

CLINICAL THYROIDOLOGY FOR PATIENTS



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order to understand the future risk of recurrence of cancer from these initial features.

Kramer JA et.al, Primary tumor size is a prognostic parameter in patients suffering from differentiated thyroid carcinoma with extrathyroidal growth: results of the MSDS trial. *Eur J Endocrinology* 2010;163:637-44

THYROID AND PREGNANCY Thyroid disorders are common in pregnant women without risk factors for thyroid disease

Thyroid disease during pregnancy, especially hypothyroidism, may be associated with a number of complications. Women with known risk factors for thyroid disease are easily screened with blood tests of TSH and thyroid peroxidase antibody (TPO AB, a marker of autoimmune thyroid disease). However, screening all pregnant women for the presence of thyroid disease regardless of risk factors is controversial and is not currently done on a routine basis. The goal of this study was to determine how often abnormal TSH and/or TPO AB levels are found in women who have no risk factors for thyroid disease.

Horacek J et al Universal screening detects two-times more thyroid disorders in early pregnancy than targeted high-risk case finding. *Eur J Endocrinol* 2010;163:645-50. *EJE*-10-0516 [pii];10.1530/EJE-10-0516 [doi]. 9

THYROID CANCER In patients with papillary microcarcinomas, PET scan is useful to identify spread of the cancer outside the thyroid in the neck

Small papillary cancers (microcarcinomas) may be seen in up to half of new cases of thyroid cancer. Since most people with papillary microcarcinoma do well, it is unclear how aggressive to be in treating these patients. A new way of examining patients with thyroid cancer is the Positron-Emissions-Tomography (PET) scan. Some reports suggest that PET scans can detect the spread of the thyroid cancer outside the thyroid and identify the abnormal lymph nodes in the neck that may be missed by ultrasound. This study examines the usefulness of PET scans to identify spread of cancer outside the thyroid in patients with papillary microcarcinomas.

Yun M et al; Visually discernible [18F]fluorodeoxyglucose uptake in papillary thyroid microcarcinoma: a potential new risk factor. *J Clin Endocrinol Metab* 2010;95:3182-8. . . . 11

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Editor

Alan P. Farwell, MD
Boston Medical Center
Boston University School of Medicine
88 East Newton St., Boston, MA 02115
Director of Patient Education
American Thyroid Association
e-mail: thyroid@thyroid.org
www.thyroid.org/patients/ct/index.html

Associate Editor

Ernest L. Mazzaferri, MD
University of Florida

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Barbara R. Smith, CAE
American Thyroid Association
6066 Leesburg Pike, Suite 550
Falls Church, VA 22041
Telephone: 703-998-8890
Fax: 703-998-8893
Email: thyroid@thyroid.org

Designed by

Karen Durland
Email: kdurland@gmail.com

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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, studies ask the following questions:

- Does exposure to dental x-rays increase your risk of thyroid cancer?
- Are there differences in thyroid cancer behavior between adolescents and adults?
- What is the relationship between thyroid cancer size and cancer recurrence?
- What is the best way to identify thyroid disorders in pregnant women?
- Does PET scanning have a role in the management of patients with thyroid cancer before the initial surgery?

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**.



THYROID CANCER

Dental x-rays may be associated with an increased greater risk of thyroid cancer

WHAT IS THE STUDY ABOUT?

Large amounts of radiation exposure are associated with higher risk of thyroid cancers. This can be seen after radiation therapy for other cancers that may have included the thyroid in the radiation field. Smaller amounts of radiation — for example from dental x-rays — may also be associated with cancers. Some studies have shown that dentists, dental assistants and x-ray workers have increased risk of thyroid cancer. Because dental x-rays are a common source of radiation to the neck, understanding whether dental x-rays are associated with greater risk of thyroid cancer impacts public health. This study was performed to assess whether there is an association between dental x-rays and thyroid cancer.

THE FULL ARTICLE TITLE:

Memon A et al. Dental x-rays and the risk of thyroid cancer: a case-control study. *Acta Oncol* 2010;49:447-53.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine whether exposure to dental x-rays was associated with higher risk of thyroid cancer.

WHO WAS STUDIED?

