Anesthesia Complication in Induction, Maintenance and Recovery of Subtotal Thyroidectomy in Baghdad City/Iraq

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Abstract

Thyroidectomy is a common surgical procedure that has several potential complications or sequels including hemorrhage, vocal cord palsy, and laryngeal edema**.** Aim of study: To study the incidence of complication that occurs during induction, maintenance and recovery from subtotal thyroidectomy surgery. The current study began on November the 1st, 2021 till April the 17th, 2022 in Baghdad Teaching Hospital at the General and ENT surgical departments; it included 50 patients (45 females, and 5 males). Pre-operative Medical history and physical examination was practiced and recorded, all surgeries was performed under general anasthesia with endotracheal intubation, with continuous monitoring during and after surgery.

According to their age the patients categorized into group of 20-29 years of age (16 patients, 32% of the total cases) 14 female 28%; 2 male patients 4%. Group of 30-39 years age (12 patients 24% of the total cases) female 10 patients 20%; male 2 patients 4%. Group of 40-49 years age (15 patients, 30% of the total cases) female 15 patients 30%; male 0. Group of 50-59 years of age (7 patients 14% of the total cases) female 6 patients 12%; male 1 patient 2%. According to the gender females was 45 patients (90%); while the males was 5 patients (10%). Total toxic goiter was 29 cases 58% and nontoxic goiter 21 cases 42%. The goiter was toxic in 25 female patients (50%) and in 4 male patients (8%). Nontoxic goiter in females 20 patients (40%) and in males 1 patient (2%).

As expected this study concluded that thyroid diseases are more common in females than in males. Complications can be reduced by limiting the practicing of thyroid surgery to the surgeons specialized in thyroid surgery.

Keywords: *Thyroid gland, Anesthesia complication, Subtotal thyroidectomy.*

مضاعفات التخدير اثناء الحث، المداومة والافاقة في عمليات استئصال الغدة الدرقية الجزئي في بغداد ـ العراق

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الخلاصة

استئصال الغدة الدرقية هو إجراء جراحي شائع له عدة مضاعفات أوعقابيل محتملة بما في ذلك النزيف وشلل الحبل الصوتي ووذمة الحنجرة. هدف الدراسة: دراسة حدوث المضاعفات اثناء الحث، المداومة والافاقة في عمليات استئصال الغدة الدرقية الجزئي.

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بدأت الدراسة في الأول من تشرين الثاني (نوفمبر) 2021 وحتى 17 نيسان (أبريل) 2022 في مستشفى بغداد التعليمي في اقسام الجراحة العامة وجراحة الأنف والأذن والحنجرة، وشملت الدراسة 50 مريضًا (إناث 45 وذكور5). تم اعطاء التخدير العام (جراحة انتقائية). تم اخذ التاريخ الطبي للمريض مع اجراء الفحوص السريريه المتبعه قبل العمليات والتي اجريت تحت التخدير العام مع أستخدام ألانبوب الرغامي مع مراقبة الوضائف الحيويه اثناء وبعد العمليه.

حسب العمر قسم المرضى الى المجموعه العمريه 20-29 سنة تتكون من 16 مريض وبنسبة (32٪) من العدد الكلي, إناث 14 مريضاً (28٪) والذكور2 مريض (4٪). وفي الفئة العمرية (30-39) هي 12 مريض وبنسبة (24٪) إجمالاً ,الإناث 10 مرضى (20٪) والذكور 2 مريض هي (4٪). وفي الفئة العمرية (40-49) هي 15 مريض وبنسبة (30٪) إجمالاً ,الإناث 15 مريضاً (30٪) والذكور صفر). اما في الفئة العمرية (50-59) هي 7 مرضى وبنسبة (14٪) إجمالاً ,الإناث 6 مرضى (12٪) والذكورمريض واحد (2٪). وتبعا للجنس شكل الإناث 45 مريضاً (90٪) والذكور5 مرضى (10٪). إجمالي تضخم الغدة الدرقية السامة 29 مريض ذكور وإناث وبنسبة (58٪) وإجمالي تضخم الغدة الدرقية غيرالسام 21 مريض ذكور وإناث وبنسبة (42٪). تضخم الغدة الدرقية السام حدث عند الاناث 25 مريض وبنسبة (50٪) وعند الذكور 4 مرضى وبنسبة (8٪).

كما هو متوقع ، خلصت هذه الدراسة إلى أن أمراض الغدة الدرقية أكثر شيوعًا عند الإناث منها عند الذكور. يمكن تقليل المضاعفات عن طريق قصر ممارسة جراحة الغدة الدرقية على الجراحين المتخصصين في جراحة الغدة الدرقية .

