

The chirurgical treatment of thyroid nodules (in the chirurgical service of Shkoder regional hospital)

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Abstract: Thyroid nodules are a frequent pathology of which the surgeon must face in his own practice in hospital. They are about four times more common among women than men. Number of nodules that could be touched by hand grows as people get older, reaching a prevalence of up to 5% in the population over 50 years old. Prevalence increases if there are added either the discoveries made during autopsies or surgical interventions, or when it is used ultrasonography, 50% of thyroid studied by this way have shown nodules, most of which are benign. Other nodules develop at the rate of 0.1% per year, starting in the new age and reaching up to 2% in the case of ionizing radiation exposure.

Purpose: To present our experience in the preoperational diagnosis and surgical treatment of nodular disease of the thyroid gland especially in the preoperational diagnosis of the cancer thyroid gland.

Materials and methods: In this paper work there were included 110 cases of which 108 treated with surgical intervention for thyroid nodular gland pathology and 2 cases with thyroid gland cancer treated conservatively in a period of approximately 3 years (1 January 2010 - 31 December 2012). Of these the following ratio M: F is 7/103 and the average age of 47.5 years. All cases were examined by the ECHO thyroid gland where were found one or more nodules. All cases are filled with TSH value measurements, ft3 (60 cases) and FT4 (81 cases). Schintigraphy was carried out in 37 cases and in 103 cases it was done FNA. 108 patients underwent interventions and in two cases there were set to be treated with radioactive iodine. In these patients thyroid cancer diagnosis was clear but they were counter-indication for interventional. There are realized a totality of 72 thyroidectomy, 20 cases with Subtotal thyroidectomy (almost total) and 16 cases with lobectomy. Post-operator biopsy was performed in all cases. The patients were followed up for at least 3 months after intervention until the examinations were completed and have passed for prosecution by the control of endocrinologist doctor.

Results: TSH value has served as a guideline for tactics in pursuit of the cases presented with the thyroid nodules detected by ECHO (100% of cases) or clinically affected wrist. In 37 schintigraphy which have resulted with cold nodules in 23 cases and with hot nodules 14 cases. After the intervention no case of hot nodule results to be cancer. 65 FNA turns negative, 16 suspicious cases, sure for cancer five cases, no diagnostic 6 cases and 11 cases insufficient material. From the post operational biopsies there were resulted 19 cases of cancer (12 cases of papillary type, 2 cases of follicular and 5 cases papillary type with follicular aspect) 0% mortality. 0% of massive intra haemorrhages or post operational one. Minimum drainage flow 50-100 ml in 3 days (average of staying days), wound infection 0%, voice hoarseness for a short period (up to 2 weeks) 8 cases and 2 cases with long-term voice hoarseness (6 months). 12 cases have hypo-calcium with light fingers contracture phenomena in the first week, of these 5 cases are stabilized within 3 months and 2 cases have lasted more than 3 months.

Conclusions: Visit the clinician and the ECHO thyroid gland are the initial data for nodular thyroid gland pathology. An ECHO can also provide information on a possible malignant pathology.

It is necessary and sufficient to measure the value of TSH in order to make schintigraphy examinations (TSH decreased value) or realized Fna (normal or increased TSH value).

In cases with suspicious FNA for Ca or with positive results for thyroids cancer, the selected operational technique is the total Strumectomy. In pathology by a raised thyroid function, in multi-nodular Struma the chosen technique might be total or 'almost total' Strumectomy.

The most frequent complications are voice hoarseness and hypo-calcify in its clinic. The choice of 'almost total' intervention reduces the availability of these complications and reduces the number of patients who should receive lifelong hormone replacement.

Key words: thyroid gland, FNA, ultrasound, thyroidectomy, scintigraphy, cancer, nodes.

Epidemiology: Mc Gregor defines thyroid nodes as: **'a particular lesion of (discrete) in thyroid gland that stands out from the surrounding parenchyma by touch or ultrasound (1).**

It is estimated that 4-7% of adults in the U.S. have evident touched by hand thyroid nodules. They are more common in women, and their prevalence increases along with age. In 50% of case autopsies there are revealed unknown nodules. When normal people or patients with problems which are not related to thyroid gland, undertake imaging examinations of cervical area, including thyroid, there are found thyroid nodules in 30-50% of these cases. This is a growing problem, because many people do echo-Doppler for carotid artery, CT or MRI scanner, for various medical reasons, and suddenly thyroid nodules are discovered. For example, during the breast cancer treatment on women, often it occurs to identify thyroid nodules. Most of these nodules are found accidentally and cannot be touched even though it is known their presence. These are called the thyroid accidentaloma. In Iodine deficiency countries the thyroid nodules are common.

