

CLINICAL THYROIDOLOGY FOR PATIENTS



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THYROID CANCER

While most patients with thyroid cancer do well and do not die from their cancer, a small number of patients are not cured with the usual regimen of surgery and radioactive iodine and have cancers that spread and continue to grow. In the past, there was little to offer these unfortunate patients as there had been no effective chemotherapy drugs. Sorafenib is a new drug that has been shown to have some effect on metastatic thyroid cancer that does not respond to radioactive iodine. This study reports the results of a Phase II clinical trial of Sorafenib in patients with metastatic thyroid cancer.

Kloos RT, Ringel MD, Knopp MV, Hall NC, King M, Stevens R, Liang J, Wakely PE Jr, Vasko VV, Saji M, Rittenberry J, Wei L, Arbogast D, Collamore M, Wright JJ, Grever M, Shah MH. Phase II trial of sorafenib in metastatic thyroid cancer. *J Clin Oncol* 2009;27:1675–84. 3

ANTI-THYROID MEDICATION

Methimazole is an antithyroid medication that is frequently used to treat hyperthyroidism due to Graves' disease. Methimazole is usually a well-tolerated and safe drug, but on rare occasions, serious side effects can occur. The most serious side effect is called agranulocytosis, which may occur in 1 in 500 – 1000 patients. This is when the number of infection-fighting white blood cells in the blood decreases and cause the patient to be more likely to get an infection. This study attempts to see if agranulocytosis is more common in patients on 30 mg of Methimazole as compared to 15 mg of the drug.

Takata, K., Kubota S, Fukata S., Kudo T, Nishihara E, Ito M, Amino N, Miyachi A. Methimazole-induced agranulocytosis in patients with Graves' disease is more frequent with an initial dose of 30 mg daily than with 15 mg daily. *Thyroid* 2009; 19: 559–63. 5

THYROID NODULES

Thyroid nodules are extremely common in adults, occurring in about half of the population according to some studies. Since about 5% of thyroid nodules are cancer, it is important to determine which nodules should undergo a fine needle aspiration biopsy. Guidelines developed by the American Thyroid Association indicate that the best way to initially evaluate thyroid nodules is to perform an ultrasound examination of the thyroid. This study examines what ultrasound features are most helpful in selecting which

nodules should be biopsied and which nodules are more likely to be benign (non-cancerous).

Popowicz B, Klencki M, Lewinski A, Slowinska-Kiencka D. The usefulness of sonographic features in selection of thyroid nodules for biopsy in relation to the nodule's size. *Eur J Endocrinol* 2009;161:103–11. 7

THYROID CANCER

Papillary microcarcinoma is a form of thyroid cancer where the cancer is very small (<1 cm). Since very few patients with Papillary microcarcinoma will die from their cancer, it is not clear how aggressive treatment should be for these patients. In larger thyroid cancers, there are features of the cancer that are known risk factors for recurrence of the cancer. This study looked at how common one or more of these findings were found in papillary microcarcinomas and whether these risk factors were associated with cancer recurrence in these smaller cancers.

Arora N, Turbendian HK, Kato MA, Moo TA, Zarnegar R, Fahet TJ. Papillary thyroid carcinoma and microcarcinoma: is there a need to distinguish the two? *Thyroid* 2009;19:473–77 9

THYROID NODULES

Thyroid nodules occur in about 1–2% of children and adolescents. Fine needle aspiration biopsy (FNAB) is a procedure commonly used to evaluate patients with thyroid nodules to determine if these nodules are cancerous. Some studies in adults have shown that when FNAB is done with the help of an ultrasound machine (US-FNAB), the accuracy is better than if the sample is obtained guided only by palpation of the nodule. No information is available regarding the usefulness of this method in children. This study looks at the value of US-FNAB in the evaluation and treatment of children with thyroid nodules

Izquierdo R, Shankar R, Kort K, Khurana K. Ultrasound-guided fine-needle aspiration in the management of thyroid nodules in children and adolescents. *Thyroid* 2009;19:703–5. 11

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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 recently published articles from the medical literature that covers 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. The **Calendar of Events** highlights educational forums and support groups that are organized 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:

- How effective of the new cancer drug, Sorafenib, in treating advanced, metastatic thyroid cancer?
- Is the severe side effect of Methimazole-induced agranulocytosis dose-related?
- What ultrasound features separate benign from cancerous thyroid nodules?
- What are the risk factors for cancer recurrence in patients with papillary microcarcinoma?
- What is the role of ultrasound-guided biopsy in the evaluation of thyroid nodules in children and adolescents?

