



Unilateral Thyroid Lobectomy as Day Care Procedure: A Cross Sectional Study with Literature Review on the Safety and Cost Effectiveness

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Abstract

Introduction Thyroid nodules are common globally in almost one fifth of the adult population. The gold standard treatment for thyroid nodule is thyroid lobectomy or total thyroidectomy depending upon the diagnosis. Thyroidectomy has a few known complications but, as per the ATA consensus statement, it is a safe surgery to be done as a day care procedure.

Objective To assess the feasibility and safety of thyroid lobectomy as a day care surgery and its effect on decreasing overall financial burdens.

Methods This retrospective chart review was done from 2006 to 2022. A total of 736 patients underwent thyroid lobectomy among which only 56 were done as day care surgery. Data analysis was done using the IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY, USA).

Results A total of 40% of the population was male. The mean age of the study population was 42 years. Bethesda II was the most encountered diagnosis, with a rate of 69%. The majority of patients were discharged after 6 hours of postoperative observation. The only complication encountered was seroma, which was seen in two patients.

Conclusion Thyroid lobectomy appears to be a safe procedure with a drastic difference in overall cost as a day care procedure. We recommend switching the practice of inpatient thyroid lobectomy to a day care procedure in carefully selected candidates. The major hurdle in day care lobectomy can be approval from insurance.

Keywords

- ▶ thyroid
- ▶ thyroid nodule
- ▶ daycare surgery
- ▶ ambulatory surgery
- ▶ thyroid lobectomy

Introduction

Thyroid nodule is a common pathological entity that is found globally in almost one fifth of the adult population.^{1,2} Asymptomatic nodules have an incidence ranging from

almost 19 to as high as 68% as accidental finding on ultrasound. A gender based discrepancy of prevalence of palpable thyroid nodules exists, in which a prevalence of 1% is found in the male population in comparison to 5% in the female

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population.^{1,3} The detection is important clinically to exclude malignancy, which has a rate of ~7 to 15%.³ Thyroidectomy, either lobectomy or total thyroidectomy, is the gold standard treatment depending upon the diagnosis.⁴ The known complications include recurrent laryngeal nerve paralysis, dysphagia, dysphonia, seroma, compressive hematoma, and hypoparathyroidism.^{2,5}

After the introduction of T. Kocher's meticulous surgical technique in the beginning of 20th century, the progression in the development of safer general anesthesia techniques, the development of fine hemostatic instruments and better antiseptic means and measures, thyroidectomy has evolved into a surgical procedure with low morbidity and mortality rates.⁴⁻⁶ The frequency of thyroidectomy has increased secondary to the increase in prevalence of thyroid carcinoma globally.² Previously, a 10.7% morbidity rate was reported after thyroidectomy but, according to Lombardi et al., the mortality rate has gone down to essentially 0% and morbidity rates have declined to 3%;⁵ whereas the mortality rate after thyroid lobectomy according to British association of endocrine and thyroid surgeons (BAETS) is 0.2%, majorly secondary to hematoma.⁷ In a US-based study, the rate of postoperative hematoma after thyroid surgery was 1 to 2.3%.^{8,9} Similar assertions have been made across the literature to ensure and promote day care surgeries as a viable option.^{10,11}

Traditionally, thyroidectomy, unilateral or bilateral, is considered an inpatient surgery.⁶ The recommendation was largely based on the inherent risk of postoperative complications.^{6,12} In 2013, the American Thyroid Association (ATA) surgical affairs published an interdisciplinary consensus statement which defined safety and eligibility criteria for thyroidectomy as an outpatient procedure.⁸ The eligibility criteria for outpatient thyroidectomy include ASA I/II, availability of primary caregiver postoperatively, proximity to a hospital setting, patient understanding, and preoperative education.^{8,12} A detailed preoperative history and physical examination is necessary. Patients with any critical comorbidities (seizure disorder, renal failure, pregnancy, obstructive sleep apnea), language barrier, massive goiter, lack of transportation, patient preference, and challenging hemostasis are not safe candidates for outpatient thyroid surgeries.^{8,12} In the published studies, postoperative observation time varied from 3 to 6 hours.⁸ The requirement for discharge is adequate pain control on oral analgesics, tolerating diet, and good understanding of the possible complications.⁸ The decision for this consideration has to be based on empirical evidence of both an appropriate preoperative patient condition and the provision of good home health care to ensure minimization of emergency room visits and readmissions with complications.^{11,13}

