

## Comparison between Thyroidectomy and Hemithyroidectomy in treatment of single thyroid nodules identified as indeterminate follicular lesions by fine-needle aspiration cytology



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### Comparison between Thyroidectomy and Hemithyroidectomy in treatment of single thyroid nodules identified as indeterminate follicular lesions by fine-needle aspiration cytology

**AIM:** The objective of this study is to determine the optimal surgical approach for patients undergoing thyroid operation for indeterminate follicular lesions diagnosed by cytology and to evaluate the long-term outcome of patients treated by hemi or total thyroidectomy for these lesions.

**MATERIAL OF STUDY:** From January 2000 to January 2010, 98 patients having a solitary thyroid nodule with a cytological diagnosis of "indeterminate follicular lesion" were selected retrospectively.

**RESULTS:** There were 81 women and 17 men with a mean age of 56 years (range: 28-83). Hemithyroidectomy (HT) was performed in 57 patients (58%) and a Total thyroidectomy (TT) in 41 (42%). Postoperative morbidity was 3.50% in patients who underwent HT and 9.75% in those who underwent TT. At the histological analysis 16 (16.32%) patients had a malignant lesion.

**DISCUSSION:** HT was considered adequate treatment for 51 patients (89.48%) while in 6 patients (10.52%) has been necessary a completion thyroidectomy. Total thyroidectomy was not associated with clinically significant additive morbidity. No permanent hypoparathyroidism and no definitive recurrent nerve palsies were observed in either group. Postoperative thyroid hormone replacement was required in 40.35% of lobectomy patients. Overall, in the indeterminate follicular lesions patient population, 57 hemithyroidectomies were performed and no further operation was required in about 90% of patients.

**CONCLUSIONS:** Considering the high rate in which HT represents the adequate treatment, and the low rate of re-operation morbidity, HT seems to be the preferable initial surgical approach for indeterminate follicular lesions. Long-term ultrasonographic follow-up seems advisable.

**KEY WORDS:** Fine-needle biopsy, Follicular lesion, Hemithyroidectomy, Total thyroidectomy.

### Introduction

Thyroid nodules are extremely common and are palpable in 4% to 7% of adults in North America <sup>1,2</sup>.

Currently, fine-needle aspiration cytology (FNAC) is the most important initial test for diagnosing malignancy in individuals with nodular thyroid disease. Unfortunately, on the basis of cytological characteristics alone, the pathologist cannot reliably distinguish benign from malignant follicular thyroid lesions, and approximately 20% of FNACs will be given a final diagnosis of follicular malignancy <sup>3-7</sup>. No clear-cut cytologic criteria are available to help the clinician in decision making and the surgical treatment of benign thyroid pathology is controversial. The objective of this study was to determine the optimal surgical approach for individuals undergoing thyroidectomy for a single thyroid nodule identified as "indeterminate follicular lesion" on preoperative

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FNAC diagnosis and to estimate the long-term outcome of patients treated by lobectomy for solitary follicular thyroid nodule. We evaluated the difference between hemithyroidectomy (HT) with related risk of recurrence and complications for reintervention, and total thyroidectomy (TT) with consequent necessity of thyroid hormone replacement therapy.

## Material and Method

A retrospective chart, pathology, and cytology review was performed for 98 consecutive thyroid operations performed at the General Surgery Department of the University of Trieste between January 2000 and January 2010, for patients having a solitary thyroid nodule with a cytologically "indeterminate follicular thyroid nodule" were selected. Overall, patients with a FNAC diagnosis of Follicular-Neoplasm/Suspicious for Follicular Neoplasm, micro-follicular lesions, and Hürthle cell neoplasms were included<sup>8-10</sup>.

Patients with preoperative diagnosis of malignancy, presence of enlarged lymph nodes in the neck observed ultrasonographically or distant metastases, bilateral or diffuse disease, the history of radiotherapy, and presence of Hashimoto's thyroiditis were excluded because these conditions would uniformly be managed by bilateral thyroidectomy.

All patients included in this study had their final cytological diagnosis reported as indeterminate follicular lesions and underwent thyroid hemithyroidectomy and total thyroidectomy to establish a histological tissue diagnosis.