Doctors, who treat patients with thyroid cancer, of course deal either with patients who have thyroid nodules. Instead, those who care for patients with nodules are not an active part of thyroid cancer treatment. Most patients diagnosed with thyroid cancer, initially present themselves to the doctor with thyroid nodules. Thyroid nodules are very common, whereas thyroid cancer is rare. For the doctor, it is important to distinguish cancerous nodules because they must be operated, while a large proportion of patients with benign nodules can be treated conservatively.

Clinical Symptoms: Most of thyroids nodule as malignant and benign usually show no symptoms and may be evidenced by the doctor, even without having any local effect. There are cases when they are discovered by the patient himself when he is bathing, do toilet, shaving, and at social events. Most of them are discovered during medical tests such as by obstetricians and gynaecologists, who find nodules when patients perform routine gynaecological examination or appear for the first antenatal control, which includes thyroids, touch (6). This is done because the possibility nodule is greater among women, mainly in the age 20-60 years old.

A large undetected nodule, symptoms appeared as compression, during ingestion or breathing problems, and changes the sound. Pain is not a frequent symptom. The differential diagnosis of painful thyroid nodule includes sub-acute and acute thyroid, and cancers that grow quickly as lymphomas and also an anaplastic cancer with neck pain in diseases such as pharyngitis, laryngitis, lymphadenia, cellulitis and flebit. These can exist together with nodules.

Once a nodule is detected, the patient wants to know if it is cancer and what to do (7)? Diagnosis is evaluating the clinical symptoms that increase or reduce the chance of being malignant. Patient's age, heredity, exposure to radiation is anamnestic data that help to clarify the diagnosis. Cancerous nodules are usually hard by touch, irregular and fixed to adjacent structures.

For setting the diagnosis it should be checked the condition of thyroid function, to determine whether we have normal, reduced or increased function. For this purpose it serves to measure the TSH value. When its value results in reduced rate or at the edges of normality, it is recommended to the patient to make scintigraphy, while if the TSH value is normal or increased

it is recommended to the patient other examinations as Echography or FNA. Measuring values as ft3 or ft4 complete the functional state of the thyroid gland.

Schintigraphy has historically been based on examination to assess the thyroid nodule. It is the technique that allows the evaluation of thyroid gland function and detection of tissue areas with autonomic function. Relevance of these nodules in adults lies in the fact that these are almost always benign. Schintigraphic specification in the detection of malignant nodules is 10-15%. On the basis of radioactive substance capture the nodule can be classified as hot, hypo-functional (cold) and warm (8). Technically, schintigraphy performed with ^{99m}Tc isotopes or ^{123}I , ^{131}I and each has strengths and limitations. In conclusion, not all patients require thyroid nodule schintigraphic examination. In many large specialized centres FNA has passed in a second plan the schintigraphic examination as a primary procedure in the evaluation of thyroid nodule. However AACE (American Association of Clinical Endocrinologists) urges doctors to put in function their experience in order to establish themselves on the qualities of each individual, of which method will be used.

Many scholars believe that ultrasound can make a differentiation between benign and malignant nodule. A sonographer with very good resolution needs no prior preparation, is relatively not expensive, it takes not much time to be realized as an examination, it gives no radiation and no risk is posed to the patients' and doctors health. This makes it more acceptable to patients. Ultrasound (5) provides data for establishing nodules, number, size, structure, the arrangement of borders, vascularise echogenety, calcification presence, presence of neck lymph-nodes etc. Also the dynamic of nodules evolution is followed by echography which helps in obtaining FNA in small nodules, in which it is used intra-operator for the evaluation of small nodules.

The best test with effective cost in order to show that a nodule is malignant is the FNA realization (4). Realized 'with hand and eye' it is an excellent test for the pulping nodules of thyroid gland. Also, for lesions that are not touched and are discovered only by FNA images is realized with Echography. Responds to FNA results are interpreted as benign, malignant, and suspicious for cancer, non-insufficient diagnostic material. Complications of the procedure as haemorrhage, hematoma small, pain and infection are rare and a mechanical tamponing for a few minutes is enough to stop the bleeding.

