



**A CASE SERIES OF 40-OUTCOME OF VENTRICULOPERITONEAL SHUNTS IN PATIENTS OF HYDROCEPHALOUS**

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**ABSTRACT**

**Introduction** - Hydrocephalus has amazed and challenged clinicians throughout the history of medicine. Hydrocephalus is an abnormal accumulation of cerebrospinal fluid (CSF) in the ventricles, or cavities, of the brain. **Aims & Objectives** - The aim of our study is to evaluate the outcome of V.P. shunts in terms of complications, shunt survival, reoperation and mortality. **Maetrial & Method** - Prospective and retrospective data are used to formulate the present study. We have registered 40 cases of hydrocephalous from all age group admitted/operated (Ventriculoperitoneal shunt) in Department of Neurosurgery, L.L.R.M. Medical college, Meerut U.P. The period of study was from October 2012 to October 2013. **Conclusion** - Result showed that in total 40 patients, Seven (07) Patients (17.5%) had >1 shunt surgeries. It was found that single shunt revision was done in 5(12.5%) out of total 40 patients. In 2 patients (5%) shunt revision was done twice. Shunt survival was calculated from the time of shunt insertion to the development of shunt-related complications. The median time of shunt survival is 19.71 months in the study done at LLRM meerut. Median shunt survival in the reoperated group (in 7 patients) was found to be 26.06 months.

**KEYWORDS:** cerebrospinal fluid (CSF), Ventriculoperitoneal shunt.

**INTRODUCTION**

Hydrocephalus is usually due to blockage of cerebrospinal fluid (CSF) outflow in the ventricles or in the subarachnoid space over the brain. The goal of treatment is to reduce or prevent brain damage by improving the flow of CSF. Hydrocephalus treatment is surgical, generally creating various types of cerebral shunts like ventriculoperitoneal shunts, ventriculoatrial shunts and lumbar peritoneal shunts. In the present study an attempt has been made to study the clinical & radiological features of hydrocephalous, its management (VP Shunt) and outcome. Study material used for the present study are the patients of hydrocephalous presented to SVBP hospital and treated here surgically and kept in follow up for assessment of outcome.

**AIMS AND OBJECTIVES**

To study the epidemiology of hydrocephalous in all age groups, Etiology of hydrocephalous, mortality and morbidity following VP shunt, reoperation rate & to study final outcome of VP shunt in patients of hydrocephalous.

**MATERIAL AND METHOD**

Prospective and retrospective study of outcome following VP shunt in patients of hydrocephalous.

**INCLUSION CRITERIA**

Patients of hydrocephalous admitted in SVBP hospital from all age groups and both sexes are included.

**EXCLUSION CRITERIA**

Hydrocephalous patients who don't give consent for operation, are unfit for surgery under GA and having intra abdominal peritoneal pathology are excluded from the study.



**Observation in patients of hydrocephalous admitted in llrm meerut.**

**CLINICAL PRESENTATION (total patients 40).**

Clinical Features	NO OF PATIENTS
Increased head size	11
Fever	15
Headache	10
Altered sensorium	08
Seizure	04
Vertigo	01
Neurological deficit	05
Diminished vision	03
Excessive cry	01

(Many patients have more than one symptoms).

**COMPLICATIONS BASED ON ETIOLOGY OF HYDROCEPHALOUS**

	HEADACHE	extrusion	SEIZURE	UNCONSCIOUSNESS	CN PALSY	DIMINUTION OF VISION	EXPIRY	Shunt block	POSTURE(decerebrate/decorticate)
AQUIRED SPACE OCCUPYING LESION(n=9)	0	0	1	0	0	0	1	1	0
CONGENITAL AQUEDUCTAL STENOSIS(n=14)	3	0	1	0	0	1	0	4	0
TUBERCULAR INFECTION(n=15)	5	0	1	6	4	2	1	3	2
PYOGENIC INFECTION(n=4)	1	1	3	1	0	0	1	0	2

**Number of Times The Patients of Hydrocephalous Reoperated.**

NO OF TIMES OP.	NO OF PATIENTS (%)	Total procedures done
ONCE	31 (77.5%)	31
TWICE	5 (12.5)	10 (5+5 reoperated)
3 TIMES	2 (5%)	06 (2+4 reoperated)
4 TIMES	0 (0%)	00
NONE	1 (2.5%)	00
total	39	47

1 patient had EVD under LA.

Single or Multiple revisions were done during the follow up period. Those patients that came for followup after previous shunt surgeries and planned for revision were included in the study.

In the present study it was found that 31 patients were operated (VP shunt) only once. 7 Patients had >1 shunt surgeries.

Shunt revision rate was 9/47(19.14%).

31 out of 38 patients operated (VP SHUNT) are doing well with single shunt surgery.

