

Efficacy of Ventriculoperitoneal Shunt For The Management of Cerebellar Haematomas

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ABSTRACT:

Object: To determine the role of ventriculoperitoneal shunt in the management of cerebellar haematoma with obstructive hydrocephalus.

Study: This is a retrospective study of 10 cases during a period of 4 years from Feb. 2003 to Feb. 2007, conducted at the Department of Neurosurgery, PGMI / Lahore General Hospital, Lahore.

Result: A total of 10 cases were included in the study. Six (60%) were male and 4 (40%) were female. Age range was from 35 – 63 years. The clinical presentation was sudden severe headache, vomiting, loss of consciousness. Glasscow coma score was $6/15$ to $13/15$. C T Scan brain revealed cerebellar haematoma compressing the fourth ventricle with obstructive hydrocephalus. The range of volume of cerebellar haematoma was from 20 ml to a maximum of 80 ml. Various management plan were offered, decision was done case to case basis. Three (30%) patients with mean cerebellar haematoma volume of 30 ml (range 20-40) obstructive hydrocephalus were managed by a ventriculoperitoneal shunt (V.P. Shunt) alone. All three patients had excellent post operative recovery within a period of 2 to 4 weeks. Seven (70%) patients were operated for removal of cerebellar haematoma alongwith external ventricular drain (EVD.), which was removed on 5th – 7th day but in one case V.P. shunt was inserted post operatively. Result were good in 3 cases, excellent in 2 cases, fair in one case due to persistant hydrocephalus and mortality in one case. The patient who died was operated for removal of cerebellar haematoma and external ventricular drain was passed He died due to chest infection post operatively. Thus out of 10 cases V.P. shunt was done in 4 cases.

Conclusion: For the management of cerebellar haematoma, ventriculoperitoneal shunt is an important and efficacious method either alone or in combination with surgery for removal of cerebellar haematoma. Moderate size cerebellar haematoma (20 – 40 ml) can be managed with V.P. shunt alone.

Keywords: Cerebellar haematoma, intracranial haematoma, obstructive Hydrocephalus, ventriculoperitoneal shunt.

Abbreviations: EVD: External ventricular drain. V.P. Shunt: Ventriculoperitoneal shunt..

INTRODUCTION

Spontaneous cerebellar haematoma are less common then supratentorial haematomas but their management is a challenge for neurosurgeons. Causes of spontaneous intracerebellar haematoma includes hypertension, vascular malformation, coagulopathies, Aneurysms and tumours.¹ Deterioration of patient is more rapid when blood in present in the cerebellum because of direct compression on the ventricular system result-

ing in blockage of 4th ventricle and obstructive hydrocephalus. Secondly the hermination like tonsillar herniation may occur rapidly due to small volume available in posterior fossa. Therefore it is always necessary to react effectively against a smaller haematoma in the cerebellum so that challenge of raised ICP may be delt within appropriate time period. These haematoma have prolonged affect as well because ventricular system and outlets of CSF are compromised therefore chance

of chronic Hydrocephallus is also important which can be addressed with permanent CSF diversion procedures like V-P shunt insertion¹. Controvercies still exist in the treatment protocols.²

MATERIAL AND METHODS

This is a retrospective study of 4 years from June 2003 to June 2007, conducted at the department of Neurosurgery PGMI / Lahore General Hospital Lahore. Spontaneous cerebellar haematoma were included in the study. All of these haematomas were subsequent to uncontrolled hypertension. Patients were not using anti hypertensive drugs regularly. Cerebellar haematomas due to other causes were not included in this study.

It our study patient were divided in 3 groups, depending upon the treatment strategies.

Group A includes V-P shunt alone with no surgery on haematoma itself.

Group B had surgical evacuation of haematoma and External Ventricular drain.

Group C has all the these things during the course for disease i.e. Surgical removal of haematoma, temporary ventricular drainage (EVD) to reduce intracranial pressure. ICP and finally insertion of V-P shunt to reduce the effect of hydrocephalus. All the patients were admitted through emergency department. We had taken focused on risk factors and purely hypertensive bleeds were selected for study, all other cause of bleed were Excluded. After the routine investigations CT Scan brain was performed for definitive diagnosis and final decision for treatment was taken depending upon the sift, size, compression of 4th ventricle, associated injury and Hydrocephalus. No doubt conscious level of the patient was monitored strictly to observe any change, consequences measures were taken to change in decision about surgical management.

RESULTS

Sex Incidence

Out of 10 cases (60%) were male and 4 (40% were female shown in table 1.

Table 1: Sex Incidence.

Sex	Number	%
Male	6	60
Female	4	40
Total	10	100

Age Range

Youngest patient was 35 years of age and oldest patient was 65 years of age. Mean age was 55.8 years as shown in table 2.

