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REVIEW ARTICLE

# Incidence of Vocal Cords Palsy and Hypocalcaemia in Reoperative Thyroid Surgery

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## Abstract:

background: Subtotal thyroidectomy is associated with fewer complications but also with an increased risk of recurrent goiter in the future. It was the procedure of choice for patients with goiter until the 1980s.

Patients and methods: 128 patients with recurrent goiter, in whom vocal cord palsy and hypocalcemia were excluded preoperatively by examination and biochemical estimation of serum calcium, were operated upon in our institution from January 2016 to April 2024 and examined postoperatively for vocal cord palsy and hypocalcemia, and data were reported.

Results: No vocal cord palsy reported. Hypocalcemia occurred in 1 case (0.7%).

Conclusion: In experienced hands, revision thyroid surgery is associated with a very low incidence of vocal cord palsy and hypocalcemia, and patients with recurrent thyroid disease should not be denied reoperation because of fears of these complications.

**Keywords:**Revision, Re-operative, Thyroid Surgery, Complications

## Introduction

A recurrent goiter is the regrowth of thyroid tissues after thyroidectomy. This may occur after surgery for benign disease or malignancy of the thyroid. While recurrence after surgery for benign disease should be preventable, recurrence after malignant disease depends on many factors. Recurrences of multinodular goiter (MNG) account for up to 12% of all thyroid operations. 1. Surgery for recurrent goiter is associated with a higher complication rate.

Controversy has surrounded thyroid surgery since its inception. Albucasis (El Zahrawi) is believed to have performed the first thyroidectomy in 975 AD. 2.3 The first credible reports of thyroid surgery came from the School of Salerno in the 13th century, and by 1850 only 14 successful partial or total thyroidectomies had been reported across Europe—results were appalling. 2.3 In 1850, the French Academy of Medicine banned thyroidectomy due to the fear of complications and uncertainty in histological classification. Subtotal thyroidectomy (STT) was the main operation for goiters until the 1980s. The main issue with a subtotal surgery is recurrence. 4–8 One of the primary reasons why subtotal thyroidectomy fails can be attributed to the fact that STT does not treat the underlying generalized disease process adequately. Multinodular goiter and toxicity are the main indications for thyroidectomy in benign disease. For both of these conditions, subtotal thyroidectomy is not a curative procedure. Therefore, it is reasonable to anticipate a recurrence following surgery. The practice of offering STT continued for over 100 years due to the fear of complications alluded to above. Multinodular goiter is believed to result primarily from two factors. The first factor is genetic heterogeneity of follicular cells with regard to function (i.e., thyroid hormone synthesis) and growth. Genetic analysis has identified two chromosomal regions (MNG-1 and Xp 22) in multinodular goiter. 9 The second factor is the acquisition of new qualities that were not present in mother cells and become inheritable during further replication. The pathological process of MNG disease affects the whole gland. If you remove part of an MNG, the remaining portion is likely to grow again.

## 2.Patients and Methods

2.1. Description of the Study

This is a single-center observational study at Al Dewania General Teaching Hospital—Iraq, Al Dewania Governorate. A total of 128 cases of structurally persistent or recurrent thyroid resection procedures were done over the period from January 2016 to April 2024 by one surgeon who is double Arab and Iraqi Board qualified in general surgery with 20 years of experience in thyroid surgery.

2.2 Inclusion and Exclusion Criteria

144 patients visited or transferred to our thyroid clinic seeking medical care and surgical opinions about their recurrent goiter, were assessed by the surgical team, and consented to the surgery and the study. Data for each patient were collected and reported in a predesigned form, including patient age, gender, date of first operation, number of previous thyroid surger-

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ies, indications of revision surgery, anatomy of recurrence, and TIRAD classification, which was estimated by neck ultrasound.

All patients were examined by indirect laryngoscopy to assess the vocal cords; those who proved to have vocal cord palsy were excluded from the study. All patients were examined for features of hypocalcemia, and serum calcium was estimated, and those who tested low were excluded from the study.

2.3. Procedure

The procedure was done via the anterior approach. The scar was revised, and superior and inferior subplatysmal flaps were elevated using Ligasure technology with a curved jaw. A disposable open handle was utilized in achieving excellent hemostasis and bilateral carotid Sheaths were localized, and bilateral paratracheal spaces and tracheoesophageal grooves were entered, and complete exploration of regions of superior and inferior pedicles bilaterally was done. Frequent saline wash of the field aids in identification of vital structures, including the RLN and parathyroid glands. Leveling up to the suprahyoid spaces bilaterally was considered the superior margin of the procedure, and bilateral carotid sheaths were considered the lateral Margins of exploration, retroclavicular and retrosternal regions were explored routinely and considered the inferior margin of the procedure. Negative pressure drain was used in all cases. The wound was closed in layers.

