



INTRODUCTION

Incidental Parathyroid Removal

- Incidental parathyroidectomy (IP) remains a common complication of thyroid surgery
- Pathologists routinely identify normal parathyroid gland tissue in 4-28% of thyroidectomy specimens¹⁻⁶
- The rise in ultrasound-guided discovery of thyroid nodules and thyroidectomies suggests this issue to be of growing consequence⁷⁻⁹
- Despite intraoperative technologic advances, studies across time suggest no associated decline in IP rates²

Effects of IP

- Isolated removal of a single parathyroid may confer no ill effects, as the remaining three organs often compensate.
- However, IP may contribute to or be a surrogate for hypoparathyroidism and hypocalcemia, should the remaining parathyroids suffer disrupted blood supply¹⁰
- This is especially relevant in central neck dissection (CND) for thyroid cancer, which pose greater risk to gland vascularity^{11, 12}

Impact of Surgical Volume?

- Prior reports have found high thyroidectomy case volume to confer superior outcomes¹³⁻²⁰
- Less is known about IP removal, which is not reported in national hospital or inpatient registries
- The impact of central neck dissection volumes deserves further investigation
 - Intrinsic elevated risk of IP
 - Tradeoff between minimizing complications and maximizing lymph node yield

HYPOTHESIS

The incidence of incidental parathyroid removal declines with greater surgical case volumes in both thyroidectomy and central neck dissection.

Incidental parathyroidectomy in thyroidectomy and central neck dissection

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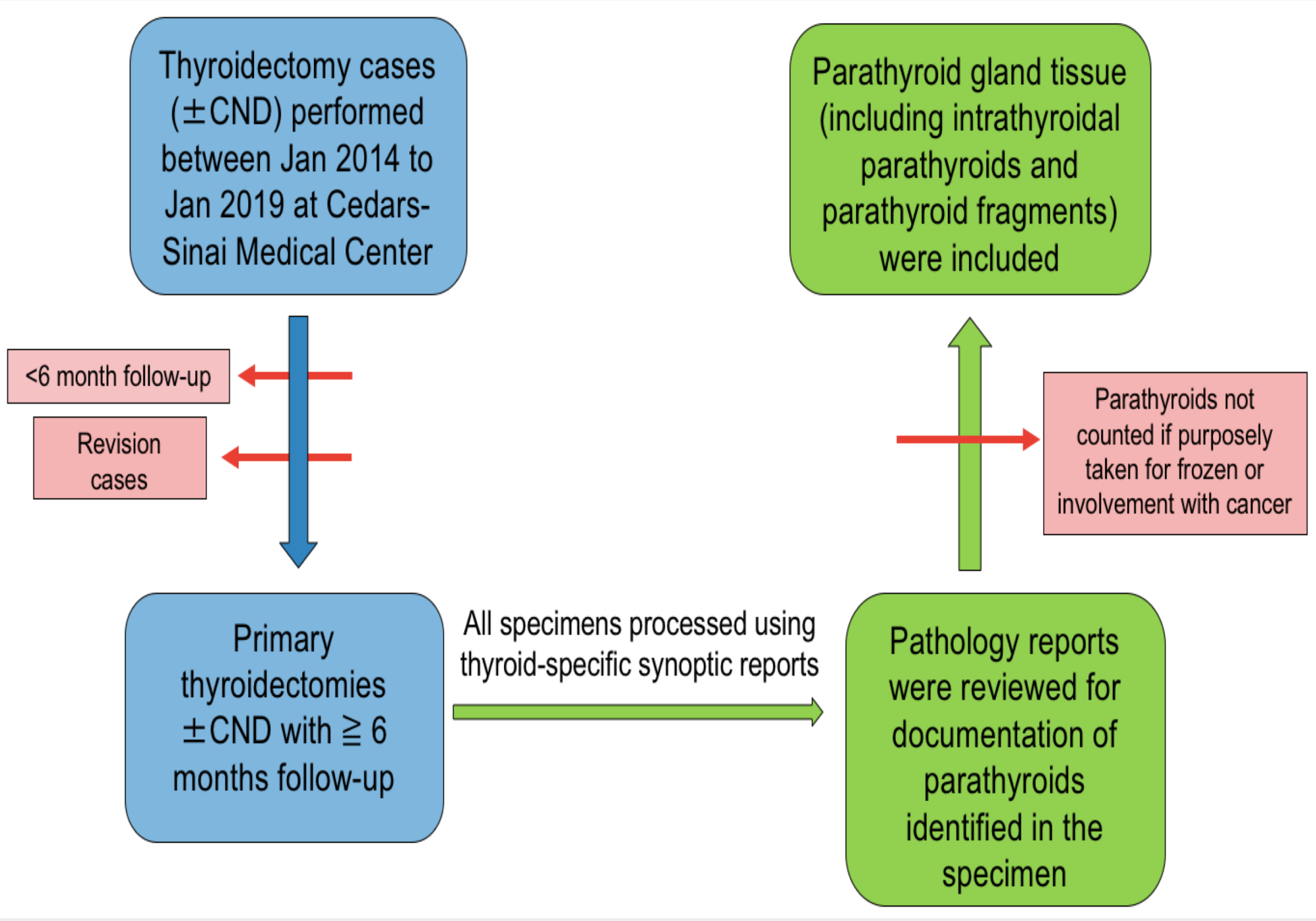
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METHODS & MATERIALS

