The Increasing Role of Otolaryngology in the Management of Surgical Thyroid Disorders

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Objectives/Hypothesis: To determine trends in office visits and medical specialty seen for surgical diagnoses of the thyroid gland.

Study Design: A cross-sectional analysis of a national healthcare database.

Methods: From the National Ambulatory Medical Care Survey (NAMCS), all cases of surgical thyroid disorders (e.g., benign neoplasm of thyroid gland, malignant neoplasm of thyroid gland, multinodular goiter) were extracted for 2 calendar year cohorts: 1995 to 1999 and 2005 to 2009. In addition to demographic information, the medical specialty of the health care provider seen was extracted. Comparisons were conducted for the proportion of surgical thyroid cases seen between general surgeons and otolaryngologists for the respective cohorts.

Results: In the 1995 to 1999 cohort, there were a total of 107 ± 13 thousand outpatient visits annually to either general surgery or otolaryngology for surgical thyroid conditions. Among these, 62.7 ± 8.4 thousand visits (58.3 ± 5.6%) were seen by general surgery versus 44.8 ± 9.1 thousand (41.7 ± 5.6%) seen by otolaryngology. In comparison, in the 2005 to 2009 cohort, there were 218 ± 29 thousand visits annually for surgical thyroid conditions. Among these, 88.4 ± 17 thousand (40.5 ± 5.4%) were seen by general surgery versus 130 ± 21 thousand (59.5 ± 5.4%) seen by otolaryngology. The increase in proportion of surgical thyroid patients seen by otolaryngology in the second 5 year cohort was statistically significant (P = 0.032, chi-square).

Conclusions: There is a national trend in the United States toward otolaryngologists seeing an increasing majority proportion of increasingly prevalent surgical thyroid conditions. These data objectively confirm the perceived increasing role of otolaryngologists in the management of surgical thyroid disorders on a national level.

Key Words: Thyroid disorders, specialty, thyroidectomy, epidemiology, otolaryngology, thyroid nodule.

Level of Evidence: 2a.

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INTRODUCTION

The incidence of benign and malignant conditions of the thyroid requiring surgical management has been on the rise in recent decades.1–5 It is estimated that 4% to 7% of the population has a palpable thyroid nodule,6,7 with the incidence of thyroid cancer increasing from 4.8 cases per 100,000 persons in 1975 to 9.0 cases per 100,000 persons in 2003.8 These increases in thyroid cancer incidence rates have been seen across both demographic markers and tumor size at presentation.5,9,10 A total of 59,478 thyroidectomies were performed in 2009,11 with current rate increases projecting roughly 67,000 thyroidectomies in 2020,12 although these numbers may be significantly higher when estimating both inpatient and ambulatory procedures.13 Presently in the United States, the diagnosis and management of thyroid conditions may involve a variety of medical specialties, including primary care physicians, endocrinologists, oncologists, radiologists, pathologists, and surgeons, often with a multidisciplinary approach in cases of thyroid malignancy.

Historically, surgery of the thyroid gland has been primarily the domain of general surgeons, with otolaryngologists taking on a larger portion of surgical thyroid disease as the specialty matured, particularly that of head and neck surgery. Coincident with the increase in volume of patients in recent decades, there is additional evidence that suggests otolaryngologists are playing an increasing role in the surgical management of thyroid conditions. By analyzing the number of publications on the subject of thyroid disease and examining residency training case logs, several studies have argued that otolaryngology is now caring for the majority proportion of surgical thyroid disorders in the United States.14,15 There is also evidence that otolaryngologists in Europe are assuming an increasing role in thyroid management as well.16

To our knowledge, however, no study to date has effectively and objectively examined specialty trends in the management of thyroid disorders by looking at actual outpatient clinic volume over time. In this study,
we sought to determine trends in office visits by medical specialty for surgical diagnoses of the thyroid gland to better understand the evolving role that otolaryngology is taking in the surgical management of disorders of the thyroid.

MATERIALS AND METHODS

The data sources for this study were derived from the National Ambulatory Medical Care Survey (NAMCS), consisting of two aggregated cohorts: 1995 to 1999 inclusive and 2005 to 2009 inclusive. This study was reviewed by our hospital’s institutional review board and determined to be exempt from review. From the 1995 to 1999 and 2005 to 2009 cohorts, all cases of outpatient clinic visits that received at least one International Classification of Diseases (ICD-9) diagnosis code pertaining to a surgical thyroid condition were extracted and imported into the Statistical Package for Social Sciences (SPSS version 17.0, Chicago, Illinois). A listing of ICD-9 diagnoses that were considered surgical thyroid conditions are listed in Table I.