We welcome your feedback and suggestions. Please follow this [link](#) to 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 on your screen. To return to the Contents, move the cursor to the bottom of the page and left-click **Back to Table of Contents** which appears on every page. If you would like more information about using Bookmarks please see the help feature on the menu bar of Acrobat Reader.



THYROID CANCER

WHAT IS THE STUDY ABOUT?

In general, thyroid cancer grows slowly and is usually responds very well to treatment. Most patients with thyroid cancer can be treated with a combination of surgery, radioactive iodine therapy and thyroid hormone therapy. Unfortunately, some patients are not cured with these treatments and have cancers that spread and continue to grow. Frequently, these cancers no longer take up iodine and, thus, no longer respond to radioactive iodine. In the past, there was little to offer these unfortunate patients as there had been no effective chemotherapy drugs. External Beam Radiation, with the aim of keeping the cancer stable, is an option but has significant side effects. Recently, research studies have shown that proteins known as tyrosine kinases are overactive in thyroid cancer cells. Because of this finding, a group of drugs known as tyrosine kinase inhibitors have been studied and have shown great promise in being effective in the rare patient that has metastatic thyroid cancer that does not respond to radioactive iodine. In particular, Sorafenib is a tyrosine kinase inhibitor that has been shown to be effective in these patients and is currently being studied in clinical trials. This study reports the results of a Phase II clinical trial of Sorafenib in patients with metastatic thyroid cancer.

THE FULL ARTICLE TITLE: Kloos RT, Ringel MD, Knopp MV, Hall NC, King M, Stevens R, Liang J, Wakely PE Jr, Vasko VV, Saji M, Rittenberry J, Wei L, Arbogast D, Collamore M, Wright JJ, Grever M, Shah MH. Phase II trial of sorafenib in metastatic thyroid cancer. *J Clin Oncol* 2009;27:1675–84.

WHAT WAS THE AIM OF THE STUDY?

The aim of the study is to investigate the effectiveness of Sorafenib in the treatment of advanced, metastatic thyroid cancer.

WHO WAS STUDIED?

In total, 56 patients with advanced, progressive metastatic thyroid cancer that no longer responded to radioactive iodine therapy were enrolled in this clinical trial. These patients had Papillary (73 %), Follicular (4%), Hurtle cell (16%) and Anaplastic (7%) subtypes of thyroid cancer. There were 31 men and 22 women in this study.

HOW WAS THE STUDY DONE?

The patients in the study were treated with Sorafenib 400 mg twice per day. They were monitored every 4 weeks for one year. After a year, they were seen in clinic every 12 weeks. Blood and imaging studies were obtained every 8 weeks to determine cancer response. Sorafenib therapy was stopped if: 1) the cancer did not respond to the therapy, 2) the patient's health deteriorated, 3) the patient had severe side effects, or 4) the patient decided to withdraw from the study. Side effects of Sorafenib include severe hand and feet skin rash, severe fatigue, muscle and joint pains, recurrent diarrhea, weight loss, elevated blood pressure and mouth pain. If severe side effects developed, the drug was stopped then re-started at a lower dose after the side effect resolved. The dose was then increased back to full dose if tolerated.

WHAT WERE THE RESULTS OF THE STUDY?

Tumor response was assessed using the Response Evaluation Criteria in Solid tumor (RECIST). In this study, 6 of the patients with Papillary thyroid cancer had a partial response (decrease in the cancer size) that lasted up to 7.5 months. None of the other thyroid cancer types decreased in size. In more than half of the patients, the cancer remained stable (did not increase in size) for more than 6 months. In most of the patients where it was measured, the level of thyroglobulin decreased up to 25 % on Sorafenib.

