Clinical THYROIDOLOGY FOR PATIENTS

AMERICAN THYROID ASSOCIATION
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VOLUME 4 • ISSUE 4 • APRIL 2011

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Clinical Thyroidology for Patients

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EDITOR'S COMMENTS

Welcome to Clinical Thyroidology for Patients. This publication is a collection of summaries of the top articles from the recent medical literature that cover the broad spectrum of thyroid disorders. *Clinical Thyroidology for Patients* is published on a monthly basis and includes summaries of research studies that were discussed in the previous month's issue of *Clinical Thyroidology*, a publication of the American Thyroid Association for physicians. This means that you, the patients, are getting the latest information on thyroid research and treatment almost as soon as your physicians. The Calendar of Events highlights educational forums and support groups that are organized around the country by members of the Alliance for Thyroid Patient Education. The *Alliance* member groups consist of: the *American Thyroid Association*, the *Graves' Disease Foundation*, the *Light of Life Foundation* and *ThyCa: Thyroid Cancer Survivors Association*.

In this issue, the studies ask the following questions:

- Can we predict which patients with subclinical hyperthyroidism are at the highest risk to progress to overt hyperthyroidism?
- What is the correlation between thyroglobulin levels and radioiodine scans in high risk thyroid cancer patients?
- Do we even need radioiodine scans to follow thyroid cancer patients?
- What it the correlation between radioiodine and FDG-PET scans in patients with metastatic thyroid cancer?
- How common are small thyroid cancers in patients >45 years of age?
- Can we predict cancer by analyzing gene mutations in biopsy specimens?
- Are the calcification patterns in thyroid nodules predictive of the risk for thyroid cancer?
- What is the risk of prolonged/permanent hypothyroidism in women with post-partum thyroiditis?
- Do gene mutations plan a major role in patients with hyperthyroidism?

We welcome your feedback and suggestions. Let us know what you want to see in this publication. I hope you find these summaries interesting and informative.

— Alan P. Farwell, MD

HOW TO NAVIGATE THIS DOCUMENT: The Table of Contents and the Bookmarks are linked to the articles. To navigate, move your cursor over the article title you wish to see (either in the Contents or in the Bookmarks panel) and the hand will show a pointing finger, indicating a link. Left-click the title and the article will instantly appear. To return to the Contents, move the cursor to the bottom of the page and left-click Back to Table of Contents.

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HYPERTHYROIDISM

The natural progression of mild subclinical hyperthyroidism in elderly women

BACKGROUND

Hyperthyroidism occurs when the thyroid gland is overactive (producing too much of the thyroid hormones). This is usually caused by Graves' disease or a toxic nodular goiter. Overt hyperthyroidism occurs when the thyroid hormones are elevated and TSH is suppressed. Subclinical hyperthyroidism (a milder version) occurs when only the TSH is low and the thyroid hormones are normal. While subclinical hyperthyroidism may simply be early in the disease, eventually progressing to overt hyperthyroidism, sometimes it resolves on its' own or remains stable. Patients with overt hyperthyroidism usually require treatment with medications, radioactive iodine or thyroid surgery. Those with subclinical hyperthyroidism may not require any treatment aside from monitoring. This study was done to see how often older women with subclinical hyperthyroidism progress to overt hyperthyroidism.

THE FULL ARTICLE TITLE:

Rosario PW. Natural history of subclinical hyperthyroidism in elderly patients with TSH between 0.1 and 0.4 mIU/l: a prospective study. Clin Endocrinol (Oxf) 2010;72:685-8.

SUMMARY OF THE STUDY

The study included 102 women over age 60 in Brazil who had subclinical hyperthyroidism diagnosed between 2003-2008. Most (91 women) had hyperthyroidism from a toxic nodular goiter. All women were followed for up to 6 years, during which they had repeat blood tests every 3-6 months. They found that in women over age 60 with subclinical hyperthyroidism, progression to overt hyperthyroidism occurs at a rate of 1% per year. About a quarter of the patients reverted to normal thyroid function, with the majority remaining with stable subclinical hyperthyroidism.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The results of this study are reassuring in that only a small proportion of elderly individuals with subclinical hyperthyroidism go to develop overt hyperthyroidism. This means that most of these women do not require treatment other that periodic monitoring. One potential drawback of this study is that only a few of the patients likely had Graves' disease, the most common cause of hyperthyroidism in the United States. Thus, these results may not be directly applicable to women in this country.

— Angela Leung, MD

ATA THYROID BROCHURE LINKS

Hyperthyroidism: http://thyroid.org/patients/patient_brochures/hyperthyroidism.html

Graves disease: http://thyroid.org/patients/patient_brochures/graves.html

ABBREVIATIONS & DEFINITIONS

Hyperthyroidism — a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

Subclinical Hyperthyroidism — a mild form of hyperthyroidism where the only abnormal hormone level is a decreased TSH.

