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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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DIAGNOSTIC VALUE OF PHOTON-EMISSION COMPUTED TOMOGRAPHY IN THE DIAGNOSIS OF THYROID GLAND DISEASES

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Abstract.

According to the data of the World Health Organization (WHO), during the last 20-30 years, there has been an increasing number of Thyroid diseases in the world. More than 200 million people worldwide suffer from goiter. About 7-8% of the world's population suffers from various endocrine pathologies. Thyroid scintigraphy is one of very informative and sensitive methods of investigation, it mainly serves the differential diagnosis of diseases causing thyrotoxicosis. The last decade has integrated hybrid imaging - single-photon emission computed tomography (SPECT) with x-ray computed tomography (CT), SPECT/CT has revolutionized the field of conventional nuclear medicine. Available evidence indicates that this hybrid imaging technology will become the gold standard for conventional scintigraphy, has ability to give detail information about atypical location of the thyroid gland, about “hot” or “cold” nodule location, SPECT-CT images show exact topography and size of each nodule size of Thyroid gland when we have enlargement. The purpose of this study was determine the diagnostic value of SPECT-CT in Thyroid gland diseases. The material presented in the article belongs to Todua Medical center. Confirmation for using imaging material is accepted from all of the patients, including in this article.

Key words. Thyroid diseases diagnostic, thyroid scan, radionuclide diagnostic, hybrid imaging, thyroid nodules.

Introduction.

According to the Thyroid American association, more than 200 million people worldwide suffer from endemic goiter of the thyroid gland. According to the same source, the statistical numbers of thyroid diseases increase in 5% annually. Statistically women population eight times more incidence than men (8/1) [1,2].

Since 70s of last century radionuclide studies has integrated in diagnostic filed, it allowed us to measure the functional state of various organs. As a result, the diagnostic value of radioisotope research increased. The main goal of thyroid gland radionuclide diagnostic is to reveal pathological function, of thyroid gland, and make differential diagnostic among toxically diseases [3]. Also, this diagnostic method is important for reveal ectopic Thyroid tissue and, in some cases to reveal “cold noduls” (oncological in 20-30%). Scintigraphy is one of the methods of radionuclide [4].

Radionuclide diagnosis of the thyroid gland is performing in Georgia in Radionuclide Department of Clinic Todua since 1990. For today the number of thyroid patients in this department is quite high and their number reaches 400 patients annually.

There are different type of radiopharmaceuticals which are used for thyroid diagnostic, but Technetium 99 (Tc99-pertechnetate) is widely used. It has a short half-life (6 hours). Radioisotope scanning with Tc99 allows us to evaluate the location and function of the gland, the size and shapes of the lobes [5].

We are using nuclear medicine investigations for differential diagnostic among the thyroid toxic conditions:

- Graves' disease.
- Hashimoto's disease.
- Nodular toxic goiter.
- Thyroid cancer.
- Ectopic thyroid tissue.

Ectopic thyroid tissue or additional lobe if thyroid gland are rear anatomical abnormalities and may be found: under the tongue (sublingual thyroid gland), in the mediastinum (substernal goiter), on the projection of the pelvis (struma ovarii) [6].

The last decade gave us hybrid imaging technologies combining single-photon emission computed tomography (SPECT) with x-ray computed tomography (CT), SPECT/CT has revolutionized the field of conventional nuclear medicine. Available evidence indicates that this hybrid imaging technology will become the gold standard for conventional scintigraphy, has ability to give detail information about atypical location of the thyroid gland, about “hot” or “cold” nodule location, SPECT-CT images show exact topography and size of each nodule size of Thyroid gland when we have enlargement. The purpose of this study was determine the diagnostic value of SPECT-CT. New generation gamma-camera and computer-tomography (gamma camera with x-ray tube) allowed us to jointly make imaging radionuclide and radiological investigations the same tame which means simultaneous diagnosis evaluating the functional state and morphological structure of the organ [7]. The mentioned hybrid gamma-camera has been operating in the Todua clinic since 2019.