Treatment (2): When a nodule with FNA turns malignant, suspicious for cancer and non-diagnostic, to the patient it is recommended total thyroidectomy (3). When nodule is clear that it is benign, the patient is kept under observation (9) and if nodule grows and shows signs of compression, it should be recommended intervention. In this case the recommended intervention is a Subtotal or "almost total" thyroidectomy. Complications after surgical intervention include deaths, intra and post-operators haemorrhage, hyperparathyroidism, recurrence nerve damage and superior larynges, difficulties to swallow and concerns by the cicatrix.

Another alternative is the use of thyroid hormones for the benign nodules treatment. In countries with poor dietary iodine intake the results are better than in countries where the iodine intake is in normal values.

Treatment of autoimmune nodules (hot, toxic) has several options which have different values in relation to the treatment patient's condition. When the value of TSH is normal or in minimum rate limits, the patient can be observed. Surgery is the best way of dealing with hyper-functioning nodule. In these cases the sick person is prepared to return to euthyroid state and the chosen technique is the "almost total" thyroidectomy. Treatment with iodine ^{131}I avoids the intervention and the possible complications, but on the other hand has the disadvantage of the patient's exposure to radiation, the patient takes a week or month to stabilize hyper dosage and

the nodule usually does not disappear completely. The use of ethanol is an option that belongs more to the past than the present-day reality.

Materials and methods: In this study there are included all the patients treated and followed in Shkodra Regional Hospital, in the service of General Surgery and Oncology checkpoint district. The time period extends from 1 January 2010-31 December 2012. A total of 110 patients were treated of which 108 with interventional surgery. In 2 cases intervention has not been realized because of the age and associated heart disease.

Another important set of data collected is that of examinations. These include values of TSH, ft3 (T3), ft4 (T4), schintigraphy, the gland ultrasound and FNA thyroid. All cases are equipped with ECHO to thyroid gland. The low value of TSH has served as indicative of necessity for conducting schintigraphy, which are carried at Tirana University Hospital Centre or in private clinics: FNA were performed by anatomic-pathologic service of our hospital, Tirana University Hospital Centre or in private clinics.

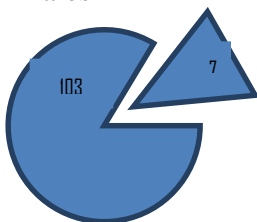
Based on the above data, the preliminary diagnosis is established, a decision is made by selecting interventional techniques operators. Total thyroidectomy, "almost total" thyroidectomy, lobectomy are the implemented techniques (6). All patients underwent intervention of having been stabilized by endocrinological (euthyroid condition) which is also carried by endocrinologist and specialist doctors confirmed by anaesthetists intensive care physicians. Kocher incisions are all for Struma, it has always been made divarication of the neck muscles without cutting them in any case. To realize haemostasis materials are used sets 3/0 and Vicryl 3/0. In each case one or two are placed in polyethylene drena in the gland Lodge for draining a possible haemorrhage. Skin tanning has become intra-cutaneous with Vicryl 4/0 or Prolen 4/0. Based on a previous study on the role of antibiotics in wounds infections in Struma, the patients were treated after the intervention with Cefasoline 2 x 1 gr or Ampicillin gr 2x2.

The last group of data collected in the survey findings is related to intra-operator and post-ambulatory complications. They have classified the short-term complications 1-3 day that coincides with the time of stay in hospital, medium-term time about 7-10 days which coincides with operators pursuing long post-ambulatory and up to 3 months' time which coincides with the transfer of patients to be checked by endocrinologist doctors. In very few cases it has had a long pursuit than 3 months.

Results: In this study there were examined 110 cases. Of these 21 cases resulted with thyroid cancer. From the resulting total number there are 103 (94%) females and 7 (6%) men in the ratio 14.7 / 1.

1. F: M ratio in the total number in the study

103-females
7- Males



The average age of the patients in the study was 47.4 years old (18, 78 years old). The average age for men was 41.8 years old (21, 52), and 47.85 years old for females (18, 78).