The study evaluated 626 individuals in Kuwait: 313 patients < 70 years of age with a diagnosis of thyroid cancer identified from the national cancer registry and 313 individuals without thyroid cancer identified from primary health care clinics of similar age, gender, nationality and geographic residence as those with thyroid cancer.

HOW WAS THE STUDY DONE?

All individuals were interviewed to obtain information about demographics, diet, family medical history, gynecologic history and medical history. The medical history included assessment of exposure to diagnostic x-rays of head, neck and chest; dental x-rays and radiotherapy. Information about the thyroid cancer was obtained from the Kuwait cancer registry. The association of dental x-ray exposure with risk of thyroid cancer was calculated, taking into account upper body (head, neck and chest) non-dental x-rays.

WHAT WERE THE RESULTS OF THE STUDY?

Of the patients with thyroid cancer, 76% were women and 55% were Kuwaiti nationals. Seventy percent of the non-Kuwaiti patients with thyroid cancer were from Arab countries. The median age at diagnosis was 35 years in women and 38 years in men. The most common type of thyroid cancer was papillary thyroid cancer, occurring in 83% of the patients with thyroid cancer.

There was a two-fold higher risk of thyroid cancer among individuals exposed to dental x-rays compared to those who had never undergone dental x-rays. Among patients with thyroid cancer, 33% reported dental x-rays compared to 18.3% among matched individuals. There was a higher risk of thyroid cancer with greater numbers of dental x-rays, with as much as a five-fold higher risk in individuals reporting 10 or more dental x-rays. Among individuals <25 years of age, about 27% of patients diagnosed with thyroid cancer had received dental x-rays compared to 18% of the matched individuals without thyroid cancer. Among individuals <20 years of age, about 22% of patients diagnosed with thyroid cancer had received dental x-rays compared with none of the matched individuals.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

This study is consistent with prior studies performed in Sweden that demonstrated a higher risk of papillary thyroid cancer among women who reported previous dental x-rays. The findings are also consistent with prior studies that show that the link between radiation exposure and thyroid cancer is greater among individuals at younger ages at the time of radiation exposure. Other studies have also suggested an increased risk of thyroid cancer among dentists/dental assistants and x-ray workers.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study raises the possibility that low-dose radiation exposure from dental x-rays may be associated with thyroid cancer. This reinforces the importance of following American Dental Association recommendations that dental practices shield the thyroid during dental x-rays.

— Ruth Belin, MD



THYROID CANCER, continued

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.

Ionizing radiation — radiation that can damage cells, causing cell death or mutation. It can originate from radioactive materials, x-ray tubes or specialized machines. It is invisible and not directly detectable by human senses.



THYROID CANCER

Differences in thyroid cancer presentation and outcomes in adolescent and young adults as compared with older adults

WHAT IS THE STUDY ABOUT?

Thyroid cancer is relatively rare in young adults, but there are still a substantial number of adolescents who are diagnosed with papillary thyroid cancer. A cancer registry of cases nationwide, the Surveillance, Epidemiology and End Results (SEER), recently reported that thyroid cancer is the 4th most commonly diagnosed malignancy in individuals 15 to 29 years of age in the US, accounting for 10% of malignancies in that group. Some studies have suggested that young adults often have more extensive disease as compared to adults and are more likely to present with lymph-node involvement and spread of the cancer outside of the neck. Such patients still have an excellent prognosis, with 5 year survival rates exceeding 99 % and usually have a long life expectancy that is minimally affected by the thyroid cancer. This study examined thyroid cancer in adolescents/young adults as compared to older adults in order to determine any differences in these two age groups in the growth pattern and metastatic behavior of papillary thyroid cancer. They also screened cancer specimens in these groups for the presence of cancer-associated genes.

THE FULL ARTICLE TITLE:

Vriens MR et al Clinical and molecular features of papillary thyroid cancer in adolescents and young adults. *Cancer* 2010. 10.1002/cncr.25369 [doi].

WHAT WAS THE AIM OF THE STUDY?

This aim of the study was to determine any differences between thyroid cancer in adolescents/young adults as compared to older adults.

WHO WAS STUDIED?

