

Associated Complications and survival rate after thyroid cancer operation

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Abstract

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Background: Thyroid cancer is a common endocrine neoplasm in all parts of the world and the commonest histologic type is PTC. The Treatment of choice for this pathology is surgery and it has associated complications commonly hypocalcaemia and RLNP with specific survival rates.

Objective: To find out the incidence of associated complications of thyroid surgery with their survival rates.

Patients and Methods: We analysed data from 574 patients diagnosed with TC from 2018 to 2021, using the Kaplan-Meier method and log-rank test to determine complications of thyroid surgery and overall survival.

Results: The mean age of the patients was 41.3 (±14.1) years, there were 92(16%) patients aged >55 years and 482(84%) patients ≤ 55 years old at the time of diagnosis. Females were more affected by the female: male ratio (3.9: 1); 456 cases occurred in females (79.4%) and 118 in males (20.6%). The most common modes of presentation were neck lump in 492 (85.7%) patients and tumor size ≤4 cm in 495(86.3) patients. The commonest stage at diagnosis is stage I 494(86.1%), of the cases confined to the thyroid gland. The main surgical procedure was total thyroidectomy for 470(81.9%) patients. The common complications are hypocalcemia 70(12.6%) and 46(8.3%) developed RLN damage. The mean survival time was (55.87) months (CI = 54.86-56.88 months), but varies according to age < 55 years (58.02 months) and ≥ 55 years (44.426 months). Sex female has a better prognosis (56.540 months) while males (52.40 months). stage I mean survival was (58.79months) while a decrease in stage IV mean survival was (23.36 months).

Conclusion: The incidence of complications associated with TC surgery in our study is close to what was published elsewhere in the world with slight differences in percentages of each complication. The survival rate drops within the available ranges.

Keywords: Thyroid cancer, Total Thyroidectomy, Postoperative complication and Survival.

Introduction

The most prevalent type of endocrine cancer is that of the thyroid gland and its incidence has steadily increased over the past three decades all over the world. Mainly from

follicular cell differentiated thyroid cancer (DTC) [which subsequently consists of papillary thyroid cancer (PTC) and follicular thyroid cancer (FTC)], anaplastic thyroid

cancer (ATC), and poorly differentiated thyroid cancer]. Medullary thyroid cancer (MTC) originates from neural crest-derived C-cells. but the incidence of MTC has been largely constant throughout the past few decades [1]. Thirty per cent of diagnosed cases has been identified only by histopathologic examination [2].

Both age and gender have a significant effect on the prevalence of thyroid cancer. The women-to-men ratio is consistently high (approximately 3:1), especially after puberty and during the reproductive years [3]. Thyroid cancer can develop at any age; however, around two-thirds of all diagnosed cases occur in people between the ages of 20 and 55. The age of 60 is typically the cutoff for diagnosing anaplastic thyroid cancer [4, 5].

These two factors may affect both survival rates and associated complications [6].

The most common postoperative complications encountered with thyroid surgery are hypocalcemia; hypothyroidism; recurrent laryngeal palsy; hematoma; wound infection; stitch granuloma; keloid and scar formation [7].

Hypocalcemia complications are commonly seen in total and completion surgeries of TC. Among the explanations for complications are an extension of the tumor, lack of experience, and jeopardization of vascularity in the region [8]. Hypocalcemia may significantly affect many systems in the body, especially the nervous and skeletal systems. clinically can be seen as muscle cramps, seizures, nerve dysfunctions, heart failure and bone remodeling problems [9]. Hypocalcemia was defined as a case receiving calcium replacement therapy, or,

with a serum calcium level of less than 8.0 mg or an ionized calcium level of 1.13 mmol/l [10].

Any hematoma, may lead to difficulties in breathing and swallowing. They may be even life-threatening for the patient. On the other hand, ugly scars especially in young females are one of the main points of concern that need special attention [11].

The survival rate for patients after thyroid cancer surgery depends on the histopathological diagnosis and in general, the overall prognosis of PTC and FTC is excellent, which is around 96% [12]. However, Hurthle cell cancer (HCC), MTC, poorly differentiated thyroid cancer (PDTC), and ATC at advanced stages III-IV have a very poor prognosis [13].

In this way, both complications and survival rates are two points of concern for both surgeon and patient. They should be studied in detail to give minimum complications and a better survival rate.

Aim to evaluate associated complications and survival rate of operated cases for thyroid cancer in the three governorates of Iraq since 2018.

Patients and Methods

Data from operated thyroid cancer patients are collected from 1st of January 2018 to the 31st of December 2021 in Teaching hospitals at all the three governorates (Erbil, Sulaymaniyah and Duhok). Follow up done till the end of December 2022.