الكلمات المفتاحية: *الغدة الدرقية، مضاعفات التخدير، استئصال الغدة الدرقية الجزئي.*

Introduction

Thyroid gland is an endocrine gland located in the neck; it has two lobes that are joined by an isthmus. It is located below the Adam's apple, in front of the neck. Functionally it has important role in controlling the metabolic function and rate of different body organs and tissues. The thyroid hormones also affect the children development, among many other things. Each thyroid lobe measures approximately 5 cm long, 3 cm wide and 2 cm thick, and the isthmus measures approximately 1.25 cm in height and width. The thyroid weighs 25 grams in humans. Iodine and tyrosine are used to create the thyroid hormones T3 and T4. The hormone calcitonin, which contributes to calcium homeostasis, is also produced by the Parafollicular C cells in the thyroid. Thyroid-stimulating hormone (TSH), which is released from the pituitary gland, controls the thyroid's hormonal output [1]. Thyrotrophic-releasing hormone (TRH), which is produced by the hypothalamus, and thyroid-stimulating hormone (TSH), which is secreted from the anterior pituitary, are both responsible for controlling the thyroid's hormonal output by both +ve and –ve feedback mechanisms [2،3]. The thyroid gland may be completely or partially surgically removed during a thyroidectomy surgery. Head and neck or endocrine surgeons frequently perform a thyroidectomy which could be total, subtotal or near total [8], due to neoplastic changes, functional disturbances, or pressure effect of the thyroid gland [2،4]. Other reasons for surgery include aesthetic [2]. This common surgical procedure (thyroidectomy) have a number of potential side effects or sequels, such as voice changes that may be permanent or only temporarily, low calcium

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levels due to injury to the parathyroid glands that may require lifelong replacement therapy, bleeding, infections, and the chance of airway obstruction caused by bilateral vocal cord paralysis. When a skilled surgeon performs the surgery, complications are rare [5]. Levothyroxine (Synthroid), a synthetic thyroid hormone, is typically provided orally to patients after the thyroid is removed to prevent hypothyroidism [6]. The ligasure sealing approach in thyroidectomy has also been developed and tested [7]. However, there was no comparison with the use of hem clips to hold smaller vessels.

Patients and Methods

The current study began on the 1st of November 2021 till the 17th of April 2022 in Baghdad Teaching Hospital at the general surgery and ENT surgical department; it included 50 patients (female 45 and 5 male). Detailed medical history and clinical examination was done. General anesthesia was done (elective surgery) with the use of the suitable endotracheal tubes (ETT) the size of tube was 7.5 in males and 7 in females. Use of face mask in different sizes, syringe and IV cannula. Use of Macintosh laryngoscope (curved blade). Intra-operative monitoring of the heart rate, tidal volume, oxygen saturation and respiratory rate. Patient placed in supine position in all case. Premedication included Dexamethasone 8 mg/kg, Ranitidine 20 mg, Metoclopramide 5mg/kg, Midazolam 2 mg/kg. The drug used during induction of anesthesia are ketamine 50 mg, Propofol 200 mg/kg, Fentanyl 10 mcg/kg, the type of muscle relaxant was (Rocuronium 50 mg/ kg) and the reversal agents (Atropine 1.2 mg /kg with Neostigmine 2.5 mg/kg and diluted to 10 ml with normal saline). The used inhalational agents were (Halothane1% or Isoflurane 0.8%). Monitoring was continuous intra-operatively and post-operatively with the appropriate management of any complication.

Result

Table (1): Distribution of patients according to the age and gender

Age		Gender		Total	*p-value*
		Female	Male		
20 – 29	No.	14	2	16	0.7 (*NS)
	%	28.0%	4.0%	32.0%	
30 – 39	No.	10	2	12	
	%	20.0%	4.0%	24.0%	
40 – 49	No.	15	0	15	
	%	30.0%	0.0%	30.0%	
50 – 60	No.	6	1	7	
	%	12.0%	2.0.%	14.0%	
Total	No.	45	5	50	
	%	90.0%	10.0%	100.0%	

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p-value ≤0.05 considered statistically significant (S)
*p-value≤0.01 considered highly significant (HS)
*p-value>0.05 considered statistically non-significant (NS)

Table (1) shows no significant (p-*value* 0.7) between age and gender, subtotal thyroidectomy occurs in (20-29) age group (32%) of the total male and female (female 14 patients 28%; male 2 patients 4%). in (30-39) age group (24%) of the total male and female (female 10 patients 20%; male 2 patients 4%). In (40-49) age group (30%) of the total male and female (female 15 patients 30%; male 0). in (50-59) age group (14%) of the total male and female (female 6 patient 12%; male 1 patient 2%). In total 50 patients 100% total male and female (female 45 patients (90%); male 5 patients (10%)).

Table (2): Distribution of patients according to the toxic goiter and gender.

Toxicity		**Gender**		**Total**	***p-value***
		Female	**Male**		
Toxic	No.	25	4	29	0.001(*HS)
	%	50.0%	8.0%	58.0%	
Non toxic	No.	20	1	21	
	%	40.0%	2.0%	42.0%	
Total	No.	45	5	50	
	%	90.0%	10.0%	100.0%	

p-value ≤0.05 considered statistically significant (S)
p-value ≤0.01 considered highly significant (HS)
*p-value>0.05 considered statistically non-significant (NS)

Table (2) show highly significant (*p-value* 0.001) between toxic goiter and gender, toxic goiter occurs in female 25 patients (50%) and in male 4 patients (8%), and shows highly significant (p-*value* 0.001) between non-toxic goiter and gender, non-toxic goiter occurs in female 20 patients (40%) and in male 1 patient (2%). Total toxic goiter cases 29 patients male and female (58%) and total non-toxic goiter 21 patients male and female (42%).