For each office visit case, demographic data were extracted. Physician specialty of the visit provider was also extracted, as coded according to the physician specialty classification listing of the American Medical Association. The data sets were then restricted, extracting only those patients with surgical thyroid conditions seen by either general surgeons or otolaryngologists in the two 5-year cohorts. Because the NAMCS collects sample data with methods that include clustering, stratification, and weighted sampling, appropriate statistical methods utilizing the complex samples algorithms in SPSS were employed to account for the multistage probability sampling design of these data sets.

Sample data were checked to make sure that they meet reliability criteria established by the National Center for Healthcare Statistics, and accordingly were considered reliable if the standard error was less than 30% of the estimate. The data were analyzed to determine the epidemiology of surgical thyroid conditions presenting to the surgical specialties of general surgery and otolaryngology over time. Data are presented as mean ± standard error of the estimate. Chi-square testing was then used to determine if changes have occurred in the proportion of patients with surgical thyroid conditions seen by general surgery versus otolaryngology over the past decade. Statistical significance was set at \( P < 0.05 \).

RESULTS

On an annual basis, the most common surgical thyroid conditions seen in the outpatient clinic setting among otolaryngologists and general surgeons were nontoxic uninodular goiter (34.3 ± 3.1%), unspecified goiter (17.7 ± 2.3%), malignant neoplasm of thyroid gland (16.2 ± 2.2%), and nontoxic multinodular goiter (13.2 ± 3.7%). In the 1995 to 1999 cohort, there were a total of 107,13 thousand outpatient office visits (annualized) to either general surgery or otolaryngology for surgical thyroid conditions. Among these, 62.7 ± 8.4 thousand visits (58.3 ± 5.6%) were seen by general surgery versus 44.8 ± 9.1 thousand (41.7 ± 5.6%) seen by otolaryngology. In comparison, in the 2005 to 2009 cohort there were 218 ± 29 thousand visits (annualized) for surgical thyroid conditions. Among these, 88.4 ± 17 thousand (40.5 ± 5.4%) were seen by general surgery versus 130 ± 21 thousand (59.5 ± 5.4%) seen by otolaryngology. Figure 1 demonstrates the outpatient visits by specialty between the two cohorts. The increase in proportion of surgical thyroid patients seen by otolaryngology in the second 5-year cohort relative to the previous calendar cohort was statistically significant (\( P = 0.032 \), chi-square).

DISCUSSION

The management of thyroid disorders by surgeons has substantially increased over the past decade, as evidenced by a nearly two-fold increase in the number of office visits to either otolaryngology or general surgery for diagnoses related to the thyroid gland between the 1995 to 1999 and 2005 to 2009 cohorts in this study. The escalation in office visits for thyroid disorders is likely related to a combination of factors, including the earlier detection of disease from an increase in screening exams and improved ultrasonography, increasing incidence of thyroid carcinoma, and possibly the increase in...
incidental radiographic findings from workup of unrelated symptoms. Improvement in surgical techniques leading to decreased morbidity, such as the routine use of recurrent laryngeal nerve monitoring, may also play a role in increasing referral rates and patient decisions to seek surgery; however, this potential link requires further investigation.

Furthermore, this study objectively confirms the current perception that otolaryngologists are assuming an increasing role in the management of thyroid disorders, now seeing the majority proportion of office visits related to surgical thyroid disorders. We believe office visits to be representative of the true national trend in the management of thyroid disorders over other surrogate markers, such as hospital admissions or surgical codes, for several reasons. First, there is an increasing trend toward outpatient thyroid surgery, which may not be captured in hospital admission data. Additionally, disorders of the thyroid do not always require surgical intervention, and several have argued a surgeons role should often be educating patients not to have thyroid surgery when appropriate.

The specific trend toward otolaryngologists managing the majority proportion of surgical thyroid disease may be directly related to exposure during residency training. Since 1996, otolaryngology residents have, on average, performing more thyroid surgery during residency than general surgery residents. One recent study looking at residency graduate case logs between 2004 and 2008 found that otolaryngology residents graduate with more than twice as many thyroid procedures as their general surgery counterparts. Although operative experience with thyroid conditions increased for both general surgery and otolaryngology during this time period, the gap in case numbers between the two specialties has continued to increase over the past few decades. Of note, greater than 70% of general surgery graduates seek subsequent training, and the development of an endocrine fellowship through the American Association of Endocrine Surgeons has provided an opportunity for additional training for general surgeons interested in specialty training in thyroid disorders.

