**Journal of Cardiovascular Disease Research**

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

# Preventing injury to nerves during whole lobe or thyroidectomy procedures

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**Abstract:**

The purpose of this research was to identify the most common postoperative problems, with a focus on nerve injury, after a total thyroidectomy or complete lobectomy. All patients diagnosed with thyroid diseases within the last 3 years (i.e., from 2020 to June 2023) were included in the study to compare the outcomes of total thyroidectomy and total lobectomy in terms of complications, such as nerve damage. Patients diagnosed with thyroid problems, including thyroid cancer, had a series of 63 successive procedures, some of which included central neck dissection and others not. People who had thyroid cancer, recurrent laryngeal nerve palsy as a result of a prior thyroid operation, or other conditions that alter voice were the only ones we left out. The supervising physician oversaw the retrieval of clinical data from the patients' hospital records. The procedures that were carried out included a full thyroidectomy, a unilateral total lobectomy, a revision thyroidectomy to remove remnant or recurrent thyroid tissue, and a completion thyroidectomy to remove the contralateral lobe from patients who had previously had a thyroid lobectomy alone. A top surgeon oversaw all procedures. Thyroid problems, including thyroid cancer, were treated with 63 successive procedures, some of which included central neck dissection and others not. Only patients who had thyroid cancer or recurrent laryngeal nerve palsy as a result of a prior thyroid operation were considered for exclusion . The average age of the participants in the research was 43.24 ± 4.45 years, and there were 59 females (93.7%) and 4 men (6.3%). Four individuals, or 6.3% of the total, had a minor consequence, such as an infection.

In conclusion, preventing nerve damage requires meticulous hemostasis and a careful approach. It is advised to separate all the blood vessels that are flush with the thyroid capsule on both the outside and inside of the gland during surgery. The external branch of the superior laryngeal nerves may be preserved by ligating the anterior and posterior branches of the superior thyroid artery separately.

**Keywords: Thyroid, thyroidectomy, nerve, Surgery.**

## Introduction:

Surgery to remove the thyroid gland in its whole or in part is known as a thyroidectomy. It's a popular procedure, especially in nations where iodine shortage is widespread.(2-5)Total thyroidectomy is quickly replacing other less desired surgical options as the

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

gold standard for treating multinodular goitre. When there is a significant chance of recurrence and both thyroid lobes are affected, it seems that a total thyroidectomy is the best course of action (6). The main goals of thyroidectomy are to preserve the parathyroid glands, achieve precise haemostasis, preserve the recurrent laryngeal nerves, and provide great cosmesis.(7) Factors that increase the likelihood of thyroid surgery complications include extensive resection, the need for a second operation to finish the procedure, the number of patients per surgeon, and the physician's level of expertise. A critical component in reducing the occurrence of problems is meticulous dissection. Hypoparathyroidism and recurrent laryngeal nerve damage are the primary postoperative consequences of thyroidectomy (see point (8)).(9) Vocal weakness (hoarseness) or loss (aphonia) and respiratory tract issues may occur from injury to the recurrent laryngeal nerves.(10) The right recurrent laryngeal nerve's proximity to the right inferior thyroid artery bifurcation makes it more vulnerable to injury during thyroid surgery; the nerve can pass in front of, behind, or between the branches of the artery.(11).

An important source of medicolegal concerns for surgeons is the possibility of irreversible nerve injury in 0.33 to 3% of thyroid surgery and temporary harm in 3 to 8% of procedures.(12). Singing and voice projection issues may result from injuries to the external branch of the superior laryngeal nerve. Be cautious while ligating the arteries at the vascular pedicle of the superior poles of the thyroid lobe, since it is close to the external branch of the superior laryngeal nerve. This is to ensure that the nerve is not injured.(13).

Consequently, the purpose of this research was to identify the most common postoperative problems, with a focus on nerve injury, after a total thyroidectomy or complete lobectomy.

**Materials and Methods:**

All patients diagnosed with thyroid diseases within the last 3 years (i.e., from 2020 to June 2023) were included in the study to compare the outcomes of total thyroidectomy and total lobectomy in terms of complications, such as nerve damage.

Patients diagnosed with thyroid problems, including thyroid cancer, had a series of 63 successive procedures, some of which included central neck dissection and others not. People who had thyroid cancer, recurrent laryngeal nerve palsy as a result of a prior thyroid operation, or other conditions that alter voice were the only ones we left out.

The supervising physician oversaw the retrieval of clinical data from the patients' hospital records. The procedures that were carried out included a full thyroidectomy, a unilateral total lobectomy, a revision thyroidectomy to remove remnant or recurrent thyroid tissue, and a completion thyroidectomy to remove the contralateral lobe from patients who had previously had a thyroid lobectomy alone. A top surgeon oversaw all procedures.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

Statistical analysis was done by using SPSS.

**Results:**

Thyroid problems, including thyroid cancer, were treated with 63 successive procedures, some of which included central neck dissection and others not. Only patients who had thyroid cancer or recurrent laryngeal nerve palsy as a result of a prior thyroid operation were considered for exclusion .