### *Preoperative FNA technique*

FNA biopsies were performed with ultrasound guidance: palpable and non-palpable thyroid nodules were aspirated under ultrasound guidance by a radiologist with a cytopathologist present on-site. All aspirations were performed with a free-hand technique using non-cutting, 2.5-cm-long, 25- to 27-gauge needles connected to a 20-mL syringe. A high-frequency linear-array probe, from the initial 5-MHz probes to the present 5- to 10-MHz multifrequency probes, was used for biopsies performed under ultrasound guidance. Two aspirations per nodule were considered sufficient in most cases; additional aspirations were obtained in large or highly suspicious nodules or when the cytopathologist judged the first specimens to be inadequate, for example, due to excess blood contamination<sup>11</sup>. Fixation was achieved by either rapid immersion of the slides into a fixative solution, usually 95% alcohol, or air-dried. Microscopic evaluation was normally done both with Papanicolaou and Giemsa staining.

### *FNA interpretation*

The cytology results, according with the National Cancer Institute (NCI) Thyroid fine-needle aspiration state of the Science Conference on October 22-23, 2007 in Bethesda, were categorized into five groups: positive for malignancy, suspicious for malignancy, indeterminate for malignancy (our study population), negative for malignancy, and nondiagnostic specimen<sup>10,12</sup>.

Specimens were defined as indeterminate follicular lesions when it was not possible to make a diagnosis of a follicular adenoma or carcinoma because this depends on the absence or presence of capsular or lymphovascular invasion, which can only be determined on histology<sup>13,14</sup>.

In this heterogeneous category, all cases in which the cytologic findings were not convincingly benign, yet the degree of cellular or architectural atypia is not sufficient for an interpretation of "Follicular Neoplasm" or "Suspicious for Malignancy", were included<sup>8-10</sup>.

Non-papillary follicular patterned lesions/neoplasms and Hurthle cell lesions/neoplasms were also included in this category.

Hürthle cell neoplasms were characterized by nuclear enlargement, prominent nucleoli and abundant, dense, well-defined, granular cytoplasm as a dominant cell population; in the absence of these cytologic features, the diagnosis of follicular neoplasm was done<sup>10</sup>.

Surgery was performed on the basis of FNAC diagnosis. The results of FNA were compared with the post-operative histological findings to identify TT that were an "over-treatment", and HT that required a further operation representing an "under-treatment".

No randomization was performed. In patients with indeterminate follicular lesions on FNAC, we prefer to perform, according to the patient, a hemithyroidectomy as initial surgical approach, eventually followed by a completion thyroidectomy in the presence of malignant diagnosis on definitive histology. In patients who preferred the radical intervention we performed a TT as primary operation.

Only enlarged lymph nodes, revealed at the time of operation, were removed and sent for frozen section (FS) examination.

Preoperative informed consent was obtained from all patients. Complete preoperative assessment (thyroid function tests including T(3), T(4), TSH, antimicrosomal antibody, ultrasonography to evaluate nodule size and gland volume, and fine needle aspiration cytology was obtained from all patients.

Follow-up evaluation included laryngoscopy to check vocal cord mobility in all patients three weeks after operation. The nerve palsy was considered transient when there was complete recovery six months after surgery; if not, the palsy was defined as permanent.

The neuromonitoring to reduce the risk to the patient of iatrogenic damage to the laryngeal nerve was not utilized because not available in our Institute.

In all patients, serum calcium levels and parathyroid hormone (PTH) levels were measured four hours after operation and at postoperative days 1 and 2. Hypocalcemia was defined as a serum calcium < 8.0 mg/dL. In case of postoperative serum calcium levels as low as 8.0 mg/dL (2.2 mmol/L), patients were treated with substitutive therapy with Calcium carbonate tablets and with Dihydrotachysterol solution per os. The serum calcium level of hypocalcemic patients was rechecked every three days.

In all patients, thyroid function testing, serum thyroglobulin levels were measured one month after operation.

Follow-up ranged from 6 to 120 (median 71 months) months was possible in all patients.

