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Role of non operative management of extradural hematoma and reasons for conversion in patients admitted in tertiary care hospital in Bihar

Sumeet Kumar
Assistant Professor, Department of General surgery (Trauma and emergency), IGIMS, Patna, Bihar

Dr. Siddharth Kumar Singh
Assistant Professor, Department of Medicine (Trauma and emergency), IGIMS, Patna, Bihar

Dr. Santosh Kumar Nayan
Assistant Professor, Department of Medicine (Trauma and emergency), IGIMS, Patna, Bihar

Dr. Samarendra Kumar Singh*
Associate Professor, Department of Neurosurgery, IGIMS, Patna, Bihar
***Corresponding Author**

***Abstract*---**Background: A patient with traumatic extradural hematoma may be managed conservatively, but constant monitoring is recommended because neurological impairment might progress suddenly. Aim: The goal of our research was to look into the role of conservative management in traumatic extradural hematoma as well as the various reasons for conversion in patients admitted in tertiary care hospital in Bihar. Methods and Materials: Patients with EDH were divided into two groups. Group-A: those who needed the hematoma surgically removed right away. Group B was subdivided into two subgroups: B1- Individuals who were given conservative treatment. B2 - Individuals who responded well to conservative treatment despite the presence of EDH on its first CT scan and who required surgery during conservative management due to various reasons like neurodeterioration. Complete evaluations were carried out for other factors for conversion of non surgical management into surgical management. Results: In this study a total of 120 patients were evaluated. 31 patients were managed by surgery. 69 patients were managed conservatively. 20 patients were there in which

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conversion from conservative management to surgical management took place. There were numerous causes for delayed operational intervention in the patients admitted, with deterioration in neural function being the most common explanation affecting nine patients. There was one death and three patients who had a bad outcome in patients in which conversion was observed from conservative management into surgical management. In this study sixty nine patients underwent conservative management. 89.95% of them had good outcome while 5.7% had poor outcome and 4.83% participants died. Poor outcome was observed to be higher when lesion was more than 12 ml and located in frontal region or fronto temporal region. Death was more when location was temporal region and temporoparietal region and size was more than 12 ml. Conclusion: The parameters for nonsurgical management of extradural hematoma are size less than 12mm, GCS more than12, and places other than the temporal area... There are numerous causes for delayed operational intervention in the patients undergoing conservative management, with deterioration in neural function being the most common explanation in the patients admitted in tertiary care hospital.

***Keywords*---**Nonsurgical management, extradural hematoma, conversion.

Introduction

Extradural hematoma considered as EDH is the most profound avoidable side effect of traumatic brain injury, needing immediate assessment and surgical treatment. It is a traumatic collection of blood in the area under consideration seen between the inner table of the cranium and the separated off dural membrane. It has excellent prognosis if handled assertively, occurring in two percent of patient populations having head injuries and 5–15 percent of cases with catastrophic injuries of head.[1-3]

EDH is usually stable, reaching maximum size within minutes of injury, according to some researchers. However, it is possible that it will worsen in the initial twenty four hours after the accident. This advancement is thought to be caused by rebleeding or continual leaking. EDH can have a long-term course and only be noticed a few days after an accident.[4-6]

A patient with a modest EDH may be managed conservatively, but constant monitoring is recommended because neurological impairment might progress slowly but suddenly. Though surgical evacuation is the only way to cure this illness, many individuals can be averted from craniotomy with careful monitoring and frequent neurological exams.[7-9]The goal of our research was to look into the function of conservative management as well as the various grounds for surgical intervention in the therapy of traumatic EDH.

Patients and Methods

This study was carried out in IGIMS, Patna from July 1, 2020 to June 30, 2021. A total of 120 patients were included in our study, all of whom were diagnosed with EDH after undergoing a CT scan. Cases with concomitant brain lesions were also considered, but only if the extradural effusion was the relevant lesion. On admission, the very first medical assessment was performed in our emergency department. Assessment and stabilization of airway patency, breathing, and circulation were among the first resuscitation measures. A complete trauma assessment was carried out. a thorough evaluation for evidence of traumatic sequelae and related neurological problems, skull bone fractures, blood clot, severe bruising, bradycardia, high blood pressure, and other associated problems were carried out.

Anisocoria, lack of strength, speech problems and defects in visual field, numbness, and ataxia as well as all symptoms of CSF ottorrhoea or rhinorrhoea were assessed. The development of elevated intracranial pressure was monitored with repeated neurological tests. Aside from standard laboratory tests, pertinent X-ray diagnostic studies were carried out. Patients with EDH were divided into groups based on clinical parameters, treatment modalities, as well as neuro logical as well as radiological observations at the time of enrollment and hospital stay for this study. Group-A: those who needed the hematoma surgically removed right away. It included 31 patients. Group B was subdivided into two subgroups: B1, individuals who were given conservative treatment. It included 69 patients. B2, individuals who responded well to conservative treatment despite the presence of EDH on its first CT scan and who required surgery during conservative management due to some factor. It included 20 patients.