The mentioned news made the joint, integrated work of radioisotope and computed tomography specialists together. Photon-emission computed tomography- SPECT/CT, as an additional mode of research, it is used for detail interpretation picture of the thyroid gland [8]. When scintigraphyc images do not allow for a full assessment of this. Additional mode photon-emission computer tomography, we are using when we suspecting the presence of "cold" nodule, also when we have large volume of the gland, to determine relation to other organs. Exact localization (using axial coronary and sagittal slises), it is especially relevant to use the mentioned mode in cases when we have unusual spreading location of thyroid gland in the

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mediastinal area, behind the sternum. Use of hybrid technology in the diagnostic direction, such as photon-emission computed tomography - SPECT/CT, is of great informative data in this cases [9].

The use of computer- tomography mode allows us to determine gland's spreading location, determine the density and structure of the gland, especially in case of anomalies, ectopic tissue or an additional lobe of the thyroid gland, as well as when the gland tissue is sharply enlarged (in multinodular goiter) and spread in order to determine the planning the surgery. In this cases, the data of SPECT (single photon emission computer tomography) an CT (computed tomography) together- "fused images" (SPECT/CT) with radioisotope scanning are very important to determine the structure and anatomical localization. The practical use of the mentioned mode (technological integration of radionuclide radiological studies) allowed us to make a full-fledged diagnosis and to plan the correct treatment with a higher reliability rate [10].

For example, below are some practical cases that represent the practical work of the radionuclide department of Todua Clinic.

Materials and Methods.

The study begins with preparation of tc99 for patient, measurement of syringe the radiopharmaceutical (doses according to weight which are provided by the European Radionuclide Association guideline), then iv injection, generally the injected dose is 100-150 mbq (megabequerels), before scanning time delay is 20-25 min. The imaging process lasts an average of 1-2-3 minutes, depending on the dose of injected radiopharmaceutical and thyroid gland disease. The examination of the patient is mainly in a horizontal position, although in some cases (especially in cases of claustrophobia) it is in vertical sitting position [6]. According to the received data, in the norm, Tc99 involvement in the gland tissue should be equal (homogeneous), visual evaluation of medium intensity. The rate of absorption in thyroid tissue (uptake) should range from 1.0-2.0 (total uptake) in the adult population. In nodular diseases of the thyroid gland, depend on the Tc99 involvement, we can get different types of images, in the form of low inhomogeneous uptake in gland, high homogenous uptake, high local uptake ("Hot" toxic nodule - causes local activation of high activity, against the background of which the activation in the rest of the tissue of the gland is reduced). "Warm" nodule - is manifested by a slightly increased activity compared to the rest parenchyma of the gland, although there is no significant contrast of the inclusion index in relation to the gland tissue, this type of nodule has a low clinical diagnostic value [7].

"Cold" nodule - non-functional active tissue of the of thyroid gland, characterized by very low uptake in local area, or defect of uptake. In this type of nodules, mainly there are nodules of colloid structure (75%), however, when the colloid structure of the nodule is not confirmed by ultrasound examination, otherwise patient should make morphological diagnostic, because malignancy is high Risk (20%-30% especially in young, mostly male patients). In patient history, last time performed Radiation therapy is also a risk factor (40%).

In the case of SPECT/CT, the research continues with the movement of the gamma camera around the neck area for 360 degrees for 20 minutes, and then by marking CT scan, with the fusion of images. A SPECT-CT scan is usually done at the same time as other types of scans that use a nuclear medicine gamma camera.

Results and Discussion.