Indication for completion thyroidectomy were malignant lesions with major diameter more than 1 cm or malignancy infiltrating thyroid capsule.

The indication to hormone replacement in patients after hemithyroidectomy was based on postoperative thyroid-stimulating hormone (TSH) and free thyroxine (T4) serum levels, thyroid antibody levels, and histological diagnosis<sup>15-16</sup>.

Preoperative fine-needle aspirate results, final pathologic evaluation, perioperative complications, determinations of need for subsequent thyroid surgery after lobectomy, and need for thyroid hormone replacement therapy after surgery, were retrospectively evaluated.

### Statistical analysis

The statistical analysis was performed by using the following tests: the Mann-Whitney test for age, major diameter of the dominant nodule, operative time, length of hospital stay, and for the pain evaluation; the  $\chi^2$  test for gender; and the Fisher exact test for complications.

The software used was the "Statistica released 7".

A p value less than 0.05 was considered statistically significant.

## Results

HT was performed in 57 patients (58%) and a TT in 41 (42%).

In the HT group there were 47 women and 10 men with a mean age of 52 years (range 28 to 76 years) and the TT group comprised 34 women and 7 men ( $p < 0.37$ ) with a mean age of 63 years (range 38 to 83 years) ( $p < 0.002$ ).

The two groups were well matched for preoperative diagnosis, gender, and nodule size. Table I lists the patients' characteristics of both groups (Table I).

There was a significant difference regarding patients' age in the two groups ( $p < 0.002$ ).

Preoperative diagnoses were all thyroid adenomas in both groups ( $p < 0.97$ ).

Patients having HT had a significantly ( $p < 0.00006$ ) less operative time than patients undergoing TT: mean operative time for hemithyroidectomy was 92 minutes (range 55 to 130 minutes) and 118 minutes (range 85 to 180) for total thyroidectomy.

Mean postoperative hospital stay was respectively 2.26 days (range 1 to 6 days) in the HT group and 3.11 days (range 1 to 7 days) in the TT group ( $p < 0.075$ ). Postoperative complications in HT group included 2 (3.50 %) temporary laryngeal nerve palsies (complete recovery after 3 months). Neither permanent recurrent laryngeal nerve palsy nor permanent hypoparathyroidism occurred after either procedure. The laryngeal nerve was identified in all cases.

In the TT group, mean postoperative complications included 2 (4.87 %) transient hypocalcemia and 2 (4.87%) temporary laryngeal nerve palsies ( $p < 0.31$ ). Patients having HT experienced significantly ( $p < 0.001$ ) less pain than patients undergoing TT, as evaluated by VAS. The mean postoperative pain evaluated by VAS at 4 and 24 hours after operation was, respectively 2.53 (range 0 to 6) for TT versus 1.57 (range 0 to 6) for HT.

No statistically difference was found between the two

TABLE I - Patients' characteristic in two groups.

Characteristic	HT	TT	p value
Male/Female	10/47	7/34	$p < 0.37$
Mean age in years	52 years (range 28 to 76)	63 years (range 38 to 83)	$p < 0.002$
Major diameter of the dominant nodule	34,3 mm (range 8-80)	30,6 mm (range 34-80)	$p < 0.97$
Mean operative time	92 minutes (range 55 to 130)	118 minutes (range 85 to 180)	$p < 0.00006$
Postoperative pain (mm) by VAS	1.57 (range 0 to 6)	2.53 (range 0 to 6)	$p < 0.001$
Mean hospital stay	2.26 days (range 1 to 6 days)	3,11 days (range 1 to 7) days)	$p < 0.07$
Postoperative morbidity:	2/57	4/41	$p < 0.13$
– Transient hypocalcemia	0	2 (4.87 %)	$p < 0.31$
– Temporary laryngeal nerve palsy	2 (3.50 %)	2 (4.87 %)	$p < 0.31$

TABLE II - Preoperative diagnosis and histological results in two groups.