Severe side effects were common including severe hand and feet skin rash, severe fatigue, and muscle and joint pains. The Sorafenib dose had to be decreased in more than half of the patients in this study.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Another study used Sorafenib for treating advanced metastatic Papillary thyroid cancer at the same dose for a shorter period of time (16 weeks compared to up to 14 months in the current study). Close to 25% of the treated patients had a decrease in cancer size (compared to only 15 % in this study). Similar to this study, a little over half of the patients had stable disease and the Thyroglobulin level decreased in almost all patients. Side effects were similar in both studies, although one patient died of liver failure in the other study, probably due to Sorafenib therapy.

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THYROID CANCER, continued

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Sorafenib offers some hope for patients with advanced, progressive metastatic Papillary thyroid cancer. The drug is relatively well tolerated and is effective in slowing the progression of disease. However, patients need to be followed closely for significant side effects of the drug.

— Mona Sabra, 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.

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.

Clinical trials — when a new drug is developed, it must undergo an extensive series of steps, called phases, to prove that it is more effective in patients than the drugs that are currently available to treat the condition. A Phase I trial tests a new drug or treatment in a small group of people for the first time to evaluate its safety, determine a safe dosage range, and identify

side effects. A Phase II trial gives the drug to a larger group of people to see if it is effective and to further evaluate its safety. A Phase III trial gives the drug to large groups of people to confirm its effectiveness, monitor side effects, compare it to commonly used treatments, and collect information that will allow the drug or treatment to be used safely.

RECIST: Response Evaluation Criteria in Solid Tumors — this is a set of published rules that define when cancer patients improve (“respond”), stay the same (“stable”) or worsen (“progression”) during treatments.

Sorafenib — an anticancer drug that has been shown to be effective in thyroid cancer.

Tyrosine kinases — proteins that are overactive in many of the pathways that cause cells to be cancerous.



ANTI-THYROID MEDICATION

WHAT IS THE STUDY ABOUT?

Methimazole is an antithyroid medication that blocks the thyroid from making thyroid hormone. It is used to treat hyperthyroidism. The most common cause of hyperthyroidism is Graves' disease, an autoimmune disease where the body makes antibodies that turn on the thyroid gland. Methimazole is usually a well-tolerated and safe drug, but on rare occasions, serious side effects can occur. The most serious side effect is called agranulocytosis, which may occur in 1 in 500 – 1000 patients. This is when the number of infection-fighting white blood cells in the blood decreases and cause the patient to be more likely to get an infection. The most common symptoms of this rare side effect are fever and/or a sore throat. For this reason, any patient on Methimazole is told to stop the drug and call their doctor should either of these symptoms occur. In the vast majority of patients with agranulocytosis, the white blood cell count returns to normal within 7–10 days. Some studies suggest that agranulocytosis is more likely to occur at higher rather than lower doses of Methimazole. This study attempts to see if agranulocytosis is more common in patients on 30 mg of Methimazole as compared to 15 mg of the drug.

THE FULL ARTICLE TITLE: Takata, K., Kubota S, Fukata S., Kudo T, Nishihara E, Ito M, Amino N, Miyauchi A. Methimazole-induced agranulocytosis in patients with Graves' disease is more frequent with an initial dose of 30 mg daily than with 15 mg daily. *Thyroid* 2009; 19: 559–63.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to see if the rare side effect of agranulocytosis is more common in patients on 30 mg of Methimazole as compared to 15 mg of the drug.

WHO WAS STUDIED?

This study looked at 6,658 patients with Graves' disease treated with Methimazole at Kuma hospital in Japan between 1991–2005.

HOW WAS THE STUDY DONE?

The records of the study patients diagnosed with Graves' and treated with Methimazole were reviewed. If a patient developed a fever, Methimazole was discontinued and a white blood cell count was performed. Agranulocytosis was diagnosed if the white blood cell count was <1000 (normal range usually 5000–10,000).

WHAT WERE THE RESULTS OF THE STUDY?

In all, 28 of the 6,658 patients (0.4%) were diagnosed with agranulocytosis. A total of 17 patients of the 2087 on 30 mg of Methimazole developed agranulocytosis (0.8%). A total of 6 patients of the 2739 on 15 mg of Methimazole developed agranulocytosis (0.3%). Dividing the groups more broadly, a total of 22 of the 3174 patients (0.7%) treated with over 20 mg of Methimazole developed agranulocytosis as compared to 6 of the 3484 patients (0.2%) on less than 15 mg of Methimazole. No patient on less than 10 mg of Methimazole developed agranulocytosis.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

There are few studies on this topic. However, those studies do show that agranulocytosis is related to the dose of methimazole.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Agranulocytosis is a very rare side effect of the antithyroid drug Methimazole which is commonly used to treat hyperthyroidism caused by Graves' disease. This rare side effect is more likely in patients treated with a daily dose of 30 mg than with 15 mg of Methimazole.

