

Study of Complications Following Thyroidectomy for Benign Thyroid Diseases

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Abstract

Background: Surgery of thyroid takes place in the area of complicated anatomy in which a number of vital physiological functions and special senses are controlled.

Method: Fifty patients having cytological evidence of benign thyroid disease were selected for study. Every patient underwent thyroid-stimulating hormone, T_3 , T_4 , analysis, ultrasonography of neck, and aspiration of cytology from suspected area. Computed tomography scan in tracheal compression patients and indirect laryngoscopy was done preoperatively to assess the position of vocal cords. Thyroidectomy was done under general anesthesia and administered by endotracheal intubation. Flexible laryngoscopy was done when indirect laryngoscopy was inconclusive.

Results: Six (12%) were hyperthyroidism, 14 (28%) were retro-sternal extension, 17 (34%) were firm feel, 3 (6%) were tracheal compression, and 10 (20%) were adhesion. Patients with palsy were 1 (2%) anterior relation to inferior thyroid artery, 2 (4%) branching variation of recurrent laryngeal nerve (RLN), 3 (6%) RLN close to anterior entry, vocal cord palsy 2 (4%) in retro-sternal, 2 (4%) in firm gland, and 3 (6%) in adhesion of gland cases.

Conclusion: It is confirmed that meticulous surgical dissection and thorough knowledge of anatomy can minimize the post-surgical complications.

Key words: Vocal cords, Recurrent laryngeal nerve, Inferior thyroid artery strobolaryngoscopy

INTRODUCTION

Thyroid disorders such as thyroid cancer, benign multinodular goiter, and toxic multinodular goiter, and Graves diseases are very common in adults.^[1] Despite advances in conservative management, treatment often involves surgery. Nowadays, thyroidectomy is relatively safe surgical procedure which is associated <5% morbidity.^[2] The surgical procedure itself demands both perfect knowledge of anatomical structures of the neck and a meticulous surgical technique.

However, there remains some debate about the suitability of thyroidectomy in the treatment of some disease because of risk of complications.^[3] Most significant

operative complications include injury to recurrent or superior laryngeal nerve. Devascularization, trauma and inadvertent removal of parathyroid glands will probably result in hypothyroidism and hypocalcemia; however, the cause of post-operative hypocalcaemia is multifactorial and be transient or permanent.^[4] Meticulous identification of anatomy and preservation of blood supply and nerve supply will be a successful surgery but complications are un-avoidable in thyroidectomy due to anatomical variations of neuro-vascular supply to thyroid gland and neighbor structures of the neck.

The aim of this study was to evaluate the various complications and risk factors because study is likely to provide information which could be challenge to clinician and surgeon as well.

MATERIALS AND METHODS

Fifty patients visited to surgery Outpatient department of Malla Reddy Narayana Multispeciality Hospital – Hyderabad Telangana - 500 055 with thyroid disorders were studied.

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Inclusion Criteria

Patients having clinical and cytological evidence of benign, diseases of thyroid were selected for study.

Exclusion Criteria

Patients with malignancy of thyroid, patients having recurrent goiter, cytological suspicion of malignancy, and immune-compromised patients were excluded from study.

Method

Every patient underwent clinical examination followed by thyroid-stimulating hormone, T₃, T₄, and ultrasonography of neck. Aspiration of cytology was done from suspicious area. Computed tomography scan was taken in the tracheal compression indirect laryngoscopy was done for pre-operative assessment of vocal cords.

Thyroidectomy was done under general anesthesia administered by endotracheal intubation. All patients under went direct laryngeal examination after extubation and indirect laryngoscopy in the post-operative period. Flexible strobolaryngoscopy was done when indirect laryngoscopy was inconclusive. The patients who were found to have defective vocal cord movements were reviewed every month for 6 months. Serum corrected calcium was estimated at 6 am on post-operative days and hypocalcemia is defined as serum corrected calcium level <8.5 mg/dl patients with hypocalcemia were followed for 6 months with monthly estimation of serum corrected calcium.

The clinical manifestations considered to influence the rate of complications were the presence of tracheal compression, mediastinal extension, and hyperthyroidism. Intra-operative features included consistency of goiter, adhesions to the perithyroid soft tissue, type of external division of superior laryngeal nerve, course of recurrent laryngeal nerve (RLN), and its relation to inferior thyroid artery (ITA) and the number of parathyroid glands identified and preserved. The consistency of the gland was recorded based on the subjective assessment of the surgeon and graded as firm when goiter was not yielding to pressure and difficult to retract medially.

