Clinical THYROIDOLOGY FOR PATIENTS

AMERICAN THYROID ASSOCIATION
FOUNDED 1923

VOLUME 4 • ISSUE 3 • MARCH 2011

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Clinical Thyroidology for Patients

CLINICAL THYROIDOLOGY **FOR PATIENTS**

A publication of the American Thyroid Association

VOLUME 4 • ISSUE 3 • MARCH 2011

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, we are highlighting the Light of Life Foundation as they report some exciting new activities for 2011!

In this issue, the studies ask the following questions:

- What are the current patient safety instructions after being treated with radioactive iodine?
- What is new in the treatment of Graves' eye disease?
- What is the long-term risk of hypocalcemia in patients after thyroid surgery?
- Does cancer-associated gene analysis help to diagnose follicular thyroid cancer on thyroid biopsies?
- Are familial forms of thyroid cancer more aggressive than those that do not run in families?
- What is the best way to determine which thyroid cancer patients are at high risk for recurrence of their cancer?

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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THYROID SURGERY

Implications of long-term hypocalcemia with normal PTH levels following thyroid surgery

BACKGROUND

Parathyroid hormone (PTH), which regulates calcium levels, is produced by the parathyroid glands. Because of their position next to the thyroid, the parathyroid glands often are temporarily damaged after thyroid surgery, leading to low calcium levels (hypocalcemia) to varying degrees. Permanent hypoparathyroidism is rare, but is the most common serious complication of thyroid surgery. This study was performed to look at patients who had long-term low serum calcium levels despite normal PTH levels following thyroid removal surgery. The authors wanted to compare PTH levels in these patients with permanent hypocalcemia.

THE FULL ARTICLE TITLE:

Promberger et al Normal parathyroid hormone levels do not exclude permanent hypoparathyroidism after thyroidectomy. Thyroid. December 29, 2010.

SUMMARY OF THE STUDY

Eight patients were studied who had low serum calcium levels two months following their thyroidectomy. Their blood levels of calcium and PTH were measured at two months and twelve months following surgery. All of these patients had normal PTH levels following surgery, but persistently low calcium and ionized calcium levels 12 months following surgery. This suggests that even normal parathyroid levels may indicate an inadequate PTH response to hypoclacemia.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This report suggests that some patients may have mild hypoparathyroidism despite in the presence of normal serum PTH after thyroid surgery due to damage to the parathyroid glands during surgery. In patients who have low calcium levels after thyroidectomy, physicians should be aware that they might have hypoparathyroidism despite normal levels of serum PTH.

— Heather Hofflich, MD

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS & DEFINITIONS

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.

Hypoparathyroidism — low calcium levels due to decreased secretion of parathyroid hormone (PTH) from the parathyroid glands next to the thyroid. This can occur as a result of damage to the glands during thyroid surgery and usually resolves. This may also occur as a result of autoimmune destruction of the glands, in which case it is usually permanent.

Hypocalcemia — low calcium levels in the blood, a complication from thyroid surgery that is usually short-term and relatively easily treated with calcium pills. If left untreated, low calcium may be associated with muscle twitching or cramping and, if severe, can cause seizures and/or heart problems.

Parathyroid glands — usually four small glands located around the thyroid that secrete parathyroid hormone (PTH), which regulates the body's calcium levels.

Parathyroid hormone (PTH) — the hormone that regulates the body's calcium levels. High levels of PTH cause hypercalcemia, or too much calcium in the blood. Low levels of PTH cause hypocalcemia, or too little calcium in the blood.

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RADIOACTIVE IODINE

Radioactive iodine practices in the United States

BACKGROUND

Iodine, in the form of iodide, is made into two radioactive isotopes that are commonly used in patients with thyroid diseases: **I-123** — harmless to thyroid cells — used to take pictures and determine the activity of the intact thyroid gland (Thyroid Scan and Radioactive Iodine Uptake, RAIU) and **I-131** — destroys thyroid cells — is given to destroy overactive thyroid tissue in the patient with hyperthyroidism, to treat patients with thyroid cancer and to shrink thyroid glands that are functioning normally but are causing problems because of their size. Although the treatments with I-131 are generally safe, it does produce radiation, so patients must do their best to avoid radiation exposure to others, particularly to pregnant women and young children. Up until 1997, thyroid cancer patients treated with radioactive iodine had to be admitted to a radiation safety room in the hospital for 1–3 days to decrease radiation exposure to others. Since 1997, the Nuclear Regulatory Commission has allowed patients that can follow specific radiation safety precautions to be treated on an out-patient basis. Recently, this practice has been questioned and some have urged its repeal because of risks that thyroid patients treated with radioactive iodine pose to others. This paper reported on the current practice of treating thyroid patients with radioactive iodine and offers a revised set of radiation safety precautions to be used in this situation.