— Heather Hofflich, MD

ATA THYROID BROCHURE LINKS

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

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

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ANTI-THYROID MEDICATION, continued

ABBREVIATIONS & DEFINITIONS

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

Graves' disease: the most common cause of hyperthyroidism in the United States.

Agranulocytosis: a marked decrease in the white blood cell count that causes a patient to be more likely to develop an infection. This is commonly associated with a fever and/or a sore throat.

White blood cells: the infection-fighting cells of the blood.

Methimazole: an antithyroid medication that blocks the thyroid from making thyroid hormone. Methimazole is used to treat hyperthyroidism, especially when it is caused by Graves' disease.



THYROID NODULES

WHAT IS THE STUDY ABOUT?

Thyroid nodules are extremely common in adults. With the increased use of imaging tests, some studies suggest that thyroid nodules occur in up to half of the population. The concern about thyroid nodules surrounds the possibility of thyroid cancer, with studies reporting that ~5% of thyroid nodules are cancer. The fine needle aspiration biopsy is the best way to determine if a nodule is a cancer. Since most of the thyroid nodules are not cancer, it is important to determine which nodules should undergo a biopsy. Guidelines developed by the American Thyroid Association indicate that the best way to initially evaluate thyroid nodules is to perform an ultrasound examination of the thyroid. This study examines what ultrasound features are most helpful in selecting which nodules should be biopsied and which nodules are more likely to be benign (non-cancerous).

THE FULL ARTICLE TITLE: Popowicz B, Klencki M, Lewinski A, Slowinska-Kiencka D. The usefulness of sonographic features in selection of thyroid nodules for biopsy in relation to the nodule's size. *Eur J Endocrinol* 2009;161:103–11.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine what ultrasound features of thyroid nodules were important in distinguishing between benign nodules and thyroid cancer.

WHO WAS STUDIED?

The study group was 672 patients with 1141 thyroid nodules (some had multiple nodules) who underwent thyroid surgery at the Medical University of Lodz in Poland.

HOW WAS THE STUDY DONE?

The records of the patients were reviewed. Based on the pathology after the surgery, the nodules were classified as either benign or cancer. All patients had ultrasound examinations before surgery. The ultrasound features that were examined included: 1) nodule shape, 2) nodule echogenicity—the nodule appeared as bright as, less bright or brighter than the surrounding normal thyroid tissue,

3) whether the nodule was solid or cystic or both and 4) blood flow pattern through the nodule. They also examined whether the number of nodules and whether nodule size (small, <15 mm compared to large, ≥15 mm) had any bearing on the likelihood that a nodule was cancer or not.

WHAT WERE THE RESULTS OF THE STUDY?

There were 96 cancers in these patients. Cancers were more often less bright than the surrounding normal thyroid tissue, were the only nodule in the thyroid, contained small calcifications and had a greater height to width compared to benign nodules. These features were particularly true in patients with small as opposed to large nodules. The blood flow pattern through the nodule did not help in distinguishing between benign and cancers in small thyroid nodules.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Multiple other studies have looked at the ultrasound characteristics of benign and cancerous thyroid nodules. Most have shown an increased risk of cancer in thyroid nodules that are less bright than the surrounding tissue, have small calcium deposits in them, and have irregular margins. Some also have shown that nodules that are taller than wide and show increased blood flow within the nodule increase the risk for cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Clinicians should use the various ultrasound features to select which thyroid nodules should have a fine-needle aspiration biopsy. In particular, biopsy should be considered if the nodule is less bright, has small calcifications and is taller than wide regardless of nodule size.

— Glenn Braunstein, 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

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THYROID NODULES, continued

ABBREVIATIONS & DEFINITIONS

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 Ultrasound: a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves 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.

Thyroid fine needle aspiration biopsy: 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.