In general the nodule symptomatic is mute. Clinical signs appear with increasing nodule or when they are malignant. In these cases the main characters are dysphagia, hoarsen of voice, pain and breathe absence. For the presentation of clinical signs there are displayed some data in the totality of patients or in patients with cancer (Table 6) provide the following: From 21 cases with thyroid cancer 9 of them have to present at least 3 signs, while from 89 other cases in the study only 3 of them have three of the above signs, but that doesn't present malignant pathology.

2. Distribution according to the age in totality

Age	Number of the Cases	
Under 20 Years old	1	1%
21-30 Years old	8	7%
31-40 Years old	16	15%
41-50 Years old	41	37%
51-60 Years old	31	28%
61- 70 Years old	11	10%
>70 years old	2	2%
Total	110	100%

3. Clinical signs and the total number of patients with cancer

Signs	Total	CA cases
Dispne	27	10(38.5)
Dysphagia	30	12(40)
Hoarseness voice	16	11(68.8)
Pain	24	9(37.5)

By clinical examination we have received information concerning the nodule consistency. Appreciating as a subjective the term "medium", it shows that the majority of patients with cancer have strong consistency. The data are presented in this table:

Consistence	Total Number	Number with cancer	%
Soft	31	3	9,7
Medium	38	4	10.5
Hard	39	14	35.9
	108	21	

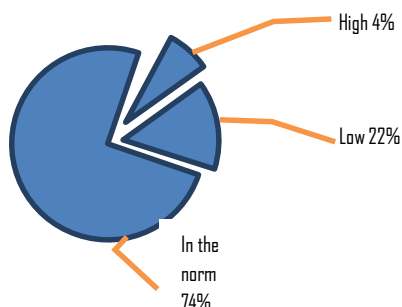
4. Findings during palpation for consistency in patients with cancer thyroid

From anamnesis we have collected data that show the time when nodes has been distinguished, when they have gone to a doctor and received medication before intervention. The following tables present the data in order to increase nodes from the time of identification for the first time by the sick person or from doctor:

Time nodule growth	Number of cases	
0-6 moths	6	5.7%
Up to 1 year	6	5.7%
1-3 years	24	21.5%
3-5 years	39	53.7%
>5 years	35	31.4%
Total	110	100%

5. Nodes speed increase from the time of ascertainment

The TSH levels



6. The % report of the values in TSH

In general, patients are presented for intervention in eutyroidene state. Many of them have made more than one measurement of TSH, ft3; ft4 and a part of them TG (tyreoglobuline). Ft3 values, ft4 have no value for determining whether we are dealing with cancer thyroid.

	Patients number		Cancer
Cold nodes	23	61%	6 cases
Warm nodes	7	18.4%	
Added diffuse injection	2	5.3%	
Added nonhomogeneous injection	5	13.2%	
Added diffuse injection with a cold nodes	1	2.1%	
Total	38	100%	

7. Schintigraphy reading results

N6 shown in the graph reports the findings of TSH values that are reduced in 24 (21.8%) of cases, the rate of 81 (73.6%) of cases and increased in 5 (4.5%) of cases. Values or very low minimum rate limits have served as a guide to achieve the gland Schintigraphy thyroid (with J131 or 99mTc). We have conducted 38 Schintigraphy and the results are shown in the table above N7. In no case there hasn't been able to establish the diagnosis of cancer thyroid Schintigraphy. On other 6 patients who showed cold nodes in Schintigraphy, after the biopsy surgery in the biopsy they were resulted cancer thyroid.

Echography is an examination that was performed in 100% of cases and often more than once. In the tables below there are shown the results of our findings in relation to diffuse or nodular structure and nodes characteristics:

Seen forms	Number of cases	Percentage
Struma without nodules	2	1.8
Thyroid with small nodules	7	6.4
Sn unilateral nodules	19	17.3
Dx unilateral nodules	20	18.2
Bilateral nodular	62	56.4
Total	110	100.0

8. Echography data of whole gland thyroid.

Echo genity	Cases number		Cases with ca	
Hypoechogen	73	67.5%	14	66.6%
Hyperechogen	11	10%	3	14.2%
Izoechogen	24	22.5%	4	19.2%
Total	108	100%	21	100%

9. The ultrasound data based on nodes echogenity.

Structure	Cases number		Cases with ca	
Solid	15	13.8%	12	57.1%
Cystic	28	25.9%	1	4.7%
Mixed	65	60.3%	8	38.2%
Total	108	100%	21	100%