Graves' disease — the most common cause of hyperthyroidism in the United States. It is caused by antibodies that attack the thyroid and turn it on.

Toxic nodular goiter — characterized by one or more nodules or lumps in the thyroid that may gradually grow and increase their activity so that the total output of thyroid hormone in the blood is greater than normal.

TSH: Thyroid stimulating hormone — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

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HYPERTHYROIDISM

Progression of subclinical hyperthyroidism to overt hyperthyroidism occurs more rapidly when thyroid nodules are the cause

BACKGROUND

Hyperthyroidism occurs when the thyroid gland is overactive (producing too much of the thyroid hormones). This is usually caused by Graves' disease or a toxic nodular goiter. Overt hyperthyroidism occurs when the thyroid hormones are elevated and TSH is suppressed. Subclinical hyperthyroidism (a milder version) occurs when only the TSH is low and the thyroid hormones are normal. While subclinical hyperthyroidism may simply be early in the disease, eventually progressing to overt hyperthyroidism, sometimes it resolves on its' own or remains stable. Patients with overt hyperthyroidism usually require treatment with medications, radioactive iodine or thyroid surgery. Those with subclinical hyperthyroidism may not require any treatment aside from monitoring.

This study was performed to examine the factors which can predict the likelihood of rapid progression over a few years of subclinical hyperthyroidism to overt hyperthyroidism in patients with Graves' disease, toxic multinodular goiter or a toxic nodule.

THE FULL ARTICLE TITLE:

Shouten BJ et al. Subclinical thyrotoxicosis in an outpatient population-predictors of outcome. Clin Endocrinol (Oxf) 2011;74:257-61.

SUMMARY OF THE STUDY

A total of 96 patients with subclinical hyperthyroidism treated at a hospital in New Zealand were studied. They were monitored for an average of 3.8 years. In the patients with Graves' disease (12 patients), the rate of progression was 9% per year. In those with toxic multinodular goiters (70 patients), the rate of progression was 21% per year. In those with toxic toxic nodules (14 patients), the rate of progression was 61% per year. No other clinical factors, such as gender, family history or symptoms helped to predict the progression.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that if patients with subclinical hyperthyroidism have nodules, especially a single nodule, they are likely to progress to overt hyperthyroidism. The risk for progression is much less in those patients with subclinical hyperthyroidism due to Graves' Disease. Patients with nodules may consider definitive therapy (radioactive iodine or surgery) earlier in the course of the disease, but Graves' Disease patients may consider a more conservative course with observation.

— Jerrold Stock, MD

ATA THYROID BROCHURE LINKS

Hyperthyroidism: http://thyroid.org/patients/patient_brochures/hyperthyroidism.html

Graves disease: http://thyroid.org/patients/patient_brochures/graves.html

ABBREVIATIONS & DEFINITIONS

Hyperthyroidism — a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

Subclinical Hyperthyroidism — a mild form of hyperthyroidism where the only abnormal hormone level is a decreased TSH.

Graves' disease — the most common cause of hyperthyroidism in the United States. It is caused by antibodies that attack the thyroid and turn it on.

Toxic nodular goiter — characterized by one or more nodules or lumps in the thyroid that may gradually grow and increase their activity so that the total output of thyroid hormone in the blood is greater than normal.

TSH: Thyroid stimulating hormone — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

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THYROID CANCER

Imaging in thyroid cancer patients with spread of the cancer outside of the neck

BACKGROUND

The vast majority of patients diagnosed with thyroid cancer do very well. Most are cured of their cancer through a combination of surgery and radioactive iodine, which is taken up by the cancer to destroy it. While overall death from thyroid cancer is rare, the prognosis of thyroid cancer patients with spread of the cancer outside of the neck is less favorable. This is especially true for patients over the age of 45 or if the cancer does not take up radioactive iodine. FDG-PET scans use a small amount of radioactive glucose (FDG) to identify cancer and have been used to predict prognosis in other cancers. This study examined whether FDG-PET scans can be used as a prognostic factor in thyroid cancer patients with spread of the cancer outside of the neck.

THE FULL ARTICLE TITLE:

Deandreis et al. Tumor necrosis and absence of I-131 uptake predict progression of metastatic thyroid cancer. Endocr Relat Cancer 2011;18:159-169.

