MANAGEMENT OF THYROID NODULES

Mahmudov U.I
Fergana Public Health Medical Institute, Fergana, Uzbekistan

Abstract: *Thyroid nodules, those tiny, often unnoticed growths, are more common than you might think. Imagine this: around 4 to 7% of people might feel them during a simple touch, while a staggering 19 to 68% can spot them using high-resolution ultrasound! The majority of these nodules are harmless little things, benign as can be. However, about 7 to 15% of them have a mischievous streak and might turn out to be malignant.*

You see, these nodules are like silent spectators, usually discovered by chance. Maybe during a routine check-up, or perhaps while scanning for something entirely different. But once they're spotted, they demand attention! Every single nodule gets its moment under the clinical spotlight.

Now, if we're talking about evaluating these nodules, the star of the show is thyroid stimulating hormone, or TSH for short. If your TSH levels are dancing below the norm, it's time for a radionuclide thyroid scan. Why? To check if that nodule is just a hyperactive troublemaker. On the other hand, if TSH behaves itself or even goes high, ultrasonography, or US for the cool kids, steps in. Trust me, US is the Sherlock Holmes of thyroid imaging, spotting things others might miss.

As for CT scans and magnetic resonance imaging? They're like the backup dancers, not usually stealing the limelight in the initial evaluation. But hey, they have their moments too!

Now, let's talk risk. There's a whole circus of risk classification systems out there, but the American Thyroid Association and the American College of Radiology are the headliners. They're the ones everyone knows and trusts.

When it comes to checking out these nodules up close and personal, Fine Needle Aspiration Biopsy, or FNAB, takes center stage. It's the gold standard, the benchmark, the go-to method. And when FNAB speaks, it uses the Bethesda System for Reporting Thyroid Cytopathology, or TBSRTC for friends. It's a neat, tidy 6-category system, freshened up just last year in 2023.

Now, here's the plot twist: molecular tests are becoming the new buzzword, especially for those Bethesda III and IV nodules. Why? To maybe, just maybe, skip the whole surgical drama.

Speaking of drama, treatments vary based on the nodule's malignant potential. Some nodules get the VIP treatment with regular check-ups, while others might face the surgeon's knife, a dose of radioactive iodine, or even some non-surgical zapping. It's a tailored approach, because let's face it, one size rarely fits all in the world of thyroid nodules!

Thyroid nodules, those tiny growths in the thyroid gland, are surprisingly common, making them a familiar face in the general population. Picture this: they're found in about 4 to 7% of people when discovered by touch, but that number jumps to a wide-ranging 19 to 68% when high-resolution ultrasound, or US, gets involved. And guess what? Women and our seasoned citizens, the elderly, seem to be more in the nodules' crosshairs.

Now, here's the reassuring part: the majority of these nodules are harmless, playing for the benign team. But there's a catch. A small but significant 7 to 15% can be a bit rogue, showing signs of malignancy. It's like a game of chance, really, depending on various factors linked to the patient.

With the leaps and bounds we've seen in imaging technology over the past 30 to 40 years, it's no surprise that we're catching more of these nodules—and unfortunately, more thyroid cancers too. Finding a lump, any lump, can send shivers down anyone's spine, triggering fears of the big 'C' word.

Now, here's the thing: not all nodules are created equal. Some are just there, minding their own business, not causing any fuss. Others, however, need a closer look, possibly even some intervention. But hold on! Surgery isn't the go-to solution for every nodule that pops up. The main culprits that might send a nodule under the knife? Cancer, an overactive nodule, or when it starts causing trouble by compressing nearby structures.

Navigating the world of thyroid nodules can be like walking through a maze. It's a hot topic, with plenty of debate swirling around the best way to diagnose and treat them. So, let's dive into the strategies and approaches, sifting through the controversies, to get a clearer picture of managing these tricky thyroid nodules.

Ah, the enigmatic thyroid nodule! So, what exactly is it? Well, imagine a little spot on the thyroid gland that stands out from its surroundings, making its presence known through ultrasound or other sharp-eyed imaging methods.

Now, let's spice things up a bit. If your thyroid starts sprouting these nodules left and right, transforming into a lumpy landscape, we call it nodular goiter. Think of it like a garden with one standout flower—it's a solitary thyroid nodule. But if that garden turns into a bouquet with multiple flowers, that's a multinodular goiter, or MNG for short.