All cases diagnosed as thyroid cancer by both cytology and histopathological exam were included. Notes about preoperative evaluation by laryngoscopy, and neck ultrasonography were taken into consideration. The exclusion criterion was:

ages under 18 years old, those who refused to participate and inoperable cases.

A questionnaire was formulated especially for this reason. It includes both demographic and surgical information fields. The demographic characteristics of concern were age, sex. The surgical field includes clinical presentation, surgical procedure and follow-up.

Data regarding surgical outcomes, postoperative complications and survival rate for six months and one-year were gained after patient follow-up. An associated complication that was recorded includes hypocalcemia, RLNP, hematoma formation, wound infection, hypothyroidism, seroma, stitch granuloma and scar or keloid formation. These complications were established based on clinical assessment aided by biochemical and/or laryngoscopy examination.

Temporal and permanent complications were defined with a cut-off time of 6 months(14). Serum calcium levels were measured on the next postoperative day in all operated cases. Temporary hypocalcemia was considered when the total serum calcium level was less than 8.0 mg/dL associated with muscle spasms, perioral numbness, and tingling sensation and which responded to exogenous calcium supplementation for less than 6 months. Likewise, permanent hypocalcemia was considered when both clinical and biochemical findings persisted for more than 6 months despite regular calcium and vitamin D supplementation.

RLNP was defined as the presence of hoarseness or vocal cord palsy confirmed post-operatively by an otolaryngologist by

laryngoscopic evaluation as recorded in the chart.

Other complications like hematoma, wound infection, seroma, and stitch granuloma were included if they were seen clinically.

All patients were follow-upped by direct contact or by telephone call: asking about the presence of any complications after surgery, development of ugly scar at the site of operation and whether patient is alive or dead?

Hypothyroidism defined as an underactive thyroid is when the thyroid gland doesn't make enough thyroid hormones to meet body's need. TSH concentrations above the reference range (most commonly used 0.5 to 4.5 mIU/L). we didn't evaluate the hypothyroidism because we only analyzed early complications of thyroid cancer operation and the majority of cases are totally thyroidectomized even those patients lobotomized are putting on thyroxine to reduce TSH level.

Prognostic factors for survival rates according to: age, sex, type of thyroid cancer, staging of tumor and treatment were calculated. The guidelines of the American Joint Committee on Cancer were used for staging: tumor (T), nodal (N), and distant metastasis (M).

Statistical Analysis

Data entry was carried out by Excel sheet analyzed using the SPSS version 25. Numerical variables were summarized by calculating the means and the standard deviations (SDs). Categorical variables were presented in the form of frequencies and proportions. Kaplan-Meier survival analysis was applied, and Log Rank (Mantel-Cox) test was used to compare the survival curves of

the studied variables (like age, gender, grading, and size). The Kaplan-Meier method and log-rank estimate is the simplest way of computing the survival over time in spite of all these difficulties associated with subjects or situations. The Kaplan-Meier survival curve is defined as the probability of surviving in a given length of time while considering time in many small intervals[15]. A P value of ≤ 0.05 was considered statistically significant.

Results

The total number of patients with TC was 574 cases. Among them, thyroid surgery was performed for 557 (97.3%) cases. The mean age was 41.3 (± 14.1) years, the median was 38.5 years, and the age range was 18-87 years. There were 92(16%) patients aged >55 years old and 482(84%) patients ≤ 55 years old at the time of diagnosis. Regarding gender comprising 456 females (79.4%) and 118 males (20.6%). The female: male ratio

was 3.9: 1. The most common modes of presentation were a lump in 492 (85.7%) patients, pain in 140(24.4%) patients, and dyspnea in 134(23.3%) patients, dysphagia 50(8.7), hoarseness of voice 36(6.3) and stridor 7(1.2). before the operation, results of the fine needle aspiration cytology showed that 382(66.6%) of the specimens were malignant.

The most common histopathological diagnosis was papillary carcinoma in 479(86.0%) of patients, stage I is the commonest type in 494(86.1), mean tumor size was 2.26 cm and 79(13.7) patients' tumor size >4 cm. Surgical interventions were done in 557(97.3) patients. Total thyroidectomy (TT) was done for 470(81.9%) of patients, lobectomy with completion was done for 44(7.7%) of patients, and lobectomy was done for 34(5.9%) of patients, in addition to the other details mentioned in Table (1).