THYROID CANCER

WHAT IS THE STUDY ABOUT?

Papillary microcarcinoma is a form of thyroid cancer where the cancer is very small (<1 cm). While only a small number of patients with papillary cancer will die from their cancer, most of those that do die will have larger cancers when the cancer is initially found. Since very few patients with Papillary microcarcinoma will die from their cancer, it is not clear how aggressive treatment should be for these patients. If one could predict which microcarcinomas come back after the initial treatment, one could target those cancers for more aggressive treatment when they are initially discovered. Known risk factors for recurrence of larger thyroid cancers are: 1) spread to lymph nodes in the neck, 2) extension of the cancer outside of the thyroid, 3) spread of the cancer into the blood and 4) more than one cancer found within the thyroid gland. This study looked at how common one or more of these findings were found in papillary microcarcinomas and whether these risk factors were associated with cancer recurrence in these smaller cancers.

THE FULL ARTICLE TITLE: Arora N, Turbendian HK, Kato MA, Moo TA, Zarnegar R, Fahet TJ. Papillary thyroid carcinoma and microcarcinoma: is there a need to distinguish the two? *Thyroid* 2009;19:473–77.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to determine how common known risk factors for cancer recurrence were found in papillary microcarcinomas and whether these risk factors were associated with cancer recurrence in these smaller cancers.

WHO WAS STUDIED?

This study looked at 184 patients with papillary thyroid cancer seen at New York Presbyterian Hospital–Cornell over a ten year period from 1995 to 2005. A total of 124 patients had papillary thyroid cancer (PTC) and 60 patients had papillary thyroid microcarcinoma (PTMC). All of the patients had their entire thyroid glands removed by surgery.

HOW WAS THE STUDY DONE?

The records of patients in the study were reviewed. At the time of initial surgery, patients were evaluated for the following risk factors: 1) spread to lymph nodes in the neck, 2) extension of the cancer outside of the thyroid, 3) spread of the cancer into the blood and 4) more than one cancer found within the thyroid gland. Patients were followed over the study period for cancer recurrence.

WHAT WERE THE RESULTS OF THE STUDY?

Spread of the cancer to lymph nodes in the neck was found in 63 (51%) patients with PTC and 26 (43%) patients with PTMC. Extension of the cancer outside of the thyroid was found in 19 (14%) PTC patients and 3 (4.5%) PTMC patients. Spread of the cancer into the blood was found in 18 (13%) PTC patients and 4 (6%) PTMC patients. More than one cancer found within the thyroid gland was found in 71 (52%) of PTC patients and 37 (56%) of PTMC patients.

Cancer recurrence was found in 29 (21.3%) of the patients with PTC and 11 (17%) of the patients with PTMC at an average of 2.7 years after surgery. The main predictor of recurrence in PTMC was spread of the cancer into the blood.

None of 14 patients who were unexpectedly found to have PTMC after surgery for what was thought to be noncancerous disease (ie hyperthyroidism) had recurrence of their thyroid cancer after initial surgery.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

The high recurrence rate (17%) for PTMC is surprising since several prior studies have reported recurrence rates ~5%. Spread into the blood has been reported to be a risk factor for recurrence of PTMC by other studies, as was spread to lymph nodes in the neck and extension of the cancer outside of the thyroid.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that spread of the cancer into the blood is an excellent predictor of recurrence for both PTC and PTMC. The study also demonstrated a similar rate of spread to lymph nodes and extension outside the thyroid recurrence for both small thyroid in both PTC and PTMC. More importantly, this study showed a similar rate of recurrence for PTMC and PTC, although the rate of recurrence of PTMC was significantly higher than many other prior studies. This study brings into question the use of a less-aggressive approach to smaller thyroid cancers as is recommended in current therapeutic guidelines.

—Frank Cranz, 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 (PTC) — the most common type of thyroid cancer.

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

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

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



THYROID NODULES

WHAT IS THE STUDY ABOUT?

