INTERNATIONAL JOURNAL OF
INTEGRATIVE AND
MODERN MEDICINE

Assessment Outcomes of Common Complications and Side Effects of Thyroidectomy, Retrospective Cross-Sectional Study

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Annotation: Thyroid illness is the most prevalent medical condition among Iraqi people. In general, endoscopic thyroidectomy is a highly effective, safe, and popular method for cosmetic purposes. This study aims to determine data of 86 Iraqi patients who have undergone endoscopic thyroidectomy in, particularly of complications, pain scores, and quality of life. From 6 February 2023 to 15 July 2024, data pertaining to surgical procedures performed on Iraqi patients (86) were collated from medical facilities in Baghdad, Iraq. In the case of endoscopic thyroidectomy, the clinical data associated with the surgical procedure were determined in accordance with the following parameters: duration of surgery, length of hospital stay, rates of post-operative pain and complications, patient satisfaction, and quality of life following surgery. The clinical findings of the endoscopic thyroidectomy are as follows: the operational duration was 105.77 ± 22.58 minutes, the blood loss was 26.72 ± 9.80 mL, five cases demanded blood transfusion, the length of hospital stay was 1.55 ± 0.62 days, two cases were admitted to the intensive care unit, and there were no mortalities. In patients who underwent endoscopic thyroidectomy, eight cases had complications. In the quality-of-life evaluations, it was found that physical health and psychological functioning were the most dominant factors in determining whether patients had a successful quality of life. The findings of our current study indicate that endoscopic thyroidectomy is the optimal surgical procedure for achieving high clinical outcomes in terms of low pain and complication rates and ideal quality of life for patients.

Keywords: Endoscopic thyroidectomy; Mortality rate; postoperative complications; Hospital stay time; and VAS score of pain.

1. INTRODUCTION

In the world, thyroid disease is a very prevalent health problem. Currently, endoscopic thyroidectomy is a common surgical approach that has been deemed safe [1 – 4]. On the contrary, it is mostly patients aged above 40 whose they have thyroid ailments [5]. For this reason, endoscopic thyroidectomy has become more popular for cosmetic purposes than other types of surgeries [6]. In worldwide, increasingly more affected practitioners have embraced minimally invasive endoscopic thyroidectomy. [7,8]

Recently, many centers have been applying Endoscopic Thyroidectomy in several ways, including axillary route, areola, and transoral approach. Evidence shows it is safe for both benign and malignant thyroid tumors, but there are no guidelines available on indications or operative techniques [9 – 11]. On the other hand, endoscopic thyroidectomy has excellent therapeutic results with better cosmetic outcomes. [12]

Furthermore, it is well-known that endoscopic thyroid surgery results in enhanced postoperative quality of life with respect to scarring-related issues, difficulty in swallowing, and psychological problems. However, there remain two areas of controversy regarding endoscopic thyroidectomy: the difficulty of the procedure itself and the range of surgical separation. [13 – 17]

Various methods have been introduced so far, but the chest-collarbone technique is simple to operate and provides a satisfactory aesthetic appearance [18]. This alternative for thyroid gland removal appears recent with its merits and demerits compared to the normal operation not yet grasped completely [19]. Thus, a cross-sectional study was carried out in 86 individuals who had endoscopic surgery for the thyroid gland whereby complications as well as life quality were considered. [20]

2. PATIENTS AND METHODS

2.1. Participants data

In total, 86 patients aged between 25 and 45 years were studied for the purpose of this study on thyroid diseases; both male and female patients were included. Clinical and demographic data were collected from hospitals in Baghdad, Iraq, over a period running from 6 February 2023 to 15 July 2024. Age, gender, body mass index (BMI), which was considered as underweight, normal weight, overweight, and obese; past operations; other existing diseases; types of thyroid disorders; clinical signs and smoking habits made up the different types of demographic data we used.

Patients were excluded according to the following criteria: Patients under 25 years and over 45 years; Patients who had diseases such as cancer or cholecystectomy; patients suffering from fractures or osteoporosis, while the data included patients who included all patients between 25-45 years; patients who had diseases associated with each of (hypertension, diabetes, obesity, asthma, anemia); and smoking.

2.2. Examination enrolment

This study also recorded for every patient the diagnostic data like ultrasound, CT scan and MRI tests. All patients were diagnosed using ultrasound, CT scan, and MRI techniques considering the size side (1 or 2) of the tumor, focal foci (unifocal or multifocal), size of the tumor (greater than 1.5 cm versus lesser than 1.5 cm), as well as thyroid glands state as the diagnostic parameters. There were four patients without any residual disease, two others without any remaining disease, while one more had no remaining diseases.