Table (1): Characteristics of Thyroid Cancer

	No.	(%)
FNAC n=574		
Benign	48	8.4
Indeterminant	128	22.3
Follicular neoplasm*	16	2.8
Malignant	382	66.6
Type of malignant (n=382)		
Papillary	345	90.3
Medullary	17	4.5
Anaplastic	20	5.2
Total	574	100
Histopathologic diagnosis n=557		
Papillary	479	86
Follicular	37	6.6
Huthle cell	5	0.9

Medullary	18	3.2
Anaplastic	14	2.5
Lymphoma	1	0.2
Poorly differentiated	3	0.5
Staging n=574		
StageI	494	86.1
StageII	33	8.1
StageIII	5	0.5
StageIV	42	7.3
Tumour size (cm)n=574		
≤4cm	495	86.3
>4cm	79	13.7
Type of surgery n=557		
Total thyroidectomy	470	81.9
Lobectomy with completion	44	7.7
Lobectomy	34	5.9
Subtotal thyroidectomy	5	0.9
Debulking	4	0.7
Follicular neoplasm* is a preliminary diagnosis that include both non-cancerous and cancerous condition by (FNAC)		

The majority 416(74.7%) of the patients had no complication after the operation, 70(12.6%) developed hypocalcemia {Temporal 52(9.4%) and Permanent18(3.2%)}, and 46(8.3%) developed RLN damage {Temporal38(6.8%) and Permanent8(1.5%)}. 15(2.7%) hematomata developed in addition to other complications mentioned in Table (2).

Table (2): Post-operative complications

	No.	(%)
No complication	416	(74.7)
Hypocalcemia	70	(12.6)
RLN damage	46	(8.3)
Hematoma	15	(2.7)
Wound infection	7	(1.3)
Seroma	3	(0.5)
Total	557	(100.0)

Regarding hypocalcaemia, in which both female gender and those age group ≤ 55 years old age were associated more risk of postoperative hypocalcaemia and those age

group > 55 years old age is critical for associated complications like RLNP, hematoma and infection, which was significant correlation between patients age and male gender, additional information mentioned in Table (3).

Table (3): Post operative complication according to age group and gender

Complication	≤ 55	> 55	Male	Female	P value
No complication	362 (75.6)	54 (69.2)	76 (69.7)	340 (75.9)	0.061*
Hypocalcaemia	62 (12.9)	8 (10.3)	12 (11)	58 (12.9)	
RLN damage	38 (7.9)	8 (10.3)	13 (11.9)	33 (7.4)	
Hematoma	10 (2.1)	5 (6.4)	5 (4.6)	10 (2.2)	
Wound infection	4 (0.8)	3 (3.8)	1 (0.9)	6 (1.3)	
Seroma	3 (0.6)	0 (0)	2 (1.8)	1 (0.2)	

Regarding complications associated with different types of surgical approach were comprising only 141 (25.3%) patients, lobectomy had least complications (only one case (2.9%) of RLNP) and, total thyroidectomy had greatest complications 123 (26.2%) patients, hypocalcemia 63 cases (13.4%), 8 (18.18%) cases had RLN injury. in addition to other findings presented in Table (4).

Table (4): Complications according to types of operation

Complication	Lobectomy	Subtotal thyroidectomy	Total thyroidectomy	Debulking	Lobectomy with completion	Total	P value
No complication	33 (97.1)	2(40)	347(73.8)	3(75)	31(70.5)	416(74.7)	0.02
Hypocalcemia	0	2(40)	63(13.4)	1(25)	4(9.1)	70(12.6)	
RLN damage	1 (2.9)	0	37(7.9)	0	8(18.2)	46(8.3)	
Hematoma	0	0	14(3)	0	1(2.3)	15(2.7)	
Wound infection	0	1(20)	6(1.3)	0	0	7(1.3)	
Seroma	0	0	3(0.6)	0	0	3(0.5)	
Total	34(100)	5(100)	470(100)	4(100)	44(100)	557(100)	

The mean survival time of those 482 (84.0%) who aged less than 55 years (58.02 months) was significantly ($p < 0.001$) higher than the mean survival time of those 92 (16.0%) aged ≥ 55 years (44.42 months), male thyroid cancer patients showed a relatively poor prognosis compared to female cases, the mean survival time of females (56.54 months) was significantly ($p = 0.011$) higher than that of males (52.40 months) and survival time regarding the tumor stage, it was 58.79 months for stage I, and then it decreased to 23.36 months for stage IV ($p < 0.001$) as presented in Table (5).

Table (5): Mean survival time of the studied cases

Variables*	Mean survival time (months)	Standard error	95% confidence interval	
			Lower Bound	Upper Bound
Age at diagnosis				
< 55	58.029	(0.323)	57.396	58.661
≥ 55	44.426	(2.430)	39.663	49.188
Gender				
Male	52.402	(1.472)	49.518	55.287
Female	56.540	(0.515)	55.532	57.549
Staging				
Stage I	58.792	(0.148)	58.502	59.082
Stage II	49.412	(2.622)	44.272	54.551
Stage III	34.000	(5.367)	23.482	44.518
Stage IV	23.360	(3.507)	16.486	30.234
Overall	55.874	(0.515)	54.865	56.883

The survival was least when the tumor size exceeds 4 cm, and the difference between the mean survival time of the different tumor

sizes was significant ($p < 0.001$) as illustrated in Figure (1).

