Efficacy of Ventriculoperitoneal Shunting for Idiopathic Intracranial Hypertension: A Single Institution Experience

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Introduction

Idiopathic intracranial hypertension (IIH) most often afflicts obese women of childbearing age. Common signs and symptoms include headache, papilledema, and vision loss. While medical management is first line therapy, many patients require surgical intervention. The most common surgical intervention is cerebrospinal fluid diversion via a ventriculoperitoneal (VP) or lumboperitoneal (LP) shunt (1,2). We present our single institution experience treating IIH using VP shunts over a four year period.

Methods

A retrospective chart review was performed on patients who underwent VP shunt placement for IIH by the senior author.

Results

***Demographics*:**

Table 1: Patient Demographics

Population Size	21
Gender	21 Female
Average age (Range)	29 (19-44)
Average BMI (Range)	38 (22-57)
Medical Management	
Acetazolamide	17
Furosemide	2
Pain medication only	2
Prior IIH Surgery	2
Average Opening Pressure (Range)	38 cm of water (21-50)

Symptoms:

All patients presented with headaches. Pre-operative visual analog pain scale ratings for headaches were obtained in 14 patients. 12 (57%) of the patients presented with visual findings, reflecting the predominant pattern of referrals from neuro-ophthalmologists.

Table 2: Presenting Symptoms

Headache	21
Average Pain Scale (range) [1]	6.5 (5-10)
Papilledema	15
Visual field deficit	9
Visual acuity deficit	7
Nausea	7
Vomiting	5

[1]Data from 14 patients

Outcomes:

20 patients received an adjustable valve (Pro-Gav, Aesculap) and 1 patient received a constant flow valve (OSV II, Integra).

Table 3: Symptomatic Improvement

Symptom	Improvement
Headache	18/21 (86%)
Average Pain Reduction*	4.5 pts (2-8)
Papilledema	12/15 (80%)
Visual field deficits	4/9 (44%)
Visual acuity deficits	5/7 (71%)
Nausea	6/7 (86%)
Vomiting	4/5 (80%)

*Data from 14 patients

Shunt Revisions:

Only 10 of the 21 patients (48%) had sustained relief of their IIH symptoms after VP shunt placement during the couse of this study. 3 patients suffered complications from initial shunt placement surgery requiring immediate revision or removal. Of the remaining 18 patients, 8 required at least one revision due to shunt malfunction. 2 patients required multiple revisions due to repetitive shunt malfunction.

Table 4: Time to Revision

Revision	Avg Time From Surgery Or Last Revision
First Revision	612 days (203-1306)
Second Revision	342 days (104 -580)

Revisions due to surgical complications excluded.

Shunt Revisions:

Table 5: Revision Rate by Date of Procedure

Date of Initial Shunt	Patients w. revisions
2012	0/2 (0%)
2011	1/3 (33%)
2010	0/4 (0%)
2009 and older	7/12 (58%)

Shunt failure rates increase with longer duration of follow up. Thus, the number of patients with sustained relief of IIH symptoms is predicted to decrease in the future.

Table 6: Location of Malfunction

Revision	# of Patients
First Revision	8
Proximal	3
Distal	2
Proximal and Distal	3
Second Revision	2
Proximal	1
Proximal and Distal	1

Complications:

Three patients (14%) experienced a surgical complication from initial VP shunt placement. 2 patients (25%) experienced a complication from shunt revision surgery.

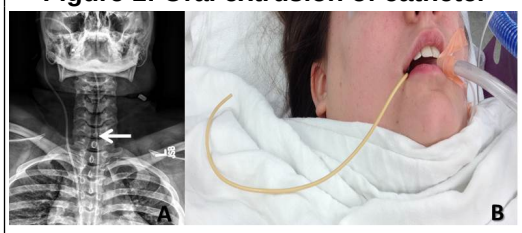
Table 7: Complication Type

Complication	Days Post-op
Initial implantation	
Abdominal hernia	54
Distal Catheter migration	36
Wound infection	42
First revision	
Bowel perforation	9
Proximal disconnect	9

Unique Case Presentation:

The patient presented one year after shunt placement. With emesis, oral extrusion of the distal catheter occurred.

Figure 1: Oral extrusion of catheter



A. Chest AP X-ray showing the distal catheter ascending the esophaus (arrow). B. Intraoperative photograph demonstrating oral extrusion of the distal shunt catheter.

Conclusions

- VP shunt placement can provide effective initial symptomatic relief for IIH patients that fail medical therapy.
- Durability of benefit may be limited and a significant number of patients (>50%) will require a VP shunt revision.
- Revisions are associated with an high rate of surgical complications.
- As the incidence of IIH is likely to rise due to increasing obesity rates, development of new techniques for IIH treatment with more durable benefit and lower complication rates is needed.

References

1. Abu-Serieh, et al. (2007). "Stereotactic ventriculoperitoneal shunting for refractory idiopathic intracranial hypertension." Neurosurgery 60(6): 1039-1043; discussion 1043-1034.
2. Abubaker, K., et al. (2011). "Idiopathic intracranial hypertension: lumboperitoneal shunts versus ventriculoperitoneal shunts-case series and literature review." Br J Neurosurg 25(1): 94-99.