A recent survey of endocrine surgeons cites endocrine fellows averaging 150 thyroidectomies during fellowship; and of those surveyed, 97% reported feeling comfortable performing thyroidectomy in practice. It is unclear whether fellowship training adequately prepares endocrine fellows for the full extent of surgery sometimes required to treat thyroid disease; however, as only 68% of those surveyed reported feeling comfortable performing neck dissections upon graduation, a surgical skill often needed for advanced stage thyroid cancer.

Changing surgical workforce trends may also play a role in the shift toward otolaryngologists managing the majority portion of surgical thyroid disorders. From 1996 to 2006, the number of practicing otolaryngologists in the United States increased 13% from 8,745 to 9,909. During a similar time period, the number of general surgeons remained stable from 17,775 in 1991 to 17,727 in 2008. Interpretation of these workforce trends is complicated, however, by the fact that not all otolaryngologists and general surgeons perform thyroid surgery. Good data on who performs thyroid surgery within each specialty is lacking, but future study may help elucidate evolving subspecialization within each specialty. Additionally, given the large overall shift in the office visits for surgical thyroid conditions over the two study periods, it is unlikely that this amount of change would be solely accounted for by the small relative increase in the number of practicing otolaryngologists during this time.

The vast majority of thyroid operations in the United States are currently performed by surgeons who do not focus in endocrine or thyroid surgery and perform on average three or less thyroid procedures each year. There is some evidence, however, that low volume thyroid surgery may be in decline. One report based on a Maryland experience found that the number of surgeons performing less than three thyroid procedures a year has decreased over the past 2 decades, while the number of surgeons performing greater than 24 thyroid procedures per year doubled during the same time period. We speculate that, among general surgeons, there is likely a trend toward a smaller number of endocrine-trained surgeons taking on the majority share of thyroid conditions that are seen by general surgeons, as reflected in the Maryland data. Among otolaryngologists, data is currently lacking regarding the distribution of surgical thyroid disorders and whether thyroid conditions remain evenly spread throughout the specialty or are becoming more concentrated among an increasing number of subspecializing otolaryngologists. We speculate that the latter is occurring in similar fashion as general surgery.

Although we would argue that the perception among practicing physicians of which specialty manages the majority of surgical thyroid disease has shifted to otolaryngology in recent decades, this is not universally the case for physicians in training. In a 2010 polling of primary care residents, only 47% of respondents viewed otolaryngologists as experts in thyroid surgery versus 87% for general surgery. These data could be interpreted in several ways, but one possibility may relate to a lack of exposure of primary care residents to otolaryngology in medical school or early in their residency and may not truly reflect a preference toward general surgery as thyroid experts.

This study identifies specialty trends in management of surgical thyroid disorders and does not attempt to comment on the quality of care provided between specialties. The exact number of thyroid surgeries needed during training in order to become a competent thyroid surgeon remains unknown and is likely different for each surgeon. Outcome data suggest better outcomes for those surgeons performing more operations, although the number of procedures per year for optimal outcomes remains unclear. In a study from the Johns Hopkins Hospital, complications were lowest in surgeons performing greater than 16 thyroid operations per year. Another study found that surgeons performing 24 or more thyroid procedures per year had lower rates of complications.
As part of our analysis, we attempted to quantify and compare the office visit rates for surgical parathyroid conditions (e.g., parathyroid adenoma), but the data were insufficient between the calendar cohorts to allow for reliable estimate determination and subsequent statistical comparisons.

Several authors have asserted that thyroid surgery should be performed by surgeons with sufficient training and experience, regardless of specialty. Aschebroek-Kilfoil B, Ward MH, Sabra MM, Devesa SS. Thyroid cancer incidence patterns in the United States, 1988-2005. Thyroid 2011;21:125-134. We echo this sentiment. The ideal thyroid surgeon is one with sufficient training to deal with all aspects of thyroid disease, operates on a significant number of cases per year, and embraces the importance of a multidisciplinary team approach that may include primary care physicians, endocrinologists, oncologists, radiologists, and pathologists in order to achieve the highest quality outcomes. With the increasing volume of thyroid disease over time, and the changes in the specialties managing thyroid disease, there is no question that the landscape of thyroid surgery will continue to rapidly evolve.

CONCLUSION

There is a national trend in the United States toward otolaryngologists seeing an increasing majority proportion of increasingly prevalent surgical thyroid conditions. These data objectively confirm the previously perceived increasing role of otolaryngologists in the management of surgical thyroid conditions on a national level. Surgical training in thyroid disease is essential in otolaryngology programs, and as a specialty, additional emphasis on thyroid research and clinical trials is warranted.

BIBLIOGRAPHY

18. Davies L, Ouellette M, Hunter M, Welch. The increasing incidence of small thyroid cancers: where are the cases coming from? Laryngoscope 2010;120:2446-2451.