10. Nodes Echography data based on the structure.

Contours	Cases number		Cases with ca	
Regular(curved, round)	70	64.8%	18	85.7%
Irregular (angular form etc.)	38	35.2%	3	14.3%
Total	108	100%	21	100%

11. Nodes echography data based on the contours regularity.

Vascularise	Cases number		Cases with ca	
Hypo-vascular	35	32.4%	3	14.2%
Hyper-vascular	28	25.9%	12	57.1%
Iso-vascular	45	41.7%	6	28.7%
Total	108	100%	21	100%

12. The echography data based on nodes vascularise.

Calcifications	Cases number		Cases with ca	
Missing	37	34.2%	8	38%
Micro-calcifications	71	65.8%	13	62%
Macro-calcifications	0	0%	0	0%
Total	108	100%	21	100%

13. Nodes echography data based on the presence and type of calcification.

In the discussion of theoretical presentation we have highlighted the importance of FNA in the increase of accuracy before surgery. The study was conducted 103 FNA by excluding from this examination 2 cases that disagreed and 5 cases with very low TSH that resulted in Schintigraphy as hot nodes. Similarly, for all the cases there have been realised biopsies after surgery. The table below gives in order comparative data obtained by FNA and biopsy. By table we see that the false positive data about cancer are 0, and false negative data are 9/103 or 8.7%

FNA results	Cases number	%	Biopsy	Normal biopsy
Malign	5	4.8	5 ca	0
Doubtful	16	15.5	5 ca	11
Undetermined	6	5.8	2 ca	4
Insufficient	11	10.6	0 ca	11
Negative	65	63.3	9 ca	56
Total	103	100	21 ca	82

14. FNA data and the post-operational biopsies

After deciding the preliminary diagnosis there have been realized operator interventions. In all cases the material is sent for biopsy and it is determined histopathological diagnosis. The data on operator techniques are shown in the table below:

Kind of intervention	Cases number	Percentage
Total strumectomy	72	66.7
Almost total strumectomy	15	13.9
Subtotal strumectomy	5	4.6
Lobectomy	16	14.8
Total	108	100

15. The realized operational techniques.

After surgery the patients were followed for post-operational period of stay in hospital for a period of 3 months after surgery. This coincides with the time when the patient with total thyroidectomy is reassessed and replacement therapy starts, on the other hand the patients with cancer are being reassessed if there is a residual tissue or Meta in a distance. During operation there have never been major complications such as bleeding, thorax injuries, and non-refundable nerve damages. There are shown below the observed complications up to 3 months after surgery:

Complications	Total number	Kind of intervention			
		Total	Almost total	Subtotal	Lobectomy
Voice loss for a week	3	3	0	0	0
Voice loss for 6 moths	2	2	0	0	0
No voice stability (not to strong) one week	3	2	0	0	1
No voice stability 1-4 weeks	2	3	2	0	0
No voice stability 6 moths	3	8	0	0	0
Dysphagia	2	2	0	0	0
Haemorrhage up to 50 ml (drens)	43	27	6	2	8
Intra-operational haemorrhage	0	0	0	0	0
Post-operational haemorrhage	0	0	0	0	0

Post larynx edems	2	2	0	0	0
Definitive nerve damages	0	0	0	0	0
Pnx or respiratory damages	0	0	0	0	0
Decease	0	0	0	0	0
Wound infection	0	0	0	0	0
	22				
Hypocalcaemia – tetanus	10	7	2	0	1
Up to 10 days	6	4	2	0	0
10-30 days	6	4	1	1	0
1-3 moths					
Hypoparatiroidosis	2	2	0	0	0

16. Presentation of post-operational complications in thyroid surgery.

DISCUSSION

The analysis and comparison of our data on morbidity study concludes that thyroid gland in our country is a major problem that seems real or treated. We are focused only on the patients treated with surgical intervention; therefore we do not pretend that this is a comprehensive study, of all hospital or outpatient activity for the pathologies treatment of thyroid gland. A large proportion of patients who were presented for intervention, the first contact is not with the family doctor or specialist endocrinologist doctor, but they come after the individual or from other specialists to who they are presented for complains or other pathologies not thyroid ones. Also, there is a great difference in male-female ratio involved in this study. It is true that women have a greater disposition to be affected by thyroid diseases, but by literature this results in a ratio F: M (3:1). From our data this ratio is approximately 15:1 and I believe that this is not a real report. The reason I find, among other things, to the indifference of men facing illness, traditional family obligations that keep away the male patient from controls or proper treatment in case of thyroid gland illness.