SPECT images showed in thyroid enlargement with "hot" functioning or hypofunctioning nodules were detected; a "toxic hot" nodule in one of lobs with uptake suppression of the other. "cold" non-functioning thyroid nodules. CT scans allowed to identify morphological patterns of nodules - solid, cystic or complex; available calcifications or capsulation; hyperplastic or

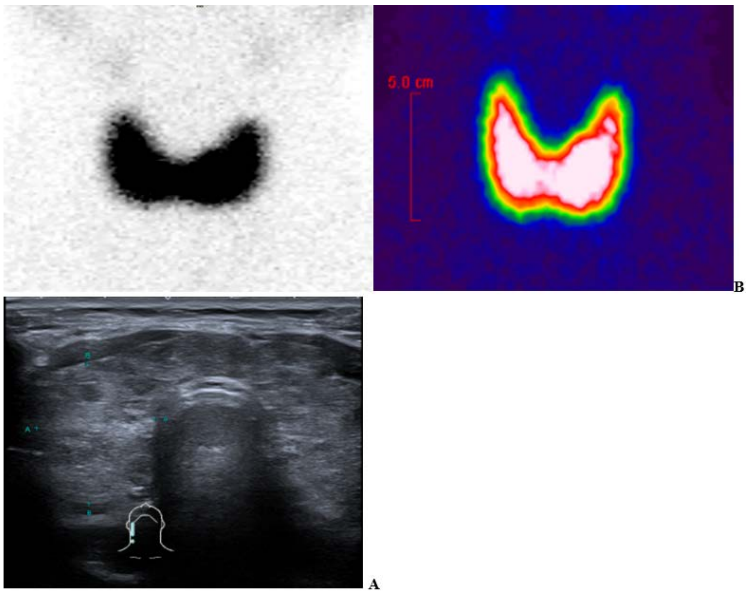


Figure 1. *The patient is a 23-year-old woman. Clinic of thyrotoxicosis, laboratory picture of thyrotoxicosis, differential diagnosis between graves and Hashimoto's thyroiditis. a) An ultrasound study shows diffuse inhomogeneous thyroid parenchyma with small, reduced echogenicity inclusions. b) Increased Tc99 uptake was detected in radioisotope investigation 5.5% (norms 1,0%-2,0%). Diagnosis: diffuse toxic goiter.*