2.3. Surgical parameters enrolment

During the period, from 86 patients who had an endoscopy thyroidectomy, this research was included in another 86, all of whom were admitted to the hospital. Variables related to surgical information were documented. It includes operation duration, blood loss and transfusion volume, hospital stay and intensive care unit (ICU) admission length, mortality rate, different pain levels, measurement of drainage volumes, and postoperative complications.

2.4. Measurements of quality of life and pain scores

The postoperative questionnaire outcomes were assessed by a questionnaire consisting of ten items. The visual analogue scale (VAS) pain score at the surgical site ranged from 0 (no pain at all) to 10 (the worst pain ever experienced). To assess patients' quality of life, a questionnaire was utilized with a score range of 0-100, where 0 indicates poor quality of life and 100 indicates optimal quality of life. The score of the questionnaire was valued against these standards: physical health, psychological aspect, energy/fatigue, emotional performance, social functioning, and general health.

2.5. Statistical analysis

The values have been presented as mean ± standard deviations of the mean while data analyses were carried out using one-way analysis of variance and followed by Fisher's exact test or unpaired t-tests (SPSS Version 22.0). It is accepted that $P < 0.05$ is statistically significant

3. RESULTS

Table 1: Basics characteristics of patients.

Characteristics	No. of cases (86)	Percentage (%)
Age		
25 – 35	31	36.05%
36 – 45	55	63.95%
Sex		
Male	23	26.74%
Female	63	73.26%
BMI, Kg/m3		
Underweight	11	12.79%
Normal weight	17	19.77%
Overweight	23	26.74%
Obesity	35	40.70%
No. of comorbidities		
1	57	66.28%
2	37	43.02%
3	24	27.91%
4	18	20.93%
5	4	4.65%
Symptoms		
Difficulty swallowing	27	31.4%
Hoarseness or voice changes	16	18.6%
Difficulty breathing	6	6.98%
Pain in the neck	7	8.14%
Fatigue	16	18.6%
Weight changes	9	10.47%
Changes in mood	5	5.81%
Smoking status		
Yes	30	34.88%
No	56	65.12%
Prior surgeries		
Yes	16	18.60%
No	70	81.40%
Medications used		
Yes	54	62.79%
No	32	37.21%
Marital status		
Married	61	70.93%
Divorced	18	20.93%
Widow	7	8.14%
Educational status (%)		
Secondary	17	19.77%
University/College	30	34.88%
Post-graduated	39	45.35%
Monthly income, $		
< 600	46	53.49%
600 – 700	26	30.23%
> 700	14	16.28%
❖ No. of illnesses: Hypertension; Diabetes; Obesity; Asthma; and Anemia		

Table 2: Determining diagnoses data of participants.

Variables	**No of patients** (86)	**Percentage** (%)
Imaging		
Ultrasound	74	86.05%
CT scan	55	63.95%
MRI	23	26.74%
Illnesses		
Graves' disease	11	12.79%
Nodular goiter	38	44.19%
Follicular adenomas	12	13.95%
Thyroid cancer	25	29.07%
Tumor side		
Unilateral	76	88.37%
Bilateral	10	11.63%
Tumor focality		
Unifocal	63	73.26%
Multifocal	23	26.74%
Tumor size		
> 1.5 cm	66	76.74%
< 1.5 cm	20	23.26%
Parathyroid glands		
Four are left in place	52	60.47%
Two are left in place	24	27.91%
One left in place	10	11.63%
Vital signs		
SBP (mmHg)	116.44 ± 13.58	
DBP (mmHg)	74.25 ± 9.46	
PR (bpm)	75.62 ± 4.76	

Table 3: Endoscopy thyroidectomy data.

Variables	**Surgical details**
Operative time (min), mean±SD	105.77 ± 22.58
Blood loss (mL), mean±SD	26.72 ± 9.80
Blood transfusion, n (%)	
Yes	5 (5.81%)
No	81 (94.19%)
Clinical factors	
Albumin (g/dl)	3.82 ± 0.34
Phosphorus (mg/dl)	3.3 ± 0.5
Calcium (mg/dl)	8.57 ± 0.78
Hospital stay time (day), mean±SD	1.55 ± 0.62
Admission to the intensive care unit, N (%)	
Yes	2 [2.33%]
No	84 [97.67%]
Mortality rate, N (%)	
Yes	0 (0%)
No	86 (100%)
Amount of postoperative drainage	88.27 ± 20.56
Complications	8 (9.30%)

Hypocalcemia	3 (3.49%)
Scarring	0 (0%)
Hoarseness	0 (0%)
Dysphagia	1 (1.16%)
Wound infection	4 (4.65%)
Vocal cord paresis	0 (0%)
Pain scores	
1st day	4.10 ± 0.05
1st week	2.6 ± 0.3
1st month	0.68 ± 0.1
6^{th} month	0.30 ± 0.014

Table 4: Quality of Life Questionnaire for Patients After Endoscopy Thyroidectomy.