Preoperative FNAC diagnosis	HT	TT	Hystology of malignancy	REINTERVENTION (Completion Thyroidectomy)
Follicular neoplasms (N=54)	29	25	6 (11.10%) 6 follicular variant of PTC    0 PTC classical pattern	6
Follicular neoplasms (N=4)	2	2	1 (25%) 1 Follicular carcinoma	0
Hürthle cell neoplasm (N=40)	26	14	6 (20%) 4 follicular variant of PTC    5 PTC classical pattern	
Tot = 98	57	41	16 (16.32%)	6

groups concerning preoperative diagnosis, length of hospital stay, and morbidity.

Overall, after histological evaluation, carcinoma was found in 16 (16.32%) patients of the 98 indeterminate cases. Particularly, of the 54 patients with a preoperative cytological diagnosis of follicular neoplasm, carcinoma was found in 6 (11.11%) patients (follicular variant of PTC). Among the 40 patients with a preoperative diagnosis of Hürthle cell neoplasm, definitive histology demonstrated the malignant lesions in 9 (22.50%) patients (4 follicular variant of PTC, and 5 PTC classical patterns). Of the 4 patients with a preoperative cytological diagnosis of microfollicular neoplasm, carcinoma was found in 1 (25%) patient (follicular carcinoma).

Total thyroidectomy was performed as the initial surgical procedure in 10 of the 16 patients whereas thyroid lobectomy was performed in the other 6 patients who returned to the operating room for completion thyroidectomy (Table II).

Considering the total follicular lesions populations, hemithyroidectomy was considered adequate treatment for 51 patients (89.48%) while in 6 patients who underwent HT (10.52%) has been necessary a completion thyroidectomy. Furthermore we observed that TT was an over-treatment in 75.70% of cases.

In one patient, central lymph nodes were removed. Only enlarged lymph nodes were removed and sent for frozen section (FS) examination. The number of lymph nodes removed was 2.

In patients with PTC no metastases were found at FS or final histology examination. No evidence of recurrent or residual disease was found at follow-up.

The mean tumor diameter for patients with PTC underwent completion thyroidectomy, was 31 mm (range 12-60 mm). The histological examination never revealed malignancy in the specimen removed during completion thyroidectomy and no complications were observed in these patients.

Postoperative thyroid hormone replacement was required in 23 of 57 lobectomy patients (40.35%).

At mean 71-months follow-up (range: from 6 to 120

months), among patients who underwent lobectomy, 3 (5.26%) developed a recurrence: one had a nodular hyperplasia and two had an adenoma.

## Discussion and commentary

Thyroid FNA cytology is now established as reliable and safe and has become an integral part of thyroid nodule evaluation<sup>13,14</sup>. Unfortunately, indeterminate FNA results which we have subclassified into follicular, microfollicular, and Hürthle cell neoplasms, are due to poorly defined morphologic criteria to distinguish benign from malignant lesions because FNA cannot provide cytologic evidence of capsular and/or vascular invasion. In particular, the diagnosis of follicular carcinoma usually requires an assessment of vascular or capsular (thyroid capsule or tumor capsule or both) invasion, findings that necessitate histological evaluation; therefore, surgical excision of all indeterminate thyroid nodules is recommended<sup>5</sup>.

Repeated biopsy of these nodules is not advisable because it creates confusion and does not provide additional useful information for management.

In the case of follicular neoplasia, after excluding the hyperfunctioning nature of the nodule by TSH measurement and confirmatory thyroid scan (hot nodule), no other test can distinguish the benign or malignant nature of the nodule.

About 15-20% of these thyroid nodules are classified as malign at final histology<sup>10</sup>, as a result also by our data (16.38%).

A majority of studies have shown that up to 20% of the thyroid lesions classified as such are found to be malignant on surgical excision (low to intermediate risk of malignancy 20-30%). This percentage may be higher in Hürthle cell lesions if the nodule is equal to or larger than 3.5 cm in greatest dimension<sup>10</sup>.

In order to improve therapeutic strategies of indeterminate cytologic findings on FNA of thyroid nodules, these can be subdivided into groups with different malignant

risks. The Papanicolaou Society of Cytopathology recently proposed six diagnostic categories for the classification of thyroid FNA cytology. These categories were beneficial for triaging patients for either clinical follow-up or surgical management<sup>17</sup>.