Database

- Retrospective analysis of thyroidectomy cases (\pm CND) over a 5-year period at Cedars-Sinai Medical Center
 - Hybrid tertiary institution comprised of both academic faculty and community physicians
- Included self-identified thyroid surgeons (both general surgeons and head and neck surgeons)
- “High-volume surgeons” were defined as averaging >25 thyroidectomies per year (>125 cases over the 5-year study period)¹³⁻¹⁶

Selection Criteria



Outcomes Evaluated

- Incidental parathyroidectomy rates
- Transient hypoparathyroidism: PTH below normal range (14-64 pg/mL) at the time of surgery that resolved by 6 months
- Permanent hypoparathyroidism: persistently low PTH levels after 6 months with no documented recovery
- Permanent hypocalcemia: serum calcium below normal range (8.4-10.2 mg/dL) or the need to take calcium or calcitriol to avoid symptoms with no documented recovery

Statistical Analysis

- SPSS Version 26 (Chicago, IL)
- Multiple regression model used to determine significance
- Univariate and multivariable analyses adjusting for patient and thyroid-specific covariates were performed

RESULTS

Of the 395 patients included in the study, 32 (8.1%) returned to the ER within 30 days. The all-cause readmission rate was 7.6% (30 patients), and the unplanned readmission rate was 6.6% (26 patients).

On average, patients returned to the ER on post-op day 18.4 ± 10.5 and were readmitted on post-op day 20.8 ± 8.8 .

While ER visits within 30 days did not impact survival ($p=0.553$), readmission within 30 days was a poor prognostic factor with worse overall survival ($p=0.006$).

Patients with a T4 stage tumor were the most likely to return to the ER versus patients with lower T stages ($p = 0.01$). Older patients (>65 years of age) had a significantly higher readmission rate than their younger counterparts ($p = 0.026$).

Wound-related complications (infection, dehiscence, or fistula formation) comprised 38.5% of all unplanned readmissions.

Other factors such as sex, tobacco use, history of prior treatment, nodal involvement, requirement of a free flap, and length of hospital stay did not significantly affect 30-day ER visits or readmission.

Covariate	All Surgeons
Age (\pm SD)	51.5 (15.3)
Patient Sex	
Male	294 (26.4%)
Female	820 (73.6%)
Procedure	
Hemithyroidectomy	428 (38.4%)
Total thyroidectomy	686 (61.6%)
Central neck dissection	396 (N/A)
Lateral neck dissection	115 (N/A)
Nodule size (cm) (\pm SD)	2.2 (1.8)
Thyroid gland weight (g) (\pm SD)	37.6 (49.1)
Grave's Disease	
No	1081 (97.0%)
Yes	33 (3.0%)
Hashimoto's Disease	
No	813 (73.0%)
Yes	301 (27.0%)

Table 1. Baseline patient characteristics and demographics

Covariate	Univariate OR (95% CI)	p	Multivariable OR (95% CI)	p
Surgeon Type				
High-Volume	1.00	--	1.00	--
Low-Volume	2.21 (1.65-2.98)	<0.001	2.63 (1.89-3.65)	<0.001
Patient Age	0.36 (0.99-1.014)	<0.001	1.32 (0.96-1.83)	0.088
Patient Sex				
Male	1.00	--	1.00	--
Female	0.82 (0.59-1.14)	0.239	1.49 (1.03-2.15)	0.036
Thyroid Procedure				
Hemithyroidectomy	1.00	--	1.00	--
Total thyroidectomy	2.03 (1.48-2.77)	<0.001	1.13 (0.77-1.66)	0.524
Central neck dissection				
No	1.00	--	1.00	--
Yes	3.12 (2.34-4.17)	<0.001	2.73 (1.77-4.19)	<0.001
Lateral neck dissection				
No	1.00	--	1.00	--
Yes	3.32 (2.23-4.94)	<0.001	2.24 (1.28-3.92)	0.005
Nodule size (cm)	0.93 (0.86-1.02)	0.118	1.03 (0.91-1.17)	0.649
Thyroid gland weight (g)	1.00 (0.99-1.00)	0.028	0.99 (0.99-1.00)	0.350
Grave's Disease				
No	1.00	--	1.00	--
Yes	0.76 (0.31-1.86)	0.545	0.71 (0.23-2.24)	0.560
Hashimoto's Disease				
No	1.00	--	1.00	--
Yes	0.86 (0.62-1.18)	0.348	0.61 (0.43-0.88)	0.800

Table 2. Univariate and multivariable logistic regression assessing incidental parathyroidectomy rates

	Temporary hypoparathyroidism		Permanent hypoparathyroidism		Permanent hypocalcemia	
Covariate	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Surgeon Type						
High-volume surgeon	1.00	--	1.00	--	1.00	--
Low-volume surgeon	2.14 (1.41-3.24)	<0.001	0.98 (0.38-2.50)	0.96	1.83 (1.03-3.25)	0.039
Incidental parathyroidectomy						
No	1.00	--	1.00	--	1.00	--
Yes	2.82 (1.89-4.22)	<0.001	5.65 (2.24-14.27)	<0.001	2.37 (1.34-4.22)	0.003

Table 3. Condensed multivariable analysis

CONCLUSIONS

A small minority of patients returned to the ED or were readmitted, most commonly due to wound-related complications.

Patients with advanced T stage more frequently returned to the ED and readmitted for an unplanned postoperative complication. Older age was a significant risk factor for readmission

Patients requiring readmission within 30 days postoperatively had poorer overall survival.

A close surveillance of at-risk populations after glossectomy is needed to improve patient survival.

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