The protocol for conservative management was as follows:
If time allowed, a neurological evaluation was performed immediately after resuscitation, as well as a skull and chest X-ray. All patients had a head CT scan. Mannitol, a dehydrating drug, was used in some circumstances where there was a risk of coma due to brain damage and edoema. Dexamethasone was administered for the first several days and then progressively tapered off. Conservative management was fired right away if the subject started showing signs of concussion, a craniotomy was performed.

A good outcome was judged to be someone with a moderate impairment who regained competence (GOS-3, 2 and 1).While patients with severe disabilities, vegetative state, or death were grouped with each other in the inappropriate result group. A Chi-square test was used to look at the allocation of good and bad outcomes in relation with each of the predictive factors.

Results

In this study a total of 120 patients were evaluated. 31 patients were managed by surgery. 69 patients were managed conservatively. 20 patients were there in which conversion from conservative management to surgical management took place.

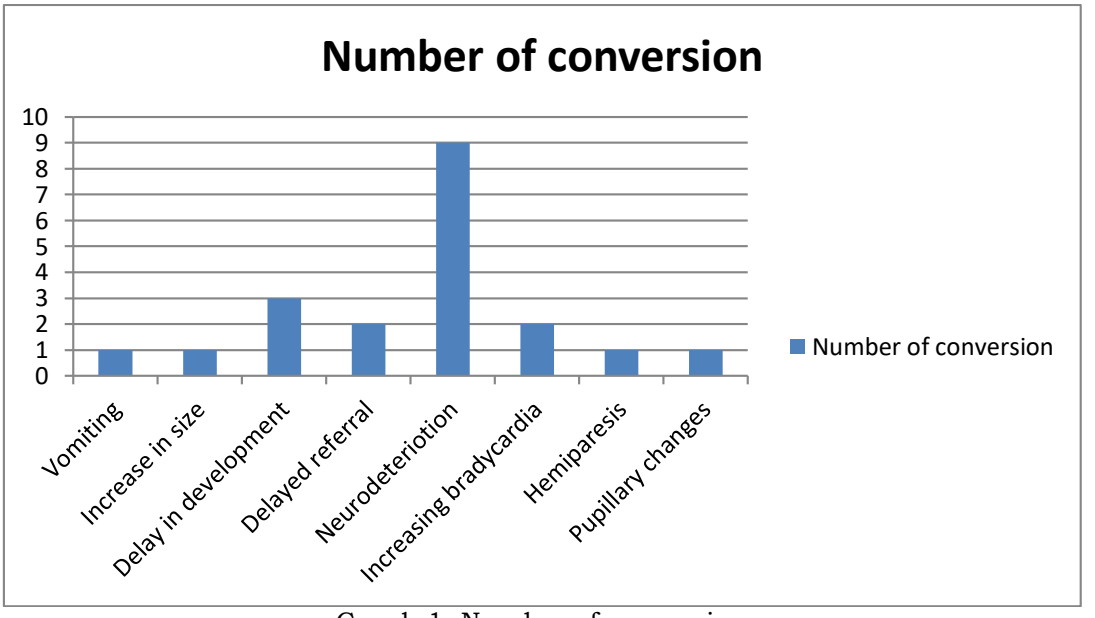
Table 1, graph 1 demonstrates the numerous causes for delayed operational intervention, with deterioration in neural function being the most common explanation affecting nine patients. Four are in the temporoparietal region, two in the temporal and parietal regions, and one in the occipital region, with growth retardation on CT in the frontal region, parietal region, and temporoparietal regions. One of the patients had pupillary abnormalities and hemiparesis in the temporoparietal area. Increased bradycardia was the cause of one case in the temporal region as well as one case in the occipital region. Two patients had a delay in referral, one in the frontal and temporoparietal regions, and one in the frontal region had an increment in hematoma size.(Table 1). In this category of patients, there was one death and three patients who had a bad outcome. In this study sixty nine patients underwent conservative management. 89.95% of them had good outcome while 5.7% had poor outcome and 4.83% participants died. (Table 2). Poor outcome was observed to be higher when lesion was more than 12 ml and located in frontal region or fronto temporal region. Death was more when location was temporal region and temporoparietal region and size was more than 12 ml.

