

**The American Academy of Otolaryngology—
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Chapter 14: Thyroid Cancer

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Chapter 14: Thyroid Cancer

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Dr. Gregory Staffel first authored this short introduction to otolaryngology for medical students at the University of Texas School for the Health Sciences in San Antonio in 1996. Written in conversational style, peppered with hints for learning (such as "read an hour a day"), and short enough to digest in one or two evenings, the book was a "hit" with medical students.

Dr. Staffel graciously donated his book to the American Academy of Otolaryngology—Head and Neck Surgery Foundation to be used as a basis for this primer. It has been revised, edited and is now in the second printing. This edition has undergone an extensive review, revision and updating. We believe that you, the reader, will find this book enjoyable and informative. We anticipate that it will whet your appetite for further learning in the discipline that we love and have found most intriguing. It should start your journey into otolaryngology, the field of Head and Neck Surgery.

Enjoy!

Mark K. Wax, MD

Editor: Primary Care Otolaryngology and Chair: AAO-HNSF Core Otolaryngology Education Faculty



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Thyroid cancer can be a confusing subject. **Thyroid nodules** are so common as to preclude removal in each patient who presents with them. Otolaryngologists therefore try to select nodules for removal that have a higher chance of being cancerous. A fine needle aspirate (FNA) that shows malignant cells is obviously an indication for surgery, as is any evidence of metastasis. If the lab report on the needle aspirate comes back benign and the patient doesn't have any other risk factors, you can be pretty certain of a benign diagnosis. If the lab report is inconclusive, however, you must press on. An ultrasound test will tell you if there are multiple nodules present. If multiple nodules are found, some otolaryngologists classify this as a **multinodular goiter** and do not operate. If you find a single (on ultrasound), inconclusive (on FNA) nodule, you may elect to try to suppress the nodule with oral **thyroid supplementation**. If any risk factors (see below) are present, you may consider operating on the nodule to get a defini-



Figure 14.1.

Notice the large neck mass. In this case, it is from a benign thyroid goiter.



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tive diagnosis. **Thyroid scans** have become less useful in the diagnostic workup of nodules with the development and refinement of fine needle aspiration.

Many more women than men have thyroid nodules, but a nodule in a male has a higher risk of being cancerous than a nodule in a female. Older people also develop more nodules than younger people. A nodule in a person younger than 40 years old has a higher chance of being cancer than a nodule in a person over 40. People who received radiation as children are also at increased risk of developing thyroid cancer.

The **4 major types of thyroid cancer** are **papillary, follicular** (including the **Hürthle cell** variant), **medullary**, and **anaplastic**, listed in increasing order of aggressiveness and decreasing order of frequency.

Papillary Carcinoma:

Approximately 80% of thyroid cancers are papillary. These may have a **follicular component**, but any amount of papillary component means the tumor will behave like a papillary tumor. These tumors **often metastasize** to neck lymph nodes, and **can be multifocal** in the gland. Lymph node masses don't appear to affect survival. Histologically, they have **clear nuclei** (Orphan Annie **cells**), and may have **psammoma** bodies. Factors predictive of a better progno-



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sis include size smaller than 1.5 cm and absence of thyroid gland capsule involvement. For unknown reasons, this disease follows a much more indolent course when discovered in people under age 30-40 than when found in people older than 40. Thus, patients under 30 ultimately live longer. This may be one of the reasons why patients younger than 30 also have a higher recurrence rate.

Treatment

In the past, **lobectomy** and **isthmectomy** have been used. Newer evidence from a study by Mazzaferri and colleagues suggests that **total thyroidectomy**, when compared to subtotal, may significantly

decrease the local recurrence rate (18% versus 7%) and ultimately the number of deaths (from 1.5% to 0.03%). This study also pointed out that treatment of patients with **radioactive iodine** and **thyroid hormone suppression** decreased the incidence of recurrence from 11% to 3%

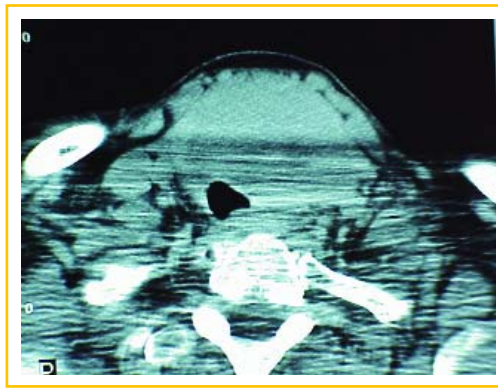


Figure 14.2.

This radiograph demonstrates invasion of the trachea with airway compression by a thyroid neoplasm.



