

## TOTAL VERSUS COMPLETION THYROIDECTOMY IN MANAGEMENT OF SUSPECTED THYROID CARCINOMA

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### ABSTRACT

**Background:** When results of the FNA are reported as indeterminate, a hemi- or total thyroidectomy may be performed, depending on the suspicion of cancer. **Objective:** This work was designed is to compare the incidence of complications and surgical outcome of total and completion thyroidectomy in management of suspected thyroid carcinoma **Patients and methods:** The study included 50 patients with STN and results of the FNA are reported as (indeterminate or a follicular lesion). They divided into 2 groups. (Group I) include 20 patients (40%) were subjected to Completion thyroidectomy and (Group II) include 30 patients (60 %) were subjected to total thyroidectomy. All cases were operated upon in the department of General Surgery department, Zagazig University Hospitals during the period of the research from May 2010 to July 2013. **Statistical analysis:** SPSS version 19. **Results:** In the present study there was 38 (76%) were males and 12 (24%) were female and the pathology of residual tissue in (Group I) showed 8 case (40%) had residual malignancy and 12 cases (60.0%) are free from malignancy. From this study the hospital stay in (Group I) ranges from 5 to 8 days with The mean stay was (  $5.9 \pm 1.0$  days ) which is longer than (group II) ranges from 3 to 5 days with The mean stay was ( $3.7 \pm 0.75$  days). From this study the development of hypoparathyroidism was greater in (Group I) (20%) than (group II) (10%) and recurrent laryngeal nerve injury was greater in (Group I) (4%) than (Group II) (2%). **Conclusion:** The frequency of complications was greater in (Group I) than (Group II) so total thyroidectomy is considered as the treatment of choice for both malignant and benign thyroid disease requiring surgical treatment when performed by experienced surgeons Moreover, it eliminates the requirement of completion thyroidectomy for incidentally diagnosed thyroid carcinoma.

### INTRODUCTION

Although a thyroid nodule is as common as in 4% to 8% of the general population, only about 5% of these nodules will prove to be malignant<sup>[1]</sup>.

The pathologist, however, often cannot distinguish reliably between benign and malignant thyroid lesions on the basis of cytology alone<sup>[2]</sup>.

When results of the Fine needle aspiration (FNA) are reported as indeterminate, suspicious, insufficient, or a follicular neoplasm, a hemi- or total thyroidectomy may be performed, depending on the suspicion of cancer<sup>[3]</sup>.

Total thyroidectomy plays an important role in the treatment of thyroid cancer: it facilitates detection and ablation of metastatic disease with radioactive iodine, allows for monitoring of thyroglobulin levels, treats residual disease of the contralateral lobe in cancer with multicentricity, decreases the risk of recurrence and it provides longer survival so large number of authors suggest total thyroidectomy for all patients with differentiated thyroid cancer<sup>[4]</sup>.

Low or intermediate risk Patients presenting with thyroid nodules in which the FNA results are inconclusive undergo a unilateral hemithyroidectomy. In cases in which the final pathology reports well differentiated thyroid carcinoma (DTC), completion thyroidectomy is considered when hemithyroidectomy alone is

considered oncologically inadequate. The advantage of this approach is to prevent the overtreatment of benign disease or low risk tumors as compared with total thyroidectomy. The drawback is the potential for a second operative procedure at a later date<sup>[3]</sup>.

### AIM OF THE WORK

This work was designed is to compare the incidence of complications and surgical outcome of total and completion thyroidectomy in management of fifty patients have suspected thyroid carcinoma.

### PATIENTS AND METHODS

The study included fifty patients with solitary thyroid nodule (STN) and results of the FNA are reported as (indeterminate, suspicious, insufficient, or follicular lesion) who were candidates for surgical treatment. Patients were included if they were 18 years or older. They divided into 2 groups. (**Group I**) include 20 patients (40%) were subjected to Completion thyroidectomy (CT) and (**Group II**) include 30 patients (60 %) were subjected to total thyroidectomy (TT). All cases were operated upon in the department of General Surgery department, Zagazig University Hospitals during the period of the research from May 2010 to July 2013.