As demonstrated in Table 2, graph 2, fig 1, 67 individuals were treated conservatively. Except for 6, all of the patients had a GCS of greater than 12. Three of the patients died as a result of intracranial lesions. There were 38 clots with a volume of less than 10 mL, 32 of which were found in the temporoparietal area. As demonstrated in Table 2, 67 individuals were treated conservatively. Except for 6, all of the patients had a GCS of greater than 12. Three of the patients died as a result of intracranial lesions. (Table 3)

Table 1
Details of cases converted from conservative treatment to surgical evacuation

Site	Size ml	No of cases	Reason for conversion	Outcome.		Deaths
				Good	Poor	
Frontal	>25	1	Increase in size (1)	1	0	0
	<25	2	Delay in development (1), Delayed referral (1)	2	0	0
Parietal	<25	1	Delayed development (1)	1	0	0
	>25	2	Neuro-deterioration (2)	2	0	0
Temporal	>25	1	Increasing bradycardia (1)	1	0	0
	<25	2	Neuro-deterioration (2)	1	0	0
Temporo	>25	8		5	3	1

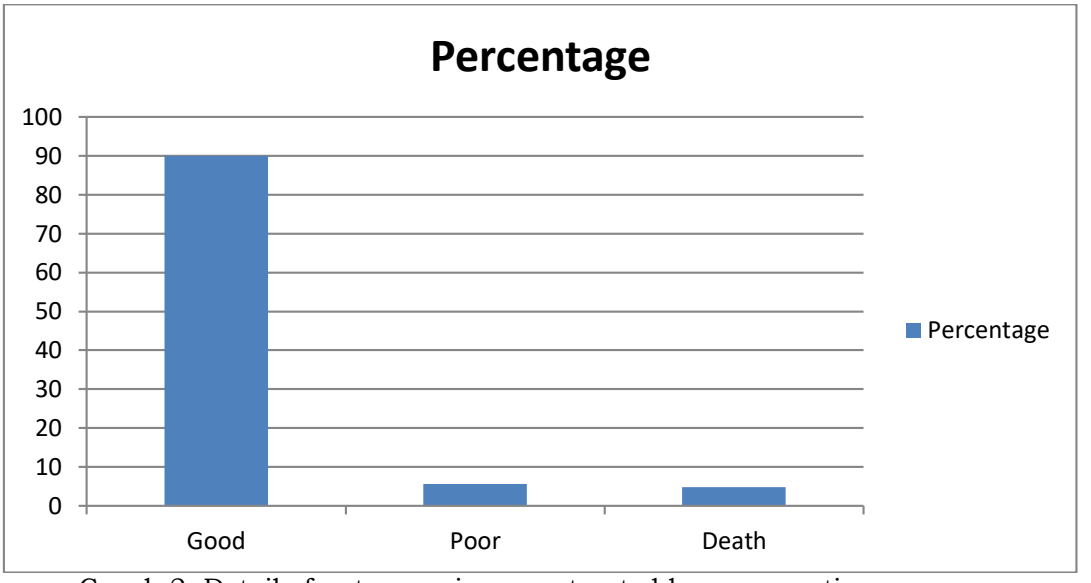
-parietal			Neuro-deterioration (4) Hemiparesis (1), Pupllary changes (1), Delay in development (1), Delayed referral (1)			
	<25	0				
Occipital	>25	2	Increasing bradycardia (1) Neuro-deterioration (1)	2	0	0
	<25	0		0	0	0
Posterior fossa	>25	0				
	<25	1	Vomiting (1)	1	0	0
		20		16	3	1



Graph 1: Number of conversion

Table 2
Detail of cases treated by conservative measures

Site		Number of cases	Outcomes		
			Good	Poor	Death
Frontal and fronto-temporal	Less than 12 ml	11	10	1	0
	More than 12 ml	13	10	3	0
Parietal	Less than 12 ml	13	13	0	0
	More than 12 ml	10	10	0	0
Temporo-parietal and temporal	Less than 12 ml	08	06	1	0
	More than 12 ml	3	1	1	1
Occipital	Less than 12 ml	6	4	1	0
	More than 12 ml	3	1	1	1
Posterior fossa	Less than 12 ml	2	2	0	0
	More than 12 ml	0	0	0	0
Total		69	62(89.95%)	4 (5.7%)	3 (4.83%)



