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ORIGINAL ARTICLE

Compare the Outcome of Surgical Versus Conservative Treatment of Traumatic Extradural Hematoma in the Supratentoral Region

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ABSTRACT

Objective: Aim of current study is to determine and compare the outcomes of surgical versus conservative treatment of traumatic extradural hematoma in the supratentoral region.

Study Design: Prospective/ Randomized study

Place and Duration: Conducted at Neurosurgery department of Bacha khan Medical College / Mardan Medical Complex Mardan and Frontier Medical and Dental College Abbottabad for duration of six months from April 2021 to September 2021.

Methods: There were one hundred and eight patients of both genders with ages 14-55 years were included. Included patients had traumatic extradural hematoma in the supratentoral region. Demographically detailed included cause of trauma, age and gender were calculated after taking informed written consent. CT scan was performed among all the patients to diagnose hematoma. Patients were equally categorized into two groups. Group I received surgical treatment and group II received conservative treatment. Symptoms and complications among both groups were assessed. Glasgow comma score was used. Post treatment outcomes were compared among both groups by using t-test. We used SPSS 21.0 version to analyze complete data.

Results: Among 54 patients in group I 31 (57.4%) cases were males and 23 (42.6%) patients were females and in group II 35 (64.8%) were male patients and 19 (35.2%) females. Majority of the patients 65 (60.2%) among both groups were in age group 21-35 years followed by 14-20 years 30 (27.8%) cases. Road traffic accident was the most common cause found in 27 (50%) and 29 (53.7%) in groups I and II. Consciousness loss, vomiting and headache were the most common symptoms. Mean hematoma volume in group I was 29.11±6.38 ml and in group II 22.16±8.47 ml. Mean GCS in group I was 15.07±3.13 and in group II was 16.18±5.38. We found that conservative treatment presented favorable outcomes 53 (98.4%) as compared to surgical treatment in 50 (92.6%) cases. No any mortality found in this study.

Conclusion: We concluded in this study that the conservative for the extradural hematoma in supratentoral region was effective and safe treatment as compared to surgical. Most common cause was RTA. There is no any mortality found in both treatments.

Keywords: Supratentoral Region, Extradural hematoma, GCS, Outcomes

INTRODUCTION

Approximately 2.5 percent to 5 percent of head-injured individuals have an extradural hematoma (EDH), which is a blood clot that develops between the dura mater and the skull. One of the most important distinctions between children and adults when it comes to head trauma is that 'children are not young adults'. Even among children who have suffered head trauma, EDHs are only discovered in 1-3 percent of cases. Accidental falling or blunt head trauma are the most common causes of head trauma in children. [3-5] The middle meningeal artery or vein is the site of bleeding in 73% of all EDH cases, which are almost always linked to a fracture of the temporal bone. In other cases, EDHs are caused by ripping of the dura mater's venous dural sinuses or emissary veins. There is a high incidence of traumatic venous EDHs in children, however the majority of them are not associated with a skull fracture. [6] EDHs are frequently found in the temporal-parietal region because the dura is easily detachable from the bone structure — GerardMarchand's dural detachment regions.

Some research on EDH management in the United States is sparse. In their study, Khan et al [7] indicated that surgery may not be necessary for epidural hematoma with a volume of less than 30 ml. EDH of a non-dangerous location can also be addressed conservatively in a patient with a healthy overall condition, according to him. If GCS is poor and the hematoma is located in the temporal area, the threshold for surgery decreases by even 10 ml. Conventional wisdom has stated that evacuating quickly is the best course of action. As CT is routinely used in the therapy of head injury patients, we believe that non-operative care should be considered more frequently in selected individuals. [9]

Traumatic EDH in children from resource-constrained impoverished nations has been the subject of hysterical literature. In our country of more than 180 million people, there is only one neurosurgeon for every 1.37 million people and 35 neurosurgical centres. In tenths, Even in rural locations, a reliable emergency transportation infrastructure is non-existent. After a long period of time, some of our patients show up at our clinics undiagnosed

and untreated. Patients in developing nations appear in varied ways.