We will take into account the fact that only 12 (10%) of patients present themselves to the doctor within a year from the time when the disease is revealed, while the remaining 24, 39 and 35 patients respectively present themselves in the periods presented 1-3 years, 3-5 years and more than 5 years it's clearly understood that by which "delay" it's required by the patient and the medical service provided to him. Treatment in old ages increases the risk of thyroid cancer and the prognosis worse. From the literature we learn that the tendency today is that nodes should be detected and treated in sizes 1 x 1 cm and in recent times even in 8 x 8 mm.

Echography is a cosy examination to be carried out; it is cost-effective and highly valuable about diagnostic results to diagnose the thyroid nodes. We have made this examination in 100% of cases, and in many cases it is repeated. Also, echography is used to realize FNA and is used in two cases intra - operator. Features such as hypoeogeneity, solid structure, adding vascularization inside the nodes, unruly lips or not well determined ,the micro calcification presence within nodes are signs that orients towards thyroid cancer presence.

In foreign literature, we encounter the idea that the two thyroid hormones measurement is not always necessary and more fair it would be the Free State hormones valorisation (ft3 and ft4). We study the values of the first measures we have taken by first visits to patients. Patients presenting for interventions are presented in prescribed eutyroidiene state by the endocrinologist doctor. The reduced TSH value has served as an indication to make schintigraphy. Also measurements of ft3 and ft4 have been made which better complemented the thyroid functional configuration. In each case the value was consistent between TSH and hormone values.

Although many doctors believe that scintigraphy is an examination that can help distinguish cancer thyroid, the reality is quite different. According to Ashkraft and Van Herle (13), the specification of scintigraphy is about 15%. From 38 realized scintigraphies, in no case it resulted as a malignant pathology. In 23 patients the scintigraphy results as cold nodes. In six of these cases the biopsy answer was positive for malignant condition after surgery.

The directed or alone FNA realisation by echography increases the accuracy of diagnosis before surgery. During the study we conducted 103 FNA and on the basis of the responses we have defined surgical position. By the study no case was resulted with FNA false positive, while the false negative report results at 8.7%. So, are treated with total thyroidectomy all patients with positive FNA, unspecified and suspicious ones. For other pathologies as the cold benign nodes, autonomous hyper-functional nodes etc. we think that the best technique is the almost total thyroidectomy. With this approach there are eliminated the possible Recidivism, post-operators reduce complications, the patient does not need to take medication for the rest of their lives and in cases that result with cancer the remaining tissue is in low size to do ablation.

According to the Institute of Nuclear Physics data the radiation level in Albania is in the European Community levels. Therefore the external environment radiation is not the major risk to increase the absolute number of cancer thyroid. Appreciable improvement of diagnostic equipment and ensuring service quality are primary due to the relative increase in the number of this pathology.

Conclusion:

1. Treatment of thyroid pathology requires proper attention from all state, medical, social structures, so that the disease will be early diagnosed and treated, without having complications that increases the disability and their treatment cost.
2. Once the base information from the doctor or specialist is taken an ECHO, and a measurement of TSH (ft3, ft4) is very important in determining the tactics to be followed later.
3. It is not required to be made a scintigraphy by all the patients with thyroids pathology. From it benefits all the patients with curb TSH (higher hormone values). Scintigraphy doesn't help cancer diagnose. Practically thyroid autonomously nodes by higher function are not malignant.
4. In cases with normal or increased TSH performing FNA nodes (or combined with ultrasound FNA) is an accurate rapid method, and of cost effective to increase the accuracy of diagnosis. Generally patients supporting it well.
5. In patients with positive FNA or suspicious indefinite for cancer the best solution is total thyroidectomy.
6. In patients with FNA negative or insufficient results (if it is not necessary repetition) the best operator techniques is "almost total" thyroidectomy. This would be the sufficient choice for the treatment of disease and would reduce the complications, the degree of disability and cost to overcome them.

RECOMMENDATION: Conducting total thyroidectomise in all cases with previous diagnosis of thyroid cancer as well as in cases with suspicious FNA or indefinitely.