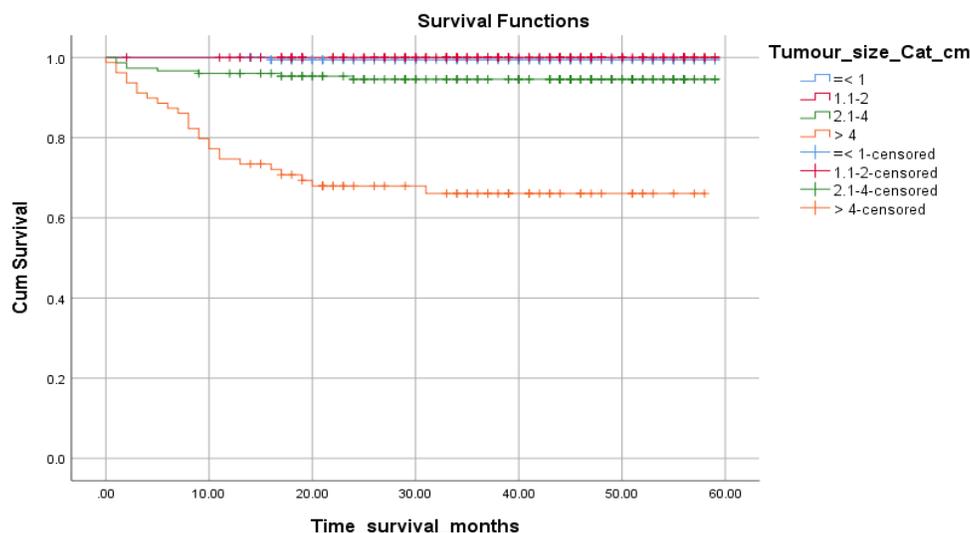


Figure (1): Survival by tumor size. $P < 0.001$

It is evident in Figure (2) that there was a significant difference between the mean survival time of the histopathological cancer types ($p < 0.001$), where it is evident that the

highest survival time was that of the PTC and the least survival time was that of the anaplastic type, and also the poorly differentiated type.

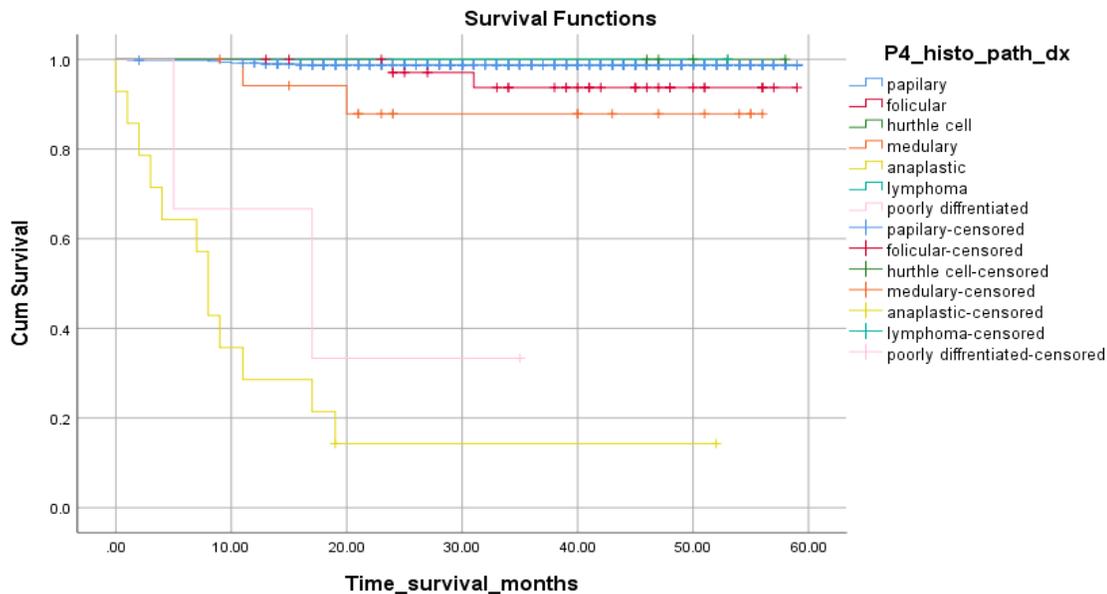


Figure (2): Survival by histopathological diagnosis. P < 0.001

Discussion

In the current study, we found that the incidence rates of postoperative complications in thyroid surgery are as follows: temporal hypocalcemia, permanent hypocalcemia, temporal RLN palsy, permanent RLN palsy, hematoma, and seroma were 9.4%, 3.2%, 6.8%, 1.5%, 2.7%, and 0.5%, respectively all of which are in good agreement with other previous reports [16, 17].