After a few days of injury, EDH can develop into a chronic condition that must be treated. According to the results of the neurological exam, a patient with a modest EDH should only receive non-surgical treatment. [11,12] When it comes to EDH, surgical versus non-surgical treatments were compared in this'study'. According to the research, surgical care of EDH can be avoided in patients with head traumas if the hematoma volume is less than 30 ml. No information is known on the scope of this issue among local residents, though. As long equally conservative care is as effective as surgery in individuals with hematoma volumes less than 30ml, this condition will be treated conservatively moving forward and avoidable procedures will be avoided.

MATERIAL AND METHODS

This prospective/ randomized study was conducted at Neurosurgery department of Bacha khan Medical College / Mardan Medical Complex Mardan and Frontier Medical and Dental College Abbottabad for duration of six months from April 2021 to September 2021. The study comprised of 108 patients. Demographicall details including cause of trauma, age and gender were calculated after taking informed written consent. Patients less than 14 years of age, intracerebral hematoma, post craniotomy hematoma and those did not give any written consent were excluded from this study.

Included patients had traumatic extradural hematoma in the supratentoral region with ages 14-55 years. The EDH volume was measured on a CT scan for all of the patients, and the results were recorded. By employing "the lottery approach," researchers assigned the patients to two groups and "randomly divided them." Surgical treatment was administered to patients in group I. Patients in group II receive conservative treatment. It was the same neurosurgeon who performed the surgeries. There was a 5-day follow-up period after the procedure in the postsurgical ward. The Glasgow outcome scale was observed over the course of seven days.

Symptoms and complications among both groups were assessed. Glasgow comma score was used. Post treatment outcomes were compared among both groups by using t-test. We used SPSS 21.0 version to analyze complete data.

RESULTS

Among 54 patients in group I 31 (57.4%) cases were males and 23 (42.6%) patients were females and in group II 35 (64.8%) were male patients and 19 (35.2%) females. Majority of the patients 65 (60.2%) among both groups were in age group 21-35 years followed by 14-20 years 30 (27.8%) cases. Road traffic accident was the most common cause found in 27 (50%) and 29 (53.7%) in groups I and II.(table 1)

Consciousness loss, vomiting and headache were the most common symptoms.(table 2)

Mean hematoma volume in group I was 29.11±6.38 ml and in group II 22.16±8.47 ml. Mean GCS in group I was 15.07±3.13 and in group II was 16.18±5.38.(table 3)

We found that conservative treatment presented favorable outcomes 53 (98.4%) as compared to surgical treatment in 50 (92.6%) cases. No any mortality found in this study.(table 4)

Table 1: Baseline characteristics of enrolled cases

Variables	Group I	Group II
Gender		
Male	31 (57.4%)	35 (64.8%)
Female	23 (42.6%)	19 (35.2%)
Age Group		
14-20	15 (27.8%)	15 (27.8%)
31-35	32 (59.3%)	33 (61.1%)
36-55	7 (12.9%)	6 (11.1%)
Cause of Trauma		
RTA	27 (50%)	29 (53.7%)
Fall from height	18 (33.3%)	14 (25.9%)
Assault	9 (16.7%)	11 (20.7%)

Table 2: Association of symptoms among both groups

Variables	Group I	Group II
Symptoms		
Consciousness loss	25 (46.3%)	24 (44.4%)
Vomiting	16 (29.6%)	18 (33.3%)
Headache	13 (24.1%)	12 (22.2%)

Table 3: Comparison of hematoma volume and GCS score among both groups

Variables	Group I	Group II
Mean hematoma volume (ml)	29.11±6.38	22.16±8.47
Mean GCS	15.07±3.13	16.18±5.38

Table 4: Comparison of outcomes among both groups

Variables	Group I	Group II
Outcomes		
Excellent	22 (40.7%)	20 (37.04%)
Good	18 (33.3%)	25 (46.3%)
Fair	10 (18.5%)	8 (14.8%)
Poor	4 (7.4%)	1 (1.9%)