The average age of the participants in the research was 43.24 ± 4.45 years, and there were 59 females (93.7%) and 4 men (6.3%). Table 1 shows the distribution of patients based on demographic variables and their return to work.

**Table 1:** Main attribute of the participants.

| **Characteristics** | **No.** | **(%)** |
|---|---|---|
| **Gender** | | |
| Male | 4 | (6.3) |
| Female | 59 | (93.7) |
| **Address** | | |
| Inside city | 30 | (47.6) |
| Outside city | 33 | (52.4) |
| **Type of procedure** | | |
| Total thyroidectomy | 35 | (55.6) |
| Total lobectomy | 28 | (44.4) |
| **Age** | | |
| **Mean ± SD** | 43.24 ± 4.45 | |
| **Duration of the disease/ months** | | |
| **Mean ± SD** | 20.14 ± 2.51 | |

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

Four individuals, or 6.3% of the total, had a minor consequence, such as an infection. Table 2 shows the distribution of problems.

**Table 2:** Patient satisfaction and the distribution of thyroidectomy recurrence.patients based on issues that may arise after surgery,.

| Complications | No. | (%) |
|---|---|---|
| Infecti on Yes | 04 | (6.3) |
| No | 59 | (93.7) |
| Voice change Yes | 0 | (0.0) |
| No | 63 | (100.0) |
| Neurological Symptoms Yes | 0 | (0.0) |
| No | 63 | (100.0) |
| Serum calcium before operation Normal | 62 | (98.4) |
| abnormal | 1 | (1.6) |
| Serum calcium after operation Normal | 63 | (100) |
| abnormal | 0 | (0.0) |

**Discussion:**

We found no cases of persistent vocal cord palsy in our research, and patients who had temporary changes to their voice immediately after surgery returned to full function within a year. Neuropraxic damage to the recurrent laryngeal nerve is thought to be the cause of transitory vocal cord palsy that occurs after thyroid surgery. Stretching, direct trauma during difficult dissection, electrocautery-induced thermal damage, devascularization, postoperative hematoma compressive injury, or any combination of these may cause this. Due to its sticky nature to scar tissue, the RLN may be more vulnerable to stretching and direct impact during revision surgery.(14). Elective central neck dissection for papillary thyroid cancer and the potential increased risk of sequelae compared to complete thyroidectomy alone are topics of heated controversy in the medical literature. There was no discernible rise in the incidence of transitory vocal cord palsy in studies that analysed the effects of central neck dissection. (14-20). Full function and symptom resolution are achieved by the vast majority of individuals with recurrent laryngeal nerve neuropraxia within a few months. Recovery of typical Vocal mobility might take up to two years, according to reports.21 However, the majority of doctors consider vocal cord palsy to be permanent if it lasts more than a year (22-25). When the surgeon notes that the recurrent laryngeal nerve was preserved

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

intraoperatively during a thyroidectomy, but the patient still experiences permanent vocal cord palsy, it could be because the anterior-most branch, which supplies the intrinsic laryngeal muscles with motor control, was injured and went unnoticed.(26). After analysing 7,266 benign goitre procedures carried out at 45 institutions, Thomusch et al. identified two separate risk factors: extensive resection and subsequent goitre. There is a correlation between the surgeon's degree of expertise and the incidence of RLN palsy after thyroid surgery (27- 29). There was no evidence of chronic recurring damage to the superior laryngeal or laryngeal nerves in our investigation. While this does help reduce the likelihood of difficulties, it does not prove that ligating the veins at the periphery is a foolproof procedure. Nerve dysfunction or paralysis may happen even in the most skilled hands and under the most ideal of conditions. In the informed consent process that precedes surgical procedures, all patients are apprised of these dangers.

**Conclusion:**

Preventing nerve damage requires meticulous hemostasis and a careful approach. It is advised to separate all the blood vessels that are flush with the thyroid capsule on both the outside and inside of the gland during surgery. The external branch of the superior laryngeal nerves may be preserved by ligating the anterior and posterior branches of the superior thyroid artery separately.

**References:**

1. Mathur AK, GM Doherty. Thyroidectomy and neck dissection. Current procedures: Surgery In Minter RM and GM Doherty. New York: McGraw-Hill; 2010.
2. Mishra A, Agarwal A, Agarwal G, Mishra SK. Total thyroidectomy for benign thyroid disorders in an endemic region. World J Surg 2001; 25(3):307-10.

3. Bron LP, O'Brien CJ. Total thyroidectomy for clinically benign disease of the thyroid gland. Br J Surg 2004; 91(5):569-74.

4. Bellantone R, Celestino PL, Maurizio B, Mauro B, Carmela DC, Pierfrancesco A, et al. Total thyroidectomy for management of benign thyroid disease: review of 526 cases. World J Surg 2002; 26 (12): 1468-71.

5. Giles Y, Harika B, Tarik T, Serdar Tezelman. The advantage of total thyroidectomy to avoid reoperation for incidental thyroid cancer in multinodular goiter. Archives of Surgery 2004; 139

.82-179 :(2)

6. Szubin L, Kacker A, Kakani R, Komisar A, Blaugrund S. The management of post- thyroidectomy hypocalcemia. Ear Nose Throat J 1996; 75:612-6.