While thyroid nodules are very common in adults, they are much less common in children. Studies suggest that thyroid nodules occur in about 1–2% of children and adolescents. Fine needle aspiration biopsy (FNAB) is a procedure commonly used to evaluate patients with thyroid nodules to determine if these nodules are cancerous. FNAB has been shown to be very accurate and helpful in selecting those patients who will need surgery. In 5–10% of FNABs, there are not enough cells obtained to make a diagnosis and this is termed an inadequate/insufficient biopsy. Some studies in adults have shown that the number of inadequate/insufficient biopsies decreases when FNAB is done with the help of ultrasound guidance (US-FNAB). No information is available regarding the usefulness of this method in children. This study looks at the value of US-FNAB in the evaluation and treatment of children with thyroid nodules

THE FULL ARTICLE TITLE: Izquierdo R, Shankar R, Kort K, Khurana K. Ultrasound-guided fine-needle aspiration in the management of thyroid nodules in children and adolescents. *Thyroid* 2009;19:703–5.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study is to evaluate the usefulness of ultrasound guidance when doing a biopsy of thyroid nodules in children and adolescents.

WHO WAS STUDIED?

The patient group consisted of 42 children and adolescents who had enlargement of their thyroid glands (goiters) or thyroid nodules larger than 1 cm in size on exam who were sent for biopsies of these nodules at a medical center in upstate New York between January of 1999 and October 2006. All these children had US-FNAB of their nodules. Some of these children were sent for surgery based on the results of this biopsy. The results of the US-FNABs done in these children were compared to a previous study of FNABs done without ultrasound guidance published by the same authors.

HOW WAS THE STUDY DONE?

The medical records of those 42 children and adolescents, ages between 8 and 19 years, were reviewed. These children had biopsies of nodules that were > 1cm (total 52

biopsies) and these biopsies were all done using the guidance of an ultrasound. Eleven of these children, who had 16 nodules in total, had all or a part of their thyroid glands removed. The results of the biopsy (cytology) were compared with the final results obtained by a pathologist from inspecting the thyroid glands that had been removed. The accuracy of the US-FNA was determined by comparing the results obtained from the ultrasound guided biopsy with the results obtained from inspection of the thyroid glands removed surgically.

WHAT WERE THE RESULTS OF THE STUDY?

The study showed that the accuracy of the diagnosis made from samples obtained by US-FNAB in children was much better than results obtained in the previous study by FNAB without ultrasound guidance. Also, the number of inadequate/insufficient biopsies obtained by US-FNAB (2% of biopsies) was much lower than the FNABs done without ultrasound (11% of biopsies).

HOW DOES THIS COMPARE WITH OTHER STUDIES?

Previous studies in adults had shown that US-FNAB are more accurate and more helpful in selecting patients that need surgery than FNAB done guided only by palpation of the nodule. However, no studies looking at this had been done in children

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The use of ultrasound to guide biopsies of thyroid nodules in children and adolescents is more accurate than biopsies guided by palpation only. Ultrasound guidance also reduces the number of inadequate/insufficient results and, therefore, decreases the need to repeat the biopsy. These results are similar to those obtained in adults. When possible, biopsy of thyroid nodules in children and adolescents should be done with ultrasound guidance.

— 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

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THYROID NODULES, continued

ABBREVIATIONS & DEFINITIONS

Thyroid nodule: an abnormal growth of thyroid cells into 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.

Inadequate/Insufficient biopsy: this happens with not enough cells are obtained during the biopsy to provide a diagnosis. This occurs in 5–10% of biopsies. This

often results in the need to repeat the biopsy.

Thyroid Ultrasound: a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves 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 (US-FNAB).

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.



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Friends of the ATA
Founded 2005

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Get the latest thyroid health information. You'll be among the first to know the latest cutting-edge thyroid research that is important to you and your family.



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.





ATA Alliance for Thyroid Patient Education CALENDAR OF EVENTS

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

DATE	EVENT	PLACE	ORGANIZATION
October 21, 2009	Light of Life Annual Fundraiser www.checkyourneck.com	New York, NY	Light of Life
October 16–18, 2009	ThyCa 12th International Thyroid Cancer Survivors' Conference www.ThyCa.org http://www.thyca.org/conferences.htm	Boston, MA	ThyCa
October 16–18, 2009	Patient & Family Conference www.ngdf.org http://www.ngdf.org/conference.php	Charlotte, NC	Graves' Disease Foundation
Spring 2010	Light of Life Educational Symposium www.checkyourneck.com	New York City	Light of Life