Clinical Risk Factors for Thyroid Cancer

Ah, thyroid cancers—the most common types of endocrine cancer, yet the malignancy rate in thyroid nodules isn't exactly through the roof. It's a bit like finding a needle in a haystack, but the needle is pretty rare. Now, what makes these cancers tick? Well, there's a handful of risk factors we've managed to identify.

First off, there's ionizing radiation, whether from treatments during childhood or unfortunate accidents. Then, there's the mysterious dance of dietary iodine—too much or too little can sway the risk. Throw in a family history of thyroid cancer or certain

hereditary syndromes, and you've got yourself a recipe for a higher risk. In fact, having a family history can crank up the risk 5 to 10 times!

Now, let's dive into the world of familial non-medullary thyroid cancers. They can be split into two groups: syndromic and non-syndromic. Most of them aren't linked to any syndromes, but there are exceptions like familial adenomatous polyposis, Carney complex, and DICER 1 syndrome, to name a few. These syndromes bring along their own sets of challenges, affecting different types of thyroid cancers.

But wait, there's more! Familial medullary thyroid cancers have their own spotlight, especially when linked to multiple endocrine neoplasia 2A/2B syndromes. And here's a recent twist: where the nodule hangs out in the thyroid gland can actually hint at its malignancy risk. Nodules from the isthmus? They're the high-risk rebels. Those chilling in the lower third of the lobe? They're the laid-back ones, lowest on the risk scale compared to their middle or upper pole pals.

Age plays its part too. Finding a nodule when you're young (under 14) or when you're more... seasoned (over 70) bumps up the risk. And let's not forget gender. Ladies, you've got about a 3 times higher risk compared to the gents. Now, why that is? The jury's still out on the hormonal factors, but interestingly enough, the risk for malignancy is higher in male patients with thyroid nodules.

So, while thyroid nodules might seem like small, innocent bumps, there's a whole world of factors swirling around, influencing their potential to be the rare, but worrisome, cancerous kind.

Clinical Diagnostic Approach in Thyroid Nodules

Ah, the thyroid nodule—a tiny bump that can be caused by a variety of both benign and malignant conditions. It's like a detective story where the culprit could be anyone! So, let's break down the usual suspects behind these thyroid nodules.

First up, the benign gang. We've got the follicular nodular disease, follicular adenoma, and oncocytic adenoma—each with their own quirks. Then there's the simple or hemorrhagic cyst, Hashimoto's thyroiditis, and subacute thyroiditis. These benign conditions can all masquerade as innocent-looking thyroid nodules, but they're generally not the dangerous type.

But wait, there's a twist! There are some low-risk tumors, like non-invasive follicular thyroid neoplasm with papillary-like nuclear features, that sneak in under the radar. These guys are like the stealthy ninjas of the thyroid world, rarely presenting themselves as nodules but still lurking around.

Now, let's talk about the malignant crew. Follicular cell-derived tumors are the main troublemakers here, making up the bulk of primary malignant thyroid tumors that show up as nodules. We've got papillary thyroid carcinoma (PTC), the invasive encapsulated follicular variant, follicular thyroid carcinoma (FTC), and oncocytic carcinoma—each with its own level of mischief. And let's not forget the high-grade anaplastic thyroid carcinomas (ATCs), the aggressive ones that are less common but definitely pack a punch.

But wait, there's more! Sometimes, lymphomas and metastatic cancers decide to crash the thyroid party, showing up as nodules when you least expect them. And just to keep things interesting, even the connective and supporting tissues around the thyroid follicles can occasionally give rise to both benign and malignant nodules.

So, when it comes to thyroid nodules, it's a mixed bag of benign conditions, low-risk tumors, and potentially malignant culprits. Each one has its own story to tell, its own characteristics, and its own level of concern. It's like a thyroid nodule mystery novel where every chapter reveals a new twist!

Imaging Methods

Ah, thyroid ultrasonography (US)—the Sherlock Holmes of thyroid investigations! This high-resolution method is like the magnifying glass that reveals all the intricate details of thyroid nodules, making it the go-to detective in the world of thyroid imaging.

Why is US the superstar? Well, it's super sensitive, outshining other imaging methods when it comes to spotting thyroid nodules and getting the lowdown on their size, shape, borders, location, and even their echo levels. Plus, it's non-invasive, easy on the wallet, and best of all—no ionizing radiation. But here's the catch: it's crucial to have an experienced physician at the helm, guiding the US investigation.

