



## Research Article

### Thyroidectomy in elderly; is it safe?

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#### ABSTRACT

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**Keywords:** goiter in elderly, thyroid surgery in elderly, post thyroidectomy complication in elderly.



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**Background:** The prevalence of thyroid nodules rise with age and different data available about the risks of thyroid surgery in old age people. In general, old age could be a predictor of perioperative mortality and morbidity. The aim of this study is to prove if there is increased risk accompanying thyroidectomy in elderly patients.

**Subjects and Methods:** Prospective study of one surgeon of study sample undergoing thyroid surgery at Al-Kindy teaching hospital and Saint Raphael hospital. This study was including two groups; group (A) involved patients 65 years and older, group (B) involved patients below 65 years old who were subjected to thyroidectomy. Taking in consideration histopathology results, indications of surgery (compressive symptoms, suspicious or confirmed malignancy, toxic goiter and recurrent goiter) and complications (including rates of temporary and permanent hypocalcaemia, temporary and permanent RLN paralysis, postoperative hematoma, wound infection and seroma), in addition to the risk of perioperative mortality.

**Results:** There were 574 patients below 65 years and 127 elderly patients ( $\geq 65$  years) who underwent thyroidectomy between January 2015 and December of 2018. There were no deaths in either group; no one had bilateral RLN paralysis. Old age patients had a lower frequency of complications in comparison to the younger counterparts, including transient hypocalcaemia (3.1% vs 14.8%, respectively) and temporary RLN injury (0% vs 0.69%, respectively), in addition to permanent RLN injury (0% vs 0.34%, respectively).

**Conclusions:** Thyroidectomy in elderly is safe as compared to younger patients regarding perioperative complications.

#### Introduction

Who had defined elderly patients in developed world as people older than 65 years [1]. Thyroid diseases including benign or malignant occur commonly in the old people and this may be partly related to that the incidence of thyroid nodules increase with age [2]. The prevalence of thyroid nodules and thyroid malignancy increases

with age [3-5]. Thyroid gland dysfunction is common among older patients, and can lead to significant morbidity when left untreated [3].

Some other studies say that about 90% of women after the age of 60 years demonstrate the thyroid nodules and about 60% of men after the age of 80 [6]. The percentage of the elderly people to the younger people had increased by ninety percent over the last thirty

years, and some authors predict that by the year 2020, the ratio of the people over sixty-five years will increase from 12.4 % to 20% [7].

Other authors estimated that if in 2000 in the world there were 600 million people in age of 65 years or more, in 2050 there will be 2 billion [6]. According to the German Federal Statistical Office, 28% of the population in 2030 and 33% in 2060 will be older than 65 years [8]. Therefore, more elective surgery is performed on aged patients than in the past decades [9].

Approximately fifty percent of all surgical operations are involving patients over sixty-five years [10]. In general surgery, one of the main predictive factors for perioperative morbidity is age [11]. Although age is not a contraindication for major surgery [12-14], few elderly patients receive programmed thyroid surgery due to the major risk of morbidity [13-15].

Common surgical indications in the elderly include secondary thyrotoxicosis resistant to non-surgical treatment, compressive symptoms, suspicious thyroid nodule requiring histologic diagnosis or confirmed thyroid malignancy [16, 17].

In general, some authors suggest that old people have a much stronger or emergent indications for surgery like trachea infiltration or severe compressive symptoms due to thyroid carcinoma [18]. Some authors suggest that thyroid surgery presents various risks for older people [19]. Nevertheless, the decision to perform surgery is not often straightforward as reoperation for persistent or recurrent thyroid cancer is generally associated with increased surgical morbidity [20].

Thyroid surgery remains the treatment of choice for benign and malignant thyroid diseases. Because of improved methods of disease detection and treatment, there will be an increased demand for thyroid surgical procedures in the elderly patients' population [21]. A recent study from Germany also reported that thyroid surgery could be performed safely and without impairment of quality of life [22].

It had been proposed that thyroid surgery in elderly should be limited to those whose lesions are at high risk of malignancy, whereas low risk lesions may be followed [23]. Since thyroid surgery remains one of the most commonly performed operations worldwide, thyroid surgery in the elderly has become an important topic in endocrine surgery [24, 25].

