

Six-Year Experience of Outpatient Total and Completion Thyroidectomy at a Single Academic Institution

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Outpatient thyroidectomy has become slowly accepted with various published reports predominantly examining partial or subtotal thyroidectomy. Concerns regarding the safety of outpatient total and completion thyroidectomy remain, especially with regard to vocal fold paralysis, hypocalcemia, and catastrophic hematoma. We aimed to evaluate the safety of outpatient thyroid surgery in a large cohort by retrospectively comparing outcomes in those who underwent outpatient (n = 251) versus inpatient (n = 291) completion or total thyroidectomy between February 2009 and February 2015. Outpatient completion and total thyroidectomy had lower rates of temporary hypocalcemia (6% vs 24.4%; $P < 0.001$) and no significant difference in rates of return to emergency department (1.2% vs 1.4%), hematoma formation (0.8% vs 0.7%), temporary (2% vs 4.1%) or permanent (0.4% vs 0.7%) vocal fold paralysis, or permanent hypocalcemia (0.4% vs 0%) compared with the inpatient group. Outpatients requiring calcium replacement had shorter duration of postoperative calcium supplementation (44.4 ± 59.3 days vs 63.3 ± 94.4 days; $P < 0.001$). Our data demonstrate similar safety in outpatient and inpatient total and completion thyroidectomy.

OUTPATIENT THYROID SURGERY has steadily increased in popularity over the past two decades due to purported health care savings,¹ improved patient comfort,² and decreased risk for hospital-related morbidities such as nosocomial infection and iatrogenic injury.² However, because many surgical complications do not arise in the immediate postoperative period, patients undergoing outpatient surgery may be at greater risk of experiencing significant complications after discharge. Management of these complications in the outpatient setting is clearly more challenging than those occurring in the hospital setting. Approximately 1 per cent of patients will develop a hematoma after thyroidectomy,² with 20 per cent occurring after discharge.^{2, 3} Fortunately many of these are self-limiting, but others may result in an airway emergency. Untreated hypocalcemia may result in muscle cramping and tetany. Aspiration and respiratory difficulty may result from new-onset recurrent laryngeal nerve (RLN) paralysis.

Many authors have reported low complication rates associated with outpatient thyroid surgery,⁴⁻¹² but most

have focused on partial and subtotal thyroid surgery. Recent reports suggest that outpatient total and completion thyroidectomy are also safe, but the volume of procedures supporting many of these reports remains low.⁶⁻⁹ Understandably, controversy remains over whether outpatient completion and total thyroidectomy should be routinely performed.^{2, 13}

The aim of this study was to assess the safety and efficacy of outpatient completion and total thyroidectomy in a large series of patients treated at an academic institution.

Methods

After Institutional Review Board approval, we retrospectively reviewed 542 consecutive patients who underwent total or completion thyroidectomy from a single surgeon (AS) in the Department of Otolaryngology at Loma Linda University from February 2009 to February 2015. Patients undergoing concomitant sternotomy, lateral neck dissection, or parathyroid surgery were excluded before the analysis. Data were collected from inpatient and outpatient medical records, including phone or other communications from other providers to provide the most complete outcome assessment and data analysis.

All patients were observed for a minimum of two hours to assure absence of respiratory difficulty,

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TABLE 1. Patient Demographics (All Patients)

	Outpatient (n = 251)	Inpatient (n = 291)	P Value
Gender			
Female	78.1%	80.1%	0.5713
Age (years)	54.5 ± 17.8	54.9 ± 18.0	0.7904
Malignant diagnosis	39.0%	42.6%	0.6502
Procedure			
Total	80.1%	87.3%	0.02268*
thyroidectomy			
Completion	19.9%	12.7%	
thyroidectomy			
Concurrent	3.0%	17.9%	<0.001*
paratracheal dissection			

dysphagia, uncontrolled nausea or pain, and lack of cervical swelling or hematoma. Surgical drains were rarely used and did not preclude outpatient management. Patients meeting the above criteria and parathyroid hormone level (PTH) > 15 pg/mL drawn one hour after surgery were eligible for outpatient management and same-day discharge. Data analysis was performed in R using an unpaired *t* test or two-sample Z-test as appropriate.