7. Hydman J, Mattsson P. "Collateral reinnervation by the superior laryngeal nerve after recurrent laryngeal nerve injury." Muscle Nerve 2008; 38(4): 1280-9.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

8. Pattou F, Frederic C, Sylvain F, Bruno C, Marc D, Jean-Louis W, et al. Hypocalcemia following thyroid surgery: incidence and prediction of outcome. World J Surg 1998; 22:718-24.

9. Zambudio AR, Rodríguez J, Riquelme J, Soria T, Canteras M, Parrilla P. Prospective study of postoperative complications after total thyroidectomy. Thyroid Research 2012; 5(15):4-5.

10. Moore KL, Arthur FD, Anne MR. Clinically oriented anatomy. Lippincott Williams & Wilkins; 2013.

11. Bergenfelz A, Jansson S, Kristoffersson A, Mårtensson H, Reihnér E, Wallin G, et al. Complications to thyroid surgery. Results as reported in a database from a multicenter audit comprising 3,660 patients. Langenbeck Arch Surg 2008; 393:667-73.

12. Bhattacharyya N, Fried M. Assessment of the morbidity and complications of total thyroidectomy. Arch Otolaryngol Head Neck Surg 2002; 128:389-92.

13. Hayward N J, Simon G, Meei Y, William RJ, Jonathan S. "A Review Of Recurrent Laryngeal Nerve Injury In Thyroid surgery. ANZ Journal of Surgery 2013; 83(1–2):15-21.

14. Thomusch O, Machens A, Sekulla C, Ukkat J, Lippert H, Gastinger I, et al. Multivariate analysis of risk factors for postoperative complications in benign goiter surgery: prospective multicenter study in Germany. World J Surg 2000; 24 (11):1335-41.

15. Wingert DJ, Friesen SR, Iliopoulos JI, Pierce GE, Thomas JH, Hermreck AS. Post-thyroidectomy Hypocalcemia. Am J Surg 1986; 152:608-10.

16. Reyes H, Wright J. Prevention of hypocalcemia in children due to parathyroid infarction after thy- roidectomy. Sur Gynecol Obstet 1979; 148:76-8.

17. Duh Q, Sancho J, Clark O. Parathyroid localization: clinical review. Acta Chir Scand 1987; 153:241-54.

18. Gardner E, Gray D, O'rahilly R. Anatomia. 4th ed. Rio de Janeiro: Guanabara; 1978. PP. 668-704.

19. Chan WF, Lang BH, Lo CY. The role of intraoperative neuromonitoring of recurrent laryngeal nerve during thyroidectomy: a comparative study on 1000 nerves at risk. Surgery 2006; 140(6):866-72.

20. White ML, Gauger PG, Doherty GM. Central Lymph Node Dissection In Differentiated Thyroid Cancer. World J Surg 2007; 31(5):895-904.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 12, 2023

21. Zuniga S, Sanabria A. Prophylactic central neck dissection in stage N0 papillary thyroid carcinoma. Arch Otolaryngol Head Neck Surg 2009; 135(11):1087-91.

22. Osime U. Incidence of hypo-parathyroidism following thyroidectomy in a prospective study of 108 consecutive African patients. Cent Afr J Med 1992; 38:343-5.

23. Shindo M, Stern A. Total thyroidectomy with and without selective central compartment dissection: a comparison of complication rates. Arch Otolaryngol Head Neck Surg 2010; 136(6):584-7.

24. Henry JF, Gramatica L, Denizot A, Kvachenyuk A, Puccini M, Defechereux T. Morbidity of prophylactic lymph node dissection in the central neck area in patients with papillary thyroid carcinoma. Langenbecks Arch Surg 1998; 383

.9-167:(2)

25. Steurer M, Passler C, Denk DM, Schneider B, Niederle B, Bigenzahn W. Advantages of recurrent laryngeal nerve identification in thyroidectomy and parathyroidectomy and the importance of preoperative and postoperative laryngoscopic examination in more than 1000 nerves at risk. Laryngoscope 2002; 112:(1)

124-33.

26. Rafferty MA, David PG, Lorne R, Sylvia LS, Tony P, Patrick G, et al. Completion thyroidectomy versus total thyroidectomy: is there a difference in complication rates? An analysis of 350 patients. J Am Coll Surg 2007; 205(4):602-7.

27. Snyder SK, Lairmore TC, Hendricks JC, Roberts JW. Elucidating mechanisms of recurrent laryngeal nerve injury during thyroidectomy and parathyroidectomy. J Am Coll Surg 2008; 206: 123-30.

28. Mishra A, Agarwal G, Agarwal A, Mishra SK. Safety and efficacy of total thyroidectomy in hands of endocrine surgery trainees. Am J Surg 1999; 178:377-80.

29. Sosa JA, Bowman HM, Tielsch JM, Powe NR, Gordon TA, Udelsman R. The importance of surgeon experience for clinical and economic outcomes from thyroidectomy. Ann Surg 1998; 228:320-30.