

First-choice Lumboperitoneal Shunting for Idiopathic Intracranial Hypertension (IIH): Are We Making the Correct Choice? An Analysis of Cost and Complications Using the Nationwide Inpatient Sample

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Learning Objectives

By the conclusion of this session, participants should be able to:

1) Describe the healthcare cost implications involved in the most commonly selected surgical treatment options for Idiopathic Intracranial Hypertension.

2) Compare the incidence and cumulative impact of revision surgery for lumboperitoneal versus ventriculoperitoneal shunting procedures.

 Discuss justifications for appropriate treatment decisions with patients based upon known risk factors and overall healthcare cost output.

Introduction

Complications following lumboperitoneal (LP) shunting have been reported in from 18 to 85% of cases. The need for multiple revision surgeries, incidence of iatrogenic Chiari malformation and frequent wound issues have prompted many to abandon this procedure or the treatment of IIH altogether. A direct comparison of the healthcare costs between first-choice LP versus ventriculoperitoneal (VP) shunting is presented.

Methods

The Nationwide Inpatient Sample database was queried for all patients with the diagnosis of benign intracranial hypertension (ICD-9-CM 348.2) from 2005-2009. This data was stratified by operative intervention with demographic and cost of hospitalization data generated for each.

Results

A weighted sample of 4480 patients were identified as having the diagnosis of IIH, with 2505 (55.9%) undergoing first-time VP shunting and 1754 (31.2%) undergoing initial LP shunting. Revision surgery occurred in 3.8% of admissions (n=98) for VP shunts and in 6.6% of admissions (n=123) for LP shunts (p<0.0001). Initial VP shunts were identified to occur at teaching institutions in 84.6% of cases, versus only 77.6% for LP shunts (p<0.0001). The incidence of shunt revision did not differ significantly based upon teaching status (p=0.3339). Hospital length of stay (LOS) differed significantly between primary VP (3 days) and primary LP shunt (4 days) procedures (p < 0.001). Mean total cost for revision or removal of a single LP shunt was \$45,911.00, with a cumulative cost over the entire study period of \$5,424,999, or \$1,084,999 per vear. VP shunt malfunction showed a mean total cost of \$41,478.50 with a cumulative cost of \$3,726,440 or \$745,288 per year.

Table 1								
		Primary VP shunting	VP Shunt revision	VP shunt removal	Primary LP shunting	LP Shunt revision	LP Shunt removal	
Count		2505	92	6	1754	70	53	
Death during hospitalization	No	2505	92	6	1749	70	53	
	Yes	0	0	0	5	0	0	
Sex	Male	237	9	0	195	5	10	
	Female	2243	83	6	1540	65	44	
Obesity	No	1770	67	0	1274	55	49	
	Yes	736	25	6	480	15	4	
Elderly	<65 yrs	2471	92	6	1739	70	53	
	≥65 yrs	34	0	0	15	0	0	
Meningitis	No	2486	92	6	1744	70	53	
	Yes	20	0	0	10	0	0	
Wound infection	No	2505	92	6	1754	70	53	
	Yes	0	0	0	0	0	0	
Hospital location	Rural	65	11	0	4	5	5	
	Urban	2417	82	6	1741	64	48	
Hospital teaching status	Non- teaching	383	35	0	390	21	31	
	Teaching	2100	58	6	1355	48	23	

Table 2								
	Mean total charges	Length of stay			Routine discharge disposition	Non-routine discharge diosposition		
		Mean	Median	Range				
Primary VP shunting	\$37,708.00	3	2	45	2341	165		
VP Shunt revision	\$37,543.00	4	3	14	87	5		
VP shunt removal	\$45,414.00	6	6	0	6	0		
Primary LP shunting	\$32,617.00	4	3	38	1663	92		
LP Shunt revision	\$32,849.00	4	2	14	64	5		
LP Shunt removal	\$58,973.00	6	5	17	53	0		

Table 3							
	VP shunt	LP shunt	р	OR	95% CI		
Female	2243 (90.4%)	1540 (88.8%)	0.0852				
Age > 65	34 (1.3%)	15 (0.9%)	0.1719				
Menigitis diagnosis	20 (0.8%)	10 (0.6%)	0.4924				
Need for revision	98 (3.8%)	123 (6.6%)	0.0001	0.6	0.4-0.7		
LOS (days)	4	3	0.001				
Teaching hospital	2100 (84.6%)	1355 (77.6%)	0.0001	1.6	1.3-1.8		
Rural location	65 (2.6%)	4 (0.2%)	0.0001	11.7	4.2-32.1		

Conclusions

The presented results appear to call into question the selection of LP shunting as primary treatment for IIH, as this procedure is associated with significantly greater likelihood of need for revision and greater overall cost to the healthcare system.

References

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