THE FULL ARTICLE TITLE:

Greenlee C et al. Current safety practices relating to I-131 administration for diseases of the thyroid: a survey of physicians and allied practitioners. Thyroid. 21:151-160, 2011.

SUMMARY OF THE STUDY

This paper is the first report of safety practices surrounding the treatment of patients with radioactive iodine. After a review of a variety of studies, it is clear that radioactive iodine is a very safe treatment and that there has been no report of any individual that has been harmed as a result of exposure to a patient that has been treated with radioactive iodine. However, it is important to do whatever can be done to limit exposure to the smallest possible amount. This paper presents some uniform recommendations for patient safety instructions during and after radioactive iodine treatment. In additionm the latest Nuclear Regulatory Commission guidance on release of patients following iodine treatment for thyroid conditions is found on the following site: http://www.nrc.gov/reading-rm/doc-collections/gen-comm/reg-issues/2011/index.html.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Based on available information, the American Thyroid Association believes that the current regulations allowing thyroid patients to be treated with radioactive iodine on an outpatient basis are appropriate and safe. There is minimal risk of radiation exposure to others as long as patients follow reasonable radiation safety precautions. However, staying in hotels after radioactive iodine treatment is not recommended at this time. A summary of current recommendations is provided in this issue (Radioactive Iodine Therapy FAQ) with links to a more complete brochure on the ATA website.

— Alan P. Farwell, MD

ATA THYROID BROCHURE LINKS

Radioactive Iodine: http://thyroid.org/patients/brochures/Radioactive_iodine_brochure.pdf

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

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

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RADIOACTIVE IODINE, continued

ABBREVIATIONS & DEFINITIONS

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).

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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THYROID CANCER

Nonmedullary thyroid cancer survival is similar regardless of whether it runs in families

BACKGROUND

The thyroid cancer that most frequently runs in families is medullary thyroid cancer and is associated with certain cancer-associated genes. Occasionally nonmedullary thyroid cancer (usually papillary thyroid cancer) runs in families. Much less is known about this form of thyroid cancer, as there are no known cancer-associated genes or risk factors. Some prior studies suggest that familial nonmedullary thyroid cancer is more aggressive, with more frequent cancer return and worse survival, while other studies suggest there is no difference from the usual thyroid cancer. This study was done to determine whether patients with familial nonmedullary thyroid cancer had worse outcomes compared to patients with the usual sporadic form of nonmedullary thyroid cancer that does not run in families.

THE FULL ARTICLE TITLE:

Robenshtok E et al. Clinical characteristics and outcome of familial nonmedullary thyroid cancer: a retrospective controlled study. Thyroid 2011;21:43-8. Epub October 18, 2010.

SUMMARY OF THE STUDY

Sixty-seven patients diagnosed with familial nonmedullary thyroid cancer and 375 patients with sporadic nonmedullary thyroid cancer were studied. Patients with familial cancer had complete records regarding the spread of cancer, the type of thyroid cancer and treatments given. Also, they had 2 first-degree relatives with nonmedullary thyroid cancer as confirmed by the investigators. The 67 patients included 54 patients from the Israeli Rabin Medical Center Thyroid Cancer Registry and 13 patients from other endocrine clinics in Israel seen since 1973. Patients with sporadic nonmedullary thyroid cancer were drawn from the Rabin Medical Center Thyroid Cancer Registry. Patients with known cancer-causing genes and exposures were excluded from the study. There was an average of 8-9 years for which there was follow up information after the initial thyroid cancer diagnosis. Patients with familial forms of nonmedullary thyroid cancer did not differ from patients with nonfamilial forms in the spread of cancer at the time of diagnosis, types of surgery and treatments and time after the initial treatment without thyroid cancer return.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that familial forms of nonmedullary thyroid cancer are not a more aggressive form of thyroid cancer and have similar risk of thyroid cancer return compared to nonfamilial forms of nonmedullary thyroid cancer. The implication is that patients with familial forms of nonmedullary thyroid cancer do not need to undergo more aggressive treatment at the time of the initial diagnosis and therapy.