The duration of study was April-2021–July-2021.

Statistical Analysis

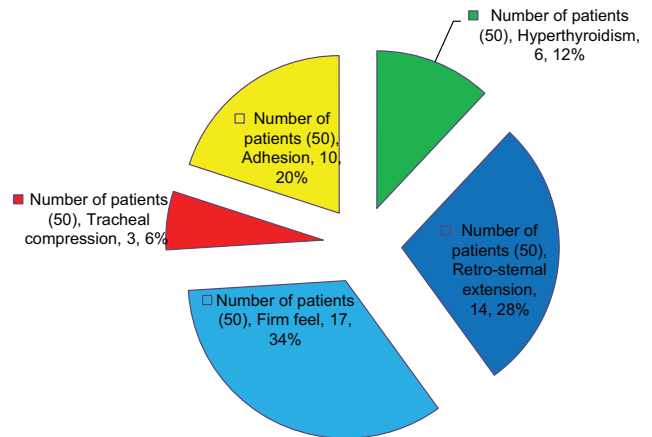
Various complication following benign thyroid and anatomical variations were classified with percentage. The statistical data were analyzed in SPSS software. The ratio of females and males was 2:1

OBSERVATION AND RESULTS

Table 1: Study of various complications – 6 (12%) hyperthyroidism, 14 (28%) retro-sternal extension,

Table 1: Study of various complications in benign thyroid

Sl No	Complications	Number of patients (50)	Percentage (%)
1	Hyperthyroidism	6	12
2	Retro-sternal extension	14	28
3	Firm feel	17	34
4	Tracheal compression	3	6
5	Adhesion	10	20



17 (34%) firm feel of the gland, 3 (6%) tracheal compression, and 10 (20%) adhesion.

Table 2: Study of risk of palsy due to anatomical variations.

- 1) Nine (18%) with anatomical variation of anterior relation of ITA variations with palsy.
- 2) Branching of RLN 11 (22%) was observed out of them 3 (4%) had palsy.
- 3) RLN close to anterior entry in 30 (60%) patients out of them 3 (6%) had palsy.

Table 3: Study of vocal cord palsy observed in 2 (4%) patients having retro-sternal extension, 2 (4%) had vocal cord palsy in firm gland patients, and 3 (6%) had vocal cord palsy in adhesion of gland patients.

DISCUSSION

The present study of complications following thyroidectomy for benign thyroid diseases. The complications were hyperthyroidism 6 (12%) retro-sternal extension, 14 (28%) 17 (34%) firm feel of the gland, 3 (6%) of tracheal compression, and 10 (20%) adhesion [Table 1]. Out of 9 (18%) gland related anteriorly with ITA among them 1 (2%) had palsy, 11 (22%) had branching of RLN/SLN among them, 2 (4%) had palsy, 30 (60%) RLN close to entry among them, and 3 (6%) had palsy [Table 2]. Vocal cord palsy included 2 (4%) in retro-sternal extension, 2 (4%) vocal cord palsy in firm gland, and 3 (6%) vocal cord palsy in adhesion [Table 3]. These

Table 2: Study of risk of palsy due to anatomical variations

Sl No	Anatomical variations	No. of patients with variations	No of patients with palsy
1	Anterior relation to ITA	9 (18%)	1 (2%)
2	Branching of RLN	11 (22%)	2 (4%)
3	Close to anterior entry	30 (60%)	3 (6%)

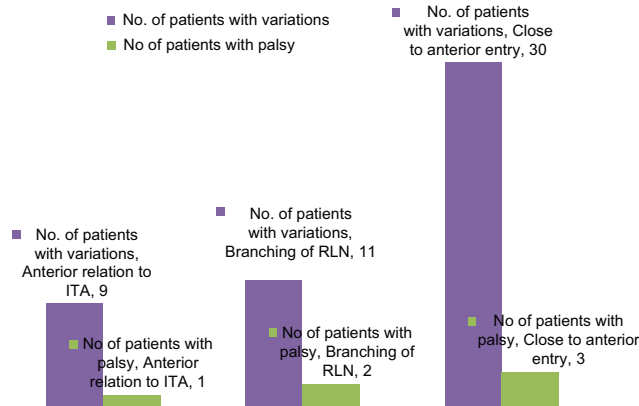
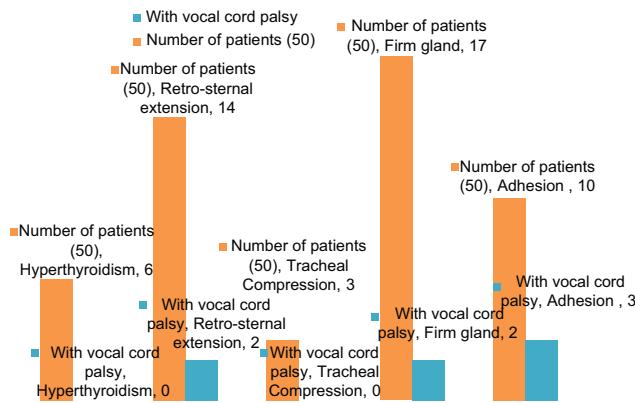