SUMMARY OF THE STUDY

In this study the effect of different prognostic factors were examined in 80 thyroid cancer patients over the age of 45 with spread of the cancer outside of the neck who were followed for 4 years. All patients had a total thyroidectomy and radioactive iodine treatment and all patients showing radioactive iodine uptake in the cancer were given additional radioactive iodine treatments every 6-12 months. Most patients (80%) had an FDG-PET scan 1 year after the diagnosis of spread of the cancer outside of the neck and the rest about 2-10 years later. A total of 4 patients were free of cancer after 3 years of treatments; all of those had cancers that took up I-131 but not FDG. All patients without FDG-uptake in the cancer were alive after 2 years follow-up, whereas only 60% of patients with FDG-uptake were still alive in the same time. All of the patients who died (14) had FDG-uptake in their cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

While the spread of thyroid cancer outside of the neck is an unfavorable prognosis, some patients still do well for a long period of time. FDG-PET scans can be used to identify those patients who don't do well. In thyroid cancer patients with distant metastasis, the absence of radioactive uptake and the presence of FDG-uptake are associated with unfavorable outcome. These patients can be selected for more aggressive treatment or new experimental therapies.

— Jamshid Farahiti, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

Radioactive Iodine Therapy: http://thyroid.org/patients/patient_brochures/radioactive.html

ABBREVIATIONS & DEFINITIONS

Total thyroidectomy — surgery to remove the entire thyroid gland.

Radioactive iodine (RAI) — this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid (Thyroid Scan) or to take pictures of the whole body to look for thyroid cancer (Whole Body Scan).

Positron-Emission-Tomography (PET) scans — a nuclear medicine imaging test that uses a small amount of radiolabeled glucose (FDG) to identify cancer. Since cancer cells are more active than normal cells, the cancer cells take up more of the radiolabeled glucose and show up on the PET scan. PET scans are frequently combined with CT scans to accurately identify where the cancer is located.

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THYROID CANCER

TSH-stimulated thyroglobulin testing is sufficient in following high-risk thyroid cancer patients

BACKGROUND

In patients with low-risk thyroid cancer, TSH-stimulated thyroglobulin testing is a more sensitive indicator of cancer recurrence than diagnostic whole-body scans. However, this has not been shown for patients with more advanced stages of thyroid cancer. The purpose of this study was to determine whether routine diagnostic whole-body scans 6 to 12 months after initial treatment provide additional information to that provided by TSH-stimulated thyroglobulin testing during the first year of follow-up of high-risk thyroid cancer.

THE FULL ARTICLE TITLE:

de Meer SG et al. The role of routine diagnostic radioiodine whole-body scintigraphy in patients with high-risk differentiated thyroid cancer. J Nucl Med 2011;52:56-9. Epub December 13, 2010.

SUMMARY OF THE STUDY

High-risk patients were defined as those with cancers larger than 4 cm or cancers that were locally invasive or associated with spread to the lymph nodes. TSH-stimulated thyroglobulin testing was performed after treatment with recombinant human TSH and compared with diagnostic whole-body scans.

The study group included 112 patients: 81% had papillary cancer and 19% had follicular cancer. Stimulated thyroglobulin was >0.2 ng/ml in 65%: 8 patients of this group had positive diagnostic whole body scans. In 6 patients, there was recurrence of the cancer only in the neck. One patient had spread of the cancer to the skull and another to the lung and brain. TSH-stimulated thyroglobulin was <0.2 ng/ml in 30% of patients. Only 1 of these patients had a positive diagnostic whole body scan. Additional studies did not reveal a source and a diagnostic whole body scan 1 year later was negative in this patient. Five percent of the patients had thyroglobulin antibodies that made the measurement of thyroglobulin unreliable.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

It is clear that some type of TSH-stimulated testing is important in predicting thyroid cancer recurrence and in assigning thyroid cancer patients as low or high risk for future cancer recurrence. Initially a TSH-stimulated diagnostic whole body scanning was paired with thyroglobulin testing in all patients. The scan was dropped in patients initially thought to be low risk. Now this study suggests that scans do not add important information in high-risk patients. This is important since scans require more preparation and an additional day of testing at the hospital. Thus, for most patients, TSH-stimulated thyroglobulin testing is sufficient.

— Alan P. Farwell, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

ABBREVIATIONS & DEFINITIONS

TSH: thyroid stimulating hormone — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

Thyroglobulin — a protein made only by thyroid cells, both normal and cancerous. When all normal thyroid tissue is destroyed after radioactive iodine therapy in patients with thyroid cancer, thyroglobulin can be used as a thyroid cancer marker in patients that do not have thyroglobulin antibodies.

TSH-stimulated thyroglobulin testing — this test is used to measure whether there is any cancer present in a patient that has previously been treated with surgery and radioactive iodine. TSH levels are increased, either by withdrawing the patient from thyroid hormone or treating the patient with recombinant human TSH, then levels of thyroglobulin are measured. Sometimes this test is combined with a whole body iodine scan.

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THYROID CANCER, continued

Radioactive iodine (RAI) — this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid (Thyroid Scan) or to take pictures of the whole body to look for thyroid cancer (Whole Body Scan).

Recombinant human TSH (rhTSH) — human TSH that is produced in the laboratory and used to produce high levels of TSH in patients after an intramuscular injection. This is mainly used in thyroid cancer patients before treating with radioactive iodine or performing a whole body scan. The brand name for rhTSH is Thyrogen™.