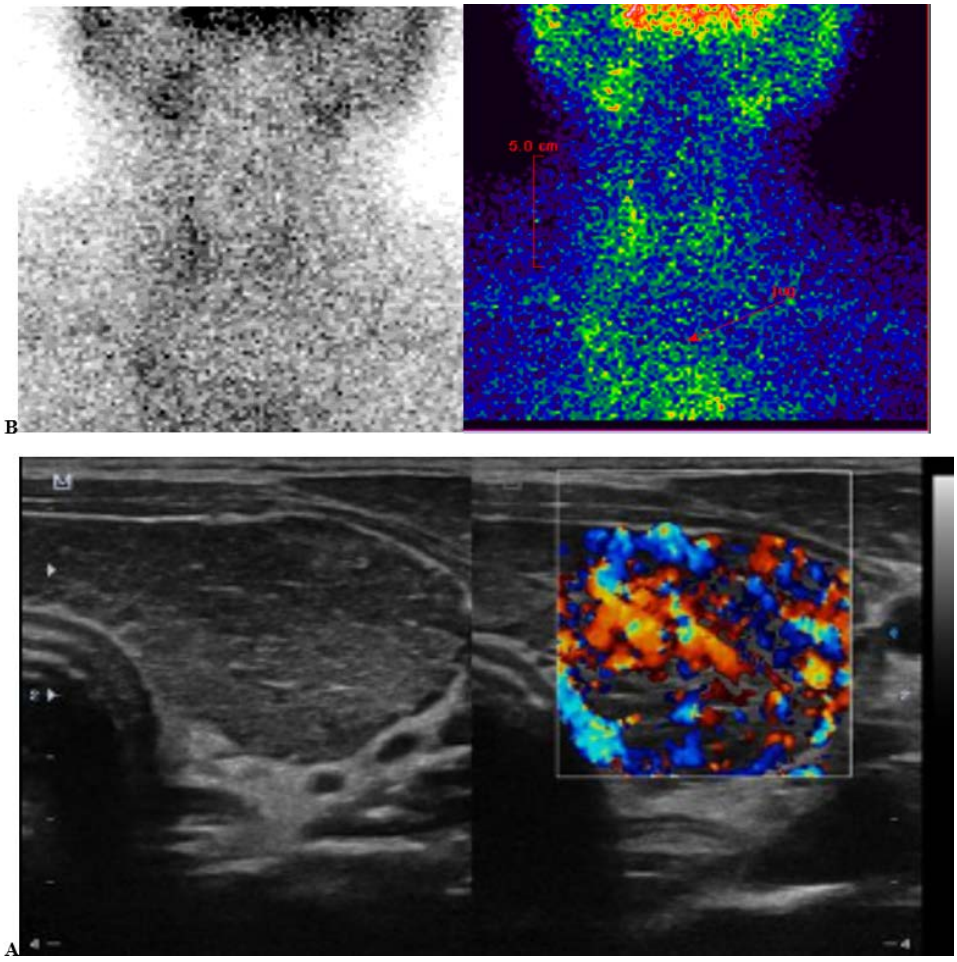


Figure 2. *55-year-old woman. Clinic of thyrotoxicosis, laboratory picture of thyrotoxicosis, differential diagnosis between diffuse toxic goiter and Hashimoto's disease (thyroiditis), a) The ultrasound examination shows diffuse changes, the parenchyma of the thyroid gland has an inhomogeneous structure, with small reduced (low) echogenicity inclusions in it, a picture of thyrotoxicosis in the laboratory. b) Low uptake in the gland revealed a decreased inclusion rate of Tc99 0.2%.*

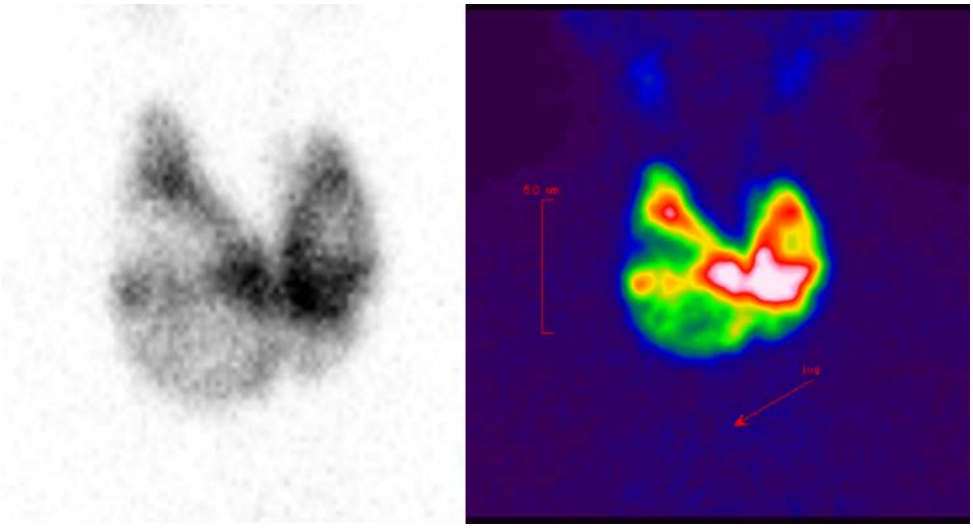


Figure 3. *A 35-year-old man, Clinic of thyrotoxicosis, laboratory picture of thyrotoxicosis, ultrasound examination shows a picture of multinodular goiter with solid nodules of heterogeneous structure. Laboratory picture of thyrotoxicosis. Radioisotope study in the gland showed a nonhomogeneous uptake of Tc99- 9.9%, with defects of inclusion, indicating the coexistence of "cold" nodes on the background of diffuse toxic goiter.*