2.4. Postoperative Assessment and Results Obtaining.

We searched for vocal cord palsy in the immediate postoperative period after endotracheal extubation by the anesthetist via direct laryngoscopy. In the early postoperative period, we frequently examined patients clinically for stridor and voice changes. Hypocalcemia was assessed clinically and biochemically by serum calcium estimations until day 10 postoperatively. Data were reported accordingly.

This study was conducted in accordance with the local legislation and institutional requirements. We obtained written informed consent for participation from all patients.

## 3. Results

3.1. Number: 144 patients who had previous thyroid surgery in our institutions and in other institutions visited our clinic and searched for medical care regarding their neck swellings or follow-up of their thyroid disease status. 128 patients were enrolled in our study. 14 patients were excluded due to asymptomatic unilateral vocal cord palsy (3 cases) and hypocalcemia (11 cases).

3.2 Gender: 78 (60.9%) were female and 50 (39.1%) were male.

Table 1: gender distribution.

| Gender | No. | Percent |
|---|---|---|
| Male | 50 | 39.1% |
| Female | 78 | 60.9% |
| Total | 128 | |

3.3 Age: Age ranged from 24 years old to 67.

3.4 Date of first thyroid surgery: ranging from 3 years to 25 years.

3.5 Number of previous thyroid surgeries: 118 (92.1%) had one surgery, 9 (7.03%) had two, and 1 (0.78%) case had three.

Table 2: previous surgeries

| Number of previous Surgeries | No. | Percent |
|---|---|---|
| One | 118 | 92.2% |
| Two | 9 | 7.02% |
| Three | 1 | 0.78% |

3.6. Indications of surgery were cosmetic concerns and patient wishes (5 cases, 3.9%) and suspicious thyroid nodules (114 cases, 89.06%). And retrosternal and tracheal compression (9 cases, 7.03%)

Table 3: indication for surgery.

| Indications of surgery | No. | Percent |
|---|---|---|
| Cosmetic | 5 | 3.9% |
| Suspicious Thyroid Nodules | 114 | 89.08 |
| Retrosternal and tracheal compression | 9 | 7.02% |
| Total | 128 | |

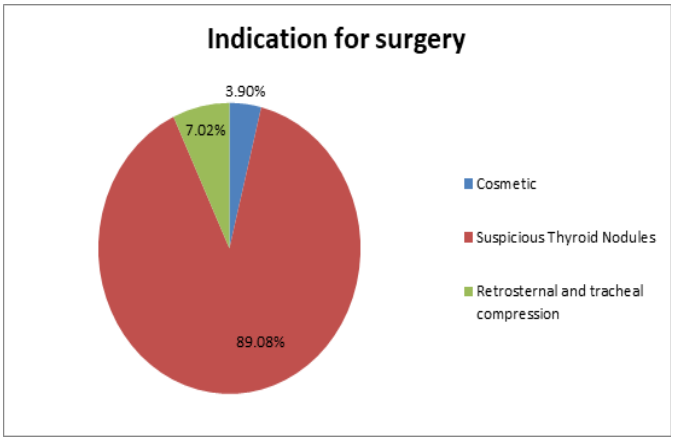


Figure 1: indication for surgery.

3.7. TIRAD Classification: Class I: 11 cases (8.5%), Class II: 49 cases (38.2%) Class III: 38 cases (29.6%) Class IV: 40 cases (31.2%) Class V: 3 cases (2.3%). Note: Different classes in the same patients of multinodular goiter were diagnosed.

Table 4: Reveal TIRAD Classification.

| TIRAD Classification | No. | Percent |
|---|---|---|
| Class I | 11 | 8.5% |
| Class II | 49 | 38.2% |
| Class III | 38 | 29.6% |
| Class IV | 40 | 31.2% |
| Class V | 3 | 2.3% |

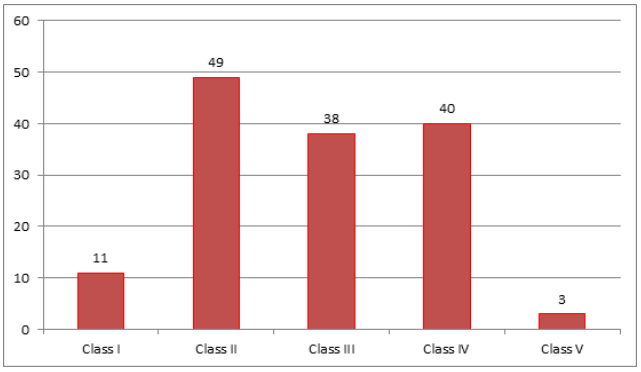


Figure 2: show TIRAD Classification

3.8. Anatomy of recurrence: 7 regions were noticed to be sites of recurrence, and these are Right superior pedicle: 33 (25.7%) Left superior pedicle: 92 (71.8%) Left ZuckerKandle region: 91 (71%) Right inferior pedicle: 37 (28.9%) right ZuckerKandle region: 128 (100%) Left inferior pedicle: 9 (7.03%) Retrosternal/ Retroclavicular: 9 (7.03%) 101 patients were having combined recurrence in more than one region. No cases of vocal cord palsy were reported (0%). One case of hypocalcemia was reported (0.7%).

