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CONTENTS

Editorial 38

Original Articles

Histopathological Profile of Posterior Cranial Fossa Midline Tumors in Children 40
Md. Arif Reza, Kaisar Haroon, Rawzatul Zannat, K. K. Barua

Surgical Outcome of Extradural Haematoma Associated with Parenchymal Injury 43
ATM Ashadullah, Monirul Islam, Shafiul Alam, Sanat Kumar saha, Joynul Islam, Fazle Elahy

Comparative Analysis of the Surgical Outcome of Traumatic Acute Subdural Haematoma with Associated and not Associated Underlying Brain Injury 47
Sanat Kumar Saha, Mohammad Abu Sayed, Joynul Islam, Shafiul Alam, ATM Asadullah, Misbah Uddin Ahmad, Shamsul Islam Khan

Spontaneous Intracerebral Haematoma: Socioeconomic Information, Precipitating Factors, Clinical Presentations and Neurological Findings by CT Scan 51
Mohammad Nazrul Hossain, Shamsul Islam Khan, Israt Zerin Eva, Mohammad Harun Ur Rashid, Mahmudul Hasan, Nazmul Hassan, Rumana Kamal, Md. Reaz Ahmed Howlader

Case Report

Aneurysmal Bone Cyst of the Lumber Spine : A Case Report 59
Shafiul Alam, Tayseer Farzana, Kazi Hafiz Uddin, Shamsul Islam Khan, ATM Asadullah

Non-traumatic High-Pressure Cerebrospinal Fluid Rhinorrhea as an Initial Presentation of Tentorial Base Meningioma- Case Report and Review of the Literature 62
Dhiman Chowdhury, Nazmin Ahmed, Bipin Kumar Chaurasia, Nwoshin Jahan, Rabiul Karim, Kanak Kanti Barua

Extradural Cavernous Hemangioma of Thoracic Spine- A Case Report 67
Kaisar Haroon, Tania Taher, Moklasur Rahman, Sk. Sader Hossain

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Original Article

Surgical Outcome of Extradural Haematoma Associated with Parenchymal Injury

ATM Ashadullah[1], Monirul Islam[2], Shafiul Alam[3], Sanat Kumar saha[4], Joynul Islam[5], Fazle Elahy[6]

Abstract:

Background: Extradural haematoma with cerebral compression is one of the most urgent of all surgical emergencies. Treated on time the patient make full recovery. Failure to diagnose and operate will definitely lead to death.

Introduction: The aim of this study was to elucidate and compare the outcome of extradural haematoma and extradural haematoma with associated parenchymal injury after surgical evacuation of haematoma.

Methodology: A total 86 patients were included in this study. These patients were divided into two groups: Group A extradural haematoma with parenchymal injury 40 patients and Group B extradural haematoma without parenchymal injury 46 patients. The outcome of the patients were analyzed by Glasgow outcome scale (GOS).

Results:In this series in group A, out of all patients with favorable outcome 36.7% had GCS 3-8, 60.0% had GCS 9-13 and 3.3% had GCS 14-15 and in patients with unfavorable outcome 90.0% had GCS 3-8 and 10.0% had GCS 9-13%. In group B, out of all patients with favorable outcome 18.6% had GCS 3-8, 41.9% had GCS 9-13 and 39.5% had GCS 14-15 and in patients with unfavorable outcome all had GCS within 3 to 8.

Conclusion: It can be concluded that unfavorable outcome was observed in patients with extradural haematoma associated with parenchymal injury, which was statistically significant.

Key Words: Surgical outcome, Extradural haematoma, Associated with parenchymal injury.

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Introduction:

Extradural haematoma is a collection of blood between the skull and the dura mater. It is caused by a ruptured artery or vein in the epidural space due to trauma. Historically, bleeding from the middle meningeal artery has been considered the main source of bleeding[1].There is a lot of controversy in the management and its outcome though surgery is the treatment of choice.This is observed that extradural haematoma if treated early the prognosis is usually excellent because the damage to the underlying brain is usually limited and outcome is directly limited to the neurological status of the patient before surgery[2]. Extradural haematoma and associated parenchymal injury following trauma precipitates a cascade of adverse metabolic events, which culminate in a cycle of swelling, reduction in blood flow and in oxygen and glucose supply. Immediate surgical evacuation of clot to reduce intracranial pressure following acute brain injury is the corner stone in the management of these patients. The introduction of surgical intervention to reduce intracranial pressure has been one of the factors leading to potential improvements in outcome[3,4]. The aim of this study was to elucidate and compare the outcome of extradural haematoma and extradural haematoma with associated parenchymal injury after surgical evacuation of haematoma.

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Materials and methods:

This was a quasi-experimental study. This study was carried out in the department of Neurosurgery, Dhaka medical college Hospital between the period of January,2007 to December, 2008. The sample technique was purposive. All the patients who underwent surgery with diagnosis of extradural haematoma with or without parenchymal injury were included in this study. Non traumatic extradural haematoma, bilateral extradural haematoma, posterior fossa extradural haematoma and patient not willing to participate in this study were excluded. A total 86 patients were included in this study. These patients were divided into two groups: Group A extradural haematoma with parenchymal injury 40 patients and Group B extradural haematoma without parenchymal injury 46 patients. The outcome of the patients were analyzed by Glasgow outcome scale (GOS). All the data were checked and edited after collection. Then the data were entered into computer and statistical analyses of the results were obtained by using window based computer software devised with Statistical Packages for Social Sciences (SPSS-13). The results were presented in tables and figures.