The study group was obtained after a screening of records of 1011 patients treated at the University of California, San Francisco for thyroid cancer between January 1983 and December 2003. Patients were separated into two groups: 1) Young adults included 109 patients diagnosed with papillary thyroid cancer between 15 and 39 years of age and 2) Older adults included 145 patients diagnosed after 40 years of age.

HOW WAS THE STUDY DONE?

The patient's records were examined as to clinical presentations, recurrence rates and outcomes over time. These data were also compared to the SEER outcome data from 1973-2006. Primary cancer samples of a subset of patients from both groups were analyzed for variations in certain cancer-associated genes as well as some genes unrelated to cancer.

WHAT WERE THE RESULTS OF THE STUDY?

The Young Adults group included more women. Their cancer was smaller at diagnosis and had a higher incidence of spread of the cancer to the lymph nodes of the neck. They also were less likely to have spread of the cancer outside of the neck and had less cancer recurrence at follow-up. Finally, the Young Adults group had a significantly higher overall survival as compared to the Older Adults group. These results were similar to the outcomes obtained by national SEER database.

While there were no significant differences between the expression of cancer-associated genes between the two groups, several genes showed tendencies toward differences. Further studies are needed to determine any potential role for these genes in thyroid cancer.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Several other studies have shown that children have more advanced thyroid cancer at their initial diagnosis than adults, although no studies have specifically compared older adults to adolescents and young adults.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that young adults with papillary cancer have more extensive disease at presentation but have better outcomes as compared to older patients. Further, several novel genes were identified that warrant further study as to their role in thyroid cancer.

— Mona Sabra, MD

ATA THYROID BROCHURE LINKS

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

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THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer — the most common type of thyroid 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.

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

Thyroid cancer size is related to growth of the cancer outside the thyroid and to recurrence of the cancer

WHAT IS THE STUDY ABOUT?

The majority of patients with thyroid cancer do well after the initial surgery and, frequently, radioactive iodine treatment. While overall death from thyroid cancer is rare, recurrence of the cancer is relatively common and usually occurs within the neck. Many factors are examined in thyroid cancer patients at the time of surgery to estimate the risk of recurrence of cancer and to help decide upon the need and type of further treatments. The factors that are considered important in predicting cancer recurrence are: cancer type, cancer size, degree of spread outside the thyroid (minimal or extensive) and presence of spread to surrounding removed lymph nodes. This study was done to examine these factors years after initial treatment in order to understand the future risk of recurrence of cancer from these initial features.

THE FULL ARTICLE TITLE:

Kramer JA et.al, Primary tumor size is a prognostic parameter in patients suffering from differentiated thyroid carcinoma with extrathyroidal growth: results of the MSDS trial. Eur J Endocrinology 2010;163:637-44.

WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to calculate the future risk of recurrence of thyroid cancer from the initial type, size, degree of spread to surrounding tissues and presence of lymph nodes with cancer at the time of initial surgery.

WHO WAS STUDIED?

The Multicenter Study Differentiated Thyroid Cancer (MSDS) collective is a well-defined group of patients in Europe with thyroid cancers with extrathyroidal extension. The study group included 324 thyroid cancer patients in the MSDS group in Germany, Austria and Switzerland. There were 307 patients with minimal extrathyroidal growth of the cancer and 17 patients with more extensive extrathyroidal growth.

HOW WAS THE STUDY DONE?

All patients were treated with total thyroid removal (total thyroidectomy), lymph node removal and radioactive iodine treatment. Patients were monitored

by examination, neck ultrasound, Thyroglobulin measurement and other x-ray imaging tests for 6 years.

WHAT WERE THE RESULTS OF THE STUDY?