— Ruth Belin, MD

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS & DEFINITIONS

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.

Cancer recurrence — this occurs when the cancer comes back after an initial treatment that was successful in destroying all detectable cancer at some point.

Medullary thyroid cancer — a relatively rare type of thyroid cancer that often runs in families. Medullary cancer arises from the C-cells in the thyroid.

Familial nonmedullary thyroid cancer — type of thyroid cancer that runs in families that is not medullary thyroid cancer. This is usually papillary thyroid cancer and occurs in about 10% of thyroid cancers.

Sporadic nonmedullary thyroid cancer — usual form of thyroid cancer that does not have a genetic component and does not run in families.

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

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THYROID CANCER

Prediction of thyroid cancer recurrence

BACKGROUND

In general, patients with thyroid cancer do well after initial treatments that include surgery, thyroid hormone suppression with Levothyroxine and, frequently, radioactive iodine therapy. While most patients do not have a recurrence of their cancer, predicting the risk of thyroid cancer recurrence can be difficult. The American Thyroid Association (ATA) has recently developed a staging system for prediction of thyroid cancer recurrence based on certain clinical parameters. The goal of the first study was to examine the effectiveness of the ATA staging system combined with an assessment of response to therapy in predicting cancer recurrence.

In addition, many physicians use stimulated thyroglobulin levels to predict recurrence in thyroid cancer patients. Most often, recombinant human TSH (rhTSH) is used in the stimulation testing. Current guidelines suggest that patients treated with radioactive iodine undergo stimulated thyroglobulin testing about 1 year after initial radioiodine treatment. Some have suggested that if the stimulated thyroglobulin level is undectectable or very low (< 1ng/ml), then the patient is at very low risk of recurrence and future stimulated thyroglobulin testing may not be needed. The goal of the second study was to determine how effective is stimulation testing with rhTSH in predicting thyroid cancer recurrence.

THE FULL ARTICLE TITLES:

Tuttle RM et al. Estimating risk of recurrence in differentiated thyroid cancer after total thyroidectomy and radioactive iodine remnant ablation: using response to therapy variables to modify the initial risk estimates predicted by the new American Thyroid Association staging system. Thyroid 2010;20:1341-9. Epub October 29, 2010.

Kloos RT. Thyroid cancer recurrence in patients clinically free of disease with undetectable or very low serum thyroglobulin values. J Clin Endocrinol Metab 2010;95:5241-8. Epub September 15, 2010.

SUMMARY OF THE STUDIES

In the first study, 588 thyroid cancer patients from Memorial Sloan-Kettering Cancer Center were studied. Patients were categorized using the ATA staging system as low risk (23% of patients), intermediate risk (49% of patients) or high risk (27% of patients) of recurrence. Their response to initial therapy was determined to be either excellent, acceptable or incomplete based on suppressed and stimulated thyroglobulin levels, neck ultrasound and other imaging studies. Patients with an excellent or acceptable treatment response had a lower risk of recurrence than those with an incomplete response in all stages. Patients categorized as high risk by the ATA staging system who had an excellent response to treatment were at lower risk of recurrence than initially predicted. Thus, both response to treatment and stage are important in predicting thyroid cancer recurrence.

In the second study, 107 patients with thyroid cancer treated at The Ohio State University were studied. All patients underwent thyroidectomy followed by radioiodine treatment. All had thyroglobulin stimulation testing with rhTSH and were divided into the following groups: Group 1 - thyroglobulin ≤0.5ng/ml, Group 2 – thyroglobulin 0.6-2.0 ng/ml and Group 3 - thyroglobulin > 2.0 ng/ml. Thyroid cancer recurrence rates were as follows: Group 1 - 3%, Group 2 - 11% and Group 3 – 80%. This study demonstrated that a rhTSH stimulated thyroglobulin threshold of 2.5 ng/ml or greater indicated a high risk of thyroid cancer recurrence.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

These studies provide valuable information to physicians treating patients with thyroid cancer. While most patients do very well after their initial treatment, it is important to be able to identify those who do not. The demonstration that an excellent response to initial treatment could decrease the risk of recurrence in patients with otherwise advanced stage thyroid cancer provides hope for those individuals. For those with less advanced cancer at

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THYROID CANCER, continued

presentation, the use of stimulated thyroglobulin levels clearly helps identify those patients that warrant more aggressive follow-up as well as those that clearly are at low risk for recurrence. However, these studies also show that the low risk patients still have a low rate of recurrence, reinforcing the fact that thyroid cancer patients require long term cancer follow-up.

