Geriatric Thyroidectomy

Safety of Thyroid Surgery in an Aging Population

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Objective: To ascertain whether there are incremental risks associated with thyroid surgery in the elderly population.

Design: Prospective analysis of a consecutive single-surgeon series of patients undergoing thyroid surgery at an academic health center.

Setting: Tertiary care health center.

Patients: The study included patients aged 21 to 35 years and patients 65 years and older who underwent thyroidectomy.

Main Outcome Measures: Pathology reports, complications (including rates of temporary and permanent hypocalcemia and temporary and permanent true vocal fold [TVF] paralysis), and need for admission or readmission were included in the analysis.

Results: There were 86 youthful patients who underwent thyroidectomy between November 2003 and December of 2007; 44 elderly patients underwent surgery during that same time frame. There were no deaths in either cohort, no hematomas, and no cases of permanent TVF paralysis. The elderly patients had a similar rate of complications when compared with the youthful patients, including transient hypocalcemia (12.5% vs 11.1%, respectively) and temporary TVF paresis (2.9% vs 3.9%), but a higher rate of readmission (4.5% vs 1.2%, \( P = .26 \)).

Conclusions: Thyroid surgeons will be faced more often with the prospect of elective thyroid surgery in patients of advanced age as an increasingly aged population emerges and the prevalence of thyroid nodules and thyroid cancer increases. Thyroid surgery in elderly patients is safe and no more dangerous than surgery in youthful patients. There is a slightly higher rate of readmission.


According to US Census Bureau data, the over-65 segment of the US population has increased by 90% over the last 30 years; the over-80 segment has increased by an astonishing 232%. Practicing clinicians are therefore increasingly asked to care for patients of advanced age. As the population ages, surgery is being performed on geriatric patients more frequently on an elective basis than in decades past, for both malignant and benign diseases.1,2

Thyroid disorders, particularly those requiring surgical intervention, represent many of the conditions that must be managed, although little has been written about the geriatric patient population and the special challenges they may pose. Surgery in elderly patients has been considered to be more hazardous than in a youthful population; however, this increased risk appears to be related to the presence of comorbidities rather than to age alone.3 It is possible that careful preoperative clearance and risk stratification can help ameliorate the likelihood of perioperative morbidity.

We sought to ascertain whether there are incremental risks associated with thyroid surgery in the elderly population. Specifically, we evaluated the likelihood of complications, including rates of transient and permanent hypocalcemia and temporary and permanent true vocal fold (TVF) paralysis, and the need for postoperative admission or readmission after discharge.

METHODS

A prospective, nonrandomized study of consecutive patients undergoing thyroidectomy by a single surgeon (D.T.J.) was performed at the Medical College of Georgia Health System and Augusta Veterans Administration Hospital between November 2003 and December 2007. Demographic and clinical data, including pa-
tient age, sex, and indication for surgery, were collected. Patients were stratified into 1 of 2 groups on the basis of age: patients were considered elderly if they were older than 65 years; youthful patients were those between 21 and 35 years of age. Outcome measures included pathology findings, complications (including rates of temporary and permanent hypocalcemia and temporary and permanent TVF paralysis), and need for admission or readmission.

At the time of surgical consultation, all patients underwent a complete and comprehensive history, physical examination, laboratory examinations, and assessment of surgical risks. Patients with a significant cardiac history or other substantial comorbidity were referred for clearance before surgery. The only absolute contraindications to surgery were the inability of the surgeon to safely administer general or local anesthesia or surgery deemed to be futile (eg, anaplastic carcinoma or other malignant disease resulting in a short anticipated life expectancy). A specific tool or questionnaire was not used. Advanced age was not considered a contraindication for surgery.

Patients underwent thyroidectomy by 1 of 3 techniques (dictated by patient and disease characteristics): conventional thyroidectomy (using a Kocher incision); minimally invasive non-endoscopic thyroidectomy (using a 3- to 6-cm incision and no drain); or endoscopic thyroidectomy (incision length of 15-30 mm, no drain, and usually on an outpatient basis [Figure 1]). Laryngeal nerve monitoring was used selectively until 2006, when its use became routine. Vocal fold mobility was assessed and documented before surgery and again in the postanesthesia care unit using flexible fiberoptic laryngoscopy. After surgery, outpatients were evaluated and discharged once they were ambulatory, tolerating a diet, and managing their pain with oral medications. At discharge, all patients and those involved in their home care were counseled regarding symptoms of operative complications, in particular respiratory compromise and hypocalcemia (in patients who underwent total thyroidectomy), and were instructed to seek prompt medical attention for admission or readmission.

Results

A total of 428 patients underwent thyroidectomy between November 2003 and December 2007. This larger group included 44 elderly patients and 86 youthful patients. The mean (SD) age was 71.3 (5.2) years in the elderly group and 29.5 (5.3) years in the youthful group. The preoperative diagnosis was benign in 95.5% of the elderly patients and malignant in the remaining 4.5%; in the youthful group, it was 97.7% benign and 2.3% malignant. All the elderly patients who were referred for surgical treatment underwent surgery except for 1 patient who had widely metastatic breast cancer (and for whom a small papillary cancer was determined to be a secondary concern). In no patients was surgical treatment withheld owing to medical risk stratification. Outpatient surgery was performed in 20 of 44 elderly patients (45.5%) and in 44 of 86 youthful patients (51.2%). This difference was not statistically significant ($P=31$). The final pathology reports revealed malignant disease in 12 elderly patients (27.3%) and in 16 youthful patients (18.6%) (Figure 2).