Table 3: Study of vocal cord palsy in different clinical manifestations

Sl No	Clinical Manifestation	Number of patients (50)	With vocal cord palsy
1	Hyperthyroidism	6 (12%)	--
2	Retro-sternal extension	14 (28%)	2 (4%)
3	Tracheal Compression	3 (6%)	--
4	Firm gland	17 (34%)	2 (4%)
5	Adhesion	10 (20%)	3 (6%)



findings are more or less in agreement with the previous studies.^[5-7]

Most common post-surgical complication includes hypocalcaemia following total thyroidectomy. Complications can be life threatening if not diagnosed and treated properly.^[8]

Retro-sternal extension increases difficulty in thyroidectomy and may result in hypocalcaemia. The patients with thyroiditis had hypocalcaemia. This could be due to presence of adhesions. Majority had Graves’s disease (50%), colloid goiter (35%), and edema (8.3%). Although majority of the cases are temporary and correct themselves over time, most of them still need calcium supplementation to prevent or treat the symptoms associated with hypocalcaemia (reported range from 1 to 4% even in unilateral lobotomy).^[9] It is also reported that, some surgeon administer oral calcium supplement as a part of routine post-operative management. This may mask the immediate onset of post-operative hypocalcaemia, tending to deflate overall incidence immediately diagnosed post-operative hypoparathyroidism.

In general, it is believed that injury to RLN is either temporary or permanent occurred during total thyroidectomy often have more advanced diseases.^[10] Hence, rates of unilateral or bilateral vocal cord palsy have to be predicted meticulously.

SUMMARY AND CONCLUSION

Transient hypocalcaemia and vocal cord palsy are common complications of total thyroidectomy. Hyperthyroidism seems to have an increased predisposition for hypocalcaemia. The presence of adhesions and retro-sternal extension predisposes to post-operative hypocalcaemia and vocal cord palsy. Identification of parathyroid glands, proper anatomical knowledge of neck structures will minimize the risk of injury to RLN and ITA.

REFERENCES

1. Eastman CJ. Screening for thyroid disease and iodine deficiency. *Pathology* 2012;44:153-9.
2. Spitiotis J, Vaxevanidou A. Risk factors and consequences of incidental parathyroidectomy. *Am Surg* 2010;76:436-41.
3. Gangappa RB, Kenchannavar MB. Total thyroidectomy for benign thyroid diseases. *J Clin Diagn Res* 2016; 110:4-7.
4. Almqvist M, Hallgimsson P. Prediction of permanent hypothyroidism after total thyroidectomy. *World J Surg* 2014;38:2613-20.
5. Edafe O, Antakia R. Systemic review and meta-analysis of predictors of post thyroidectomy hypocalcaemia. *Br J Surg* 2014;101:307-20.
6. Edafe O, Balasubramaniam SP. Incidence prevalence

- and risk factors for the post-surgical hypocalcaemia and hypoparathyroidism. *Gland Surg* 2017;6:59-68.
7. Bhattacharya N, Fried MP. Assessment of the morbidity and complications of total thyroidectomy. *Arch. Otolaryngol Head Neck Surg* 2002;128:389-92.
 8. Mishra A, Agarwal G. Safety and efficacy of total thyroidectomy in hands of endocrine surgery trainees. *Am J Surg* 1999;178:377-80.
 9. Robertson ML, Steworel DL. Continued monitoring nerve integrity during thyroidectomy. *Otolaryngol Head Neck Surg* 2004;131:596-600.
 10. Prim MP, De Diego JI. Factors related to nerve injury and hypocalcaemia in thyroid gland surgery. *Otolaryngol Head Neck Surg* 2001;124:111-4.

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