We found that below 55 years old comprising (84.0%) of the total sample. According to previous literature, the occurrence of TC is considered to be much more in the age below 55 years old, like what Ghamari (2019) published [18]. The explanation of young age group involvement in TC may be due to poor diet or iodine deficiencies in our environment. Although there is a strong relationship between age and prognosis for different types of malignancies, in which young age groups with

malignancies have a bad prognosis but in TC age prognostic factor is reverse, better prognosis in early ages [19]. These finding mimics our study (58.02 months) survival time and higher than the mean survival time of those cases (16.0%) aged > 55 years olds (44.42 months) survived. this correlation was statistically significant (p < 0.001).

Our finding regarding hypocalcemia is agree with that of Shuchleib-Cung *et al* (2022), in which both female gender and age group ≤55 years old age were associated with an increased risk of postoperative hypocalcemia [20]. In our results, it seems that the age >55 is critical for associated complications like RLNP, hematoma and infection. The incidence is much higher when compared with the group below 55 years old patients. such finding goes with the idea of Sze-How Ng *et al* (2012), but still, it is higher than that of Bliss *et al* (1999); Syebt *et al* (2009); Lang and Lo (2005); Passler *et al* (2002) (21).

Females are dominant in both prevalence and survival rates according to AGES and AMES with our data calculation and follow up. In the current study, they comprised 456 (79.4%) cases, with a female-to-male ratio of 3.9: 1. Author percentages vary slightly. For example, 79.0% Borges et al (2019); 81.05% Samargandy et al (2020); 83.8% of Pova et al (2020) (22-24).

In our study, the male gender was dominant for RLNP, hematoma and seroma while the female gender had more cases of hypocalcemia. They are supporting the idea of poor male outcomes regarding thyroid surgery as it was mentioned by Margolick (2018); Weiss et al (2014); Suzuki et al (2016), but it is contradicting that of Vashishta et al (2012); Docimo et al (2017) [25]. There is significant correlation between patients age >55 years old and male gender.

The survival rate in our study, for females was 56.54 months which is statistically significant (p = 0.011) higher than that of males (52.40 months). The higher survival rate in females compared to males has been published and assured by the majority of authors and one possible explanation for this phenomenon may come from the hormonal, effect of estrogen on the pathogenesis of tumours has been discussed [26, 27].

The tumor size may have a direct effect on both decisions of surgery and outcomes. The mean size among the participants in our study was 2.26 cm, which is comparable to the mean size found in other studies reported from Saudi Arabia (2.15 cm) [28]. In contrast to other parts of the world, in which smaller thyroid tumors have been diagnosed [29]. In our study, about 86.3% of the cases had tumor sizes ≤ 4 cm in diameter, which is

usually associated with a good prognosis and it was similar to a previous study (30). All complications which happened were much more common in the tumor size ≤ 4cm groups except that for infection this finding may be due to the proportions of different tumor sizes in the sample. The increasing rate of infection in such tumor sizes (>4 cm) the explanation is not clear.

Regarding the survival time of tumor size, for those patients ≤4 cm better than those patients with tumor size >4 cm for the same period. The results are close to what was published by Zhang et al (2020) [31].

Our histopathology results showed that the PTC is the most common type (86.0%), followed by follicular (6.6%). This was comparable to both international and Middle East-focused literature [32, 33]. Our results showed a better prognosis for PTC compared to ATC and PDTC. Which is constant with previous studies [34, 35].

According to what was published by Manzardo et al (2020) using the 8th edition of TNM classification, the distribution of TC over stages is as follows: 89.2%, 8.3%, 0.8%, and 1.7% for stages I, II, III and IV, respectively [36]. In our study, they were 86.1%, 8.1%, 0.5%, and 7.3% for stage I, II, III and IV respectively. It is very close to the above-mentioned results and to the majority of published materials.

In our study Survival time regarding the tumor stage, was (58.79) months for stage I, and then it decreased to (23.36) months for statistically significant stage IV (p < 0.001) which consistent to previous study that early detection of thyroid cancer better prognosis [37].

According to the guideline of American Thyroid Association of surgeons the indication of total thyroidectomy (TT) should be tumor size, histopathologic report and radiologic findings [38]. In our study, 81.9% of patients underwent TT which is higher than what was published by Alawadhi *et al* (2020) and less than that of Alzahrani *et al* (2017) [28, 39]. The tendency for TT may come from the fact of difficulty of regular follow-up in our locality. When the surgeon knows that the patient can not follow regular, short-duration follow-ups, he may decide to do a radical operation.