All patients were subjected to:

**I-Preoperative evaluation:**

1- Medical history taking: detailed history including personal data, presenting symptoms as thyroid swelling, lymph nodes, toxic symptoms , pain ,pressure symptoms and, primary or re-surgery, medication for hyper or hypothyroidism. History of chronic illness (DM, HTN, Heart disease.....etc) previous operations, medications, allergy or blood transfusion.

2- Clinical examination for any swelling, pressure manifestations, toxic signs, pain in the neck or referred to the ear and lymph nodes enlargement.

3- Laboratory parameters:

- Routine preoperative investigations for all patients as in any major surgery, as complete blood count , kidney function tests, electrolytes, ECG.

- Preoperative thyroid function test: T4, T3 and TSH

4-Radiological investigations:

- Thyroid and neck ultrasound done for all cases.

- Chest x-ray.

- Thyroid scan (optional) done when indicated in malignant cases.

- Computerized tomography scan neck with suspicious regional lymphadenopathy.

5-Fine needle aspiration cytology: For all cases with solitary nodules, the results were expressed as: Benign, Malignant, suspicious or Inconclusive.

**II-operation:**

**Group I** include twenty patients were subjected to Completion thyroidectomy (CT) in three patients of them selective lymph node dissection was done . **Group II** include thirty patients were subjected to total thyroidectomy (TT).

**III-postoperative care and follow up:**

For drain output, hospital stay and complications as hypoparathyroidism, recurrent laryngeal nerve injury, external laryngeal nerve injury and wound complications.

**IV-Histopathology:**

Histopathology was done for all thyroidectomies .The incidence of malignancy was detected in the specimens.

**Statistical Analysis:**

Standard methods using SPSS version 19 for windows were used, Student t.test, Chi-square used in appropriate situation. P. value  $\leq 0.05$  is considered the level of significance.

**RESULTS****Demographic data (Table 1, 2)**

Patients included in the study as regard to age and sex. The female (38 cases) to male (12 cases) ratio for the patients subjected to thyroid surgery was (3.16:1) and the age ranges in (group I) from 23 to 70 years with mean of age was 43.57 years ( $\pm 12.5$ ) and in (group II) from 19 to 70 years with mean of age was 38.1 years ( $\pm 12.6$ ). The highest age incidence was found to be in the fourth decade of life (17 patients) .

**Preoperative diagnosis:**

It was found that all patients (100%) presented with thyroid swelling, twenty eight (56%) presented with pressure symptoms, five patients (10%) presented with cervical lymphadenopathy.

**Operative data of the studied cases:**

In this study, 17 patients (34%) were subjected to Completion thyroidectomy for suspected solitary nodules, for 3 patients (6%) Completion thyroidectomy& selective lymph node dissection was done, for 30 patients (60 %) total thyroidectomy was done (**figure. 1**).

**Post-operative data of the studied cases:**

The length of hospitalization was calculated from the day of admission for operation to the day of discharge. For the (Group II), this was a single statistic; for the group I, this was an aggregate statistic of the first and second admission.

The hospital stay in (Group I) from 5 to 8 day with the mean stay was ( $5.9 \pm 1.0$  day) while ranges in (Group II) from 3 to 5 day with the mean stay was ( $3.7 \pm 0.75$  day) the hospital stay was lesser in (Group II) than (Group I), this was significant (P value  $< 0.001$ ) (**Table. 3**).

The frequency of complications was significantly greater in (Group I) 8 cases out of 20 (40%) than (Group II) 6 cases out of 30 (20%) (**Table. 4**).