Diagnostic Whole Body Scans — these radioactive iodine scans are performed under TSH stimulation, either after thyroid hormone withdrawal or after injections of recombinant human TSH (Thyrogen) and usually include measuring serum thyroglobulin levels.

Lymph node — bean-shaped organ that plays a role in removing what the body considers harmful, such as infections and cancer cells.

Papillary thyroid cancer — the most common type of thyroid cancer.

Follicular thyroid cancer — the second most common type of thyroid cancer.

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THYROID CANCER

Changing Age and Size Trends in Papillary Thyroid Cancer

BACKGROUND

The number of cases of papillary thyroid cancer being diagnosed in the United States is increasing according to data from the National Cancer Institute and is growing at a faster rate than any other cancer. While there are more cases being diagnosed, the risk of death from has actually decreased from the 1970's, possibly suggesting that papillary thyroid cancer is being diagnosed earlier or more low-risk cases are being identified. It is unclear what the role age has on the increasing development of papillary thyroid cancer. The authors of this study examined a large database to examine how frequently papillary thyroid carcinoma occurs by age and cancer size. They compared these rates over the past three decades. By looking at this data, the authors hoped to obtain a better understanding of the role of age in the development of papillary thyroid cancer.

THE FULL ARTICLE TITLE:

Hughes DT et al. The most commonly occurring papillary thyroid cancer in the United States is now a microcarcinoma in a patient older than 45 years. Thyroid. 2011 Mar;21(3):231-6. Epub 2011 Jan 26.

SUMMARY OF THE STUDY

This study reviewed the how frequently new cases of papillary thyroid carcinoma developed by year from 1973 to 2006 as reported in the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database. The authors looked at new cases each year based on age and size of the cancer.

Between 1974 and 2006, the most common age of diagnosis shifted from patients in their 30s to patients in the age range of 40 to 50 years. Before 1999, most cases where found in patients younger than 45 years. After 1999, papillary thyroid carcinoma was more common in patients older than 45 years. From 1988 to 2003, there was an increased number of patients diagnosed in all sizes of papillary thyroid carcinoma, with the largest increase in tumors <1 cm in patients older than 45 years.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The number of papillary thyroid carcinomas being diagnosed is increasing, especially in patients older than 45 years. This study is important because patients who are older than 45 years old are at higher risk to have a more aggressive thyroid cancer relative to younger patients and, therefore, may warrant more aggressive treatment. The number of papillary thyroid carcinomas smaller than 1 cm (papillary microcancer) is increasing in all age groups. Fortunately for patients, papillary microcancers are usually easily treatable and curable.

— Ronald Kuppersmith, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer — the most common type of thyroid cancer.

Papillary microcarcinoma — a papillary thyroid cancer smaller than 1 cm in diameter.

SEER — Surveillance, Epidemiology and End Results program, a nation-wide anonymous cancer registry generated by the National Cancer Institute that contains information on 26% of the United States population. Website: http://seer.cancer.gov/

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THYROID CANCER

How often are BRAF genetic mutations found in biopsy samples of thyroid nodules?

BACKGROUND

Papillary cancer is the most common thyroid cancer. While most patients with papillary cancer do well and have an excellent prognosis, some do have a more aggressive form of cancer. The focus of studies on patients with the more aggressive papillary cancers is on mutations in cancer-associated genes, especially a gene known as BRAF. In Korea, more than 90% of patients with thyroid cancer have papillary cancer. Surprisingly, >80% of Korean patients who have papillary thyroid cancer have a mutation in the BRAF gene called BRAF-V600E. The rate of this mutation is higher in Korea than in many western countries. The aim of this study was to determine if it was useful to check for the BRAF-V600E in thyroid fine needle aspiration biopsy (FNAB) samples of thyroid nodules. This study looked at how often the BRAF-V600E mutation was found in FNAB samples of thyroid nodules and how often thyroid cancer was diagnosed after surgery.

THE FULL ARTICLE TITLE:

Kim et al. Surgical results of thyroid nodules according to management guideline based on BRAF-V600E mutation status. J Clin Endocrinol Metab. Jan 14, 2011 [Epub ahead of print] doi:10.1210/jc.2010-1082.