Another factor that may enhance TT as a decision surgery is the wide range of complications associated with completion surgery (CS) and the variety of histopathological features associated with TC, especially (focality, local metastasis, and vascular and capsular invasion). Dealing with such complications is difficult and expensive for patients, surgeons and medical institutions. The number of completed surgery in the current study was 7.7% due to malignant findings in histopathological results in which 6.8% were subtotal and 93.2 % were lobectomy cases. Complications associated with different types of surgical approach were comprising only 25.3% out of which lobectomy had minimum complications (only one case of RLNP) and, total thyroidectomy had maximum complications (26.2%) with the most common complication being hypocalcemia (13.4%) and our result were comparable with what that published by Curto *et al* (2022)[40].

As complications associated with CS, current study there was 18.18% RLN injury;

9.1% hypocalcemia and 2.3% bleeding. This result resembles previous literature [41]. However, the survival rate after CS in our study was better than other types of surgery. The reason behind such a good survival rate may come from the primary surgery and the short duration between primary and CS.

Conclusions

The incidence of complications and survival time associated with TC surgery in our study is close to what was published elsewhere in the world with a slight difference in percentages, and it depend on the patient's condition, type of histopathology, the surgeon's skill and the type of surgery.

Recommendations

The relatively high proportion of patients underwent TT, point out the necessity of adopting certain guidelines for the indications of such surgeries, improving the training in surgical procedures and decreasing the rate of thyroidectomy to avoid the post-operative effect on patients' psychology.

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Conflict of interest: Nil

References

- [1] Araque KA, Gubbi S, Klubo-Gwiedzinska J. Updates on the Management of Thyroid Cancer. *Hormone and metabolic research = Hormon- und Stoffwechselforschung = Hormones et metabolisme.* 2020;52(8):562-77.
- [2] Konturek A, Barczyński M, Stopa M, Nowak WJWJoS. Trends in prevalence of thyroid cancer over three decades: a retrospective cohort study of 17,526 surgical patients. 2016;40(3):538-44.
- [3] Pham DX, Nguyen HD, Phung AH, Bui TD, Tran TS, Tran BN, et al. Trends in incidence and histological pattern of thyroid cancer in Ho Chi Minh City, Vietnam (1996–2015): a population-based study. 2021;21(1):1-8.
- [4] Arrangoiz R, Cordera F, Caba D, Moreno E, Luque-de-Leon E, Muñ MJJoO, et al. *Thyroid Cancer.* 2019;8(6):217-70.
- [5] Mustafa DH, Ahmed BS, Haweizy RM, Dewana AMJBs. Evaluation of anaplastic thyroid carcinoma in the Kurdistan region of Iraq. 2022;22(1):1-9.
- [6] Flemban AF, Kabrah S, Alahmadi H, Alqurashi RK, Turaes AS, Almaghrabi R, et al. Patterns of Thyroid Cancer Mortality and Incidence in Saudi Arabia: A 30-Year Study. 2022;12(11):2716.
- [7] Alqahtani SM, Almussallam B, Alatawi AS, Alsuhami NA, Albalawi A, Albalawi NS, et al. Post-Thyroidectomy Complications and Risk Factors in Tabuk, Saudi Arabia: A Retrospective Cohort Study. *Cureus.* 2020;12(10):e10852.
- [8] Ortega Beltrá N, Martínez Ruiz de Apodaca P, , Guallart Doménech F, , Cuesta González MT, , Dalmau, Galofre J. Postoperative hypocalcaemia predictors after total thyroidectomy. *Rev Osteoporos Metab Miner* 2022;14(4):. 2022;4(14):131-5.
- [9] Fong J, Khan A. Hypocalcemia: updates in diagnosis and management for primary care. *Canadian family physician Medecin de famille canadien.* 2012;58(2):158-62.
- [10] Hoang J, Choudhury KR, Eastwood J, Esclamado R, Lyman G, Shattuck T, et al. An exponential growth in incidence of thyroid cancer: trends and impact of CT imaging. 2014;35(4):778-83.
- [11] Lukinović J, Bilić M. Overview of Thyroid Surgery Complications. *Acta clinica Croatica.* 2020;59(Suppl 1):81-6.
- [12] Chatchomchuan W, Thewjitcharoen Y, Karndumri K, Porramatikul S, Krittiyawong S, Wanothayaroj E, et al. Recurrence factors and characteristic trends of papillary thyroid cancer over three decades. 2021;2021.
- [13] Barbet J, Campion Lc, Kraeber-Bodéré F, Chatal J-F, *Endocrinology GSGJTJoC, Metabolism.* Prognostic impact of serum calcitonin and carcinoembryonic antigen doubling-times in patients with medullary thyroid carcinoma. 2005;90(11):6077-84.
- [14] Pfliederer AG, Ahmad N, Draper MR, Vrotsou K, Smith WK. The timing of calcium measurements in helping to predict temporary and permanent hypocalcaemia in patients having completion and total thyroidectomies. *Annals of the Royal College of Surgeons of England.* 2009;91(2):140-6.
- [15] Goel MK, Khanna P, Kishore J. Understanding survival analysis: Kaplan-Meier estimate. *International journal of Ayurveda research.* 2010;1(4):274-8. [16]