Furthermore, over the last 10 years, major advances have occurred in general and endocrine surgery, anesthesia, perioperative care, instrumentation, and technology and they tend to reduce the overall operative risk, allowing greater proportion of elderly patients to undergo elective surgery [26].

The aim of this study is to prove if there are increased risks associated with thyroidectomy in the elderly patients.

## **Subjects and Methods**

This prospective study was conducted in Al-Kindy teaching hospital (surgical unit) and Saint Raphael hospital during a period from January 2015 to December 2018. Patients were divided into two groups: Group (A) patients were 65 years and older. Group (B) patients were those below 65 years of age.

## **Perioperative measures:**

Preoperative assessment for all patients were done including thorough history and clinical examination and thyroid function tests, preoperative vocal cords assessment and serum calcium level were done in addition to necessary laboratory investigations (complete blood count , blood urea , serum creatinine , random blood sugar, liver function test , viral screen , chest x-ray , ECG , ultrasound of neck. CT scan of the chest in special circumstances including retrosternal extension and echo study in the elderly and as needed) were done.

All patients with comorbidities were sent for medical consultation for control of comorbidity preoperatively.

All patients were subjected to total thyroidectomy, near total thyroidectomy or hemi thyroidectomy depending on patients' condition using Ligasure scalpel for hemostasis and one surgeon did all of these surgeries.

All patients were given intravenous one shot of broad-spectrum Antibiotic at the time of induction of anesthesia. All patients were sent for serum calcium level on first postoperative day and patients with symptomatic hypocalcaemia were given I.V infusion calcium and put on calcium tablets and one alpha capsules, Redivac drains were removed at 24-48 hours after surgery.

All patients put on levothyroxine tablet at morning before breakfast starting with 100 micrograms and adjusting dose according to follow up results.

## **Inclusion criteria**

The indications of surgery were Compressive symptoms (dysphagia, dyspnea), Suspicious/confirmed malignancy, toxic goiter and recurrent goiter.

## **Exclusion criteria**

Patients with inoperable anaplastic carcinoma (hard, fixed), those who refuse to participate in the study, and those who had no enough information or lost follow up were excluded

## **Ethical considerations**

The research proposal of the study was fully discussed by the scientific and ethical committee of the Iraqi board of general surgery.

The agreement of health authority in Al-Kindy teaching hospital was approved before starting of data collection.

A written consent was taken from each included patient after a full explanation about the type of surgery and the possible postoperative complications and the aim of the study and insurance of included patients that the collected data will be used for scientific purposes only and will be anonymous.

## **Statistical analysis**

The collected data were introduced into Microsoft excel sheet and loaded into IBM-SPSSV24 statistical package for statistical analysis. Descriptive statistics were presented using tables (frequency and percentages). Inferential statistics were presented through chi – squares test and fisher's exact test to find out associations between related studied variables. P-value less than 0.05 were considered as discrimination point of significant association.

**Results:**

Group (A) patients were 65 years and older (127 patients) (oldest was 82 years). Group (B) patients were those below 65 years of age (574 patients) (youngest was 12 years).

Ninety-three patients in the group (A) were female (n = 93; 73.2%), and 465 in the group (B) were female (n = 465; 81.0%). While male patients were 34 patients in group (A) (n = 34; 26.8%) and 109 patients in group (B) were females (n =109; 19%) as shown in table 1.

Ninety eight patients in group (A) had 24 hours hospital stay, (n = 98; 77.2%) and 527 patients in group (B) stay for 24 hours (n = 527; 91.8%), while 29 patients in group (A) had stay for 48 hours (n =29; 22.8%) and 47 patients in group (B) had stay for 48 hours (n =47; 8.2%) as shown in table 1.

While regarding histopathological results, 118 patients in group (A) had a benign pathology (n = 118; 92.9%), and 511 patients in group (B) had a benign pathology (n = 511; 89.02%). Regarding malignant pathology, only 9 patients had malignancy in group (A) ( n =9 ; 7.1% ) and 63 patients in group (B) ( n =63 ; 10.98% ) as shown in table 1.

