

Pre-existing Gastrostomy Tube Placement Affects Ventriculoperitoneal Shunt Insertion Infection Rates in Pediatric Patients

Ashley Sablich, BS¹; Rachel Berkowitz, MPH²; Lu Zhang, PhD²; Michael DeCuyper, MD, PhD²; Sandi Lam, MD, MBA²

¹Feinberg School of Medicine, Northwestern University, ²Pediatric Neurological Surgery, Ann & Robert H. Lurie Children's Hospital of Chicago, Northwestern Medicine

Background

- Many pediatric patients who require ventriculoperitoneal (VP) shunts will also require a gastrostomy tube (G-tube) to ensure sufficient nutritional intake.
- Shunt infections are a common yet dangerous complication with an incidence between 3-29% and a mortality rate as high as 40%.⁽¹⁾
- Pre- or post-operatively placed G-tubes may increase the risk of infection.
- Currently, there is no sequential recommendation for placing G-tubes when a VP shunt is also required due to conflicting evidence regarding the safety of performing both procedures in the same patient.⁽¹⁻³⁾

Objectives

- Determine if the sequence or time interval between VP shunt insertion and G-tube placement affects infection rates.
- Determine risk factors for infection in a patient undergoing VP shunt insertion and G-tube placement.

Methods



Pediatric patients (<18 years)
n=5,998
Documented G-tubes and VP shunts



Retrospective study using
2016-2019 ACS NSQIP-P
database



Primary outcome was
infection (superficial and
deep incisional SSI,
organ/space SSI, and sepsis)
and primary predictor was
timing of G-tube insertion



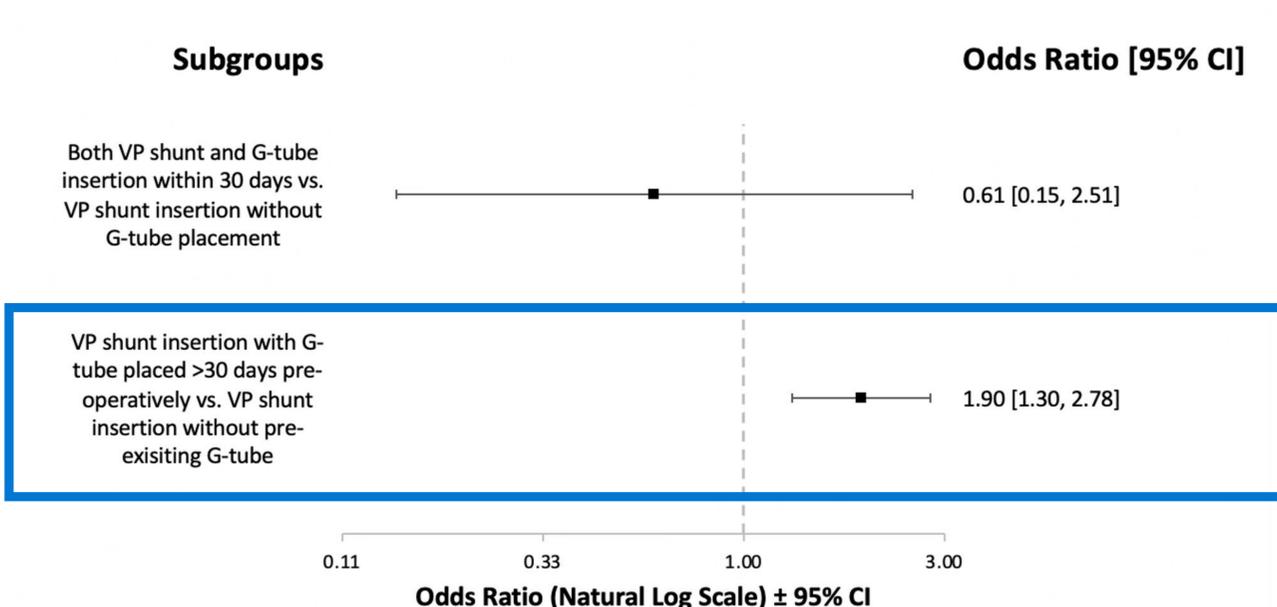
Chi-square tests, Mann-Whitney U tests, and logistic regression for analysis

Figure 1. Patient Demographics (n=5,998)

	Infection (n=242) n (col %)	Non-infection (n=5756) n (col %)	P-value*
Median Age at Surgery, months (IQR)	2.87 (0.93-14.13)	5.28 (1.87-42.33)	0.0000*
Sex			
Female	110 (45.45)	2601 (45.19)	0.9349
Race			
White	124 (51.24)	3450 (59.94)	0.0078*
Black	59 (24.38)	1148 (19.94)	
Other	14 (5.79)	206 (3.58)	
Ethnicity			
Hispanic	34 (14.05)	908 (15.77)	0.6990
ASA Class			
≤2	32 (13.22)	1029 (17.90)	0.0622

* P-values <0.05 are considered significant. Chi-square or Mann-Whitney U tests were used as appropriate.

Figure 2. Forest Plot of Odds Ratio for Infection



Results

- Infections occurred in 242 (4.03%) patients.
- **Patients who had G-tubes placed >30 days prior to VP shunts had 1.9 times higher odds of infection (OR=1.90 [95% CI: 1.30-2.78]; P<0.02) compared to VP-shunt only patients** controlling for age, sex, race, and ASA class.
- Notable negative results include no significant difference in infection rates when both procedures were performed within 14 or 30 days of each other, regardless of sequence.

Conclusions

- A G-tube placed greater than 30 days prior to a VP shunt carries a high odds of infection, highlighting a preoperative risk factor of infection for VP shunt insertion.
- These results can be used to guide surgical management of this complex patient population.

References

1. Kim, Jin-Soo, et al. "Is percutaneous endoscopic gastrostomy tube placement safe in patients with ventriculoperitoneal shunts?." *World Journal of Gastroenterology: WJG* 15.25 (2009): 3148.
2. Taylor, A. L., et al. "Percutaneous endoscopic gastrostomy in patients with ventriculoperitoneal shunts." *British journal of surgery* 88.5 (2001): 724-727.
3. Jack, Megan M., et al. "Safety, Efficacy, and Cost-Analysis of Percutaneous Endoscopic Gastrostomy and Ventriculoperitoneal Shunt Placement in a Simultaneous Surgery." *World neurosurgery* 115 (2018): e233-e237.