Table 5: show anatomy of recurrence.

| Anatomy of recurrence | No. | Percent |
|---|---|---|
| Right Superior pedicle | 33 | 25.7% |
| Left superior Pedicle | 92 | 71.8% |
| Left ZuckerKandle region | 91 | 71% |
| Right Inferior pedicle | 37 | 28.9% |
| ZuckerKandle region | 128 | 100% |
| left inferior pedicle | 9 | 7.02% |
| Retrosternal/Retroclaviculer | 9 | 7.02% |

## Discussion:

Over the years, revision thyroid surgery was associated with increased risk of complications regarding vocal cord palsy and hypocalcemia. (R) The incidence of RLN injury and hypoparathyroidism in the revision thyroid surgery was reported to be 1.5-5% and 0-5.6%, respectively. 10-23 Revision thyroid surgery for recurrent goiter or thyroid nodule disease is considered to be a very challenging procedure for the surgeons. That's because they may encounter significant difficulty in the identification and preservation of vital structures, including the RLN and parathyroid glands, because of scarring and distortion of anatomy caused by prior surgery. 15-24 The crucial part of understanding the revision surgery is knowing that the carotid sheaths, following the prior surgery, medialize and narrow the paratracheal spaces and tracheoesophageal grooves bilaterally, where the RLN may be buried inside. Fig. 1, Fig. 2. With careful, meticulous dissection and good hemostasis achieved with Ligasure and washout of tiny dissection debris by saline, the tracheoesophageal groove can be opened. Once it is opened, the identification of the RLN and parathyroid glands is achieved, or at least the course of the nerve is recognized and can be avoided while resecting the recurrent thyroid tissue. Additional care was given to the preservation of parathyroid glands and their blood supply by minimizing dissection far from the recurrent tissue, as its removal may result in cutting off the blood supply of the glands in the fields from the superior and inferior thyroid arteries. It's worth mentioning that frequent saline washes also aid in the recognition of the parathyroid glands by showing their standard color, which is typically light brown to reddish tan. 25. Figs. 3 and 4. In our study, we reported an incidence of vocal cord palsy of 0% and hypocalcemia of 0.7%. This study demonstrates that skilled practitioners can perform revision thyroid surgery with remarkably low morbidity. We achieved a complication rate lower than most of the studies published in the last 20 years in different parts of the world. 16-24 The latest two studies in 2023 and 2024 showed an incidence of hypocalcemia and vocal cord palsy of 4% and 5%. 26, 27 We believe we achieved less incidence of such complications due to our meticulous approach in dissection and good hemostasis that aids greatly in improved surgical vision and perception of anatomy.

## Conclusion:

In experienced hands, revision thyroid surgery is associated with a very low incidence of vocal cord palsy and hypocalcemia, and patients with recurrent thyroid disease should not be denied reoperation because of fears of these complications. The limitations of this study include that it was conducted at a single center by one surgical team. Most of the patients were operated on in the initial surgery in some other institutions and a long time ago, and it wasn't possible to obtain complete, exact information about that operation. We studied only two major complications, which are vocal cord palsy and hypocalcemia. Other complications like seroma, anesthetic complications, and complications associated with patient comorbidities like DM or CVS disease were not included in this study.

## References

1. Moalem J, Suh I, et al. Treatment and prevention of recurrence of multinodular goiter: an evidence-based review of the literature. World J Surg July 2008:32(7):1301–1312. DOI: 10.1007/s00268-008- 9477-0.

2. Ignjatovic M. Overview of the history of thyroid surgery. Acta Chir Iugosl 2003;50:9–36.

3. Sarkar S, Banerjee S, et al. A review on the history of 'thyroid surgery'. Indian J Surg 2016 Feb;78(1):32–36. DOI: 10.1007/ s12262-015-1317-5.

4. Yoldas T, Makay O, et al. Should subtotal thyroidectomy be abandoned in multinodular goiter patients from endemic regions requiring surgery? Int Surg 2015 Jan;100(1):9–14. DOI: 10.9738/ INTSURG-D-13-00275.1.