Follow–up time	QOL scores
Physical health	87.27 ± 9.60
Psychological functioning	76.82 ± 4.29
Energy/fatigue	83.15 ± 5.40
Emotional functioning	81.72 ± 5.92
Social functioning	86.61 ± 4.55

Table 5: Determining of side effects related to participants.

Side effects	OR	CI 95%
Female	3.6	0.26 – 6.80
Hypertension	4.8	1.28 – 7.20
Obesity	2.47	1.13 – 6.01
Smoking	1.86	0.65 – 4.93
Nodular goiter	2.10	0.74 – 4.79
Thyroid cancer	3.55	1.82 – 6.35
Tumor size	1.50	0.33 – 4.92
Bleeding	6.44	2.77 – 8.62
Wound infection	5.24	3.28 – 8.73
Hypocalcemia	4.33	2.81 – 6.93

4. DISCUSSION

As per this research, certain demographic characteristics are highlighted that show how many of the people falling in between age brackets ranging from 36 up to 45 years constituted about 63.95 %; out of those who suffered from it, a total of 73.26 % were female while their male counterparts were only 26.74%. Additionally, there were patients whose weight was found to be excessive, and this was represented by a figure that stood at 45%. It was also noted that there were individuals suffering from other conditions together with those contributing towards them by 40.70%. In addition, we put together the most common symptoms among patients, which included dysphagia (27), asthenia (16), and dysphonia (voice changes/hoarseness) (16). In the identification of diagnoses data, we enrolled diagnosis data which found the rate of patients who underwent imaging tests included us ultrasound with 74 cases, CT scan with 55 cases, and MRI with 23 cases; common illnesses prevalent in the patients found nodular goiter which got 38 cases, thyroid cancer that had 25 cases, graves' disease that had 11 cases and follicular adenomas that had 12 cases; tumor side included unilateral (76 cases) and bilateral (10 cases); tumor size (66 cases > 1.5 cm) <1.5 cm (20 cases). Vital signs contain SBP (mmHg) was 116.44 ± 13.58, DBP (mmHg) was 74.25 ± 9.46, and PR (bpm) was 75.62 ± 4.76. On surgical data, our outcomes of patients who underwent endoscopic thyroid surgery were as follows: operative time was 105.77 ± 22.58 min, blood loss was 26.72 ± 9.80, blood transfusion was

administered to 5 cases, clinical factors measured were as follows: Albumin (g/dl) level was 3.82 ± 0.34, Phosphorus level (mg/dl) was 3.3 ± 0.5 and Calcium (mg/dl) was 8.57 ± 0.78, hospital stay lasted for 1.55 ± 0.62 days in average, and the admission into intensive care unit included 2 cases, no death occurred, and the amount of post-operative drainage was 88.27 ± 20.56 at all times. With reference to post-operative findings, we hatched complications which detected in our patients, with the rate of complication common on patients undergoing endoscopic thyroid surgery with a total of 8 cases. Furthermore, we derived results of assessments from which pain scores in patients that underwent endoscopic thyroidectomy was 4.02 ± 0.02 at day one and zero after four months, whereas pain scores in patients who had traditional surgery were found to be 4.10 ± 0.05 on day one and 0.30 ± 0.014 after four months. Also, it was possible to determine the quality of life assessments, with the most common characteristics noted in our results being 87.27 ± 9.60 as physical health and 76.82 ± 4.29 as social functioning within the endoscopic thyroidectomy cluster.

A recent research is that almost endoscopic thyroidectomy can be regarded as a minor invasive procedure having fewer advantages over the common thyroid surgery since there are advantages of this type of surgery, such as smaller incisions, less postoperative pain commonly associated with open surgeries, decreased duration of hospital stay for operations than usual practices in addition to less recovery time and thus less visibility of scars on the skin. [21 – 23]

As per some studies, traditional thyroid surgery was removing a segment or the whole thyroid gland through a neck incision, and it is seen as a reliable and efficient method. This approach has been practiced for a long period of time and has shown its efficacy in isolating and eliminating thyroid tissue affected by disease [24,25]. In a French study [27], they had discovered innovative techniques for performing minimal injury thyroidectomy, including endoscopic thyroidectomy, which have been shown to enhance clinical outcomes.

