poor outcome . Significant results are obtained due to CT scan because surgery can be performed quickly in patients in better neurological condition. Repeated CT scans are indicated in patients with worsening symptoms who may have an unusual delayed intracranial hematoma. In this study patients were operated upon immediately after CT scan with poor outcome in only 2 patients. There is no question that to withhold a CT scan of a patient who does not yet have a focal neurological deficit. Jamieson during 1969 stressed that; one must prevent appearance of classical clinical picture [7].

Group	No of Cases	Mode of management	Outcome
A	10	Immediate Surgical intervention	9- Good 1- Poor (Died)
B	10	Managed Consevatively	8- Good
B1	8		
B2	2	Intially managed conservatively later undergone surgery	1- Good 1- Poor (vegetative)

CONSERVATIVE MANAGEMENT:

Sophisticated care of head injury patients in the emergency department does not demand sophisticated knowledge of neurosurgery. Instead it depends upon meticulous attention to the fundamental principles of resuscitation, prevention of secondary insult to brain that can further injure the traumatized brain. For many years it has been known that some patients can tolerate the presence of an intracranial hematoma and will recover even if it is not surgically removed. Cases of EDH, sometimes of considerable size that were not surgically treated were regularly reported in the literature. Traumatic epidural hematomas that are minimally symptomatic do not require surgical intervention. Despite the well performed clinical studies and the experience of many neurosurgeons using prompt evacuation of EDH, there have been number of reports suggesting non-operative management of selective EDH [8-15]. The use of CT scan in head trauma revealed a new class of EDH patients who may be treated conservatively. Such patients should be monitored with frequent neurological examinations and regular serial CT scans to demonstrate resolution of the hematoma and associated shift. With such clinical and radiographic monitoring, a subgroup of patients with acute EDH is detected in whom a return of normal mental status will follow loss of consciousness and in whom spontaneous resolution of their hematoma will occur [16]. In the past these hematoma were occasionally discovered even some weeks after the injury during the course of neurosurgery for other reason namely dural plastic surgery of ACF. Some expressed doubts concerning the need to remove EDH in patients affected by subjective disorders only and without neurological deficits [17], One of the several mechanisms to explain the resorption of the hematoma was the transfer of the clot into the epicranial space through the skull fracture [18]. In some studies the size of the hematoma, rather than its location, the degree of midline shift were the most influential in deciding in favor of surgical treatment in asymptomatic significant EDH [19]. But temporal location of EDH with heterogeneous density in patients whose CT scan was performed was indication for surgery, In our 10 patients managed conservatively two patients had poor outcome, 8 had temporoparietal clots and 2 with occipital clot. All patients with frontal and occipital hematoma having small size had good outcome. 8 patients had Glassgow coma scale GCS > 12, only 2 patients had GCS < 10, GCS >12 and locations other than temporal area may be considered as the criteria for conservative management.

Conclusion

In 10 patients continued conservatively, out of 10 clots <10 ml, 2 patients had poor outcome. All patients with frontal and occipital hematoma having small size had good outcome. 2 patients were needed to be treated surgically during the course of conservative management due to neuro-deterioration. Other causes for delayed surgery includes increase in size of hematoma on CT, bradycardia, hemiparesis, pupillary abnormalities, delay in referral and only 18% had poor outcome. A strict vigilance is to be kept for various reasons mentioned above and patients should be subjected to repeat CT scan. 9 patients out of 10 who were early diagnosed and immediately operated upon had good outcome, which shows the successful results of early diagnosis and intervention. Jannett and Bonds criteria measured outcome according to Glasgow outcome score 8 patients out of 10 had good outcome in Group B. It is stressed that a group of patients can be treated conservatively without undergoing surgical intervention provided a strict vigilance is required to assess clinically supplemented by repeat CT scan.

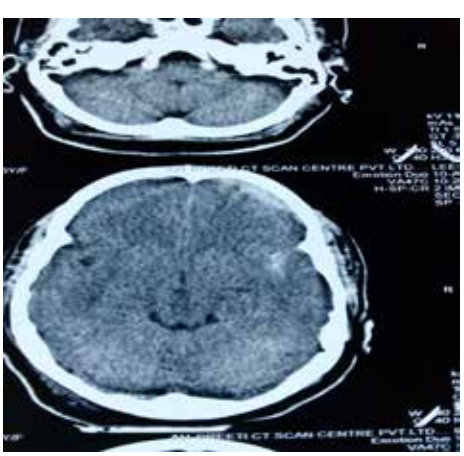

Fig 1- Plain CT scan showing extradural hematoma in left frontal region managed consevatively.

Volume : 6 | Issue : 6 | June 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

Fig 2: Plain CT scan showing extradural hematoma in left temeroparital region managed conservatively.

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