5. Röjdmark J, Järhult J. High long term recurrence rate after subtotal thyroidectomy for nodular goitre. Eur J Surg 1995 Oct;161(10): 725–727. 6. Pappalardo G, Guadalaxara A, et al. Total compared with subtotal thyroidectomy in benign nodular disease: personal series and review of published reports. Eur J Surg 1998 Jul;164(7):501–506. DOI: 10.1080/110241598750005840.

7. Cappellani A, Di Vita M, et al. Ann Ital Chir 2008;79:247–254.

8. Cirocchi R, Trastulli S, et al. Cochrane Database Syst Rev 2015

Aug 7: CD010370. DOI: 10.1002/14651858.CD010370.pub2.

9. Medeiros-Neto G, Multinodular goiter in thyroid disease manager is produced and edited Leslie J De Groot. Last updated: September 26, 2016.

10. S Calabro 1, L J Auguste, J N Attie Morbidity of completion thyroidectomy for initially misdiagnosed thyroid carcinoma , Head Neck Surg1988 Mar-Apr;10(4):235-8 doi:10.1002/j.1930-2398.1988.tb00005.x.

11. H R Tollefsen, J P Shah, A G Huvos Papillary carcinoma of the thyroid. Recurrence in the thyroid gland after initial surgical treatment Am J Surg. 1972 Oct;124(4):468-72. doi: 10.1016/0002-9610(72)90068-2.

12. Janice L. Pasieka M.D., The incidence of bilateral well-differentiated thyroid cancer found at completion thyroidectomy July 1992 Volume 16, pages 711–716, (1992).

13.Pasieka JL (2003) Reoperative thyroid surgery. In: Randolph GW (ed) Surgery of the thyroid and the parathyroid glands. Elsevier, Philadelphia, pp 385–391

14. Menegaux F, Ruprecht T, Chigot JP (1993) The surgical treatment of Graves' disease. Surg Gynecol Obstet 176:277–282 PubMed CAS

15.Miccoli P, Vitti P, Rago T, Iacconi P, Bartalena L, Bogazzi F, Fiore E, Valeriano R, Chiovato L, Rocchi R, Pinchera A (1996) Surgical treatment of Graves' disease: subtotal or total thyroidectomy? Surgery 120:1020–1025 Article PubMed CAS

16. Tan MP, Agarwal G, Reeve TS, Barraclough BH, Delbridge LW (2002) Impact of timing on completion thyroidectomy for thyroid cancer. Br J Surg 89:802–804

17.Cooper DS, Doherty GM, Haugen BR, Kloos RT, Lee SL, Mandel SJ, Mazzaferri EL, McIver B, Sherman SI, Tuttle RM (2006) Management guidelines for patients with thyroid nodules and differentiated thyroid cancer (The American Thyroid Association Guidelines Taskforce). Thyroid 16(2):1–34

18. Seiler CA, Glaser C, Wagner HE. Thyroid gland surgery in an endemic region. World J Surg. 1996;20:593–6.

19. Snook KL, Stalberg PL, Sidhu SB, Sywak MS, Edhouse P, Delbridge L. Recurrence after total thyroidectomy for benign multinodular goiter. World J Surg. 2007;31:593–8.

20. Menegaux F, Turpin G, Dahman M, Leenhardt L, Chadarevian R, Aurengo A, et al. Secondary thyroidectomy in patients with prior thyroid surgery for benign disease: a study of 203 cases. Surgery. 1999;125:479–83.

20.Levin KE, Clark AH, Duh QY, Demeure M, Siperstein AE, Clark OH. Reoperative thyroid surgery. Surgery. 1992;111:604–9.

21. Fabio Medas Complications after reoperative thyroid surgery: retrospective evaluation of 152 consecutive cases2019 Dec;71(4):705-710. doi: 10.1007/s13304-019-00647.

22. D Pironi Prevention of complications during reoperative thyroid surgery Clin Ter. 2014;165(4):e285-90.doi: 10.7417/CT.2014.1744.

23. D Pironi Reoperative thyroid surgery: personal experience and review of the literature G Chir.2008 Oct;29(10):407-12.

24. M R Diaconescu Reoperations of the thyroid gland Chirurgia (Bucur). 2007 May-Jun;102(3):297-302.

25. Parathyroid Gland - an overview | ScienceDirect Topics ScienceDirect.com https://www.sciencedirect.com › medicine-and-dentistr26.

26. SVS Deo , European Journal of Surgical Oncology Volume 49, Issue 10, October 2023, 107042

27. Sandeep Vijay Reoperative Thyroid Bed Surgery: An Evaluation of Complications and Outcomes VOL 9 NO 1 (2024)DOI 10.31557/APJCC.2024.9.1.29-33