— Whitney Woodmansee, MD

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS & DEFINITIONS

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: 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.

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.

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™.

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.

Cancer recurrence — this occurs when the cancer comes back after an initial treatment that was successful in destroying all detectable cancer at some point.

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GRAVES' DISEASE

Management of hyperthyroidism in patients with Graves' eye disease (orbitopathy)

BACKGROUND

Graves' disease is the most common cause of hyperthyroidism. Graves' disease can be treated with antithyroid drugs, radioactive iodine or surgery. One specific therapy ("block and replace") treated patients with a combination of antithyroid drugs and levothyroxine but is not commonly used currently as it did not appear to be any more effective than antithyroid drugs alone.

Graves' disease can also cause eye problems such as bulging of the eyes, damage to the eye muscles resulting in double vision, swelling of the eyelids, and in severe cases, optic nerve damage and loss of vision. This is called thyroid eye disease or Graves' orbitopathy. Some studies have suggested that Graves' orbitopathy may get worse depending on the treatment, especially when patients are treated with radioactive iodine instead of antithyroid drugs or thyroid surgery. These two articles address the best treatment of hyperthyroidism in patients with associated Graves' orbitopathy.

THE FULL ARTICLE TITLES:

Bartalena L. The dilemma of how to manage Graves' hyperthyroidism in patients with associated orbitopathy. J Clin Endocrinol Metab. doi:10.1210/jc.2010-2329.

Elbers L, Mourits M, and Wiersinga W. Outcome of very long-term treatment with antithyroid drugs in Graves' hyperthyroidism associated with Graves' orbitopathy. Thyroid, December 29, 2011. doi: 10.1089/thy.2010.0181.

SUMMARY OF THE STUDIES

Dr. Bartelena reviewed many of the trials of treatment of Graves' disease on eye problems. Studies of patients with radioactive iodine have shown that some patients without Graves' orbitopathy may develop it after treatment with radioactive iodine. Those patients who already have Graves' orbitopathy may have a worsening of their eye problems after radioactive iodine. Patients treated with antithyroid drugs or surgery have a lower risk of developing, or worsening, Graves' orbitopathy. Patients who smoke also have a higher risk of developing orbitopathy and the combination of smoking and radioactive iodine increases the risk of worsening Graves' orbitopathy. Pretreatment of patients with Graves' orbitopathy with high-dose steroids (for example prednisone) reduces the risk of worsening Graves' orbitopathy following radioactive iodine treatment and also in patients who smoke but is associated with significant side effects.

The study by Dr. Elbers and colleagues evaluated the use of the "block and replace" therapy by sending out a questionnaire to patients with Graves' orbitopathy who had received this treatment. The patients stayed on the "block and replace" until the Graves' orbitopathy had stabilized. Following discontinuation of the "block and replace," 37% of the patients had a recurrence of hyperthyroidism, but none of the patients had significant worsening of their Graves' orbitopathy. When some of the patients with recurrent hyperthyroidism were subsequently treated with radioactive iodine, none developed worsening of their Graves' orbitopathy.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Radioactive iodine can worsen active Graves' orbitopathy, especially if the patient is a smoker, but the worsening can be prevented by the use of steroids. Using a "block and replace" approach to treat the hyperthyroidism until the eye disease becomes inactive may allow radioactive iodine to be used to treat recurrent hyperthyroidism without concern that it will worsen the eye problems. Further studies are needed to confirm this very interesting study.

— Glenn Braunstein, MD

ATA THYROID BROCHURE LINKS

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

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

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GRAVES' DISEASE, continued

ABBREVIATIONS AND DEFINITIONS

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.

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.

Thyroid eye disease (TED) — also known as Graves oritopathy. TED is most often seen in patients with Graves' disease but also can be seen with Hashimoto's thyroiditis. TED includes inflammation of the eyes, eye muscles and the surrounding tissues. Symptoms include dry eyes, red eyes, bulging of the eyes and double vision.