Table 2: Age Range.

S. No.	Sex	Age
1.	Female	35
2.	Male	45
3.	Male	48
4.	Female	40
5.	Male	50
6.	Male	55
	Female	60
7.	Female	48
8.	Female	52
9.	Male	65
10.	Male	60

Clinical Presentation

All patients were hypertensive and most of them were using the antihypertensive drugs irregularly hence blood pressure was uncontrolled and fluctuant.

All cases presented with sudden severe headache, vomiting Nausea and loss of consciousness. Four patients were using Disprine for the relief of headache too frequently (Table 3).

Examination revealed pappilloedema in 6 cases Glasgow come scale was between ⁶/₁₅ to ¹³/₁₅ in all cases, selected for this study.

Cranial nerve deficits were present in 3 (30%) cases. Diabetese mellitus was present in 5 cases. All patients were admitted through Emergency department of Lahore General Hospital Lahore. Five cases were referred from other hospitals.

Investigations

Routine investigations were peritoneal in all patients. CT scan brain was the investigation of choice for diagnosis in all cases. CT scan brain revealed cerebellar haematomas of size 20 ml – 60 ml with obstructive hydrocephalus.

Surgical Procedures and Recovery

As regards surgical procedures patients can be divided into following groups:

Group A: V.P. Shunt alone was performed in 3 cases. All had excellent recovery within 2-3 weeks.

Group B: Surgical removal of cerebellar haematoma and external ventricular drain for 5-7 days in 7 cases, one patient died of pulmonary infection. 3 cases revealed good recovery. Excellent recovery was in 2 cases. One case had fair recovery (slow recovery within 2 months).

Group C: Surgical Removal followed by V.P. Shunt. Among those 7 cases of group B, External Ventricular Drain (E.V. D.) was removed on 7th day and V.P. Shunt was inserted in 1 case due to prolonged Hydrocephalus post operatively. The recovery was labeled “fair” due to prolonged recovery period and second surgery.

Table 3: Clinical Presentation.

Clinical Feature	No.	%
Headache	10	100%
Vomiting	10	100%
Loss of Consciousness	9	90%
Neck stiffness	3	30%
Papilloedema	6	60%
G.C.S.	6/15 — 13/15	100%
Cranial Nerve deficit	3	30%
Hypertension	10	100%
Diabetese Mellitus	5	50%

This case also showed good clinical recovery but his recovery was labeled as fair (being requiring 2 surgical procedures). These results are shown in table 4.

DISCUSSION

The management of cerebellar haematomas is always a challenge for neurosurgeons. But timely decision and intervention can improve the outcome many fold. We performed first a ventriculoperitoneal shunt to relief the acute Hydrocephalus due to a moderate size cerebellar haematoma (average 30 ml). These patients recorded excellent results. Role of V.P. Shunt in cerebellar haematomas have been reported in other international studies as well:

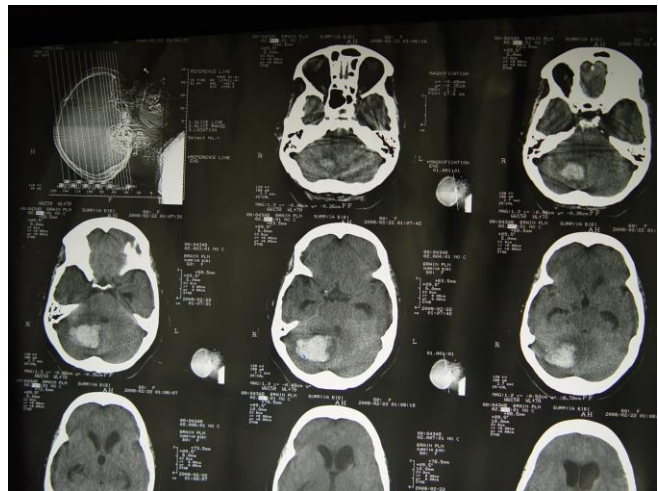


Fig. 1a-b: a: Preoperative CT Scan brain showing cerebellar haematoma with obstructive hydrocephalus (b).