Another research published in Germany showed that compared to traditional surgery, thyroidectomy has lower tissue tension as well as lesser chances of complications like hypothyroidism or other associated tissue damage, hence more patient satisfaction; however, the decision between endocrine and conventional operations depended on many considerations that included nodule size, surgeon's experience in undertaking surgeries at this site and patients' choices. [28 – 30]

5. CONCLUSION

Our study revealed that patients who underwent laparoscopic thyroidectomy received better clinical outcomes. This demonstrates that the best surgical procedure for patients with a thyroid condition is laparoscopic surgery. Therefore, surgery remains the most effective method of treating this condition by improving the quality of life for patients through minimal complications, low levels of pain, and high chances of recovery.

6. REFERENCES

1. Piromchai, P. Early outcomes of the postauricular-submental approach endoscopic thyroidectomy. J. Med. Assoc. Thai. 2017, 100, 202.
2. Piromchai, P. Endoscopic parathyroidectomy using a three-port submental approach. Langenbeck's Arch. Surg. 2020, 405, 241–246.
3. Piromchai, P.; Wijakkanalan, P.; Teeramatwanich, W.; Kasemsiri, P.; Laohasiriwong, S.; Ratanaanekchai, T. Postauricular–submental approach endoscopic thyroidectomy. Clin. Otolaryngol. 2018, 43, 767–769.
4. Chen, Y.; Chomsky-Higgins, K.; Nwaogu, I.; Seib, C.D.; Gosnell, J.E.; Shen, W.T.; Duh, Q.Y.; Suh, I. Hidden in Plain Sight: Transoral and Submental Thyroidectomy as a Compelling Alternative to "Scarless" Thyroidectomy. J. Laparoendosc. Adv. Surg. Tech A 2018, 28, 1374–1377.

5. Suh, I.; Viscardi, C.; Chen, Y.; Nwaogu, I.; Sukpanich, R.; Gosnell, J.E.; Shen, W.T.; Seib, C.D.; Duh, Q.Y. Technical Innovation in Transoral Endoscopic Endocrine Surgery: A Modified "Scarless" Technique. J. Surg. Res. 2019, 243, 123–129.
6. Harness, J.K.; Fung, L.; Thompson, N.W.; Burney, R.E.; McLeod, M.K. Total thyroidectomy: Complications and technique. World J. Surg. 1986, 10, 781–785.
7. Ware, J.E., Jr. SF-36 Health Survey. In The Use of Psychological Testing for Treatment Planning and Outcomes Assessment; Maruish, M.E., Ed.; Lawrence Erlbaum Associates Publishers: New York, NJ, USA, 1999; pp. 1227–1246.
8. Ware, J.E., Jr. SF-36 health survey update. Spine 2000, 25, 3130–3139.
9. Hawker, G.A.; Mian, S.; Kendzerska, T.; French, M. Measures of adult pain: Visual analog scale for pain (vas pain), a numeric rating scale for pain (nrs pain), McGill pain questionnaire (mpq), short-form McGill pain questionnaire (sf-mpg), chronic pain grade scale (cpgs), short form-36 bodily pain scale (sf-36 bps), and measure of intermittent and constant osteoarthritis pain (icoap). Arthritis Care Res. 2011, 63, S240–S252.
10. Kasemsiri, P.; Trakulkajornsak, S.; Bamroong, P.; Mahawerawat, K.; Piromchai, P.; Ratanaanekchai, T. Comparison of quality of life between patients undergoing trans-oral endoscopic thyroid surgery and conventional open surgery. BMC Surg. 2020, 20, 18.
11. Fu, Y.; Wu, M.; Fu, J.; Lin, S.; Song, Z.; Chen, J.; Yan, W.; Kuang, P.; Lin, F.; Luo, Y.; et al. TransOral Endoscopic Thyroidectomy via Submental and Vestibular Approach: A Preliminary Report. Front. Surg. 2020, 7, 591522.
12. Perigli, G.; Cianchi, F.; Badii, B.; Staderini, F.; Skalamera, I.; Cupellini, C.; Nelli, T.; Foppa, C. An easier option for "invisible scar" thyroidectomy: Hybrid-transoral endoscopic thyroidectomy submental access (H-TOETSA)-experience on twenty-two consecutive patients. Surg. Endosc. 2021, 35, 1796–1800.
13. Keurentjes, J.C.; Van Tol, F.R.; Fiocco, M.; Schoones, J.W.; Nelissen, R.G. Minimal clinically important differences in health-related quality of life after total hip or knee replacement: A systematic review. Bone Jt. Res. 2012, 1, 71–77.
14. Doganay Erdogan, B.; Leung, Y.Y.; Pohl, C.; Tennant, A.; Conaghan, P.G. Minimal Clinically Important Difference as Applied in Rheumatology: An OMERACT Rasch Working Group Systematic Review and Critique. J. Rheumatol. 2016, 43, 194–202.
15. Hedman, C.; Djarv, T.; Strang, P.; Lundgren, C.I. Effect of Thyroid-Related Symptoms on Long-Term Quality of Life in Patients with Differentiated Thyroid Carcinoma: A Population-Based Study in Sweden. Thyroid 2017, 27, 1034–1042.
16. Nygaard, B.; Bastholt, L.; Bennedbaek, F.N.; Klausen, T.W.; Bentzen, J. A placebo-controlled, blinded, and randomised study on the effects of recombinant human thyrotropin on quality of life in the treatment of thyroid cancer. Eur. Thyroid J. 2013, 2, 195–202.
17. Hedman, C.; Djarv, T.; Strang, P.; Lundgren, C.I. Fear of Recurrence and View of Life Affect Health-Related Quality of Life in Patients with Differentiated Thyroid Carcinoma: A Prospective Swedish Population-Based Study. Thyroid 2018, 28, 1609–1617.
18. Liang J, Zhan L, Xuan M, Zhao Q, Chen L, Yan J, et al.. Thyroidectomy for thyroid cancer via trans areola single-site endoscopic approach: results of a case-match study with large-scale population. *Surg Endoscopy* (2022) 36:1394–406.
19. Zhang Z, Xia F, Li X. Ambulatory endoscopic thyroidectomy via a chest-breast approach has an acceptable safety profile for thyroid nodules. *Front Endocrinol (Lausanne)* (2021) 12:795627.