**Table 1:** Distribution of patients' socio-demographic and clinical characteristics of the study sample

List	Age group	Group (A)		Group (B)		P-value
		Frequency	Percent	Frequency	Percent	
1.	<b>Gender</b>	Group (A)		Group (B)		P-value
	Male	34	26.8	109	19.0	
	Female	<b>93</b>	<b>73.2</b>	<b>465</b>	<b>81.0</b>	
	Total	127	100.0	574	100.0	
2.	<b>Hospital stay</b>	Group (A)		Group (B)		P-value
	24 hours	<b>98</b>	<b>77.2</b>	<b>527</b>	<b>91.8</b>	
	48 hours	29	22.8	47	8.2	
	Total	127	100.0	574	100.0	
3.	<b>Histopathology results</b>	Group (A)		Group (B)		P-value
	Benign	<b>118</b>	<b>92.9</b>	<b>511</b>	<b>89.02</b>	
	Malignant	9	7.1	63	10.98	
	Total	127	100.0	574	100.0	

F= frequency; %= percentage; NS= Not Significant; HS = highly significant

Both groups experienced Compressive symptoms as a main indication of the surgery; group (A) (n = 71; 55.9%), group (B) (n = 393; 68.5%), followed by suspicion or confirmed malignancy (n = 25; 19.7%) in group (A) and (n = 104; 18.1%) in group (B) as shown in table 2.

**Table 2:** Table 2. Distribution of indications of surgery

Indication of surgery	Group (A)		Group (B)		P-value
	Frequency	Percent	Frequency	Percent	
Compressive symptoms	71	55.9	393	68.5	0.331 (NS)
Suspicious/confirmed malignancy	25	19.7	104	18.1	
Toxic goiter	24	18.9	64	11.1	
Recurrent goiter	7	5.5	13	2.3	
Total	127	100.0	574	100.0	

F= frequency; %= percentage; NS= Not Significant

There were no recorded patients in group (A) who had temporary Unilateral RLN injury as a complication after surgery (n = 0; 0%) in

comparison to 11 patients in group (B)(n = 11; 0.69%) as shown in table3

With regard to Permanent Unilateral RLN injury, there is no patients in group (A) (n = 0; 0%), while there were 2 patients who had permanent unilateral RLN injury from the patients in group (B) (n = 2; 0.34%).

There was no bilateral RLN injury recorded in this study.

No tension hematoma was recorded in group (A) (n = 127; 100%), while in group (B), only one patient was developed hematoma and it was evacuated in the theatre at night of surgery and the bleeder was ligated (n = 1; 0.2%) as shown in table 3

**Table 3:** Distribution of post-operative complications (RLN injury and tension hematoma) of the study sample:

1.	Temporary Unilateral RLN injury	Group (A)		Group (B)		P-value
		Frequency	Percent	Frequency	Percent	
1.	Yes	0	0	11	0.69	
	No	<b>127</b>	100	<b>563</b>	99.31	
	Total	127	100.0	574	100.0	
2.	Permanent Unilateral RLN injury	Group (A)		Group (B)		P-value
		Frequency	Percent	Frequency	Percent	
2.	Yes	0	0	2	0.34	
	No	<b>127</b>	<b>100.0</b>	<b>572</b>	<b>99.66</b>	
	Total	127	100.0	574	100.0	
3.	Hematoma	Group (A)		Group (B)		P-value
		Frequency	Percent	Frequency	Percent	
3.	Yes	0	0	1	2	
	No	<b>127</b>	100	<b>573</b>	99.8	
	Total	127	100.0	574	100.0	

F= frequency; %= percentage; NS= Not Significant

**Table 4:** Table 4. Distribution of post-operative complications (hypocalcaemia and seroma) of the study sample

1	Temporary Hypocalcaemia	Group (A)		Group (B)		P-value
		Frequency	Percent	Frequency	Percent	
1	Yes	4	3.1	85	14.8	0.938 (NS)
	No	123	96.9	489	85.2	
	Total	127	100.0	574	100.0	
2	Permanent Hypocalcaemia	Group (A)		Group (B)		P-value
		Frequency	Percent	Frequency	Percent	
3	Yes	0	0	7	1.2	
	No	127	100.0	567	98.8	
	Total	127	100.0	574	100.0	
3	Seroma	Group (A)		Group (B)		P-value
		Frequency	Percent	Frequency	Percent	
4	Yes	4	3.1	12	2.09	0.122 (NS)
	No	123	96.9	562	97.91	
	Total	127	100.0	574	100.0	