But that's not all! When it comes to thyroid nodules, we can't just focus on the nodule itself. Oh no, we need to look at the whole neighborhood—the cervical lymph nodes. A thorough examination of these nodes using US is a must for every patient with or suspected of having a thyroid nodule.

So, what exactly does the US report include? Hold onto your hats! We're talking about the thyroid's parenchyma—whether it's homogeneous or heterogeneous. We're measuring the gland size and pinpointing the nodule's location—maybe it's hanging out in the right upper lobe? We're checking out its composition—is it solid, cystic, or spongiform? And let's not forget its echo character—is it hypoechoic, isoechoic, hyperechoic, or a mix of all? We're even looking at the nodule's shape, its borders, and any calcifications it might have. It's like creating a detailed profile of the nodule's personality.

And don't get me started on the cervical lymph nodes! We're also noting down their size, shape, echo levels, vascularity, and any other quirky features they might have.

So, the next time you hear about a thyroid nodule, remember, it's not just about finding it—it's about understanding it. And with thyroid ultrasonography, we're diving deep into the nodule's world, capturing every detail, and piecing together the full story.

Treatment and Follow-up

Ah, the art of follow-up in the world of thyroid nodules—like keeping an eye on a sprouting plant to see if it'll bear fruit or just stay a sprout! Let's unravel the guidelines

and recommendations for follow-ups in benign nodules, the ones that have been given a clean bill of health.

First off, let's address the elephant in the room: there's no universal agreement on how often to check up on these benign (Bethesta II) nodules. According to the American Association of Endocrinologists, if a nodule's benign on all counts—no clinical or ultrasound risk factors and no symptoms—it can chill out and be monitored without much fuss.

Now, onto the nitty-gritty details. When a fine-needle aspiration biopsy (FNAB) says a nodule is benign, we often follow it up with ultrasound (US) since the false-negative rate is pretty low. And it's not just about size—it's about the features the US reveals. So, what happens if the US shows some suspicious features even after a benign FNAB? A repeat FNAB and another US within 6–12 months are recommended. If the second FNAB is also benign, the nodule can continue its life under US surveillance.

For nodules with low or moderate suspicious features on US, we're looking at US follow-ups every 12–24 months. If the nodule grows or shows new suspicious features during these follow-ups, it's back to the FNAB or more US rounds.

Now, what about those spongioform nodules or the ones with very low suspicious features? US can be repeated, but only after a long 24-month interval. If a repeated US-guided FNAB comes back benign, then the nodule can be left alone, provided it's symptom-free and shows no suspicious US features.

But hold on, the rules change a bit for those with multiple nodules or in certain nodule sizes. A nodule's follow-up might be decided based on its size, suspicious features, or the guidelines like ACR TI-RADS. The American Radiology Association even suggests that if a nodule's size remains unchanged over 5 years, it's likely benign, and follow-ups can be stopped.

So, when it comes to benign nodules, the follow-up game is all about playing detective with US, FNAB, and guidelines in hand. It's a careful dance, balancing the need for surveillance with the desire to avoid unnecessary interventions.

Surgical Treatment

Ah, the world of thyroid nodule treatments—where surgery, radioactive iodine therapy, and non-surgical interventions come into play, tailored to each nodule's quirks and the patient's needs. Let's break it down!

Surgical Treatment

If a thyroid nodule is causing trouble—think breathing or swallowing issues, or maybe it's just not winning any beauty contests—surgical treatment might be the answer. Even progressive enlargement, though not always size alone, can signal the need for thyroidectomy. While some suggest surgery for nodules larger than 3 or 4 cm due to higher false-negative FNAB rates and risk of malignancy, others argue that size isn't everything. Some large nodules may not be more malignant than their smaller counterparts.

When surgery is on the table, it's not just about size—it's about the nodule's characteristics, symptoms, thyroid function, and the patient's overall health and preferences. In cases where the nodule's category is unclear, diagnostic lobectomy might be the go-to.

Radioactive Iodine Therapy

For those with toxic multinodular or nodular goiter, especially the elderly or those with significant health issues, radioactive iodine therapy can be a good alternative to surgery. It's also considered when there's a need for FNAB from a cold nodule detected on ultrasound.