Graph 2: Detail of outcomes in cases treated by conservative measures

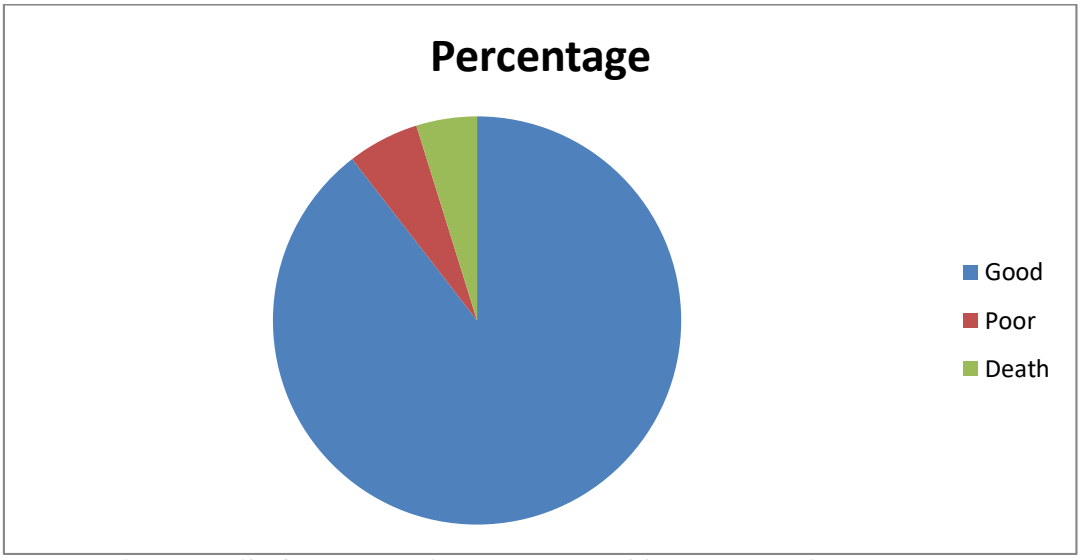


Fig1: Detail of outcomes in cases treated by conservative measures

Table 3
Details of case treated by immediate surgery

		Number of cases	Outcomes		Deaths
Site			Good	Poor	
Parietal	Less than 25 ml	1	1	0	0
	More than 25 ml	4	4	0	0

Temporal	Less than 25 ml	2	2	0	0
	More than 25 ml	3	2	1	2
Frontal and fronto temporal	Less than 25 ml	2	2	0	0
	More than 25 ml	7	7	0	0
Occipital	Less than 25 ml	1	1	0	0
	More than 25 ml	2	2	0	0
Temporal parietal	Less than 25 ml	1	1	0	0
	More than 25 ml	4	3	1	1
Total		31	27	2	2

Discussion

Conscious EDH patients have an extremely low fatality rate. Only individuals who have fell unconscious are at risk of a major herniation consequence. The non-operative treatment of EDH is well documented. As a result, in the conservative care of EDH, patient selection is critical. The management approach is influenced by a number of elements. For nonsurgical management, Dubey & Bezircioglu advocate an EDH thickness of less than 30 mm.[10-12]

A total of 120 individuals were enrolled in this trial, all of whom had been diagnosed with EDH following a CT scan. Concomitant brain lesions were also taken into account, but only if the extradural effusion was the relevant lesion. Our emergency department conducted the initial medical evaluation upon admission. One of the first resuscitation measures was to assess and stabilize airway patency, breathing, and circulation. A thorough trauma evaluation was carried out.

In this study a total of 120 patients were evaluated. 31 patients were managed by surgery. 69 patients were managed conservatively. 20 patients were there in which conversion from conservative management to surgical management took place. Deterioration in neural function being the most common explanation for conversion from conservative management to surgical management affecting nine patients. Four are in the temporoparietal region, two in the temporal and parietal regions, and one in the occipital region, with growth retardation on CT in the frontal region, parietal region, and temporoparietal regions. One of the patients

had pupillary abnormalities and hemiparesis in the temporoparietal area. Increased bradycardia was the cause of one case in the temporal region as well as one case in the occipital region. Two patients had a delay in referral, one in the frontal and temporoparietal regions, and one in the frontal region had an increment in hematoma size. In this category of patients, there was one death and three patients who had a bad outcome. In this study sixty nine patients underwent conservative management. 89.95% of them had good outcome while 5.7% had poor outcome and 4.83% participants died. A patient with a moderate EDH can be treated conservatively, but it's best to keep an eye on them because neurological damage can develop slowly but unexpectedly.[13] Though surgical evacuation is the only option to heal this sickness, with careful monitoring and frequent neurological evaluations, many people can avoid surgical intervention.[14,15]

Conclusion

The parameters for non surgical management of extra duralhaematoma are size less than 12mm, GCS more than12, and places other than the temporal area. Early diagnosis and surgical surgery yielded a positive outcome, demonstrating the benefits of early assessment and therapy. There are numerous causes for the numerous causes for delayed operational intervention in the patients undergoing conservative management, with deterioration in neural function being the most common explanation in the patients admitted in tertiary level hospital.

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