SUMMARY OF THE STUDY

A total of 849 FNAB samples were tested for the presence of the BRAF-V600E mutation. The FNAB diagnosis and percentage that had the BRAF-V600E mutation were as follows: 504 samples "benign" – 0% mutation, 141 samples "atypical" – 32% mutation, 54 samples "suspicious" for cancer – 85% mutation, 140 samples "malignant" – 92% mutation, 10 samples "indeterminate" – 10% BRAF-V600E mutation. All patients whose FNAB was read as suspicious for cancer or positive for cancer, whether or not the BRAF-V600E mutation was present, had papillary thyroid cancer at surgery. For patients who had an atypical FNAB and went to surgery, papillary thyroid cancer was diagnosed in 29 of 30 patients with the BRAF-V600E and 3 of 12 patients without the mutation. Only 3 of 8 patients whose FNAB was read as indeterminate and had surgery were diagnosed with cancer and none of them had the BRAF-V600E mutation.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors of this study concluded that for patients who have an atypical result on their thyroid nodule FNAB sample, a positive BRAF-V600E mutation test may be helpful in guiding the need for thyroid surgery. Because there were patients without the mutation that had thyroid cancer, it is important to realize that it is not a 100% accurate test. However, it is another option that can be used to help identify those patients that will benefit the most with surgery.

— Anna Sawka, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

Thyroid Surgery: http://thyroid.org/patients/patient_brochures/surgery.html

ABBREVIATIONS & DEFINITIONS

BRAF gene — this is gene that codes for a protein that is involved in a signaling pathway and is important for cell growth. Mutations in the BRAF gene in adults appear to cause cancer.

Cancer-associated genes — these are genes that are normally expressed in cells. Cancer cells frequently have mutations in these genes. It is unclear whether mutations in these genes cause the cancer or are just associated with the cancer cells. The cancer-associated genes important in thyroid cancer are BRAF, RET/PTC and RAS.

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THYROID CANCER, continued

Papillary thyroid cancer — the most common type of thyroid cancer.

Thyroid nodule — an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (Benign), ~5% are cancerous.

Thyroid fine needle aspiration biopsy (FNAB) — a simple procedure that is done in the doctor's office to determine if a thyroid nodule is benign (non-cancerous) or cancer. The doctor uses a very thin needle to withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

Indeterminate thyroid biopsy — this happens usually when the diagnosis is a follicular or hurtle cell lesion. Follicular and hurtle cells are normal cells found in the thyroid. Current analysis of thyroid biopsy results cannot differentiate between follicular or hurtle cell cancer from noncancerous adenomas. This occurs in 15-20% of biopsies and often results in the need for surgery to remove the nodule.

Atypical thyroid biopsy — this happens when there are some abnormal/atypical cells in the biopsy sample but not enough to diagnose a cancer. However, because there are abnormal cells in the biopsy sample, the specimen cannot be called benign. Sometimes a repeat biopsy may be helpful but often surgery is recommended to remove the nodule.

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THYROID NODULES

Thyroid nodule macrocalcification does not mean the nodule is benign

BACKGROUND

Thyroid nodules are the most common endocrine problem, occurring in up to half of patients that have any type of imaging study that includes the neck. The concern about a thyroid nodule is the possibility that the nodule could contain a thyroid cancer. The most recent American Thyroid Association guidelines for evaluation of thyroid nodules and cancer recommend using thyroid ultrasound to guide the clinician in the selection of nodules that need biopsy in order to exclude cancer. The thyroid ultrasound finding of small flecks of calcium (microcalcifications) are very specific for papillary thyroid cancer. While the general feeling is that large flecks of calcium (macrocalcifications) only occur in benign, non-cancerous nodules, the actual risk for cancer associated with macrocalcifications is less well known. The purpose of this study was to determine the clinical usefulness of calcification patterns of thyroid nodules found on ultrasound in predicting cancer.

THE FULL ARTICLE TITLE:

Lu et al, Clinical value of using ultrasound to assess calcification patterns in thyroid nodules. World J Surg 2011;35:122-7.

SUMMARY OF THE STUDY

A total of 2122 thyroid nodules were examined in 1498 Chinese patients within a month before thyroidectomy. Calcification patterns including macrocalcifications, microcalcifications, egg-shell/rim calcifications and isolated calcifications were correlated with the final diagnosis. Some type of calcification was found on ultrasound in15.7% of benign and 49.6% of cancerous nodules. A total of 12% of thyroid nodules were found to be cancerous, with most of the cancers (85.3%) being papillary cancer. The average size of the nodules was 2.3 cm. Microcalcifications were found in 33.7% (87 of 258) of cancerous nodules and 6.4% (120 of 1864) of benign nodules; 95% of the cancers associated with microcalcifications were papillary cancers. Macrocalcifications were found in 37% of benign nodules and 27% of cancerous nodules.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Calcifications are a common finding on ultrasound of thyroid nodules. Although microcalcifications are specific for cancer, the presence of other patterns of calcification (macrocalcifications, egg-shell/rim calcifications, other calcification) was also found in cancerous nodules. It was previously considered that macrocalcifications were usually benign and did not need evaluation or surgery. This and several other reports suggest that all types of calcifications may be seen in thyroid cancer. Thus, macrocalcifications should not exclude a nodule from further investigation, including biopsy.