F= frequency; %= percentage; NS= Not Significant

Only 4 Patients in group (A) (n = 4; 3.1%) had temporary hypocalcaemia, while in group (B) there were 85 patients (n = 85; 14.8%) with temporary hypocalcaemia as shown in table 4.

There were no patients in group (A) who had Permanent Hypocalcaemia (n = 0; 0%), we found 7 patients in group (B) (n = 7; 0.34%) as shown in table 4.

Moreover, concerning Seroma, 4 patients in group (A) had Seroma (n = 4; 3.1%), and 12 patients for those in group (B) had Seroma after surgery (n = 12; 2.09%) as shown in table 4.

Concerning post-operative wound infection, 2 patients had signs of infection in group (A) (n = 2; 1.6%), while in group (B), 16 patients had infected wound (n = 16; 2.8%) as shown in table 5.

**Table 5:** Distribution of post-operative complications (wound infection) of the study sample

	Wound infection	Group (A)		Group (B)		P-value
		Frequency	Percent	Frequency	Percent	
1.	Yes	2	1.6	16	2.8	0.791 (NS)
	No	125	98.4	558	97.2	
	Total	127	100.0	574	100.0	

F= frequency; %= percentage; NS= Not Significant

There was no perioperative mortality recorded in this study

## Discussion

The management of thyroid disorders has become increasingly specialized. The techniques of safe anesthesia and operative skills have led to an increase in the proportion of these patients being managed in specialized endocrine centers [17]. Recent studies stated that increased mortality in elderly was influenced by biological age than chronological age [14] and on the number of concomitant comorbidities [27, 28]. Passler et al., [15] indicated surgery only when absolutely indicated.

The difference between the indications of surgery in the two groups in this study:

- 1- Compressive symptoms 55.9% in group (A) , 68.5% in group (B)
- 2- Suspicion Confirmed malignancy 19.7 % in group (A) , 18.1 % in group (B)
- 3- Toxic goiter 18.9% in group (A) , 11.1% in group (B)
- 4- Recurrent goiter 5.5% in group (A) , 2.3% in group (B)

In this study, the main indication of surgery was compression symptoms next suspicion or confirmed malignancy then toxic goiter. In a study performed by Rios et al., They revealed that elderly patients more often than younger ones presented compressive symptoms and then suspicion for malignancy, recent goiter, or patient request [5].

In another study done by Raffaelli et al., they analyzed the indications for thyroid surgery in those patients whose age is 70 years and more, they noticed that the most common indication was bilateral multi-nodular goiter, next suspicion or confirmed malignant process, and toxic goiter [16].

In similar observations revealed by Lang and Lo [26], they confirmed that in patients aged 70 years and more the most common indication for thyroid surgery was retrosternal goiter, but they added that in this group of patients the volume of goiter was significantly higher.

K. Kaliszewski et al., showed that the main indication for surgery in the elderly patients group was compression symptom. The second was verified malignant tumor or suspicion of malignancy. The number of retrosternal goiters in elderly patients was significantly higher than in younger ones [29].

The next important issue of indications and thyroid surgery in the elderly patients is recurrent goiter; some authors said that the number of recurrent thyroid operations is significantly higher in elderly patients than in younger group [15, 17].

These observations were confirmed in this study, which encourage for total or near total thyroidectomy in case of multi-nodular goiter in general for all patients in endemic countries as in Iraq to prevent recurrence.

The difference between the rates of complications in the two groups regarding:

\* Tension hematoma 0 % in group (A), 2% in group (B).

F. Tartaglia et al., said that in older group it was 3.34% vs 1.49% in younger [30]. N.Tabriz show that it was 1% [31].

The low incidence in our study might be related to secured hemostasis especially by using Ligasure scalpel and proper timing of drain removal.