From this study the development of hypoparathyroidism was greater in cases with completion thyroidectomy (20%) than after total thyroidectomy (10%) and recurrent laryngeal nerve injury was greater in cases with completion thyroidectomy (4%) than after total thyroidectomy (2%) (**Table. 5, 6**).

From this study the developments of superior laryngeal nerve injury was greater in cases with (Group I) 2 cases (10 %) than (Group II) 2 cases (6.6%) (**Table. 7**).

In the present study the pathology of residual tissue in (Group I) showed 8 case (40%) had residual malignancy and 12 cases (60.0%) are free from malignancy (**Figure.2**).

**Table (1):** Age distribution of the study population:

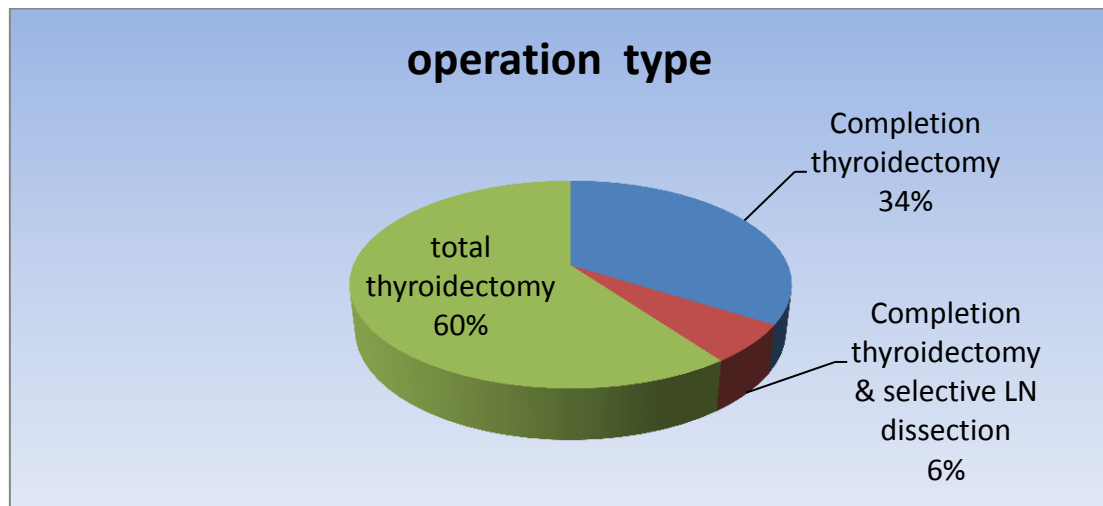
Age (Years)	Group I	Group II	t	P Value
<b>Range</b>	23-65	19-70		
			1.54	0.12
<b>Mean</b>	43.75	38.1		
<b>Sd. Deviation</b>	±12.5	±12.6		

The test was non significant (P value= 0.12)

**Table (2):** Sex distribution of the study population:

Gender	Group I N=20		Group II N=30		Total Number	X <sup>2</sup>	P value
	Number	%	Number	%			
<b>Male</b>	5	25%	7	23.3%	12		
<b>Female</b>	15	75%	23	76.7%	38	0.04	0.83
<b>Total</b>	20	100%	30	100%	50		

The test was non significant (P value= 0.83)



**Figure(1):** Types of the operations done

**Table (3):** The hospital stay /day

Hospital Stay	Group I	Group II	t	P value
Range /Days	5-8	3-5	8.78	<0.001
Mean	5.9	3.7		S.
Sd. Deviation	±1.0	±0.75		

The test was significant (P value< 0.001)

**Table (4):** Frequency of complications:

Complications	Group I		Group II		Total	X <sup>2</sup>	P value
	number	%	number	%			
Negative	12	60 %	24	80 %	36	2.38	0.12
Positive	8	40 %	6	20 %	14		
Total	20		30		50		

The test was non significant (P value=0.12)