— M. Regina Castro, MD

ATA THYROID BROCHURE LINKS

Thyroid Nodules: http://thyroid.org/patients/patient_brochures/nodules.html

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

ABBREVIATIONS & DEFINITIONS

Thyroid Ultrasound — a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.

Papillary thyroid cancer — the most common type of thyroid cancer.

Thyroidectomy — surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a total thyroidectomy. When less is removed, such as in removal of a lobe, it is termed a partial thyroidectomy.

Microcalcifications — Small flecks of calcium within a thyroid nodule, usually seen as small bright spots on ultrasonography. These are frequently seen in nodules containing papillary thyroid cancer.

Macrocalcifications — Large flecks of calcium that can be seen either inside a thyroid nodule or in the periphery (so called egg-shell/rim calcifications), usually seen as large bright spots on ultrasonography.

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HYPOTHYROIDISM

High rate of persistent hypothyroidism in a large-scale prospective study of postpartum thyroiditis in southern Italy

BACKGROUND

According to previous studies, 1.6% to 19% of women develop thyroid function abnormalities in the 6-12 months following childbirth, a condition known as postpartum thyroiditis. This is caused by an inflammation of the thyroid that first causes mild hyperthyroidism for 1-3 months after delivery. This is followed by hypothyroidism starting 4-6 months after delivery. The hypothyroidism resolves and normal thyroid function returns 12-18 months after delivery in most women. While many women have both the hyperthyroid and the hypothyroid phase, some women may only have one or the other. Of those who develop hypothyroidism, a number of them are likely to be permanently hypothyroid. Unfortunately, there is limited information as to the percentage of women with postpartum thyroiditis who develop permanent hypothyroidism. The current study looks at how many women develop postpartum thyroiditis and how many remain hypothyroid after one year.

THE FULL ARTICLE TITLE:

Stagnaro-Green A, et al. High Rate of Persistent Hypothyroidism in a Large-Scale Prospective Study of Postpartum Thyroiditis in Southern Italy. J Clin Endocrinol Metab. 96:652-657, 2011.

SUMMARY OF THE STUDY

A total of 4384 women had thyroid function studies performed at 6 and 12 months after delivery. A higher risk of developing postpartum thyroiditis was noted in those women with a positive family history of thyroid disease, presence of thyroid enlargement, symptoms suggesting thyroid disease, previous preterm delivery or miscarriage or a history of any autoimmune disease. A total of 3.9% of women (169 women) developed postpartum thyroiditis. Among those women classified as being at higher risk, 11.1% developed postpartum thyroiditis while only 1.9% of women classified as lower risk developed postpartum thyroiditis. A total of 82% of the women with postpartum thyroiditis developed hypothyroidism and 54% had persistent hypothyroidism at the end of the first postpartum year.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

More than half of the women who developed postpartum thyroiditis in the current study went on to have persistent hypothyroidism at the end of one year. These results indicate a significantly higher percentage of persistent hypothyroidism than has been previously thought. This study suggests that the widely held belief that most women with postpartum thyroiditis have a return to normal thyroid function at the end of the first year after delivery needs to be reevaluated.

— Frank Cranz, MD

ATA THYROID BROCHURE LINKS

Hypothyroidism: http://thyroid.org/patients/patient_brochures/hypothyroidism.html

Thyroid and Pregnancy: http://thyroid.org/patients/patient_brochures/pregnancy.html

Postpartum Thyroiditis: http://thyroid.org/patients/patient_brochures/postpartum.html

ABBREVIATIONS & DEFINITIONS

Hypothyroidism — a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

Postpartum thyroiditis — an inflamation of the thyroid in women who have just delivered a baby. The inflammation first causes mild hyperthyroidism for 1-3 months after delivery. This is followed by hypothyroidism starting 4-6 months after delivery. The hypothyroidism resolves and normal thyroid function returns 12–18 months after delivery in most women. While many women have both the hyperthyroid and the hypothyroid phase, some women may only have one or the other.

Hyperthyroidism — a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

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HYPERTHYROIDISM

Hereditary Activating Mutations of the TSH Receptor Lead to Hyperthyroidism

BACKGROUND

TSH (thyroid stimulating hormone) regulates thyroid function by binding to a specific TSH receptor that turns on thyroid cells, increasing the production and secretion of thyroid hormones. The most common type of hyperthyroidism is Graves' disease, an autoimmune disorder where the patient develops antibodies that attack the TSH receptor, turning in the thyroid in the absence of TSH. Rarely, hyperthyroidism may be caused by genetic mutations in the TSH receptor that cause it to be permanently in the "on" position (activating mutations). Two forms of this genetic hyperthyroidism have been reported, one that runs in families (familial form) and one that occurs by itself (sporadic form). Despite an increase in reported cases in the recent years, the genetic forms of hyperthyroidism remain rare and are incompletely characterized. The aim of this study was to evaluate the clinical and biological aspects of the familial and sporadic forms of genetic hyperthyroidism caused by activating TSH receptor mutations.