With outpatient thyroidectomy, an added advantage is the decreased risk of nosocomial infections.^{6,8} There is a certain reduction in charges; according to ATA, a reduction of USD 2,500 in the cost of ambulatory thyroid surgery can be observed.^{8,12} Re-admission rates after outpatient thyroidectomy ranges from 0 to 2.6%. Whereas when readmission was compared between outpatient thyroidectomy versus inpa-

tient discharges; the rates of readmission were comparable.^{11,12}

From our country, no series has been published on thyroidectomy as a day care procedure. Internationally, the topic has been debated upon in terms of safety of patients and cost effectiveness.

A surgical day care center was established in our hospital in 2013. Since then, multiple procedures; like tonsillectomy, cochlear implants, tympanomastoidectomy, endoscopic sinus surgery, direct laryngoscopy, and biopsy, requiring inpatient admission previously are being done as outpatient procedures. The surgical daycare suit consists of patient-waiting area, preoperative assessment area, postoperative recovery area, and four operating rooms. In our own hospital, a thyroid lobectomy costs 270 thousand rupees as an inpatient and almost 175 thousand rupees as an outpatient procedure.

In this study, we want to see how safe unilateral thyroid lobectomy is as outpatient. We will be evaluating the complication rates, rates of readmission, or need of admission postoperatively in which surgery was planned as day care initially. We want to see the patient safety in terms of postoperative complications.

Material and Methods

We did a retrospective chart review of 17 years in the department of otolaryngology & head and neck surgery at our hospital. After approval from the ethical review committee, a list of thyroid lobectomies was sought from department of Health Information & Management System (HIMS). Only thyroid lobectomies planned as a day care surgeries were included. We collected data from patient's medical records dated December 2006 to August 2022 on standard template. Patient files were reviewed in case of missing online data. Variables included age, gender, comorbid conditions, diagnosis, operative procedure, operative time, postoperative recovery time, conversion of day care admission to inpatient admission, readmission after discharge for any postsurgical complication, placement of drain, postoperative antibiotics and calcium supplementations. Variables also included any postoperative complications, like hematoma, voice changes, signs of hypocalcemia, and seroma. Data was de-identified and entered on a password-protected database.

Seven hundred thirty-six patients underwent unilateral thyroid lobectomy in the study period. A total of 680 patients underwent thyroid lobectomy as inpatient. After exclusion of these, 56 patients were evaluated for any postoperative complication, conversion of ambulatory surgery to inpatient, readmission due to operative complication. All statistical analysis was done using software the IBM SPSS Statistics for Windows, version 23.0 (IBM Corp., Armonk, NY, USA).

Results

A total of 56 patients were reviewed who underwent thyroid lobectomy and were admitted on a day care basis. Forty

percent of the participants were male, while 60% were female. The mean age of the patients was 42 years. fifty-eight percent of patients had a right thyroid nodule, while 42% had a left thyroid nodule so they underwent right and left thyroid lobectomy, respectively. The mean size of the lobe on preoperative ultrasound was 4.9 cm, while that of nodule was 2.3 cm. (► **Table 1**) Preoperative FNAC was done in all of these patients, and cytology was reported using the Bethesda system. The majority (69%) of the nodules were categorized as benign, that is, Bethesda II, followed by Bethesda III and Bethesda I, which were 19% and 12%, respectively (► **Table 2**).