Non-Surgical Interventional Procedures

Now, for those who'd rather skip the scalpel, non-surgical options are gaining traction:

- Ultrasound-Guided Ablation Procedures: Techniques like laser, radiofrequency, high-intensity focused US, or microwave energy can shrink nodules. Before diving into these, confirming the benign nature of the nodule is key. Radiofrequency ablation is particularly effective for solid or toxic nodules.

- Percutaneous Ethanol Injection: This is the go-to for mostly cystic nodules causing compression symptoms. It can be quite effective, improving symptoms in over 80% of patients.

Remember, these procedures aren't for everyone. If a nodule isn't causing symptoms or cosmetic concerns, it's usually best to leave it alone

Follow-Up After Treatment

After any treatment or intervention, it's crucial to keep an eye on things—both clinically and with ultrasound. If there's any regrowth or change in the nodule's features, a new FNAB might be needed.

Final Thoughts

Choosing the right treatment for thyroid nodules is a bit like solving a puzzle, where each piece—nodules' characteristics, patient's health, preferences, and risks—fits together to form a complete picture. With the right approach and an experienced practitioner at the helm, managing thyroid nodules can lead to successful outcomes and improved quality of life for patients.

LITERATURES:

1. Davlatov Sh.Q. THE RELATIONSHIP BETWEEN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) AND CARDIOVASCULAR DISEASE (CVD). Vol. 6(12) (2023): PEDAGOG

2. Davlatov Sh.Q., Saydaxmedov Z.I., Mahmudov U.I. CLINICS AND RESULTS OF TREATMENT OF PATIENTS WITH CORONAVIRUS INFECTION COMPLICATED BY INTERSTITIAL PNEUMONIA IN THE FERGHANA REGION MODELS AND METHODS FOR INCREASING THE EFFICIENCY OF INNOVATIVE RESEARCH: a collection scientific

works of the International scientific conference (11 January 2024) - Berlin:2024. Part 30 – 188p. 27-32

3. Mahmudov U. I. (2023). Comparative characteristics of clinical and laboratory parameters of patiunts of the diabetic foot department, depending on the presence or absence of diabetes mellitus. So'ngi ilmiy tadqiqotlar nazariyasi jurnali" ilmiy-uslubiy jurnali, 6(12), 364-369.

4. Khodjayeva G. A. NO VATEUR PUBLICATIONS JournalNX- A Multidisciplinary Peer ReviewedJournal ISSN No: 2581 - 4230 VOLUME 9, ISSUE 10, October -2023 CLASSIFICATION OF ABDOMINAL TUBERCULOSIS Fergana Medical Institute Public Health

5. Qosimova Z. M. (2023). Hypertensive Disease: History of Nosology Development. American Journal of Pediatric Medicine and Health Sciences (2993-2149), 1(10), 97–103.

6. Jo‘raboyeva G. B. The American Journal of Medical Sciences and Pharmaceutical. 2021. Issue: 08 Pages: 21-25 Changes in the functional status of the kidneys in patients whith rheumatoid arthritis.

7. Чатурведи Н. Бремя диабета и его осложнений: тенденции и последствия для вмешательства. Диабет имеет клиническую практику. 2007;76 (3): S3–S12.

8. Davlatov Sh.Q., Saydaxmedov Z.I., Mahmudov U.I. Clinical and functional status of the cardiovascular system in patients with chronic obstructive pulmonary disease with Covid-19. Scientific aspects and trends in the field of scientific research: a collection scientific works of the International scientific online conference (30th December, 2023) – Poland, Warsaw : "CESS", 2023. 16(151), 50-53.

9. Друкер Д.Дж. Расшифровка метаболических сообщений из кишечника стимулирует терапевтические инновации: лекция Бантинга 2014 года. Диабет. 2015;64:317-326. doi: 10.2337 /db14-1514.

10. Zinman B., Wanner C., Lachin J.M. et al. Empagliflozin, cardiovascular outcomes, and mortality in type 2 diabetes. N Engl J Med. 2015. № 373. P. 2117-2128.

11. Косимова, З. М. (2023). Информационно-Компьютерная Технология Организации Работы Отдела Переливании Крови В Ферганском Филиале Республиканского Научного Центра Экстренной Медицинской Помощи. Research Journal of Trauma and Disability Studies, 2(4), 7-13.