Some studies have suggested that clinical criteria such as nodule size (>4 cm), fixation, and age of the patient may be associated with increased risk for malignant potential<sup>3,18</sup>, whereas others have not confirmed these observations<sup>19</sup> and that was not observed in our series of patients.

Immunocytochemistry with claimed markers of malignancy is neither sensitive nor specific enough and such techniques should be validated before routine use. Galectin-3 test represents a complementary diagnostic method for those follicular lesions that remain indeterminate to avoid unnecessary thyroid surgical procedures but also its importance it's controversial<sup>20</sup>.

The correct diagnosis can be obtained only at histology. Follicular and Hürthle cell neoplasms should undergo thyroidectomy, and if so, it should be decided what extent of thyroid resection (hemithyroidectomy versus total thyroidectomy) is necessary to be performed. Numerous reports in the literature support either approach<sup>23-24</sup>.

The extent and type of the operation depends on various factors: patient age, size of nodule, the presence of contralateral nodular disease, the history of radiotherapy, the presence of Hashimoto's thyroiditis, and, if performed, the intraoperative analysis of the tumor by the pathologist (quick section).

In our study, we included only patients having a solitary thyroid nodule with a cytological diagnosis of "indeterminate follicular thyroid lesion", whereas patients with preoperative cytological diagnosis of non diagnostic, negative for malignancy, and positive for malignancy, thyroiditis, and history of irradiation were excluded.

In our series, there was a significant difference regarding patients' age in the two groups, this difference could be explained because the younger patients chose to undergo the upfront hemithyroidectomy to have less risk to necessity of thyroid hormone replacement therapy.

In fact, the treatment for solitary follicular neoplasm will differ between various surgeons and pathologists. Some patients will elect to have a less extensive initial operation, with the realization that a second operation, if thyroid cancer is the final pathological diagnosis, may be necessary in about 25% of all cases. Other patients may not want to face the prospect of a second surgical procedure, and elect to have a total thyroidectomy done at the time of initial surgery<sup>23</sup>.

Hemithyroidectomy and frozen-section analysis appear to be a suitable solution. However, frozen-section histopathologic analysis may miss vascular or capsular invasion due to the limited number of sections examined in centers not equipped for high-volume, more complete frozen-section analysis<sup>13,24-25</sup>. Many Authors do not perform this pro-

cedure in view of the high frequency of false negative results. In the case of follicular neoplasm with clinical suspicion of malignancy or when the patient's preference is to undergo radical surgery directly rather than take the risk of two-stage surgery in the event of malignancy found at postoperative histology, total thyroidectomy are suggested<sup>26</sup>.

A review of literature shows that completely different conclusions can be drawn about the utility of frozen section in the management of thyroid cancer, hence it is difficult to make definitive conclusions that are generalizable to all patients and centers. Some centers advocate the use of frozen sections in making a decision about proceeding to remove the whole thyroid<sup>24,25,27,28</sup>, whereas other centers do not<sup>29</sup>.

The current approach at our Department is to offer a hemithyroidectomy as the primary operation for individuals with a diagnosis of follicular neoplasms by FNAC, eventually followed by a completion thyroidectomy in the presence of malignant diagnosis on definitive histology. When HT is performed, no frozen-section analysis of the thyroid lobectomy specimen is usually performed, and in the absence of clinical evidence of invasive carcinoma, the contralateral lobe, if normal on preoperative ultrasonography, is left in situ without the exploration (in order to avoid complications due to the exploration, such adhesion). If a cancer is diagnosed by pathologic review of the surgical specimen, the decision for reoperation should be based upon tumor factors and risk assessment.

To avoid the possibility of a second operation to remove the remaining thyroid lobe, some surgeons will recommend a total thyroidectomy at the outset, especially if the fine needle aspiration biopsy is positive or highly suspicious for cancer or if the size of the thyroid nodule or other associated clinical features strongly predict an increased likelihood of thyroid cancer.

Additionally, the frequency of small foci of papillary carcinoma of the thyroid in the "contralateral lobe" has prompted some experts to recommend total thyroidectomy as the initial operation of choice, however this recommendation is not based on long-term follow-up data<sup>30</sup>.