THE FULL ARTICLE TITLE:

Hébrant A et al Genetic hyperthyroidism: hyperthyroidism due to activating TSHR mutations. Eur J Endocrinol 2011;164:1-9.

SUMMARY OF THE STUDY:

This study analyzes the medical history of 152 patients with the familial form of genetic hyperthyroidism coming from 27 families and 15 sporadic cases. Several TSH receptor mutations have been identified, some of them being reported in both the familial and sporadic forms. Men and women are equally affected in both the familial or sporadic forms.

Familial hyperthyroidism developed most frequently between adolescence and 30 years of age and it was rarely present at birth or during infancy. In contrast, all sporadic cases developed at birth or during the first year of life and they were more severe than the familial forms. Sporadic forms were associated with other complications at birth, such as prematurity and mental retardation. Members of the same family bearing the same mutation had different degrees of disease severity. Non-autoimmune hyperthyroidism tended to relapse after conventional treatment.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Similar activating TSH receptor mutations involving all thyroid cells have been described in both the familial and sporadic forms of genetic hyperthyroidism. The sporadic forms seem to be associated with stronger mutations resulting in a higher degree of thyroid activation, since hyperthyroidism appears early in life and is clinically more severe compared to familial forms. It is important to differentiate the genetic hyperthyroidism from Graves' disease because the genetic hyperthyroidism tends to relapse after antithyroid drug treatments. More patients with the sporadic forms are now able to survive with adequate treatment and will transmit the disease to their offspring. Genetic counseling is recommended for all patients with genetic hyperthyroidism.

Alina Gavrila, MD

ATA THYROID BROCHURE LINKS

Hyperthyroidism: http://thyroid.org/patients/patient_brochures/hyperthyroidism.html

Graves disease: http://thyroid.org/patients/patient_brochures/graves.html

Thyroid Function Tests: http://thyroid.org/patients/patient_brochures/function_tests.html

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HYPERTHYROIDISM, continued

ABBREVIATIONS & DEFINITIONS

TSH: thyroid stimulating hormone — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

TSH receptor — a molecule (protein) located on the thyroid cell surface that binds TSH and stimulates the production of the thyroid hormones within the thyroid cell.

Hyperthyroidism — a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

Graves' disease — the most common cause of hyperthyroidism in the United States. It is caused by antibodies that attack the thyroid and turn it on.

Genetic hyperthyroidism — a rare form of hyperthyroidism caused by genetic mutations in the TSH receptor that cause it to be permanently in the "on" position (activating mutations).

Congenital — a condition that exists at birth.

Mutation — a permanent change in one of the genes.

Antibodies — proteins that are produced by the body's immune cells that attack and destroy bacteria and viruses that cause infections. Occasionally the antibodies get confused and attack the body's own tissues, causing autoimmune disease.

ATA Alliance for Thyroid Patient Education

GOAL

The goal of our organizations is to provide accurate and reliable information for patients about the diagnosis, evaluation and treatment of thyroid diseases.

WHO WE ARE

AMERICAN THYROID ASSOCIATION

www.thyroid.org
ATA Patient Resources: http://www.thyroid.org/patients/
Find a Thyroid Specialist: www.thyroid.org
Phone (toll-free): 1-800-THYROID
e-mail: thyroid@thyroid.org

ATA Mission: The ATA leads in promoting thyroid health and understanding thyroid biology.
ATA Vision: The ATA is the leading organization focused on thyroid biology and the prevention and treatment of thyroid disorders through excellence and innovation in research, clinical care, education, and public health.
ATA Values: The ATA values scientific inquiry, clinical excellence, public service, education, collaboration, and collegiality.

To further our mission, vision and values the ATA sponsors "Friends of the ATA" online to advance the information provided to patients and the public such as this publication, *Clinical Thyroidology for Patients*. We welcome your support.

GRAVES' DISEASE FOUNDATION

www.ngdf.org
Phone (toll-free): 1-877-NGDF-123 or 643-3123
e-mail: Gravesdiseasefd@gmail.com

Founded in 1990, the Graves' Disease Foundation offers support and resources to Graves' disease patients, their families, and health care professionals. Their mission is to find the cause of and the cure for Graves' thyroid disease through research, to improve the quality of life for persons with Graves' disease and their caregivers and to educate persons with Graves' disease, their caregivers, healthcare professionals, and the general public about Graves' disease and its treatment. The web site features a monitored bulletin board.

LIGHT OF LIFE FOUNDATION

www.checkyourneck.com
email: info@checkyourneck.com

The Light of Life Foundation, founded in 1997, is a nonprofit organization that strives to improve the quality of life for thyroid cancer patients, educate the public and professionals about thyroid cancer, and promote research and development to improve thyroid cancer care.