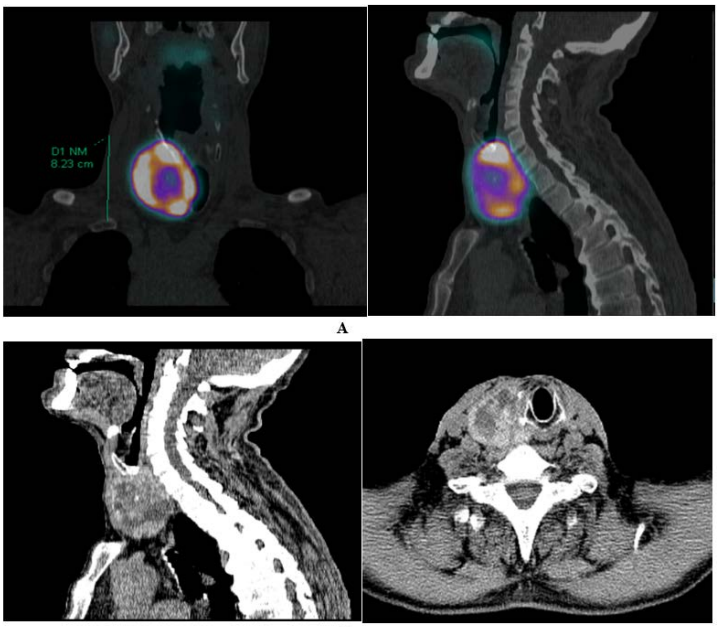
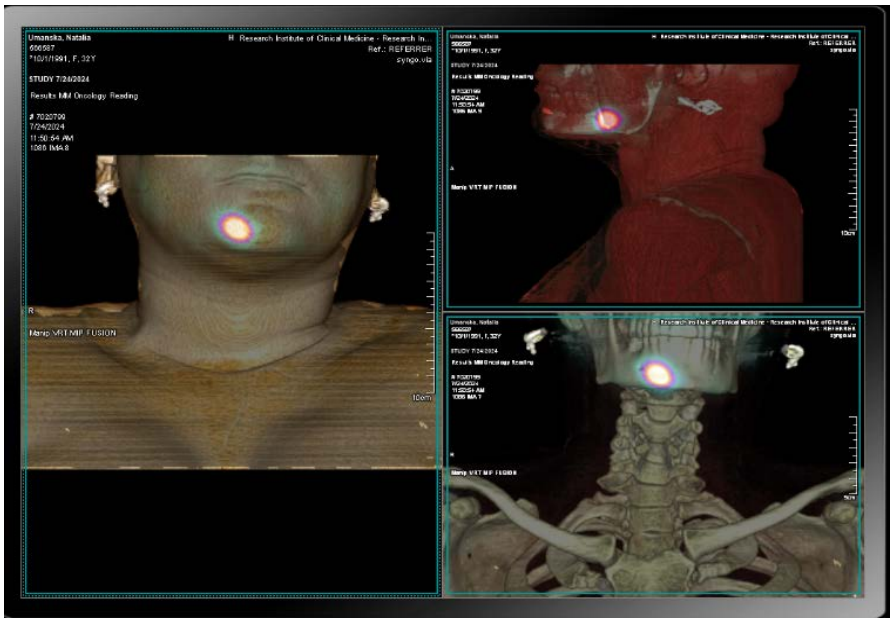
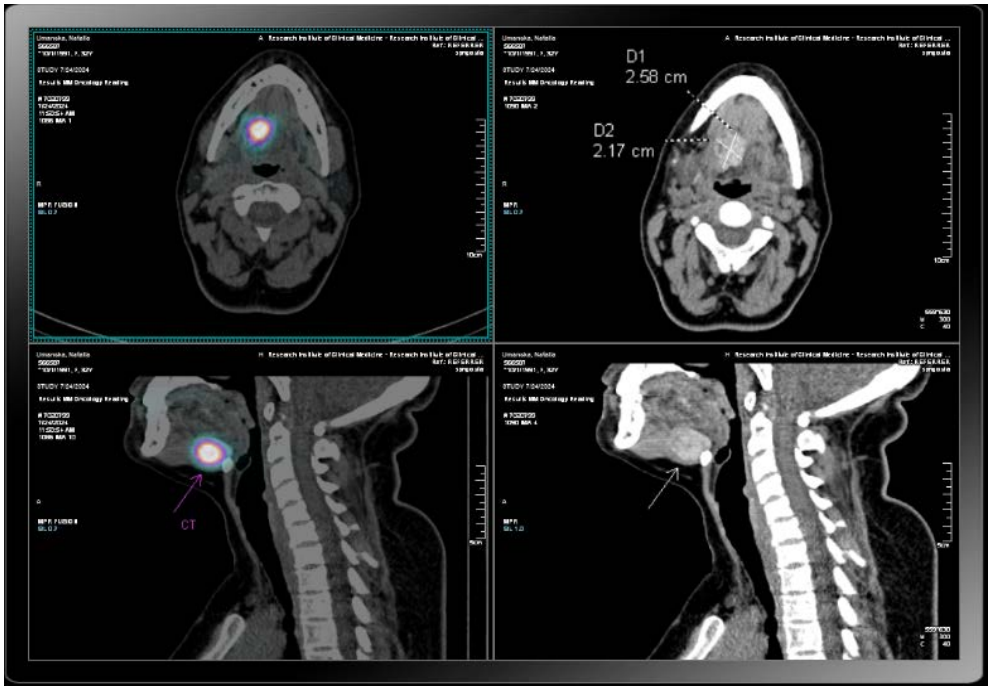