Most of the patients required more than one surgery to remove their thyroid cancer and 78% also had the central lymph nodes removed. Only 3 (0.9%) patients died of their thyroid cancer during the study period. The risk of recurrence began to increase with initial cancer size of 2 cm. For cancers less than 2 cm, the risk of recurrence was about 3.5% while recurrence was as high as 10% for cancers larger than 2 cm. A higher recurrence was seen when more extensive spread outside the thyroid margin was found and when lymph nodes were found to contain cancer at the time of surgery. Cancers smaller than 2 cm are less likely to demonstrate extensive spread outside the thyroid and therefore have a lower rate of recurrence.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Other studies support the estimate of about 5% risk of recurrence for cancers less than 1 cm in size and progressive risk for larger cancers. However several studies have suggested that the recurrence risk increased at cancers larger than 4 cm, while this study saw an increase risk beginning at cancers 2 cm in diameter.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Since the risk of recurrence is related to the initial size for the cancer, this study suggests that patients with cancers >2 cm should be treated more aggressively with surgery and radioactive iodine. These patients also should be followed more closely than patients with cancers <2 cm.

— Jerrold Stock, 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

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THYROID CANCER, 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).

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

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

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.

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.

Thyroid hormone therapy — patients with hypothyroidism are most often treated with Levothyroxine in order to return their thyroid hormone levels to normal. Replacement therapy means the goal is a TSH in the normal range and is the usual therapy. Suppressive therapy means that the goal is a TSH below the normal range and is used in thyroid cancer patients to prevent growth of any remaining cancer cells.



THYROID AND PREGNANCY

Thyroid disorders are common in pregnant women without risk factors for thyroid disease

WHAT IS THE STUDY ABOUT?

Thyroid disease during pregnancy may be associated with a number of complications including miscarriage, preterm delivery, brain abnormalities in the children and postpartum thyroid inflammation in the mother. There are known risk factors for developing thyroid disease during pregnancy, including: a family history of autoimmune thyroid disease, presence of a goiter, signs and symptoms of thyroid disease, known thyroid dysfunction, history of type 1 diabetes mellitus or other autoimmune diseases, prior neck irradiation and previous miscarriages or preterm deliveries. Pregnant women with these known risk factors are easily screened for thyroid disease with blood tests of TSH and thyroid peroxidase antibody (TPO AB, a marker of autoimmune thyroid disease). Treatment of women with abnormal levels of TSH or TPO AB can be treated with thyroid hormone to decrease the risk of complications. However, screening all pregnant women for the presence of thyroid disease regardless of risk factors is controversial and is not currently done on a routine basis. The goal of this study was to determine how often abnormal TSH and/or TPO AB levels are found in women who have no risk factors for thyroid disease.

THE FULL ARTICLE TITLE:

Horacek J et al Universal screening detects two-times more thyroid disorders in early pregnancy than targeted high-risk case finding. *Eur J Endocrinol* 2010;163:645-50. EJE-10-0516 [pii];10.1530/EJE-10-0516 [doi].

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine how often abnormal TSH and/or TPO AB levels are found in women who have no risk factors for thyroid disease.

WHO WAS STUDIED?

The study group included 400 women in the Czech Republic at weeks 9-11 of pregnancy.

HOW WAS THE STUDY DONE?

Blood tests for thyroid hormone, TSH and TPO AB were measured in all of the pregnant women. The women were

treated with thyroid hormone (levothyroxine) if either the TSH was increased or the TPO AB was positive. All women with abnormal tests also had an evaluation for thyroid risk factors.

WHAT WERE THE RESULTS OF THE STUDY?

An increased TSH was found in 41 (10.3%) women and the TPO AB was positive in 33 (8.3%). Overall, 16.3% of women had at least one abnormality. A total of 49 women were treated with Levothyroxine. Of these 49 women, 29 (55%) had no risk factors for thyroid disease.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Several studies have shown similar results, including a study in 2007 as well as one that was reported in an earlier issue of this journal ([Braunstein May 2010 Negro et al. Universal screening versus case finding for detection and treatment of thyroid hormonal dysfunction during pregnancy. J Clin Endocrinol Metab 2010](#)).

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Thyroid disorders are common in pregnant women and frequently occur in women without risk factors. The only way to identify this latter group of women at risk is through the routine screening of all pregnant women. Further studies are needed to determine if pregnancy outcomes can be improved by the identification of these women without thyroid risk factors.