Although it's true that bilateral thyroidectomy avoids future thyroid surgery, another important consideration when contemplating a total thyroidectomy is the requirement for lifelong thyroid hormone replacement.

The risk of hypothyroidism after hemithyroidectomy varies widely from study to study; some centers report rates as low as 1%, and after subtotal thyroidectomy in patients without pre-existing thyroid disease, about 4%, as in most cases, the remaining thyroid tissue grows and compensates for the piece removed. Other reports describe a 50% risk of hypothyroidism requiring thyroid hormone replacement after surgery<sup>31</sup>. In our series we founded that the thyroid hormone replacement after thyroid lobectomy was necessary in about 40% of patients.

Recent studies, reveal the incidence of hypothyroidism after thyroid lobectomy is based upon risk factors such as preoperative TSH and the presence of Hashimoto's.

Up until recently, it was common practice for physicians to place post-hemithyroidectomy patients on thyroid suppression therapy during the immediate postoperative period. That practice began to fall out of favour as a result of two developments: the publication of data that put into question the efficacy of levothyroxine therapy for preventing recurrent disease or thyroid growth and a heightened awareness of the morbidity associated with levothyroxine<sup>15-16</sup>.

Regarding the postoperative complications, the risks involved in thyroid surgery clearly depends on many factors, such as the extent of surgery, whether this is the first or second operation, the nature of the thyroid disease present, the presence of co-existing medical conditions, and the skill and experience of the surgeon<sup>32-35</sup>. A second operation to remove the remainder of the thyroid and the extent and type of additional surgical procedures required in the setting of thyroid cancer treatment depend on the initial pathology report and other associated clinical features. Patients should be aware that the risks and potential complications associated with a second operation are still low, but generally higher than for the first operation<sup>33,36</sup>.

In our series, total thyroidectomy was not associated with clinically significant additive morbidity ( $p < 0.13$ ) and no differences were found in terms of length of hospital stay ( $p < 0.075$ ).

A review of the selected Toronto experience for patients undergoing total thyroidectomy vs initial hemithyroidectomy followed by completion thyroidectomy, analyzed the complication rate for the different surgical approaches. According with our data, the rates of recurrent laryngeal paralysis were not significantly different for the three procedures, however patients having a completion thyroidectomy had a slightly longer stay in hospital<sup>37</sup>.

Although in Literature, about 25-35% of patients will have detectable thyroid cancer in the "remnant" part of the thyroid that will be found upon examination of the resected thyroid tissue after a second operation, in our series the histological examination never revealed malignancy in the specimen removed during completion thyroidectomy. The single best predictor of thyroid cancer in the thyroid remnant appears to be multifocal thyroid cancer in the original tumor<sup>38-40</sup>.

In some instances, patients will also require a second operation for benign thyroid disease, perhaps due to recurrence of a large goiter or hyperthyroidism. In our series, 5.26% of patients developed a benign recurrence. The optimal timing of the second operation will vary depending on the circumstances. Although many surgeons prefer to wait several months before re-exploring the neck, some studies suggest that waiting the extra few

months may not make a big difference to the outcome<sup>41</sup>. Nevertheless, the detection of small amounts of thyroid cancer in the other thyroid lobe after a second operation is unlikely to have any adverse prognostic implications<sup>42</sup>. A unilateral resection, such as lobectomy plus isthmusectomy, can be performed with satisfactory long-term results in low-risk patients, that is, in those with small (less than 1.5 cm) unilateral lesion and in those with no evidence of metastatic disease.

On the other hand, we should consider that the diagnosis of incidental thyroid carcinoma in patients operated on for a benign disease is recurrent. Incidental thyroid carcinoma results more frequent in euthyroid patients than in thyrotoxic patients<sup>43</sup>.

## Conclusions

The management of patients with indeterminate follicular lesions, and no evidence of autonomous function, remains somewhat controversial.

In our series, hemithyroidectomy was considered adequate treatment for a majority of the 98 FN patients in our study population.

In our opinion, hemithyroidectomy seems to be the preferred initial surgical approach for the management of individuals presenting with nodular thyroid disease and a cytologic diagnosis of indeterminate neoplasms because of its significant advantages, especially in terms of shorter operative time and less postoperative pain. Long-term ultrasonographic follow-up seems advisable.