DISCUSSION

There is a low death rate for patients with EDH who are conscious.[13] Non-operative management of EDH has been well documented, and patient selection is of highest relevance in this approach.[14] Various factors have been discovered to influence the care strategy, and patient selection is of utmost importance.[15] For conservative care, Dubey & Bezircioglu propose an EDH thickness of less than 30 mm; Bullock recommends 12–38 mm; while Giordano and colleagues have successfully handled patients with EDH thicknesses as high as 55 mm without requiring surgical intervention. .[16] In our study we did not find any mortality among 108 patients as compared to above mentioned studies.

In our study majority of the patients were males 66 (61.1%) and remaining were females. Majority of the patients 65 (60.2%) were in age group 21-35 years followed by 14-20 years 30 (27.8%) cases. Most common cause was road traffic accident. These findings were comparable to the studies conducted in past.[17,18] Consciousness loss, vomiting and headache were the most common symptoms.[19] Recoveries are influenced by a variety of factors, one of which is the location. In most

research, hematomas of the supratentorial region were not included in the analysis. [20] A volume of less than 10 mm in the posterior fossa EDH has been found to be favourable to conservative management in the literature.

In current study mean hematoma volume in group I was 29.11±6.38 ml and in group II 22.16±8.47 ml. Mean GCS in group I (surgical) was 15.07±3.13 and in group II (conservative) was 16.18±5.38. Extradural hematoma was evaluated by Bullock et al[21] in 22 patients with a volume ranging from 12 to 38 ml, all of whom were treated conservatively. As seen on CT scans, the hematoma disappeared on its own, allowing for a full neurological recovery over the course of 3–15 weeks. In the majority of research, a worse outcome has been linked to a lower GCS. [22] As a result, we set a GCS 13 or above criterion for our patients. Other factors that adversely affect the outcome include a thickness greater than 15 millimetres and a midline shift greater than 5 millimetres. [23]

We found that conservative treatment presented favorable outcomes 53 (98.4%) as compared to surgical treatment in 50 (92.6%) cases. In one study, 75.6% of patients had a positive outcome from surgery, while 93.6% of patients had conservative treatment (p=0.007). Surgeons were found to have a mortality rate of 14.7 percent, while the rate was nil with conservative treatment (p=0.005). [24] It was found that 22 individuals with EDH, who were likewise treated conservatively, were included in Pozzati et al's research study. There were no symptoms or minimal neurological abnormalities at the time of admission for any of these patients. [25] Patients with EDH and their treatment plans were examined by Zakaria et al. [26] in 2013, who focused on surgical and conservative approaches. When patients' symptoms improve but their Glasgow Coma Scale stays the same, they said, conservative care of EDH can be used effectively. More over half of 74 patients with EDH following trauma were treated conservatively; 14 had surgical evacuation as a result, according to a study by Chen Tzu-Yung et al. [27] They had a supratentorial hematoma (volume larger than 30 ml) that caused a midline shift of more than 5 mm and was thicker than 15mm, therefore surgery was necessary for them. Anesthesia and surgery have modest combined complications, according to Gerlach et al.[28]. As the attending neurosurgeon's subjective judgement and the available resources and staff are considered, the decision to operate will be made. In 23% of the patients, the hematoma size increased within the first 36 hours.

Surgical and non-surgical approaches to treating traumatic EDH30ml were shown to be equally successful in terms of patient outcomes and mortality in this particular study. Treatment with the conservative strategy is advised because it is both safe and cost-effective for the patients involved. There can be little doubt that surgical intervention plays an important role in the treatment of EDH, especially in individuals who have growing neurological impairments or whose blood is collected in potentially harmful locations such as the temporal and posterior fossa. [29]

CONCLUSION

We concluded in this study that the conservative for the extradural hematoma in supratentoral region was effective and safe treatment as compared to surgical. Most common cause was RTA. There is no any mortality found in both treatments.

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