— Angela Leung, MD

ATA THYROID BROCHURE LINKS

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

Thyroiditis: http://www.thyroid.org/patients/patient_brochures/thyroiditis.html

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

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THYROID AND PREGNANCY, continued

ABBREVIATIONS & DEFINITIONS

TPO antibodies — these are antibodies that attack the thyroid instead of bacteria and viruses, they are a marker for autoimmune thyroid disease, which is the main underlying cause for hypothyroidism and hyperthyroidism in the United States.

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.

Goiter — a thyroid gland that is enlarged for any reason is called a goiter. A goiter can be seen when the thyroid is overactive, underactive or functioning

normally. If there are nodules in the goiter it is called a nodular goiter; if there is more than one nodule it is called a multinodular goiter.

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

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

Miscarriage — this occurs when a baby dies in the first few months of a pregnancy, usually before 22 weeks of pregnancy.



THYROID CANCER

In patients with papillary microcarcinomas, PET scan is useful to identify spread of the cancer outside the thyroid in the neck

WHAT IS THE STUDY ABOUT?

The number of patients with papillary thyroid cancer is rapidly increasing. About half of the new cases are small papillary cancers <1 cm in size, also known as papillary microcarcinomas. In some of these patients, the cancer may extend outside of the thyroid and spread into the lymph nodes. Fortunately, papillary thyroid cancer has a good prognosis, even for those with cancer spreading outside the thyroid in the lymph nodes. While thyroid ultrasound is very useful in detecting the spread of thyroid cancer to the lymph nodes, it can not detect the spread of the cancer outside of the thyroid in all patients. A new way of examining patients with thyroid cancer is the Positron-Emissions-Tomography (PET) scan. Some reports suggest that PET scans can detect the spread of the thyroid cancer outside the thyroid and identify the abnormal lymph nodes in the neck that may be missed by ultrasound. This study examines the usefulness of PET scans to identify spread of cancer outside the thyroid in patients with papillary microcarcinomas.

THE FULL ARTICLE TITLE:

Yun M et al; Visually discernible [18F]fluorodeoxyglucose uptake in papillary thyroid microcarcinoma: a potential new risk factor. *J Clin Endocrinol Metab* 2010;95:3182-8.

WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to examine the usefulness of PET-scan to detect spread of cancer outside the thyroid in the neck in patients with papillary microcarcinomas.

WHO WAS STUDIED?

A total of 2311 patients were diagnosed with papillary microcarcinoma after a total thyroidectomy and central lymph node dissection from 2005–2008 in Seoul, Korea. A total of 145 of these patients had PET scans performed before their thyroidectomy and 87 of these patients were analyzed for this study.

HOW WAS THE STUDY DONE?

Patient records were reviewed for age, sex, size of cancer, surgical treatment and pathology. PET scans were analyzed

and the amount of activity taken up by the cancer in the thyroid and by the lymph nodes were measured by a nuclear medicine specialist.

WHAT WERE THE RESULTS OF THE STUDY?

A total of 46 out of 87 patients (53%) were found to have increased uptake on the PET scan (PET-scan positive) while the remaining patients showed no uptake (PET-scan negative). Spread of cancer outside of the thyroid was present in 32/46 (70%) in the PET-scan positive group as compared to 12/41 (29%) in the PET-scan negative group. Spread of the cancer to the central lymph nodes occurred in 27 patients (31%) in the PET-scan positive. A total of 19 of 46 (41%) patients in the PET-scan positive group had spread of cancer to the lymph nodes as compared with 8 of 41 (20%) in the PET-scan negative group.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

A recent study has classified microcarcinomas into a low risk group for cancer spreading out of the thyroid and a very low risk group with cancer confined to thyroid gland. They suggest that the very low risk group may require only surgery without additional radioactive iodine. The present study shows that PET scanning can help to distinguish between these two groups.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In patients with papillary microcarcinoma with a positive PET-scan, the cancer is more likely to spread outside the thyroid and to the lymph nodes in the neck than in PET-scan negative patients. This study suggests that PET scans performed before thyroid surgery may help identify the patients that require either more aggressive or less aggressive treatment.

— Jamshid Farahati, MD

ATA THYROID BROCHURE LINKS

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

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THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

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

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

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.

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.

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

Positron-Emission-Tomography (PET) scans — a nuclear medicine imaging test that uses a small amount of radiolabeled glucose 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.



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.