**Table (5):** Frequency of hypoparathyroidism :

Groups	Frequency	Temporary		Permanent		Total	X <sup>2</sup>	P value
		No.	%	No.	%			
Group I	20	3	15%	1	5%	4	0.06	0.8
Group II	30	3	10%	0	0%	3		
Total	50	6	12%	1	2%	7		

The test was non significant (P value= 0.8)

**Table (6):** Frequency of recurrent laryngeal nerve injury (RLNI):

Groups	Frequency	Temporary RLNI		Permanent RLNI		Total	X <sup>2</sup>	P value
		No.	%	No.	%			
Group I	20	1	5%	1	5%	2	0.13	0.71
Group II	30	1	3.3%	0	0%	1		
Total	50	2	4%	1	2%	3		

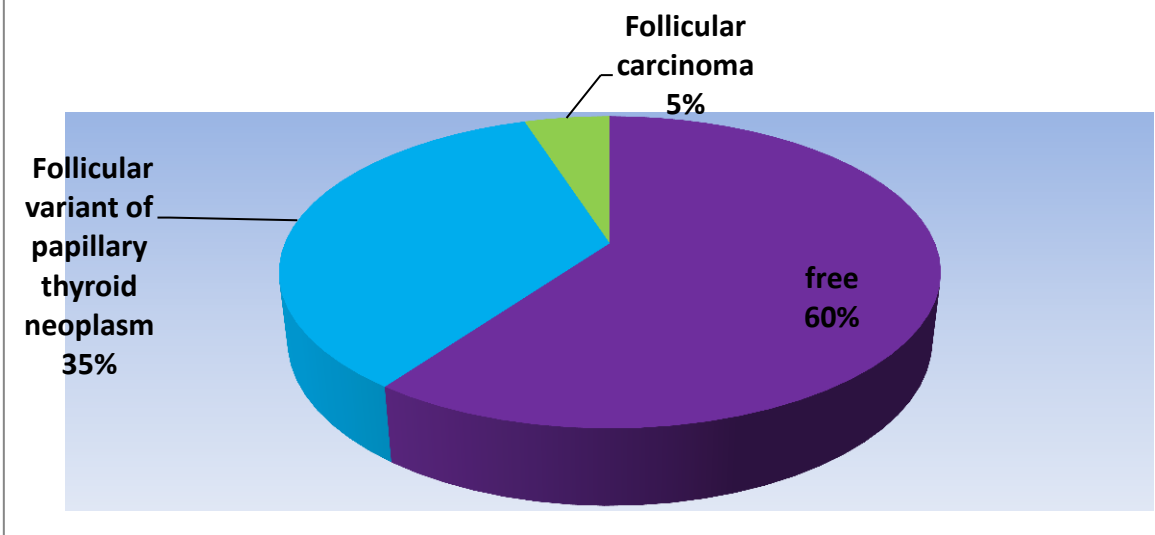
The test was non significant (P value= 0.71)

**Table (7):** Frequency of superior laryngeal nerve injury:

Groups	Frequency	Temporary		Permanent		Total	X <sup>2</sup>	P value
		No.	%	No.	%			
Group I	20	2	10%	0	0%	2	0.13	0.71
Group II	30	2	6.6%	0	0%	2		
Total	50	4	8%	0	0%	4		

The test was non significant (P value= 0.71)

### Pathology of residual tissue in group I



**Figure(2):** Pathology of residual tissue in Group I

### DISCUSSION

From this study previous Pathology in (Group I) showed that fifteen cases had follicular variant of papillary thyroid neoplasm (75%) and five cases had follicular carcinoma (25%) detected by histopathology

**Park et al (2003)** study 60 cases of Completion thyroidectomy and found that Initial pathologic results were 46 cases of papillary carcinoma (76.6%), 12 of follicular carcinoma (20%), one of medullary carcinoma and one of Hurthle cell carcinoma <sup>[5]</sup>.