Results

Patient Demographics and Procedures

The age and gender distribution of the inpatient and outpatient groups were similar (Table 1). A lower proportion of patients undergoing an outpatient procedure underwent total thyroidectomy (80.1% vs 87.3%; $P = 0.02268$). The incidence of a preoperative thyroid cancer diagnosis was similar between groups (39.0% vs 42.6%; $P = 0.6502$); however, inpatients were more likely to undergo total thyroidectomy for malignancy (30.3% vs 41.3%; $P = 0.01559$) and concurrent paratracheal dissection (17.9% vs 3.0%; $P < 0.001$).

Complications

The most common indication for admission after thyroidectomy was hypoparathyroidism (50%), followed by routine monitoring of pre-existing comorbid conditions (18%), pain control (16%), drain management (3%), or other reasons such as nausea (23%). Outpatient total and completion thyroidectomy resulted in equal or lower complication rates compared with inpatient thyroid surgery (Table 2). There was no difference in the rate of hematoma formation between outpatient and inpatient procedures (0.8% vs 0.7%; $P = 0.8819$). Temporary hypocalcemia, defined as lasting less than one month, was noted in 24.4 per cent of inpatients, but only 6 per cent of outpatients ($P < 0.001$).

TABLE 2. Complications (All Patients)

	Outpatient (n = 251)	Inpatient (n = 291)	P Value
Return to ED or hospital	1.20%	1.40%	0.8537
Hematoma	0.80%	0.70%	0.8819
Temporary hypocalcemia	6.00%	24.40%	<0.001*
Permanent hypocalcemia	0.40%	0%	0.2812
Temporary vocal fold paresis	2%	4.10%	0.1557
Permanent vocal fold paralysis	0.40%	0.70%	0.6513

There was no difference in complication rates by procedure or between total and completion thyroidectomy (Table 3). Subgroup analysis of patients having concurrent paratracheal dissection revealed no significant differences in morbidity between outpatient and inpatient groups. Return to the emergency department (ED) was due to hypocalcemia in three inpatients and one outpatient, swelling in one inpatient, nausea and vomiting in one outpatient, and hematoma in one outpatient, which occurred 11 days after surgery. There was a higher rate of paratracheal dissection for patients returning to ED in the outpatient group (33.3% vs 2.8%; $P = 0.002786$).

Discussion

Outpatient thyroidectomy is associated with decreased costs,¹ improved patient satisfaction,¹⁴ and a morbidity rate comparable with traditional inpatient thyroid surgery.^{4-6, 8-12} However, the safety and effectiveness of outpatient total and completion thyroidectomy, generally considered to have higher risks than less extensive thyroid procedures, remain controversial. Orosco et al., in an analysis of outpatient thyroidectomy data from a five-state hospital database, noted that higher rates of hematoma and readmission were seen in patients who underwent total *versus* partial thyroidectomy.¹⁵ Furthermore, others have reported that extent of surgery is a predictive factor for unplanned admission after outpatient thyroidectomy.^{4, 5} Total¹¹ and completion¹⁶ thyroidectomy clearly increase the chance of hematoma and introduce potentially hypocalcemia, decreasing likelihood of same-day discharge. There are reports advocating the safety of outpatient total and completion thyroidectomy; however, most involve small patient populations.⁷⁻⁹

In our study at an academic medical center involved in training resident surgeons, outcomes of outpatient total and completion thyroidectomy were found to be similar or improved in comparison with those managed with inpatient admission. Patients undergoing outpatient thyroidectomy had similar incidence of hematoma. Two

TABLE 3. Complications (by Procedure)