#### Association of shunt revision with primary etiology.

TOTAL REVISION	09	Age/SEX	PRIMARY ETIOLOGY	SITE OF OBSTRUCTION
REVISION DUE TO BLOCK	08	5yrs/M	Tubercular	Aqueduct of sylvius
		3.5yrs/M	Tubercular	Aqueduct of sylvius
		2.5yrs/M	Tubercular	Basal cistern
		4yrs/M	Congenital	Aqueduct of sylvius
		1yr/M	Tubercular	Aqueduct of sylvius
		11yrs/M	Tubercular	Aqueduct of sylvius
		4yrs/F	Tubercular	Basal cistern
		21yrs/M	Arachnoid cyst	3 <sup>rd</sup> ventricle
REVISION DUE TO EXTRUSION	01	2yrs/F	congenital	4 <sup>th</sup> ventricle

#### Median Shunt Survival Time in Reoperated Group.

s.no.	Age	Sex	Shunt survival time	Etiopathogenesis
1.	5yrs	M	6months & 12 months & 16 months cont...	Tubercular
2.	2yrs	F	10 months&16 months cont...	SSI (extrusion)
3.	5.5yrs	M	5 yrs & 12 months cont...	Tubercular
4.	4yrs	M	4 yrs& 2yrs cont...	Aqueduct
5.	11yrs	M	9yrs, 8 months &4months cont...	Tubercular
6.	4yrs	M	1 month & 4months cont...	Tubercular
7.	21yrs	M	8 yrs & 2 months cont...	Arachnoid cyst
	Median shunt survival	TIME	26.06 months	

In India Hydrocephalus is one of the commonest complications of tuberculous meningitis (TBM) occurring in up to 85% of children with the disease.

The median time of shunt survival is 19.71 months in the study done at LLRM meerut. Median shunt survival in the reoperated group (in 7 patients) was found to be 26.06 months.

#### Average Shunt Survival Time in All Patients.

	number of patints	number of surgeries	avg shunt survival (in months)
Single shunt surgery	31	31	13.36
multiple shunt surgeries	07	16	26.06
total	38	47	19.71 months

The median time of shunt survival is 19.71 months in the study done at LLRM meerut. Median shunt survival in the reoperated group (in 7 patients) was found to be 26.06 months.

**Complication rate following 47 v.p. Shunt surgeries in 38 patients (n=47).**

RECENT <3MONTHS	INFECTION	01	2.13%
	EXTRUSION	01	2.13%
	HEADACHE	09	19.15%
	SEIZURE	06	12.7%
	VISUAL	03	6.38%
	CRANIAL N PALSY	04	8.51%
	EXPIRY	02	4.25 %
REMOTE >3MONTHS	SHUNT BLOCKAGE	08	17.02%
	EXPIRY	00	0 %

(% out of 47 operations) In this study patients of hydrocephalous suffered one or combination of above mentioned complications. Shunt blockage is included in remote group.

**Comparison of tubercular vs nontubercular hydrocephalous.**

Group	No.	Percentage	Complications in	Group % with complications
TBM	15	37.5%	7	46.7%
NON TBM	25	62.5%	9	36%

Complication rate was found to be higher in tubercular group. It was observed that one or more complication is present in 46.7% of patients with TBM.

**Risk of Shunt Revision in Tbm/Non Tbm.**

TYPE	NO.	SHUNT REVISION	%
TBM	15	6	40
NON TBM	25	3	12
TOTAL	40	9	22.5

In this study it was observed that chances of shunt revision is higher in tubercular group (6 out of 15 undergone shunt revision surgery).

The incidence of post-operative complications is significantly higher in tubercular meningitis patients. None of the studies analyzed the factors associated with shunt malfunction.

**CONCLUSION**

At the time of admission all the patients of hydrocephalous were assessed by clinical examination and imaging technique by CT brain/MRI brain. After complete assessment of clinical presentation & severity patients were managed operatively by VP shunting and kept in followup after that.

Study of epidemiological characteristics of hydrocephalous patients confirms the fact that predominantly the paediatric age group is affected. Age of patients ranges from birth to 50 yrs. Age group below 10 yrs constitute 75% patients. In this study male patients outnumber the female patients. Male to female ratio in the present study is 2:1.

In the present study most common site of obstruction is aqueduct of sylvius accounting for 47.5% (19 patients out of total 40). Most of the patients were found to be having obstructive (noncommunicating) type hydrocephalous (29 out of 40 i.e.72.5%).

In the present study in total 40 patients, Seven (07) Patients (17.5%) had >1 shunt surgeries. It was found that single shunt revision was done in 5(12.5%) out of total 40 patients. In 2 patients (5%) shunt revision was done twice. Eight 8 revisions were done in 6 patients due to shunt blockage in long term follow up (failure rate is 17.02). In 1 patient shunt revision was done due to shunt extrusion at abdominal wound. Most of the patients in which shunt revision was done are of paediatric age group (85.71%).

In this study it was found that most of the shunt revisions were done 6 months after the previous shunt surgeries.

In the present study Shunt survival was calculated from the time of shunt insertion to the development of shunt-related complications. The median time of shunt survival is 19.71 months in the study done at LLRM meerut. Median shunt survival in the reoperated group (in 7 patients) was found to be 26.06 months. In the present study postoperative complications following V.P. Shunting are divided in recent and remote groups. During post op. period 1 patient (2.13%) developed SSI, in 1(2.13%) patient extrusion of shunt occurred from abdominal end, 9 patients (19.16%) developed headache, 6 patients (12.76%) developed seizure. In 3 patients (6.38%) diminution of vision occurred. 4 patient (8.51%) were complicated by CN III palsy. 2 patients (4.25%) expired in post op period. In the remote period shunt blockage occurred in 8 patients (17.02%). 1 patient

(2.13%) expired in remote period. In the present study tuberculosis account for 12 patients of hydrocephalous (30%) which is about 1/3<sup>rd</sup> of the total hydrocephalous burden. Complication rate (46.7%) and shunt failure rate (6 of 15, 40%) is higher in TBM patients.

In the present study overall mortality rate following VP shunt was found to be 5.26% (2/38). All the expired patients were associated with moderate to severe type hydrocephalous.

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