No immediate postoperative complications were seen in any of the patients. However, postoperative admission was required in 3 patients, 2 of whom were admitted as they were anxious and did not want to get discharged on the same day and the third patient was not allowed for day care surgery by the insurance company. Two patients presented with seroma on the 4th and 7th postoperative days, which was drained in the clinic, and the patients remained stable afterwards. Neck drain was placed in 15 patients, 11 were removed on the first postoperative day and 4 were removed on the 2nd postoperative day. (► **Table 3**) None of the patients required subsequent hospital admission.

Table 1 Showing descriptive variables of the study

Gender	Males (40%) Females (60%)
Mean age	42 years
Laterality (side)	Right (58%) Left (42%)
Procedure	Right thyroid lobectomy (58%) Left thyroid lobectomy (42%)
Mean size of lobe on preoperative ultrasound	4.9 cm
Mean size of nodule on preoperative ultrasound	3.2 cm

Table 2 Showing frequency of different Bethesda categories on preoperative FNAC

Preoperative FNAC (Bethesda category)	
Bethesda I	12%
Bethesda II	69%
Bethesda III	19%

Table 3 Showing insertion and removal of neck drain

Neck drain not placed	41 (73.2%)
Neck drain placed	15 (26.7%)
Removed on 1st postoperative day	11 (73.3%)
Removed on 2nd postoperative day	4 (26.6%)

Discussion

The culture of postsurgical care and hospitalization is shifting in light of the balance between patient care and cost minimization.¹⁴ Procedures primarily requiring a single day admission are being elevated as safe procedure to be considered as a daycare surgery.¹⁴ In case of thyroid surgery, fear of hypocalcemia, injury to recurrent laryngeal nerve and need of drain placement has proven to be an impediment for this transition.¹⁴

Thyroid lobectomy is a meticulously defined surgery; it has and uneventful post-operative period in most of the cases and have very low morbidity.¹⁵ Day care thyroid surgery has been validated by British Association of Day Surgery (BADS) and ATA.¹⁶ It is approved to be safe with no mortality.^{11,16} Several American centers, who have implemented the practice already report no symptomatic hypocalcemia, recurrent laryngeal nerve palsy or airway compromise in extensive peer review literature.¹⁶ As a foresight, it would aid the healthcare system to not only reduce the financial burden on the patient but also to minimize contact in the midst of the pandemic.

This retrospective study was based on 56 thyroid lobectomies which were done between January 2006 to August 2022 in the department of otolaryngology, head and neck surgery. Keeping in view the total patients in our population subset in the past 17 years, our dataset reveals a rate of 7.6% for outpatient thyroid lobectomy. In the literature, higher rates have been reported with minimal or no complication.^{15,17} Champault et al. reported a rate of 62% thyroid lobectomies as daycare procedure during 1999 and 2007.⁶ In 2012, Seybt and Teris in their series of 418 thyroidectomy patients, reported 49% rate of day care thyroidectomies.¹⁴ In light of our local considerations and factors, day care surgery has been a difficult entity for us as we cater to a patient subset from remote areas of the country with lodging issues in the city and poor emergency services in peripheral canters. Moreover, with an inclination toward apt patient care and keeping patient preferences in mind, it is difficult for the institution to lean toward a surgical option where the hospital contact is minimized.

The literature has been vastly supportive of the phase shift, with ample data and experiences available to shape and streamline the process of conversion.¹⁴ A significant impediment at our institution would be the placed drain and the apprehension of the patient with its placement. A meta-analysis yielded a conclusion that in thyroid surgery, neck drain placement is unnecessary with no impact on seroma prevention or hematoma formation.¹⁴ In our study population, neck drain was not placed in 73.2% patients. In those patients in whom a drain was placed, it was removed in 73.3% of cases within 24 hours of surgery, and 100% within 48 hours.