	Total Thyroidectomy			Completion Thyroidectomy		
	Outpatient (n = 201)	Inpatient (n = 254)	P Value	Outpatient (n = 50)	Inpatient (n = 37)	P Value
Return to ED	1.50%	1.20%	0.7724	0.00%	2.70%	0.2423
Hematoma	1.00%	0.80%	0.8137	0.00%	0.00%	N/A
Temporary hypocalcemia	5.50%	26%	<0.001*	8.00%	13.50%	0.4038
Permanent hypocalcemia	0.50%	0%	0.2604	0.00%	0.00%	N/A
Temporary vocal fold paresis	2.50%	4.70%	0.2115	0.00%	0.00%	N/A
Permanent vocal fold paralysis	0.50%	0.80%	0.7044	0.00%	0.00%	N/A

patients developed, one at 11 days after significant exertion and the second at 18 days after surgery with no causative factor. These were both well after a normally planned inpatient thyroid patient would have been discharged. Symptomatic temporary hypocalcemia was lower in outpatients, though this may be due to increased reporting of symptoms to staff taking care of hospitalized patients and the bias of PTH > 15 pg/mL in outpatient qualification.

Our study, therefore, suggests that both total and completion thyroidectomy may be safely performed as outpatient procedures. Comparison between our results and particularly those reported by Orosco et al.¹⁵ and Tuggle et al.¹¹ should be done cautiously. Their analyses were based on data from multiple institutions with differing standards of practice, and thus were not able to assess the impact that individual discharge criteria may have had on complication and readmission rates. By contrast, our patients were all evaluated with the same stringent postoperative discharge criteria, which may explain our lower rate of morbidity resulting in readmission and emergency room visits.

The vast majority (86.7%) of our patients having concurrent paratracheal dissection were admitted after thyroidectomy. Paratracheal neck dissection has been reported to increase the postoperative morbidity of thyroid surgery, particularly rates of hypoparathyroidism and RLN injury.¹⁷ Although our study showed no significant difference in the rate of complications after outpatient *versus* inpatient thyroid surgery with paratracheal dissection, the sample size for outpatient paratracheal dissections was only eight patients, all of whom underwent total thyroidectomy. Iannuzzi et al. analyzed readmissions after endocrine surgery and concluded that neck dissection was the best predictor of unplanned readmission within 30 days of surgery.¹⁸ Although our outpatient results are slightly more favorable than that of Iannuzzi et al., the need for paratracheal dissection did correspond with an increased rate of transient RLN injury in our patients who underwent inpatient surgery. Additionally, among outpatients concurrent central compartment neck dissection was

more common in those returning to ED. Thus, given our limited sample of outpatient thyroidectomy with paratracheal dissection and the reported increased risk inherent to paratracheal dissection, we cannot reasonably conclude that patients requiring a paratracheal dissection will have equally as safe outcomes if managed as outpatients.

A significantly greater percentage of our patients underwent total *versus* completion thyroidectomy. The postoperative safety for outpatient completion thyroidectomy was similar to the outpatient total thyroidectomy group and was consistent with other studies regarding outpatient thyroid surgery outcomes.^{6,9} Additionally, our results were in agreement with reports of similar rates of postsurgical complications between total and completion thyroidectomy.¹⁹ The low incidence of complications in both completion thyroidectomy groups may preclude extrapolation of our findings regarding outpatient completion thyroidectomy, but our results indicate excellent safety.

There are limitations to our study. As a retrospective review of patient records, there is a potential bias in our study population due to lack of patient randomization to study groups. All retrospective studies are also restricted by the completeness of medical records, so it is possible that some patient information was unknowingly unavailable to evaluation and analysis. Additionally, our study did not assess the effect that preoperative selection criteria used to determine eligibility for outpatient thyroidectomy may have had on postoperative outcomes. As multiple authors have noted, it is essential to appropriately select patients for outpatient surgery based on risk-stratification of preoperative characteristics.

Conclusion

Total and completion thyroidectomy can be performed safely with similar complications when managed as an outpatient operation. The incidence of postthyroidectomy complications is similar to rates associated with inpatient thyroid surgery.

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