The major challenge in the management of the solitary thyroid nodule remains the assessment as to which nodules require surgical excision and which can be followed conservatively. New diagnostic tools are needed to reduce the number of operations performed for benign pathology in patients with a needle biopsy diagnosis of indeterminate follicular lesions.

## Riassunto

**OBIETTIVO:** L'obiettivo di questo studio è di determinare la terapia chirurgica ottimale per i pazienti trattati chirurgicamente per la presenza di un nodulo follicolare unico della tiroide diagnosticato mediante agoaspirato e di valutarne i risultati a lungo termine.

**MATERIALI E METODI:** Dal gennaio 2000 al gennaio 2010, sono stati selezionati in modo retrospettivo 98 pazienti aventi un nodulo solitario della tiroide con diagnosi citologica "nodulo follicolare indeterminato per malignità".

**RISULTATI:** Sono stati presi in considerazione 81 femmine e 17 maschi, aventi un'età media di 56 anni (range: 28-83).

L'emitiroidectomia (HT) è stata effettuata in 57 pazienti (58%) e la tiroidectomia totale (TT) in 41 (42%).

La morbidità postoperatoria dei pazienti sottoposti a HT è stata del 3.50% mentre nei pazienti sottoposti a TT è stata del 9.75%.

All'esame istologico definitivo è stata riscontrata una lesione maligna in 16 su 98 pazienti (16.32%).

DISCUSSIONE: L'emitiroidectomia è risultata essere il trattamento chirurgico adeguato in 51 pazienti (89.48%) mentre in 6 pazienti (10.52%) è stata necessaria una tiroidectomia di completamento. La tiroidectomia totale non è stata associata ad una morbidità significativamente aumentata rispetto all'emitiroidectomia. In nessuno dei due gruppi di pazienti non si è evidenziato alcun caso di ipoparatiroidismo permanente e nessuna paralisi ricorrente definitiva. La terapia sostitutiva con levotiroxina è stata necessaria in 40.4% dei pazienti sottoposti a emitiroidectomia.

CONCLUSIONI: In conclusione, considerando i pazienti aventi un nodulo unico indeterminato della tiroide, sono state eseguite 57 emitiroidectomie e circa il 90 % dei pazienti non ha necessitato di un intervento di radicalizzazione. Vista l'alta percentuale di pazienti nei quali la sola emitiroidectomia si è rivelata essere il trattamento adeguato e visto il basso tasso di complicanze che grava l'intervento di tiroidectomia di completamento, la lobotomectomy tiroidea sembra essere il miglior approccio chirurgico iniziale per il trattamento delle lesioni follicolari indeterminate della tiroide. È consigliabile un Follow-up ecografico a lungo termine del lobo controlaterale.

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## Commento e Commentary

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*È interessante che l'estensione della tiroidectomia per lesione follicolare, argomento già ben noto e oggetto di numerose pubblicazioni, sia ancora preso in considerazione, nonostante oggi sia possibile una migliore selezione dei nodi follicolari da candidare direttamente alla tiroidectomia totale grazie a una tecnologia più avanzata. Sia una accurata analisi delle caratteristiche ultrasonografiche dei nodi (ecogenicità, vascolarizzazione, microcalcificazioni, irregolarità dei margini) sia l'integrazione del tutto recente della citologia tradizionale con la valutazione per Gal 3, HBME, BRAF (Bartolazzi A et al. Lancet Oncol, 2008; 9:543-549) sono diventati importanti elementi decisionali. Con criteri di selezione all'intervento chirurgico ancora più ristretti, l'incidenza di malignità nelle lesioni follicolari aumenta fino al 67%. In Chen H. et al (Ann Surg, 1998; 227:542-46), come anche nella nostra esperienza, il 35% delle lesioni follicolari è un carcinoma.*