Levothyroxine — the major hormone produced by the thyroid gland and available in pill form as Levoxyl™, Synthroid™, Levothroid™ and generic preparations.

Block and replace — treatment option for Graves' disease where patients are treated with a combination of antithyroid medication and Levothyroxine for a defined period of time.

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THYROID CANCER

Does analysis for the BRAF cancer-associated gene help diagnose follicular variant thyroid cancer?

BACKGROUND

The two most common types of thyroid cancer are papillary and follicular cancer. A third type of thyroid cancer is follicular variant of papillary cancer which has features of both papillary and follicular thyroid cancer. Papillary cancer is easily diagnosed with cells obtained after a thyroid biopsy. However, the diagnosis of both the follicular and follicular variant types of thyroid cancer cannot be diagnosed after a thyroid biopsy and requires analysis of the thyroid tissue after surgery. Mutations in certain cancer-associated genes can be seen in thyroid cancer and may be used to make the diagnosis of cancer easier. In particular, mutations in the BRAF gene are seen in a large percentage of papillary cancers. This study looked at this gene in follicular variant of papillary cancer in hopes of finding a marker to aid in diagnosis.

FULL ARTICLE TITLE

Proietti A et al BRAF status of follicular variant of papillary thyroid carcinoma and its relationship to its clinical and cytological features. Thyroid 2010;20:1263-70. Epub October 17, 2010.

SUMMARY OF THE STUDY

The BRAF gene was examined in cancer tissue from 187 patients with follicular variant of papillary thyroid cancer in a center in Italy. Mutations in the BRAF gene were found in only 17% of these cancers and were not associated with any specific clinical feature in patients with this cancer. In fact, most of the cancers that had mutations in the BRAF gene were identified as suspicious or positive for cancer after the thyroid biopsy.

WHAT ARE THE IMPLICATIONS OF THE STUDY?

While mutations in the BRAF gene are common in papillary cancer, it does not appear that other types of thyroid cancer share this feature. Further, while mutations in the BRAF gene were seen in a small percentage of follicular variant of papillary thyroid cancers, those cancers with mutations were able to be diagnosed by other features in thyroid biopsies. The search will continue to find means to diagnose follicular variant of papillary cancer in thyroid biopsies since BRAF gene mutations do not appear to be common and do not serve as a reliable marker of this cancer type.

— Henry Fein, 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.

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

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 is a 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.

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.

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.

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

HIGHLIGHT:
The Light of Life Foundation

On February 10th, 2011 The Light of Life Foundation hosted our 12th Honorary Awards Dinner in New York City.

We were proud to honor **Nancy Carrasco, MD** from Albert Einstein Medical College for her achievements in Thyroid Cancer research. A dinner was held in her honor and the following morning Dr. Carrasco presented her recent achievements in her research in thyroid cancer at Grand Rounds at Memorial Sloan-Kettering Cancer Center. The Light of Life Foundation's partners, friends, medical advisory board members and past award recipient were in attendance.

The Light of Life Foundation is excited to announce the launch of our 4th Thyroid Cancer Awareness Campaign.

The new campaign will feature striking images of celebrity icons **Cindy Crawford** and **Brooke Shields** wearing dramatic necklaces to draw attention to their necks. Through the faces of these celebrities it is our mission to continue to raise awareness and donations. The funds we raise through this amazing celebrity campaign will help us continue our Fellowship Program, provide Patient Support/Education, and make it possible to provide research grants to thyroid cancer physician's who are helping to improve the quality of lives for thyroid cancer patients. To date, the public service announcements are set to appear in *People*, *More* and *Gotham* Magazines.

Please visit the Light of Life Foundation website, **www.checkyourneck.com**, to view our Patient Educational Symposium which took place in New York City in 2010.

As part of our Patient Educational Program we have provided valuable information through our website of the symposium in hopes that patients everywhere can gain further information and support about their disease.

There will be other exciting programs throughout the year. Thank you for supporting our efforts by referring your patients to the Light of Life Foundation for support and education.

Sincerely,
Joan Shey
Light of Life Foundation

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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 — 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

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

FAQ: Radioactive Iodine

What is the thyroid gland?

The thyroid gland located in the neck produces thyroid hormones which help the body use energy, stay warm and keep the brain, heart, muscles, and other organs working normally.

Why is iodine used in some thyroid gland treatment?