The elderly patients had a similar rate of complications when compared with the youthful patients (Figure 3), including transient hypocalcemia (12.5% vs 11.1%, respectively) and TVF paresis (2.9% vs 3.9%), but a higher rate of readmission (4.5% vs 1.2%, $P=26$). None of the readmissions were attributable to a cause related to age (all were due to hypocalcemia). Twenty-
four of the elderly patients (54.5%) were admitted, compared with 42 (48.8%) of the youthful patients, and the indications for admission were similar. There were no incidents of postoperative hemorrhage and no cases of permanent hypocalcemia or true vocal fold paralysis in either group.

The need to establish the safety of thyroidectomy in the geriatric population has become increasingly important as the population continues to age. A report by the American Geriatric Society projects that the number of Americans 65 years and older will increase from 35.6 million persons today to more than 70 million persons by the year 2030; by 2050, it is projected that there will be 20 million Americans older than 85 years, up from fewer than 4 million today.6 Based on the prevalence of cancer and vascular disease in these patients, coupled with the demographic changes, the surgical volumes of the 65-and-older population are expected to increase from 14% to 47% by 2020.7 The impact of these demographic changes will be particularly true in regard to thyroid surgery, as the ability to detect disease has improved considerably with the widespread availability of high-resolution ultrasonography and other imaging techniques. Despite this impending surge in demand, there are surprisingly few data comparing the surgical outcomes of elderly patients with those of their more youthful counterparts.

The prevailing approach among surgeons has long been to avoid elective surgery on the elderly, as they tend to have higher rates of comorbidity, longer postoperative stays, and poorer long-term outcomes. This approach has largely been applied to thyroid surgery. The few studies that have been published to evaluate thyroid surgery in the elderly have focused on the morbidity and mortality within the scope of surgery for thyrotoxicosis, benign enlargement with compressive symptoms, and malignancy.8,9 These studies have revealed that when thyroidectomy is performed on thoroughly screened patients in a well-controlled setting, mortality is seldom a concern. Passler et al8 for example, reported no mortality among their cohort of 55 patients older than 75 years. Rios et al9 similarly reported no mortality in a group of 81 patients older than 65 years who underwent surgery for multinodular goiter.

Morbidity associated with thyroidectomy in elderly patients may be higher than in youthful patients. Both Passler et al8 and Miccoli et al10 described a higher overall complication rate in their elderly patients. Passler et al8 speculated that this higher complication rate correlated with a higher rate of malignant disease in their elderly cohort.

Our experience confirms that geriatric thyroidectomy may be performed safely, with a minimally increased risk of complications. In fact, the rate of complications was similar or lower in our geriatric population in several key measures. As in previous studies,10 the mortality rate in our study was 0. We also were able to avoid any permanent complications (TVF paralysis or hypoparathyroidism) in either the geriatric or the youthful group. While 2 previous studies described a higher incidence of postoperative hematoma in their elderly population,8,9 there were no hematomas in our geriatric patients. The older patients in our study were more likely to be readmitted than were their younger counterparts, although this difference failed to reach statistical significance (P = .26) (likely because of insufficient population size). However, readmission was still an uncommon event and was usually related to transient hypocalcemia. Like Passler et al8 we found that the older patients were more likely to harbor thyroid cancer; however, in our patients, this did not appear to translate into a higher rate of surgical complications.

A common principle that emerged from our analysis of our experience, and that is shared by other authors who have examined similar patient populations, is that 1 key to performing thyroidectomy safely in the geriatric population is careful preoperative screening. The vast majority of geriatric patients who are scheduled for surgery have at least 1 chronic illness accompanying their acute surgical problem, and nearly one-third will have 4 or more chronic conditions.11 The need for careful preoperative evaluation of the elderly patient is essential, as aging is a heterogeneous process and the presence of comorbidities does not necessarily confer increased intraoperative and postoperative risk.12 Despite our low threshold for seeking medical clearance, surgical treatment was not withheld for reasons of medical risk stratification in any patients who were referred for surgical management of their thyroid disease, which may in part reflect the tertiary nature of our practice, the collaboration with medical consultants possessing a high level of comfort with patients manifesting multisystem disease, or the relatively low systemic impact of thyroid surgery. These factors may help explain the similar incidence of perioperative morbidity when comparing our elderly and youthful populations. The geriatric patient should obtain cardiac clearance as needed, although it is worth mentioning that the vast majority of cardiac postoperative complications are concentrated in the patient population undergoing major abdominal, thoracic, and vascular surgery.

![Figure 3](http://archotol.jamanetwork.com/pdfaccess.ashx?url=/data/journals/otol/9845/) Figure 3. There were no incidents of postoperative hemorrhage and no cases of permanent hypocalcemia or true vocal fold (TVF) paralysis in either group. The elderly patients had a similar rate of complications when compared with the youthful patients. The rate of TVF paresis was calculated based on the number of nerves at risk.
In conclusion, thyroid surgery in elderly patients (>65 years of age) is safe and no more dangerous than surgery in youthful patients (age range, 21-35 years). Although there was a slightly higher rate of readmission in the elderly patients in our study, this difference was not statistically significant ($P = .26$). Careful preoperative management of comorbid conditions is essential to performing safe thyroidectomy in patients of all ages.

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Author Contributions: Drs Seybt and Terris had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Seybt and Terris. Acquisition of data: Seybt and Terris. Analysis and interpretation of data: Seybt, Khichi, and Terris. Drafting of the manuscript: Seybt, Khichi, and Terris. Critical revision of the manuscript for important intellectual content: Khichi. Administrative, technical, and material support: Seybt, Khichi, and Terris. Study supervision: Terris.

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REFERENCES