**Erdem et al (2003)** study 141 cases of Completion thyroidectomy and found that previous pathology demonstrated papillary carcinoma in 114 patients (80.5%) and follicular carcinoma in 21 patients (15%). The remaining 6 patients were found to have Hurthle cell carcinoma <sup>[6]</sup>.

From this study the hospital stay in (Group I) ranges from 5 to 8 days with the mean stay was ( $5.9 \pm 1.0$  days) which is longer than (Group II) ranges from 3 to 5 days with the mean stay was ( $3.7 \pm 0.75$  days).

**Rafferty et al (2007)** study 201 and 149 cases of completion thyroidectomy and total thyroidectomy respectively and found that mean hospital stays of completion thyroidectomy and total thyroidectomy were 4.5 days and 3.5 days respectively <sup>[3]</sup>.

**Lang and lo (2005)** study 279 cases of total thyroidectomy and found that the mean stay was ( $4.2 \pm 3.9$  day) <sup>[7]</sup>.

**Khan,etal (2009)** study 40 cases and found that the length of hospital stay of initial operation was not different from that of completion

thyroidectomy ( $5.1 \pm 0.3$  days vs.  $5.2 \pm 0.3$  days) <sup>[8]</sup>.

From this study frequency of temporary hypoparathyroidism was greater in cases with (Group I) three cases (15%) than (Group II) three cases (10%).

These were similar to the results of **Gulcelik et al (2012)**. They study 159 cases of completion thyroidectomy and 217 cases of total thyroidectomy for DTC. They found that the frequency of temporary hypoparathyroidism was greater after completion thyroidectomy 33 cases (20.7%) after total thyroidectomy 22 cases (10.1%) <sup>[9]</sup>.

This was different to the results of **Rafferty et al (2007)**. They found that the frequency of temporary hypoparathyroidism was greater after total thyroidectomy 27.1% than after completion thyroidectomy 7% <sup>[3]</sup>.

From this study frequency of permanent hypoparathyroidism was greater in cases with (Group I) one case (5%) than (Group II) no cases.

This was similar to the results of **Rafferty et al (2007)**. They found that the frequency of permanent hypoparathyroidism was greater in completion thyroidectomy 0.5% than total thyroidectomy no cases 0% <sup>[3]</sup>.

These were different to the results of **Gulcelik et al (2012)**. They found that the frequency of permanent hypoparathyroidism was greater in total thyroidectomy 10 cases (4.6%) than completion thyroidectomy 7 cases (4.4%) <sup>[9]</sup>.

This was different to the results of **Erdem, et al (2003)**. They found that permanent hypoparathyroidism was greater in total

thyroidectomy four cases (4.3%) than completion thyroidectomy 6 cases (4.2%)<sup>[6]</sup>.

From this study frequency of temporary RLNI was greater in cases with (Group I) one case (5%) than (group II) no cases.

This was similar to the results of **Gulcelik et al (2012)**. They found that the frequency of temporary recurrent laryngeal n. injury was greater in completion thyroidectomy 13 cases (8.1%) than total thyroidectomy 10 cases (4.6%)<sup>[9]</sup>.

This was different to the results of **Rafferty, et al (2007)**. They found that the frequency of temporary recurrent laryngeal n. injury was greater in total thyroidectomy five cases (3.3%) than completion thyroidectomy four cases (2%)<sup>[3]</sup>.

This was different to the results of **Erdem, et al (2003)**. They found that temporary recurrent laryngeal nerve injury was greater in total thyroidectomy 7 cases (7.6%) than completion thyroidectomy 8 cases (5.6%)<sup>[6]</sup>.

From this study frequency of permanent RLNI was greater in cases with (Group I) one case (5%) than (Group II) one case (3.3%)

This was similar to the results of **Gulcelik et al (2012)**. They found that the frequency of permanent recurrent laryngeal nerve injury was greater in completion thyroidectomy four cases (2.5%) than total thyroidectomy two cases (0.9%)<sup>[9]</sup>.