*Il piccolo numero di casi, per di più arruolati retrospettivamente in un arco di tempo di 10 anni, durante i quali ulteriori mezzi diagnostici sono comparsi, e il breve periodo medio di follow-up non consentono di trarre conclusioni significative. Per quanto riguarda i vantaggi e gli svantaggi di un atteggiamento conservativo rispetto ad uno radicale, il confronto delle complicanze tra i 41 casi trattati con tiroidectomia totale (nessuna complicanza) e i 57 sottoposti a lobectomia (di cui 10,52% hanno richiesto la totalizzazione tiroidea, 40,35% terapia ormonale sostitutiva, 5,26% sono recidivati dopo un periodo medio di 71 mesi) non giustifica la conclusione che la tiroidectomia totale, per di più senza complicanze, sia un over-treatment. A rafforzare questa considerazione costituirebbe un contributo originale, rispetto alle solite argomentazioni, un confronto dei "costi" in senso lato del follow-up delle due procedure. Il reale costo di follow-up delle lobectomie, comunque a rischio di reintervento, di cui quasi metà in terapia sostitutiva, che periodicamente richiedono ecografie, dosaggi ormonali talora di autoanticorpi, visite specialistiche, ago-aspirati etc. supera sotto il profilo sanitario, economico, emotivo di gran lunga quello delle tiroidectomie totali (non per carcinoma) senza complicanze, come in questa serie, che sono gestibili in terapia sostitutiva tiroidea teoricamente dal solo curante con dosaggio annuale di TSH.*

*In realtà su ampie casistiche riportate in letteratura la tiroidectomia totale, anche in mani esperte, ha un'incidenza sia di lesione ricorrente che di ipoparatiroidismo che la mette in discussione come approccio sistematico al nodo tiroideo follicolare, che ancora continua a dividere i pareri. Nel lavoro di Rosato L. et al (World J Surg, 2004; 28:271-76), il confronto tra le complicanze della chirurgia della tiroide in un'analisi di uno studio multicentrico su 14934 pazienti operati in Italia nell'arco di 5 anni ha dimostrato che la procedura più sicura è la lobectomia.*

\* \* \*

*It is interesting that the thyroidectomy extension for follicular thyroid lesions, a really discussed subject with a lot of literature articles, may be still a question, although the follicular nodes that need total thyroidectomy seem to be better selected nowadays by the progress of technologies and techniques. Either the ultrasonographic patterns such as hypoechogenicity, hypervascularity, microcalcifications, irregular limits and the immunocytochemistry analysis of Galectin-3 (Bartolazzi A et al. Lancet Oncol, 2008; 9:543-49), HBME and B-RAF analysis in recent years are become important in decision making. With more restrictive criteria in surgical selection, the incidence rates of malignancy increase up to 67%. In Chen H. et al (Ann Surg, 1998; 227: 542-46), as in our experience, 35% of follicular cell neoplasm were carcinomas.*

*The small number of cases, moreover collected retrospectively in a long slot (over 10 years period of time) during which other diagnostic means have improved, and the short mean follow-up period don't allow significant conclusions. As it concerns advantages and disadvantages of conservative vs radical surgical approach, the complications' comparison between 41 cases treated by total thyroidectomy (no one complication) and 57 cases undergone lobectomy (of which 10.52% required completion thyroidectomies, 40.35% thyroid hormone replacement, 5.26% relapsed at a mean period of 71 months) don't account for the conclusion that total thyroidectomy, moreover without complications, could be an overtreatment. About this subject an original contribution might arise from follow-up cost-analysis of the two procedures. Thyroid hormone replacement (necessary in about half of cases) and repeat risk, that periodically require clinical and ultrasonographic monitoring with hormonal and perhaps cytological evaluation, overload the conservatively treated patients with emotional and economic costs; those (no cancer) undergone radical complication-free treatment require only annual serum TSH determination by the generalist.*

*Really the risk of recurrent nerve palsy and hypoparathyroidism, even in skilled hands, call into question the total thyroidectomy as the systemic approach to the follicular lesion, benign in the majority of the cases, and split the opinions again. In Rosato L. et al (World J Surg 2004; 28:271-76), the comparison between complications of thyroid surgery with an analysis of a multicentric study on 14,934 patients operated on in Italy over 5 years showed that the most protective technique is lobectomy.*