- Milone M, Musella M, Conzo G, Campana G, De Filippo D, Coretti G, et al. Thyroidectomy in high body mass index patients: a single center experience. 2016;28:S38-S41.
- [17] van Zuidewijn DBdR, Songun I, Kievit J, van de Velde CJJAoSO. Complications of thyroid surgery. 1995;2:56-60.
- [18] Ghamari ZTJJJoCDC. Thyroid cancer in Isfahan province, Iran; prevalence and demographic characteristics. 2019;8(1).
- [19] Kong N, Xu Q, Zhang Z, Cui A, Tan S, Bai NJFiE. Age influences the prognosis of anaplastic thyroid cancer patients. 2021;12:704596.
- [20] Shuchleib-Cung A, Garcia-Gordillo JA, Ferreira-Hermosillo A, Mercado MJCyc. Risk factors for hypocalcemia after total thyroidectomy. 2022;90(6):765-9.
- [21] Tabriz N, Uslar VN, Tabriz I, Weyhe D. Relationship between age and outcome in thyroid surgery: a prospective observational study. Innovative surgical sciences. 2017;2(4):211-7.
- [22] Borges AKdM, Ferreira JD, Koifman S, Koifman RJJRdSP. Differentiated thyroid carcinoma: a 5-years survival study at a referral hospital in Brazil. 2019;53:106.
- [23] Samargandy S, Qari R, Aljadani A, Assaqaf Sr D, Etaiwi A, Alghamdi D, et al. Clinicopathological characteristics of thyroid cancer in a Saudi academic hospital. 2020;12(5).
- [24] Póvoa AA, Teixeira E, Bella-Cueto MR, Melo M, Oliveira MJ, Sobrinho-Simões M, et al. Clinicopathological features as prognostic predictors of poor outcome in papillary thyroid carcinoma. 2020;12(11):3186.
- [25] Gut L, Bernet S, Huembelin M, Mueller M, Baechli C, Koch D, et al. Sex-Specific Differences in Outcomes Following Thyroidectomy: A Population-Based Cohort Study. European thyroid journal. 2021;10(6):476-85.
- [26] LeClair K, Bell KJL, Furuya-Kanamori L, Doi SA, Francis DO, Davies L. Evaluation of Gender Inequity in Thyroid Cancer Diagnosis: Differences by Sex in US Thyroid Cancer Incidence Compared With a Meta-analysis of Subclinical Thyroid Cancer Rates at Autopsy. JAMA internal medicine. 2021;181(10):1351-8.
- [27] Guo K, Wang ZJJjoc, pathology e. Risk factors influencing the recurrence of papillary thyroid carcinoma: a systematic review and meta-analysis. 2014;7(9):5393.
- [28] Alzahrani AS, Alomar H, Alzahrani NJJJoE. Thyroid cancer in Saudi Arabia: a histopathological and outcome study. 2017;2017.
- [29] Lim H, Devesa SS, Sosa JA, Check D, Kitahara CMJJ. Trends in thyroid cancer incidence and mortality in the United States, 1974-2013. 2017;317(13):1338-48.
- [30] Zhang TT, Li CF, Wen SS, Huang DZ, Sun GH, Zhu YX, et al. Effects of tumor size on prognosis in differentiated thyroid carcinoma smaller than 2 cm. Oncology letters. 2019;17(5):4229-36.
- [31] Zhang J, Cheng X, Su B, Wang X, Wang L, Jayachandran M, et al. The Increased Risk of Thyroid Cancer-Specific Mortality With Tumor Size in Stage IVB Patients. 2020;10.
- [32] El-Shareif HJJTR, Practice. Clinicopathological features of differentiated thyroid carcinoma referred to radioiodine

therapy at Tripoli Medical Center. 2018;15(1):3.

[33] Arican CD, Ozturk T, Sager MS, Sertbudak I, Teksoz S, Saricoban CT, et al. Incidental Papillary Microcarcinoma and Papillary Thyroid Carcinoma in Multinodular Goiter. 2023;2023.

[34] Keinan-Boker L, Silverman BGJRMmj. Trends of thyroid cancer in Israel: 1980–2012. 2016;7(1).

[35] Xue Y, Zheng S, Du H, Zhang Y, Jin WJCEJ. Cr (III)-induced electrochemical advanced oxidation processes for the V2O3 dissolution in alkaline media. 2017;307:518-25.