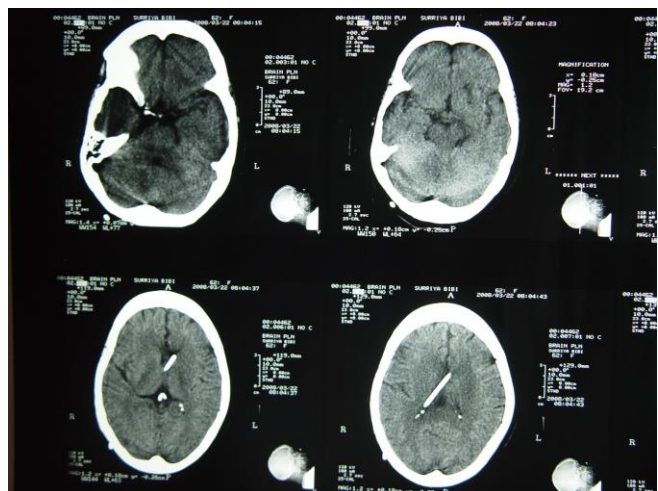


Fig. 2: a: Postoperative CT Scan brain showing V. P Shunt insitu Cerebellar haematoma resolved with no obstructive hydrocephalus.

Table 4: *Surgical Procedure and Recovery.*

Surgical procedure	No. of Cases	%	Excellent	Good	Fair	Mortality
A. V.P. Shunt alone	3	30%	3 (30%)			
B. Surgical Evacuation + EVD	6	60%	2 (20%)	3 (30%)		1 (10%)
C. Surgical removal, EVD and V.P. Shunt	1	10%			1 (10%)	

The Category of Results are as below:

Excellent: Smooth and Rapid Recovery Neurologically brain 3 Weeks.

Good: Slow Recovery within 4 – 6 Weeks.

Fair: Slow Recovery (3 – 6 weeks) and requiring second Surgical intervention (e.g. surgical Removal and EVD as first surgical procedure and the V.P. Shunt as 2nd surgical procedure).

Perez Nanez A and Colleague out lined different criteria of dealing with cerebellar haematoma and they are agreed that management should be decided on the individual basis as there is no enough evidence to support a strict treatment protocol.³

Some authors grade the haematoma in cerebellum in three grade i.e. **Grade I** normal looking 4th ventricle **Grade II** compressed IV ventricle and **Grade III** totally effected ventricle according to their studies position of 4th ventricle is important in the final outcome of surgery.^{3,4}

Mathew has discussed in detail the role of EVD in the patients suffering from stroke of posterior fossa. He observed that after EVD only 50% patients require craniectomy and evacuation of haematoma while the remaining resolved with only EVD and conservative measures.⁵

Quadrigeminal cistern obliteration on CT Scans was regarded as predictor of outcome. Taneda divided the Quadrigeminal cisterns in three Grades: normal (grade I) compressed (Grade II) or absent Grade III according to him Grade III cistern invariably predict an unfavourable outcome.⁶

Temporary External ventricular drain for the management of hydrocephalus in cerebellar haematomas is common practice and has been reported in multiple international studies.³⁻⁵

The surgical group C i.e. surgical removal of cerebellar haematoma and external ventricular drain in the 1st step and then V.P. Shunt due to persistent Hydrocephalus is a rare condition but still has been reported in International literature. The commonest cause of spontaneous cerebellar haematoma is uncontrolled Hypertension which is also reported in other studies.⁷

1988 Gradong system used by Yoshida is more practical and give a good prognostic relation of grades

with final outcome. He divide the hypertensive cerebellar haemorrhage in 5 grades.

Grade I indicates cerebellar signs without disturbance of conscious and size of haematoma less than 25 mm measured by CT Scan.

Grade II, indicates disturbance of consciousness (stupor) or progressive neurological deficits and size of haematoma less than 50 mm with acute hydrocephalus.

Grade III reveals disturbance of consciousness (stupor-semicoma) and size of hematoma less than 50 mm with acute hydrocephalus.

Grade IV disturbance of consciousness (semicoma) and size of haematoma less than 50 mm with massive ventricular haemorrhage.

Grade V includes patients in deep coma and more than 50 mm diameter of haematoma.

Ishikawa T. et al has published his experience of 23 cases of cerebellar hemorrhage. He had treated 2 cases with CSF diversion procedure without surgery for haematoma itself. In both cases size of cerebellar haematoma was less than 40 mm in diameter. He concluded that evacuation of hematoma is indicated for the

1. patients with hematoma of more than 40 mm in diameter on CT Scan.
2. The patients whose consciousness level is progressively aggravated regardless of size of hematoma.
3. The patients whose CT scan shows deformity or obstruction of ambient and/or prepontine cisterns.⁹

CONCLUSION

From the results of this study, we can conclude that:

- (i) In cerebellar Haematoma, CSF diversion procedure (External Ventricular drain or V.P. Shunt)

is required in most of the cases of acute obstructive hydrocephalus.

- (ii) V.P. Shunt alone is sufficient to treat the cases of moderate size cerebellar haematoma (20-40 ml) with obstructive hydrocephalus without performing surgery for removal of haematoma.

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