This was similar to the results of **Rafferty, et al (2007)**. They found that the frequency of permanent recurrent laryngeal nerve injury was greater in completion thyroidectomy one case (0.5%) than total thyroidectomy no cases<sup>[3]</sup>.

This was similar to the results of **Erdem, et al (2003)**. They found that permanent recurrent laryngeal nerve injury was greater in completion thyroidectomy five cases (3.5%) than total thyroidectomy three cases (3.2%)<sup>[6]</sup>.

This study showed that the frequency of complications was greater in (Group I) than (Group II). The major risk of complication after previous neck operations occurs during dissection of scar tissue surrounding either the recurrent laryngeal nerve or the vascular pedicle of the parathyroid glands.

**Rafferty et al (2007)** mentioned that in thyroid nodules in which the risk of malignancy is uncertain on FNA (i.e. needle aspirates reported as insufficient, indeterminate or a follicular neoplasm), completion thyroidectomy represents an acceptable and safe approach. But it requires a longer hospitalization, so it has implications for both hospital resources and the patients involved

and in cases in which there is a marked likelihood of ultimately having a thyroid cancer that would require total thyroidectomy with or without postoperative radioactive iodine therapy, total thyroidectomy is an appropriate first-line surgical management<sup>[3]</sup>.

**Makay et al (2006)** mentioned that completion thyroidectomy is safe in the hands of experienced endocrine surgeons and the timing of re-operation has no impact on the development of complications<sup>[4]</sup>.

**Li, et al (2012)** mentioned that total thyroidectomy was performed in patients with any of the following conditions: i) tumor size >1 cm; ii) extrathyroidal extension; iii) palpable lymph nodes; and iv) bilateral carcinomas or ipsilateral disease with nodules in the contralateral lobe. Hemithyroidectomy was only performed on patients with ipsilateral disease and none of the four risk conditions<sup>[10]</sup>.

**O'Neill et al (2011)** mentioned that survival is improved in those with minimally invasive compared with widely invasive follicular thyroid carcinoma (FTC). In patients <45 years with minimally invasive FTC without vascular invasion, hemithyroidectomy may be adequate treatment. All other patients with FTC should undergo total thyroidectomy and radioactive iodine ablation<sup>[11]</sup>.

**Gulcelik et al (2012)** mentioned that with improvements in surgical technique and experience, complication rates of thyroidectomy performed for benign or malign diseases are reduced. In spite of the improvement in surgical experience, temporary recurrent laryngeal nerve palsy and hypoparathyroidism are the main complications in completion thyroidectomies which need special attention. To evaluate the patients more carefully in preoperative period and performing adequate thyroidectomy appears more logical<sup>[9]</sup>.

**Guraya and Al-Zobydi (2011)** mentioned that thyroid reoperations for benign thyroid disease, permanent complication rate was higher than in primary thyroid operations. Difficult dissection due to adhesions from previous operation might be responsible for this high rate of complications. Higher rates of complications in reoperations stress the significance of total thyroidectomy as the primary surgical procedure which obviates the need of a secondary procedure<sup>[12]</sup>.

**Pattou (1998)** and his colleagues' study, mentioned that hypocalcaemia, tetany and recurrent laryngeal nerve injury are more frequent in cases of thyroidectomy after previous neck operations because of technical difficulties<sup>[13]</sup>.



**CONCLUSION**

- The frequency of complications was greater in (Group I) than (Group II). Therefore, total thyroidectomy is considered as the treatment of choice for both malignant and benign thyroid disease requiring surgical treatment. when performed by experienced surgeons as it treats residual disease of the contralateral lobe in cancer with multicentricity, decreases the risk of recurrence and it eliminates the requirement of completion thyroidectomy for incidentally diagnosed thyroid carcinoma and it provides longer survival. Moreover, it facilitates detection and ablation of metastatic disease with radioactive iodine, allows for monitoring of thyroglobulin levels.