\*Temporary hypocalcaemia 3.1% in group (A), 14.8% in group (B)

\*Permanent hypocalcaemia 0% in group (A), 1.2% in group (B)

C. Passler et al., said that the risk of hypo-parathyroidism in older group it was 13.6% vs 14.1% in younger [15]. Patients who were ≥70 years had a lower (but non-significant) postoperative and definitive hypocalcaemia rate than patients <70 years: 14.85% vs 20.44% regarding temporary hypocalcaemia and 0% vs 2.15% regarding permanent hypocalcaemia [32]. N. Tabriz et al., showed that temporary postoperative symptomatic hypocalcaemia is (20%) [31].

\*Temporary unilateral RLN injury 0% in group (A), 0.69% in group (B)

\*Permanent unilateral RLN injury 0% in group (A), 0.34% in group (B)

\*Bilateral RLN injury 0% in group (A), 0% in group (B)

F. Tartaglia et al., said that in older group it was 4.01% vs 3.92% in younger as nerve palsy in general [30]. Abnormal vocal cord motility rate was 12.00% in patients ≥70 years vs 9.75% in patients <70 years regarding temporary RLN injury, and 2.06% in patients ≥70 years vs 0.86% regarding permanent RLN injury [29]. N. Tabriz et al., showed that temporary vocal cord paralysis is (9%) [31].

This low percentage is strongly related to the mandatory identification of RLN in all of our patients, and presence of RLN injury may be due to thermal injury of Ligasure scalpel.

\* Wound infection 1.6% in group (A), 2.8% in group (B)

C. Passler et al., stated that the rate in older group is 2% [15].

N. Tabriz show that infection is (5%) [31].

\* Seroma 3.1% in group (A), 2.09% in group (B)

F. Tartaglia et al., said that in older group it was 3.12% vs 2.85% in younger [30].

Regarding histopathological results, in group (A) 92.9% benign and 7.1% malignant, in group (B) 89.02% benign and 10.9% malignant .F. Tartaglia et al., found higher incidence of malignant pathology in younger (21.25% vs 18.37%) [30].

Regarding hospital stay, in group (A) was 99.2% only 24 hours and 0.8% required 48 hours (mean =1.23) and in group (B) was 99.8% for 24 hours and 0.2% for 48 hours (mean = 1.08). Grogan et al., had

found that elderly (1.4 days) had significant increases in the hospital stay compared with the young (1.1 days) [33].

N. Tabriz showed that younger patients (<70 years, median = 3 days) had significantly shorter postoperative hospital stays than older patients (≥70 years, median = 4 days) [31]. This highly significant difference may be because elderly were kept more hours for close monitoring of comorbid illnesses.

The actual proportion of elderly patients undergoing elective thyroid surgery ranged between 2.5% to 21.2%, depending on patient selection and type of referral [15, 17, 26, 33-36]. In this study, group (A) was 22.1% and group (B) 81.8% from total number of thyroidectomies.

Regarding perioperative mortality which was 0% in this study, mortality in other studies is low; Passler [15] reported no perioperative mortality; Har- El [37] reported 1.9 % in old age patient with CA thyroid. This was related to proper preparation of old age patients for surgery especially those with comorbidities.

### Conclusion:

Thyroidectomy in elderly is a safe surgical operation showing a better morbidity and mortality rate in relation to younger age group. The chronological age by itself is not a contraindication to surgery. The most common indication of surgery was benign thyroid lesions. Postoperative complications rate in elderly does not differ from those noticed in younger patients.

In well selected patient group done by experienced surgeon, there was no significant increase in morbidity and mortality could be documented. Elderly with medical comorbidities need a complete and thorough preoperative work up before undergoing any thyroid intervention.

### Recommendations

For old patients who have clear indication of surgery, we recommend a careful preoperative evaluation and risk stratification. We further suggest improving pre and postoperative care with better monitoring. In the future, more data are required for analyses concerning indications for thyroid surgery in elderly in relation to overall benefits, including long-term survival, life quality, and recurrence of goiter.

Larger population-based studies will most likely provide optimal understanding and better approach to the elderly people in thyroid surgery

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### Conflict of Interest

No conflict of interest

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