Table (3) shows no significant (*p-value* 0.9) between complications of subtotal thyroidectomy and gender, complication occurs in 15 patients male and female 30% of the total cases. From those 15 patients that had complication 5 have haemorrhage 0.1%, (female 4 8%, 1 Male 2%) No patient developed laryngeal edema. 3 patients needed tracheostomy all are females (6%), with no male. 5 patient developed hoarseness of voice, (4 females 8%, 1 male 2%). 2 patient developed vocal cord palsy (4%), all of them are female with no male. 35patients passed the surgery with no complication (70%), (32 females 64%, 3 males 6%).

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Table (3): Distribution of patients according to the complications subtotal thyroidectomy and gender.

Complications		Gender		Total	*p-value*
		Female	Male		
Hemorrhage	No.	4	1	5	0.9 (*NS)
	%	8.0%	2.0%	0.1%	
Laryngeal Edema	No.	0	0	0	
	%	0.0%	0.0%	0.0%	
Tracheostomy	No.	3	0	3	
	%	6.0%	0.0%	6.0%	
Vocal Cord Palsy	No.	2	0	2	
	%	4.0%	0.0.%	4.0%	
Hoarseness of Voice	No.	4	1	5	
	%	8.0%	2.0%	0.1%	
Non	No.	32	3	35	
	%	64.0%	6.0%	70.0%	
Total	No.	45	5	50	
	%	90.0%	10.0%	100.0%	

**p-value* ≤0.05 considered statistically significant (S)
**p-value* ≤0.01 considered highly significant (HS)
**p-value*>0.05 considered statistically non-significant (NS)

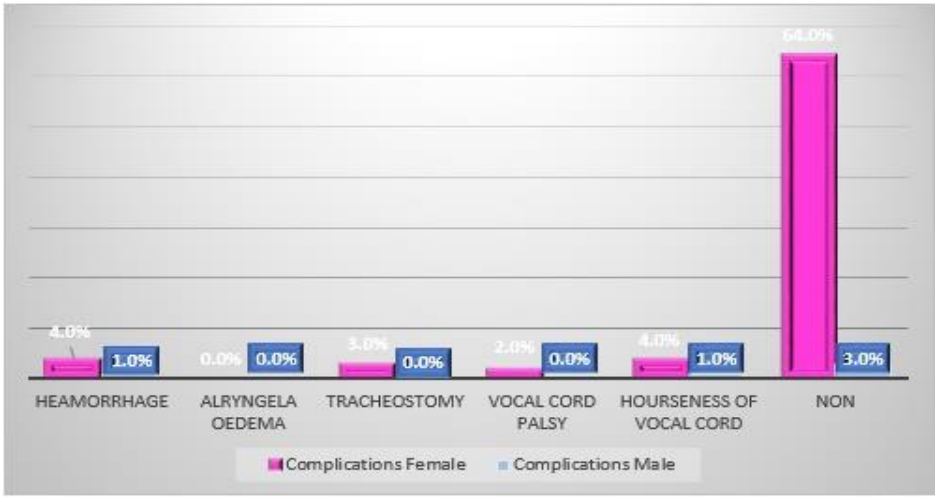

Fig (1): Distribution of sample according complications and gender.

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Discussion

Functional thyroid disorders can be in the form of hormonal production problems, benign or malignant nodules and tumors, with various types of thyroiditis.

These thyroid disorders can be presented as thyroid enlargement (goiter) in addition to other clinical and investigational abnormalities. [9 - 11].

In this study, it was discovered that women are more susceptible to thyroid diseases which may be due to multifactorial reasons like the autoimmune mechanisms and the hormonal cyclical changes during the reproductive life of the females and after menopause in addition to the psychological stress, these findings are in agreement with the World Health Organization study which included 29 thousand people, and indicated that women recorded higher numbers in most of the thyroid diseases, and recommended that women should undergo periodic examination with awareness of the early diagnosis and treatment of the diseases[12-14]. The results indicated that the complications of thyroid surgery are low if performed by experienced surgeon specialized in thyroid surgery, with 15 patient out of 50 patient having complications in this study it is regarded as significant and higher than the average. Women in the age group 20-29 are the more susceptible to thyroid disease (unknown). Toxic goiter is more common in women than in men. In male toxic goiter was more common than non-toxic in this sample. The incidence of toxic goiter in women is 1.2-4.3 times as great as that in men. Toxic goiter due to iodine deficiency and goiter size increase with age. Toxic goiter in individuals over 60 years of age is an important risk factor and also more common in female and can be treated with anti-thyroid medication, radio-iodine, or with surgery [15- 17].

Conclusion

Finally, we concluded that thyroid diseases are more common in females than in males. Less complication will occur with the appropriate patients preparation for the surgery and the use of suitable anesthetic technique and drugs with the surgery being performed by experienced specialized surgeons. Toxic goiter is more common in females than in males. In this study, toxic goiter in males are more common than non-toxic.

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