THYCA: THYROID CANCER SURVIVORS' ASSOCIATION, INC.

www.thyca.org
Phone (toll-free): 877 588-7904
e-mail: thyca@thyca.org

ThyCa: Thyroid Cancer Survivors' Association, Inc., founded in 1995, is an international nonprofit organization, guided by a medical advisory council of renowned thyroid cancer specialists, offering support and information to thyroid cancer survivors, families, and health care professionals worldwide.

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Graves' Disease Foundation
Light of Life Foundation checkyourneck.com
ThyCa

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FOUNDED 1923
www.thyroid.org

ATA Alliance for Thyroid Patient Education
CALENDAR OF EVENTS

Educational forums, patient support groups and other patient-oriented meetings

ATA Conferences www.thyroid.org

Saturday, October 29, 2011
1:00 pm – 3:00 pm — Indian Wells, CA
FREE Public Health Forum — Thyroid Disease and You

Graves' Disease Conferences www.ngdf.org

Fall, 2011 — Boston, MA
Annual Patient & Family Conference

Light of Life Foundation www.checkyourneck.com

Ongoing
Thyroid Cancer Awareness campaign with Cindy Crawford and Brooke Shields

June 12, 2010 — a previous symposium available online at:
http://www.checkyourneck.com/About-Thyroid-Cancer/Thyroid-Cancer-Symposium-Presentations

Thyroid Cancer Symposium Presentations: What's New in Thyroid Cancer?
A Day for Patients and Their Families

Please visit the Light of Life Foundation website to view the Patient Educational Symposium which took place in NYC in 2010. As part of the Patient Educational Program these online presentations provide valuable information in hopes that patients everywhere can gain further information and support about their disease.

ThyCa Conferences www.thyca.org

Free One-Day Workshops — Details at www.thyca.org

- Saturday, May 28, 2011
  Newfoundland and Labrador Thyroid Cancer' Workshop/Information Day
  St. John's, Newfoundland and Labrador — Free
  Sponsored by ThyCa: Thyroid Cancer Survivors' Association, Inc.
- Tuesday, June 7, 2011
  The Role of the Pathologist in Diagnosing Thyroid Cancer with Amir Kende, MD
  Rockville, Maryland — Free
  Sponsored by ThyCa: Thyroid Cancer Survivors' Association, Inc.
- Saturday, June 11, 2011, 8 a.m. to 5 p.m.
  Mid-Atlantic Thyroid Cancer Survivors' Workshop
  Silver Spring, Maryland — Free
  Sponsored by ThyCa: Thyroid Cancer Survivors' Association, Inc.

October 14–16, 2011 — Los Angeles, California
14th International Thyroid Cancer Survivors' Conference
(at the Hilton Los Angeles Airport Hotel, 5711 West Century Boulevard, Los Angeles, California)

September, 2011 — Worldwide
Thyroid Cancer Awareness Month

FREE Public Health Forum

AMERICAN THYROID ASSOCIATION®
FOUNDED 1923
www.thyroid.org

Thyroid Experts from the American Thyroid Association and thyroid patients join together to inform the general public, other thyroid patients, and their friends and families about:

Thyroid Disease and You

Have you experienced a significant change in:

- Energy?
- Memory?
- Fatigue level after a good night's sleep?
- Depression?
- Rapid heart beat?
- Restlessness?
- Infertility?
- Weight?
- Hair?
- A lump on your neck?

Could it be your thyroid?

Public Forum will be held on Saturday, October 29, 2011

1:00 pm – 3:00 pm • Indian Wells, California

Renaissance Esmeralda Resort and Spa, 44-400 Indian Wells Lane, Indian Wells CA 92210-8708
Phone: 760-773-4444 or toll free at 800-446-9875

Physician experts will discuss thyroid disorders. This program is free and all are welcome, including walk-in-attendees. Reservations are encouraged to ensure we have enough seating. For more information and to register, please e-mail ThyCa at thyca@thyca.org.

Who should attend? Anyone who has had an overactive or underactive thyroid, thyroiditis, a thyroid nodule, thyroid cancer, or a family history of thyroid problems or related disorders, including rheumatoid arthritis, juvenile diabetes, pernicious anemia, or prematurely gray hair (starting before age 30) Please come if you have questions, symptoms, or concerns about a thyroid problem. Receive free educational materials.

Reservations requested. Walk-ins welcome. E-mail thyca@thyca.org to RSVP
(Please indicate in your message the thyroid condition you are most concerned about.)

Online educational information for patients is provided by all members of the ATA Alliance for Patient Education co-sponsoring this forum: ThyCA: Thyroid Cancer Survivors' Association, Light of Life Foundation, and Graves' Disease Foundation. Go online to www.thyroid.org and click on "Patients and Public" to access the resources you need.