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## مقارنة الإستئصال الكلى بإعادة إستئصال الغدة الدرقية في حالات إشتباه الإصابة بسرطان الغدة الدرقية

يتم إستخدام الخزعة بالإبرة الدقيقة في تشخيص أمراض سرطان الغدة الدرقية ومع ذلك فإن هذه الطريقة لا تستطيع التفريق بصورة دقيقة بين جميع الأورام الحميدة والأورام الخبيثة بالغدة الدرقية على أساس علم الخلايا لوحدها. عندما تكون نتائج الخزعة بالإبرة الدقيقة غير محددة أو كافية أو بها نسبة احتمال وجود خلايا سرطانية فإن التدخل الجراحي يكون مهماً وذلك عن طريق الإستئصال الجزئي أو الكلى للغدة الدرقية وذلك يعتمد على درجة الإشتباه وجود خلايا سرطانية بالغدة الدرقية. هذه الدراسة أجريت على 50 حالة لعمل مقارنة لحدوث المضاعفات و النتائج الجراحية بين الإستئصال الكلى وإعادة إستئصال الغدة الدرقية عند تبين الإصابة بسرطان الغدة الدرقية و قد أجريت هذه الدراسة على المترددين على قسم الجراحة العامة - مستشفيات جامعة الزقازيق خلال الفترة من مايو 2010 الى يوليو 2013.

و بلغ عدد المرضى من النساء 38 ومن الرجال 12 بنسب ( 3.16 الى 1) وتتراوح أعمارهم بين 19 و 70 عاماً. وكانت ذروة عدد المرضى في العقد الرابع من العمر (17 مريضاً).

وقد خضع جميع المرضى لتقييم شامل قبل إجراء العمليات، والذي شمل التاريخ المرضي، الفحص السريري، الفحوصات المخبرية، فحص بالموجات فوق الصوتية وقياس وظائف الغدة الدرقية قبل العملية. شملت هذه الدراسة مجموعتين

**المجموعة الأولى :** خضعوا لإعادة استئصال الغدة الدرقية عند تبين الإصابة بسرطان الغدة الدرقية وتشمل 20 حالة (40%)

**المجموعة الثانية :** خضعوا للإستئصال الكلى للغدة الدرقية وتشمل 30 حالة (60%)

وتبين من هذه الدراسة أن نسبة وجود الورم في النسيج المتبقي بالغدة الدرقية بعد إجراء طريق الإستئصال الجزئي للغدة الدرقية حوالي 8 حالات (40%).

وتبين من هذه الدراسة ان مدة الإقامة بالمستشفى كانت أطول في حالات المجموعة الأولى بمتوسط (5.9±1) يوم عن المجموعة الثانية بمتوسط (3.7±0.75) يوم.

وتبين من هذه الدراسة أن معدل حدوث المضاعفات كان أكبر في حالات المجموعة الأولى 8 حالات (40%) عن المجموعة الثانية 6 حالات (20%).

وتبين من هذه الدراسة أن معدل إصابة العصب الحنجري الراجع وكذلك إصابة الغدة الجاردرقية كان أكبر في حالات المجموعة الأولى عن المجموعة الثانية.

**الخلاصة:** تبين من هذه الدراسة أن الإستئصال الكلى للغدة الدرقية هو الإجراء الجراحي الأمثل لعلاج الأورام الحميدة والأورام الخبيثة بالغدة الدرقية وذلك لتجنب رجوع المرض وتكرار العملية الجراحية مرة أخرى لصعوبتها وخطورتها حيث أن تكرار العملية الجراحية يرتبط بزيادة معدل إصابة العصب الحنجري الراجع وكذلك إصابة الغدة الجاردرقية و تكمن الخطورة الكبرى أثناء تشريح النسيج المحيط بالعصب الحنجري الراجع وكذلك الأوعية الدموية المغذية للغدة الجاردرقية.