Iodine is essential for proper function of the thyroid gland, which uses it to make the thyroid hormones. The thyroid is equipped with an active system or "pump" for moving iodine into its cells, where it is concentrated as iodide.

What is radioactive iodine (RAI)?

Iodine, in the form of iodide, is made into two radioactive isotopes that are commonly used in patients with thyroid diseases: I-123 (harmless to thyroid cells) and I-131 (destroys thyroid cells. RAI is safe to use in individuals who have had allergic reactions to seafood or X-ray contrast agents. RAI is given by mouth in pill or liquid form.

Does RAI for thyroid imaging provide the best results?

I-123 is the usual isotope used to take pictures and determine the activity of the intact thyroid gland (Thyroid Scan and Radioactive Iodine Uptake, RAIU), since it is harmless to thyroid cells. No special radiation precautions are necessary after a thyroid scan or RAIU with I-123.

When is RAI for treatment of thyroid disorders appropriate?

Normal Thyroid Tissue - I-131 is given to destroy overactive thyroid tissue (see Hyperthyroidism brochure) or to shrink thyroid glands that are functioning normally but are causing problems because of their size (see Goiter brochure). I-131 may occasionally cause mild pain in the neck that can be treated with aspirin, ibuprofen or acetaminophen. The RAI treatment may take up to several months to have its effect.

Thyroid Cancer - Large doses of I-131 are used to destroy thyroid cancer cells (see Thyroid Cancer brochure). This is performed after the remaining thyroid tissue (including any cancer cells) is stimulated by raising TSH levels by either withdrawing thyroid hormone or by treating with recombinant human TSH. Depending on state regulations, patients may have to stay isolated in the hospital for about 24 hours to avoid exposing other people to radiation, especially if there are young children living in the same home.

What are the radiation safety precautions after treatment with I-131 RAI?

Since RAI produces radiation, patients must do their best to avoid radiation exposure to others, particularly to pregnant women and small children. The amount of radiation exposure markedly decreases as the distance from the patient increases. Patients who need to travel in the days after I-131 RAI treatment are advised to carry a letter of explanation from their physician since radiation detection devices used at airports or in federal buildings may pick up even very small radiation levels.

Are there long term risks of I-131 RAI?

In general, RAI is a safe and effective treatment. Hypothyroidism is a common side effect of RAI for hyperthyroidism and always seen after RAI for thyroid cancer (see Hypothyroidism brochure). Some studies suggest a slight increase in thyroid cancers after RAI treatment for hyperthyroidism. Loss of taste and dry mouth due to salivary gland damage may be seen. The use of lemon drops, vitamin C or sour stimulation to potentially decrease the exposure of the salivary glands to RAI is controversial and should be discussed with your physician. Importantly, once you have been treated with RAI, regular medical follow-up is lifelong.

What are the special concerns for women?

RAI, whether I-123 or I-131, should never be used in a patient who is pregnant or nursing. Pregnancy should be put off until at least 6 - 12 months after I-131 RAI treatment since the ovaries are exposed to radiation after the treatment and to ensure that thyroid hormone levels are normal and stable prior to pregnancy. There is no clear evidence that RAI leads to infertility.

Are there special concerns for men?

Men who receive RAI treatment for thyroid cancer may have decreased sperm counts and temporary infertility for periods of roughly two years. Sperm banking is an option in a patient who is expected to need several doses of RAI for thyroid cancer.

Instructions to reduce exposure to others after I-131 RAI treatment

ACTION	DURATION (DAYS)
Sleep in a separate bed (~6 feet of separation) from another adult	1-11*
Delay return to work	1-5*
Maximize distance from children and pregnant women (6 feet)	1-5*
Limit time in public places	1-3*
Do not travel by airplane or public transportation	1-3*
Do not travel on a prolonged automobile trip with others	2-3
Maintain prudent distances from others (~6 feet)	2-3
Drink plenty of fluids	2-3
Do not prepare food for others	2-3
Do not share utensils with others	2-3
Sit to urinate and flush the toilet 2-3 times after use	2-3
Sleep in a separate bed (~6 feet of separation) from pregnant partner, child or infant	6-23*

*duration depends on dose of I-131 given

Where can I find additional information?

Further details on this and other thyroid-related topics are available in the patient information section on the American Thyroid Association website at *www.thyroid.org*.

FREE Public Health Forum

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:

AMERICAN THYROID ASSOCIATION
FOUNDED 1923

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.