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compared with those treated with thyroid suppression alone. There was, however, no difference in the number of deaths between these 2 groups. If neck masses are present, a **modified neck dissection** is indicated. Interestingly, no significant difference in recurrence has been shown between neck dissection and node plucking. The lower incidence of recurrence and death in total thyroidectomy must be weighed against the risk of **hypoparathyroidism** and **recurrent laryngeal nerve paralysis**. This risk obviously varies with each surgeon.

Follicular Carcinoma:

Approximately 15% of thyroid cancer is follicular. Two major types are **microinvasive** and **macroinvasive**. The surgical specimen of all thyroid cancers must be sectioned completely to determine if the tumor capsule or any blood vessels are invaded. This invasion is **pathognomonic**, and can't be determined by a fine needle aspirate. The cells may also look fairly benign on fine needle aspirate, so many specimens come back as "consistent with adenoma, cannot rule out follicular carcinoma." This tumor metastasizes via the blood. A variant of it is called Hürthle cell carcinoma.

Treatment

Follicular carcinoma has a higher affinity for radioactive iodine than does papillary carcinoma. Since iodine is concentrated in normal thyroid tissue, an attempt to remove



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all thyroid tissue allows a higher dose to be given to the mass. Total thyroidectomy (or at a very minimum, almost total) is therefore considered the treatment of choice. Postoperative radioactive iodine and thyroid suppression are then given.

Medullary Carcinoma:

Medullary carcinoma accounts for 6-10% of all thyroid cancer. There are **2 forms: familial (10-20%) and sporadic**. The tumor tends to be bilateral. The **parafollicular or C-cells** are the cell of origin. The familial form is a component of multiple endocrine neoplasms (MEN) IIa and IIb. MEN IIa is **parathyroid adenoma**, medullary carcinoma, and **pheochromocytoma**. MEN IIb doesn't have the parathyroid component and also has a **Marfanoid habitus** and mucosal neuromas. All patients with medullary carcinoma should get a urinary **metanephrine screen**. If this is positive, the pheochromocytoma should be found and excised first. All **1st-degree relatives** of patients with medullary carcinoma should be tested for **calcitonin level**. **Currently it has been demonstrated that the RET proto-oncogene is positive in most patients with this disease. This oncogene can be detected by a blood test.**

Total thyroidectomy is indicated if they have abnormal



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studies. Interestingly, the calcitonin level doesn't always go down after total thyroidectomy. If it does, the patient can be followed up with pentagastrin infusion studies. Medullary carcinoma metastasizes to the cervical lymph nodes 50-60% of the time. It may also characteristically produce **amyloid** that stains green with congo red.

Treatment

Most authors recommend subtotal or total thyroidectomy with elective neck dissections. In patients with a neck mass, a modified neck dissection that encompasses all the involved levels of disease should be removed. In patients with the familial form, only abnormal parathyroid glands should be removed. A total thyroidectomy is always indicated in these familial patients. C-cells don't take up radioactive iodine, thus this modality of ancillary treatment can not be used.

Anaplastic Carcinoma:

This is a rare tumor with a terrible prognosis. The surgeon's role is often limited to biopsy and securing the airway. These tumors are rarely resectable, and are often treated with radiotherapy for want of anything better.

Lymphoma:

Thyroid lymphoma can be difficult to differentiate from anaplastic carcinoma because of its rapid growth, which



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often produces airway compromise. Lymphomas typically arise in patients with a background of Hashimoto's thyroiditis, an autoimmune condition characterized by lymphocytic infiltration. Rapid diagnosis and institution of appropriate therapy is necessary to prevent airway obstruction.

This brief discussion on thyroid cancer should be distinguished from a discourse on surgery of the thyroid gland, which would include, for example, such subjects as surgery for hyperthyroidism (such as can occur with a toxic nodular goiter and Graves' disease). These conditions can also be treated medically, but further discussion here is beyond the scope of this book.

Questions, Section #14

1. The most common type of thyroid cancer is _____

2. The 2nd most common type of thyroid cancer is _____

3. The treatment of follicular cancer involves surgery plus ____

4. Patients with medullary carcinoma should have a urinary

screen.
5. The thyroid tumor with the worst prognosis is _____

carcinoma.



6. The first step in the diagnostic evaluation of a thyroid nodule after the history and physical is usually _____

7. Medullary carcinoma of the thyroid can produce amyloid. When stained with congo red and looked at through a polarizing microscope, this appears _____

Answers

1. Papillary
2. Follicular
3. Radioactive Iodine
4. Metanephrine
5. Anaplastic
6. Needle Aspiration
7. Green

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to learn more about these programs.



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