Figure 4. *40-year-old male patient, laboratory picture of thyrotoxicosis, on the projection of the right lobe of the thyroid gland, a round-shaped formation of inhomogeneous structure was observed on the ultrasound examination, the right lobe size of the gland is significantly enlarged image shows the presence of a large hot nodule, for which, in addition, a) photon emission computed tomography was used with the patient - SPECT/ CT, the projection of the right lobe of the thyroid gland shows a "hot" nodule of 8 cm in size, the mentioned nodular formation of the. b) Computed tomography exerts pressure on the esophagus, trachea and causes its deviation to the left, the spread of the nodule in the mediastinum area is not fixed.*

A





B

Figure 5. *CT part of the study was applicable to detect sublingual localization of tissue.* ***A.*** *Thyroid scintigraphy atypical sublingual localization of Thyroid gland. B. Thyroid gland sublingual SPECT/CT reconstruction imaging.*

autonomously functioning benign tissue. SPECT/CT data were used as a guide to select the most suspicious nodules for FNA or biopsy. This was important information to planning the volume of surgical intervention (Figures 1-5).

Conclusion.

Radioisotope scanning of thyroid gland is a high sensitive method of study, it is the "gold standard" in the differential diagnosis of thyroid toxicities-causing diseases, and it is also important for the diagnosis of “cold” nodules, ectopic or additional lobe of thyroid gland tissue. Considering the high sensitivity of this method it reflects the pathological changes that started in the gland at the earliest. It is used in combination with other clinical-laboratory and ultrasound research, is highly effective and successfully affects the results of treatment effectiveness. The introduction of modern hybrid technologies, in medicine such is photon-emission computed tomography (SPECT/CT) with computed tomography (CT), further expanded the usefulness of the method. Due to the high specificity of CT research, with the possibility of anatomical assessment of the gland, radionuclide photon-emission computed tomography (SPECT/CT) is a new in the modern diagnostic area, hybrid diagnostics is very relevant and widely used in Georgia since 2019 at Todua Clinic.

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