

# Trends, Practice Variations, and Outcomes of Drain Use in Thyroidectomy: A NSQIP Study

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## INTRODUCTION

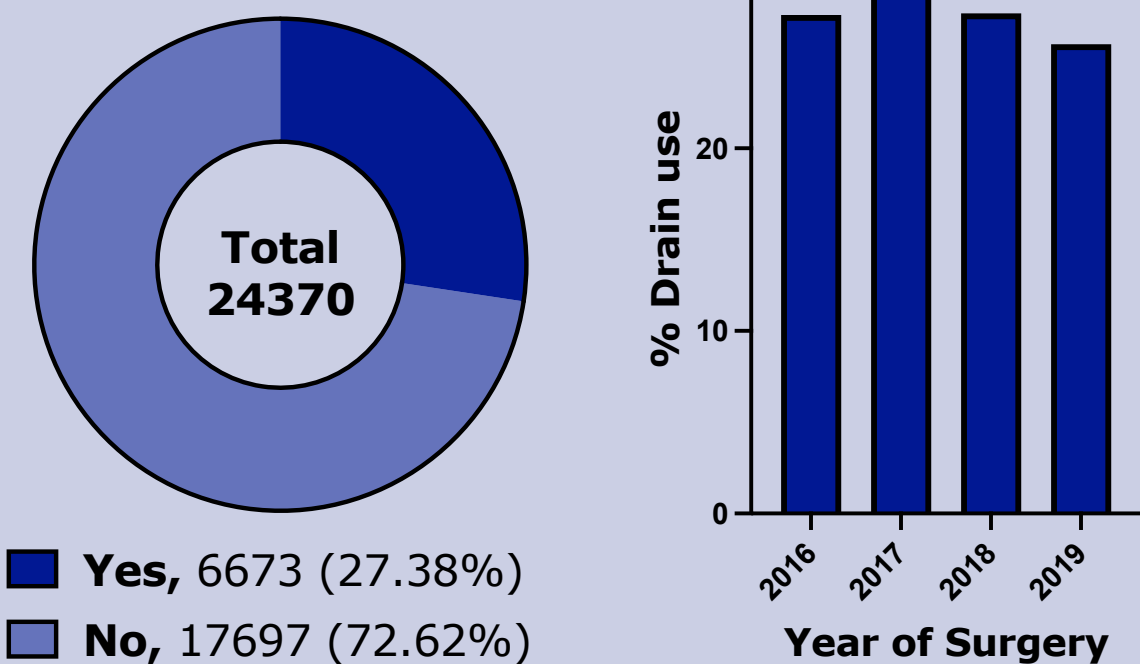
- Postoperative neck hematoma (**PNH**) is a rare but potentially life-threatening complication of thyroidectomy
- To prevent PNH, many surgeons routinely use drains after thyroid surgery; although, their use varies among thyroid surgeons of different subspecialties
- The benefits of drains remains unclear and variable among thyroid surgeons
- This study examines the utility of drain placement after thyroidectomy **across the extent of surgery, surgical specialty, and trends over time.**

## METHODS

- A pooled sample of thyroidectomy patients from the 2016-2019 American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) was utilized.
- Drain use, PNH rates, length-of-stay (**LOS**), year-over-year trends, and practice variations were evaluated using inverse-probability-weighted-regression adjustment (IPWRA) and multivariable regression analyses.

## RESULTS- Drain use

- Of 24,370 patients, 6,673 (27.38%) received drains.



- Age, smoking, higher BMI, prior neck surgery, severe goiter, cancer, bleeding disorders, concurrent neck dissection, or use of vessel-sealant devices increased the likelihood of drain use.
- Drain usage decreased from 27.3% in 2016 to 25.7% in 2019 (Cochran-Armitage test; Standardized Z-score -2.7830 p=0.0054 ).

## RESULTS- PNH and LOS

- 451(1.9%) of patients developed PNH
- Among the patients who received a drain, 2.1% developed PNH, compared to 1.8% of those who did not.
- Patients who had drain stayed 22.5 hours longer in the hospital
- Both IPWRA and multivariable logistic models showed statistically significant association between drain use and LOS but no association between drain use and PNH rates.

Table 1. Rates and Unadjusted Effect of Drain Use

Outcome	Average	Drain	No Drain	Unadjusted Effect	p-value
PNH Rate (%)	1.9	2.1	1.8	1.19*	0.079
LOS (hours)	27.3	43.6	21.1	22.5	<0.001

Table 2. Adjusted Effect of Drain Use on Study Outcomes (Reference group: No Drain)

IPWRA Model			
Outcome	Effect Size	95% CI	p-value
PNH	Risk Diff.	-0.08	-0.50 – 0.41. 0.737
	Risk Ratio	0.96	0.73 – 1.25 0.740
LOS (hours)	9.56	8.51 – 10.62	< 0.001
Multivariable Logistic Model			
Outcome	Effect Size	95% CI	p-value
PNH (OR*)	0.95	0.75 – 1.20	0.643
LOS (hours)	9.78	8.51 – 11.05	< 0.001

## RESULTS- Practice variation

ENT surgeons were more likely to use drains than General Surgeons (GS), and this effect remained significant in the multivariable logistic model (OR 6.16 [95CI 5.63 – 6.73], p < 0.001).

Table 3. Percentage Drain Use After Total Thyroidectomy by Surgical Specialty

Year	No Neck Dissection		Neck Dissection	
	GS	ENT	GS	ENT
2016	13.27	55.87	23.17	51.13
2017	18.40	58.42	26.89	65.38
2018	15.90	46.52	28.32	56.94
2019	18.67	45.24	25.78	56.25

## CONCLUSIONS

- Drain use appears to be decreasing.
- Practice variations across specialties persist between GS and ENT.
- Post-thyroidectomy drain use was associated with longer length-of-stay but no effect on hematoma rates.