The concern for hypocalcemia, which can be a life-threatening situation, has been a major discouraging element. But the rate of hypocalcemia in thyroid lobectomy is very low;⁵ however, its incidence after total thyroidectomy is reported to be as much as 42.1%.¹⁸ In our study population, the

incidence of hypocalcemia was 0%. Only 6 patients were given calcium supplementation in the initial 7 days to prevent hypocalcemia prophylactically.

Among the 56 patients operated on a day care basis none experienced any severe complications. Our conversion to inpatient rate was 5.3%, which is lower than reported by Champault et al., who had 13.7% readmission. Patients who were admitted wanted to stay for their own satisfaction and did not have any subjective or objective complaint, and one patient was admitted because the insurance company refused to support a day care procedure. Seroma was observed in two patients. There was no reported wound infection in our study population. In the literature, a 0.4% rate is reported.^{14,15}

In our institute, the average cost of a thyroid lobectomy in daycare setting is 175 thousand rupees, that is, USD 1,037 compared with 275 thousand rupees, which is the cost of the same procedure if patient is admitted to inpatient facility preoperatively and discharged within 24 hours of surgery. Bearing in mind that the risk of hospital acquired infections, especially in the era of coronavirus disease (COVID) pandemic, is very high; any acquired infection will need treatment, which will add to the additional financial burden on the economy. In the prospective review by Lacroix et al., savings of almost USD 236 per patient was possible when thyroid lobectomy was done as a day care procedure.¹⁵

There are numerous advantages to day care thyroid lobectomy over conventional thyroid lobectomy as inpatient. But careful selection of patients eligible for day care surgery is of utmost importance.¹⁹ In 2013, the ATA gave a consensus statement on the selection of eligible candidates for day care thyroid surgery. This statement emphasized on preoperative, intraoperative and postoperative factors that must be considered while performing a daycare thyroid surgery. The patient should not have any major comorbidity including respiratory disease, non-compensated cardiac disease, seizure disorder, thyrotoxicosis, visual or hearing disability, obstructive sleep apnea, pregnancy, renal failure, chronic pain syndrome, and morbid obesity. The patient should have preoperative education, there should be a primary caregiver available, and the patient should stay in proximity to a skilled facility.^{8,19} The statement also suggested revising the decision of day care surgery in case of challenging hemostasis, locally advanced cancer, massive goiter, sub sternal goiter, or association with Graves or Hashimoto disease.^{8,19} The checklist at the time of discharge from day care must include examination of operative site for any swelling, difficulty in swallowing liquids should be alarming, pain control on oral medications, and red flag signs must be explained to the patient and caregiver.^{8,9}

Our study intended to address the apprehensions of the local community of head and neck surgeons. Moreover, as the institute caters to a vastly diverse set of population; our numbers are reflective of not only physician and institutional biases but also of the patient perspective and opinion. Moreover, this dataset represents one of the highest levels of healthcare that the country has to offer. Our major limitations include a limited sample size and a single institution study. Major chunk of our patients, willing to be recruited were excluded secondary to refusal of insurance

and reimbursement companies for a day care surgery. To further substantiate our assertions, further randomized trials are needed catering to patients with lobectomies and total thyroidectomies as day care procedures.

Conclusion

Despite the common dogma recommending overnight hospitalization following thyroid lobectomy, it is our conclusion that thyroid lobectomy appears to be a feasible and safe procedure in carefully selected candidates, which can be done in day care setting, easily, with almost no complications. We would recommend switching from the common practice of inpatient thyroid lobectomy to day care surgery and prospective trials in a local population subset to further assuage and cater to patient safety as well as physician apprehension.

Compliance with Ethical Standards

Research Involving Human Participants and/or Animals

Neither human participants nor animals were involved in this review.

Informed Consent

Consent was not needed as there was no interaction with patients. Institutional Ethical Approval was obtained.

Conflict of Interests

The authors have no conflict of interests to declare.

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