[36] Manzardo OA, Cellini M, Indirli R, Dolci A, Colombo P, Carrone F, et al. TNM 8th edition in thyroid cancer staging: is there an improvement in predicting recurrence? %J Endocrine-Related Cancer. 2020;27(6):325-36.

[37] Moon S, Lee EK, Choi H, Park SK, Park YJJE, Metabolism. Survival comparison of

incidentally found versus clinically detected thyroid cancers: an analysis of a nationwide cohort study. 2023;38(1):81-92.

[38] Kiss A, Szili B, Bakos B, Ármós R, Putz Z, Árvai K, et al. Comparison of surgical strategies in the treatment of low-risk differentiated thyroid cancer. 2023;23(1):1-7.

[39] Alawadhi R, Matakah A, Alzaabi S, Ahmed N, Alduaij A, Sabri A, et al. Epidemiology and surgical characteristics of thyroid cancer in United Arab Emirates: Review of 100 consecutive patients. 2020;3(02):79-83.

[40] Curto LS, Gervasi R, Innaro NJAT. Surgical treatment of multifocal, intermediate risk, differentiated thyroid cancer (DTC): single reference centre experience. 2022;7:6.

[41] Gulcelik MA, Dogan L, Akgul GG, Güven EH, Gulcelik NEJOr, treatment. Completion thyroidectomy: safer than thought. 2018;41(6):386-90.

المضاعفات المصاحبة ومعدل البقاء على قيد الحياة بعد عملية سرطان الغدة الدرقية

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الملخص

خلفية الدراسة: يعد سرطان الغدة الدرقية وربما شائعاً للغدد الصماء في جميع أنحاء العالم ، والنوع النسيجي الأكثر شيوعاً هو سرطان الغدة الدرقية الحليمي. العلاج المفضل لهذا المرض هو الجراحة وقد ارتبطت بمضاعفات شائعة لنقص كالسيوم الدم وإصابة الحنجرة المتكررة بمعدلات بقاء محددة.

اهداف الدراسة: لمعرفة مدى حدوث المضاعفات المرتبطة بجراحة الغدة الدرقية مع معدلات بقائهم على قيد الحياة. **المرضى والطرائق:** قمنا بتحليل البيانات من 574 مريضاً تم تشخيص إصابتهم بمرض : سرطان الغدة الدرقية من 2018 إلى 2021 ، باستخدام طريقة Kaplan-Meier واختبار الترتيب القياسي لتحديد مضاعفات جراحة الغدة الدرقية والبقاء على قيد الحياة بشكل عام.

النتائج: كان متوسط عمر المرضى 41.3 (± 14.1) سنة ، وكان هناك 92 (16%) مريضاً تزيد أعمارهم عن 55 سنة و 482 (84%) مريضاً بعمر 55 سنة (أقل من 55 سنة) وقت التشخيص. كانت الإناث أكثر تأثراً بنسبة الإناث مقابل نسبة الذكور (3.9 : 1) ؛ حدثت 456 حالة في الإناث (79.4%) و 118 حالة في الذكور (20.6%). كانت أكثر طرق العرض شيوعاً هي وجود كتلة في الرقبة في 492 (85.7%) مريضاً وحجم الورم أقل من 4 سم في 495 (86.3%) مريضاً. المرحلة الأكثر شيوعاً في التشخيص هي المرحلة الأولى 494 (86.1%) ، من الحالات المحصورة في الغدة الدرقية. كانت العملية الجراحية الرئيسية هي استئصال الغدة الدرقية الكلي لـ 470 (81.9%) مريضاً. المضاعفات الشائعة هي نقص كالسيوم الدم 70 (12.6%) و 46 (8.3%) تطور تلف RLN. كان متوسط وقت البقاء على قيد الحياة (55.87) شهراً (CI = 54.86-56.88 شهراً) ، ولكنه يختلف وفقاً للعمر أقل من 55 عاماً (58.02 شهراً) و 55 عاماً (44.26 شهراً). يتمتع الجنس الأنثوي بتوقعات أفضل (56.540 شهراً) بينما يكون لدى الذكور (52.40 شهراً). كانت المرحلة الأولى تعني البقاء (58.79 شهراً) بينما كان الانخفاض في المرحلة الرابعة يعني البقاء على قيد الحياة (23.36 شهراً).

الاستنتاجات: إن حدوث المضاعفات المرتبطة بجراحة سرطان الغدة الدرقية في دراستنا قريب مما تم نشره في أماكن أخرى من العالم مع وجود اختلافات طفيفة في النسب المئوية لكل مضاعفة. ينخفض معدل البقاء ضمن النطاقات المتاحة.

الكلمات المفتاحية: سرطان الغدة الدرقية ، استئصال الغدة الدرقية الكلي ، مضاعفات ما بعد الجراحة ، البقاء على قيد الحياة

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