Results:

Table-I

Distribution of the patients by age.

Age (Years)	Group		p value
	A	B	
<10	2(5)	4(7)	
11-20	11(27.5)	11(29.3)	
21-30	9(22.5)	12(26.1)	
31-40	10(25)	10(21.7)	
41-50	4(10)	5(10.9)	
>50	4(40)	4(8.7)	
Total	40(100)	46(100)	
Mean±SD	30.8±14.65	29.61±15.5	0.716

Table-II

Distribution of the patients by sex.

Sex	Group		p value
	A	B	
Male	35(87.5)	41(89.1)	0.814
Female	5(12.5)	5(10.9)	
Total	40(100)	46(100)	

Table-III

Distribution of the patients by parenchymal injury in Group A.

Parenchymal injury	Frequency	Percentage
Cerebral contusion	28	70
Intra parenchymal haemorrhage	8	20
Diffuse axonal injury	4	10
Total	40	100

Table-IV

Distribution of outcome of the extradural haematoma in Group A.

GCS	Glasgow outcome scale		p value
	Favorable (4-5)	Unfavorable (1-3)	
3-8	11(36.7)	9(90.0)	0.014
9-13	18(60.0)	1(10.0)	
14-15	1(3.3)	0(0)	
Total	30(100.0)	10(100.0)	

Table-V

Distribution of outcome of the extradural haematoma in Group B.

GCS	Glasgow outcome scale		p value
	Favorable(4-5)	Unfavorable(1-3)	
3-8	8(18.6)	3(100.0)	0.006
9-13	18(41.9)	0(0)	
14-15	17(39.5)	0(0)	
Total	43(100.0)	3(100.0)	

Table-VI

Distribution of Glasgow outcome scale by Group at discharge of the patients.

Glasgow outcome scale	Group		p value
	A	B	
5 (Good recovery)	13(32.5)	42(91.3)	0.001
4 (Moderate disability)	17(42.5)	1(2.2)	
3 (Severe disability)	6(15.0)	3(6.5)	
2 (Persistent vegetative state)	1(2.5)	0(0)	
1 (Death)	3(7.5)	0(0)	
Total	40(100.0)	46(100.0)	

Discussion:

Extradural haematoma is considered among the most rewardingly responsive traumatic lesions treated by

neurosurgeons. The prognosis is nevertheless influenced by age, degree of comma, pupillary reaction to light, treatment delay, the size and site of the haematoma and the mechanism of injury[5,6]. The presence of concomitant intradural lesion with extradural haematoma is recognised as poor prognostic factor. With the availability of CT scan , it is now possible to define accurately the extent of the intrdural damage pre-operatively or in the early post-operatve period[7]. In this study out of all patients of group A (extradural haematoma with parenchymal injury) 82.5% and in group B (extradural haematoma without parenchymal injury) 71.7% had history of unconsciousness from onset. The presence of an intradural abnormality with extradural haematoma increased the percentage of patients who were unconscious from onset from 9 to 11% and decreased the percentage of conscious patients from 15 to 7%[8]. It has also been reported that an additional intradural damage increased the percentage of the unconsciousness in elderly patients with extradural haematoma from 35 to 62%[9].In this study, associated parenchymal injury, which was seen on CT scan findings were predominantly cerebral contusion (70%) followed by intraparenchymal haemorrhage (20%) and diffuse axonal injury (10%). Associated intracranial lesions are found in between 30 and 50.5% of adult patients with surgically evacuated extradural haematoma. These are predominantly contusions and intracerebral haemorrhages followed by subdural haematoma and diffuse brain swelling[10,11]. In this series in group A, out of all patients with favorable outcome 36.7% had GCS 3-8, 60.0% had GCS 9-13 and 3.3% had GCS 14-15 and in patients with unfavorable outcome 90.0% had GCS 3-8 and 10.0% had GCS 9-13%. In group B, out of all patients with favorable outcome 18.6% had GCS 3-8, 41.9% had GCS 9-13 and 39.5% had GCS 14-15 and in patients with unfavorable outcome all had GCS within 3 to 8. Among the both group whose GCS was 3-8 had undergone worst outcome. Several authors found that GCS before surgery is the single most important predictor of outcome in patient with extradural haematoma undergoing surgery[12,13].In the present study surgical outcome of both groups were evaluated during discharge and after one month. At discharge out of all patients of group A, 32.5% had good recovery, 42.5% had moderate disability, 15.0% had severe disability, 2.5% had persistent vegetative state and 7.5% patients died from group A all had GCS3-8 and found all mortality within the end of first week. In group B, 91.3% had good recovery, 2.2% had moderate disability and 6.5% had severe disability. No death occurred in group B. After one month out of all patients good recovery occurred 35.1% in group A and 91.3% in group B, 45.9% moderate disability in group A and 2.2% in group B and severe disability in both group A and group B was 16.2% and 6.5% respectively. 2.7% persistent vegetative state occurred only in patients of group A. Statistically significant difference was observed between groups in term of Glasgow outcome scale. It also observed that associated brain lesions as one of four independent predictors of unfavorable outcome after surgery for extradural haematoma[14]. The incidence of concomitant intradural abnormality in patient with extradural haematoma significantly increase the mortality rate from 7% to 19%[7]. In this series unfavorable outcome was observed in patient with low admission GCS and extradural haematoma patients with associated parenchymal injury.

Conclusion:

It can be concluded that unfavorable outcome was observed in patients with extradural haematoma associated with parenchymal injury, which was statistically significant.

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