20. Qu R, Li J, Yang J, Sun P, Gong J, Wang C. Treatment of differentiated thyroid cancer: can endoscopic thyroidectomy via a chest-breast approach achieve similar therapeutic effects as open surgery? *Surg Endoscopy* (2018) 32:4749–56.

21. Amin MB, Greene FL, Edge SB, Compton CC, Gershenwald JE, Brookland RK, et al. The Eighth Edition AJCC Cancer Staging Manual: Continuing to build a bridge from a population-based to a more "personalized" approach to cancer staging. *Ca: A Cancer J Clin* (2017) 67:93–9.

22. Austin PC. An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behav Res* (2011) 46:399–424.

23. Sturmer T, Rothman KJ, Avorn J, Glynn RJ. Treatment effects in the presence of unmeasured confounding: dealing with observations in the tails of the propensity score distribution–A simulation study. *Am J Epidemiol* (2010) 172:843–54.

24. Chinese Medical Association. Thyroid management guidelines on thyroid nodules and differentiated thyroid cancer. *Chin J Endoscinol Metab* (2012) 10:779–97.

25. Wang C, Feng Z, Li J, Yang W, Zhai H, Choi N, et al.. Endoscopic thyroidectomy via areola approach: summary of 1,250 cases in a single institution. *Surg Endoscopy* (2015) 29:192–201.

26. Zhang D, Wang C, Wang T, Du R, Li K, Yang M, et al.. Clinical experience of use of percutaneous continuous nerve monitoring in robotic bilateral axilla-breast thyroid surgery. *Front Endocrinol (Lausanne)* (2021) 12:817026.

27. Kim SH, Ahn JH, Yoon HJ, Kim JH, Hwang YM, Choi YS, et al. Effect of a polyglycolic acid mesh sheet (Neoveil™) in thyroid cancer surgery: A prospective randomized controlled trial. *Cancers (Basel)* (2022) 14:3901.

28. Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, et al.. American thyroid association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer: the American thyroid association guidelines task force on thyroid nodules and differentiated thyroid cancer. *Thyroid* (2015) 26:1–133.

29. Müller B, Becker KL, Schächinger H, Rickenbacher PR, Huber PR, Zimmerli W. Ritz R Data from Calcitonin precursors are reliable markers of sepsis in a medical intensive care unit. *Critical care medicine* (2000) 28:977–83.

30. Yang C, Wang Y. A novel surgery technique: non-visual dissection for establishing the operating space during total endoscopic thyroidectomy. *Surg Endoscopy* (2017) 31:5451–56.