Section: General Surgery

Original Research Article

A STUDY ON ASSESSMENT OF COMPLICATIONS AFTER THYROIDECTOMY IN A TERTIARY CARE CENTRE IN SOUTH INDIA.

Sarvepalli Sudhakar[1], Motupally Aravind Kumar[2], Rajendra[3]

[1]Associate Professor, Department of General Surgery, Sri Balaji Medical College Hospital & Research Institute, Renigunta, Tirupati, AP, India.
[2]Assistant Professor, Department of General Surgery, Sri Balaji Medical College Hospital & Research Institute, Renigunta, Tirupati, AP, India.
[3]Assistant Professor, Department of Radiology, Sri Balaji Medical College Hospital & Research Institute, Renigunta, Tirupati, AP, India.

Received *: 04/06/2024*
Received in revised form *: 26/07/2024*
Accepted *: 13/08/2024*

Corresponding Author:
Dr. Sarvepalli Sudhakar,
Associate Professor, Department of General Surgery, Sri Balaji Medical College Hospital & Research Institute, Renigunta, Tirupati, AP, India.
Email: drsudha72@gmail.com.

DOI: 10.70034/ijmedph.2024.3.65

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2024; 14 (3); 369-372

ABSTRACT

Background: Due to the rise in the incidence of thyroid disorders, the number of patients undergoing thyroidectomies has also increased. This skill demanding surgery is associated with certain permanent post-operative complications, which can be avoided in most of the situations. This study was done to evaluate the post-operative complications occurring in patients who have undergone thyroidectomies in a tertiary care center.

Materials and Methods: A total of 75 patients who had undergone thyroidectomies in the Department of Surgery____ over a period of 1 year have been included in this prospective observational study.

Results: There was female preponderance in the study, with female: male ratio being 6.5:1. The majority of the patients belonged to 31-40 years of age group. Colloid goitre was the most common pre-operative diagnosis. Hemithyroidectomy was the most commonly performed surgery. Hoarseness of voice was the most common post-operative complications and bleeding during surgery was the most common intra-operative complication.

Conclusion: Total thyroidectomy has a higher rate of post-operative complications, especially hypocalcemia (hypoparathyroidism) and hypothyroidism compared to hemi-thyroidectomy. The surgeon must be careful to preserve the nerve and parathyroid glands to avoid such complications which could be permanent.

Keywords: Thyroidectomy, post-operative complications, hypocalcemia, Recurrent laryngeal nerve palsy.

INTRODUCTION

Diseases of thyroid are one of the most commonly encountered endocrine conditions in daily practice. With the rising burden of thyroid conditions requiring surgical management, the number of thyroidectomies is also on rise.[1,2] The common indications of thyroidectomy are thyroid neoplasms, large goiters and in some cases of hyperthyroidism.[3]

The reporting of complications post-thyroidectomy dates back to the 18th century. Theodor Billroth observed that all his patients whoever underwent thyroidectomy were developing hypocalcemia, which was later found that it was due to removal of the parathyroid glands.[4,5] Kocher along with Billroth had observed that all patients who had underwent thyroidectomy developed dysphonia, hoarseness of voice and aspiration. Later in 20th century, it was found out that the recurrent laryngeal nerve which is in close proximity to the posterior part of thyroid gets damaged leading to dysphonia.[6] Over the years, due to considerable advances in technology better techniques of thyroid surgery, good hemostasis with minimal blood loss, small incisions with better cosmetic appearance of the scar have come up.

This study aims to evaluate the various post-operative complications occurring after

thyroidectomy in this era of advanced surgical technology.

MATERIAL AND METHODS

This prospective observational study was conducted in the Department of General Surgery, ¬Sri Balaji Medical College Hospital & Research Institute, Tirupati over a period of 1 year, i.e. from February 2023 till January 2024. Patients with thyroid swelling who had undergone thyroidectomy in this hospital were included in the study after taking a written informed consent to participate in this study.

A detailed history and physical examination of all the patients was done. Apart from all the routine hematological investigations, thyroid profile and serum calcium levels were done pre-operatively. Ultrasound of the neck, FNAC of thyroid swellings, and CCT of neck were neck done whenever required.

All the patients included in the study had undergone different types of thyroidectomy- hemithyroidectomy, lobectomy, near total thyroidectomy, complete thyroidectomy, and thyroidectomy with radical neck dissection (in cases of thyroid carcinoma). Patients who had underwent hemithyroidectomy and were found to have malignant lesion on histopathological examination were converted into total thyroidectomy.

Post-operatively, thyroid profile, serum calcium levels, serum parathyroid levels were determined. Indirect laryngoscopy was done to determine the status of vocal cords. The wound site was observed for any discharge or gaping or any infection.

Ethical committee clearance was obtained prior to start of the study. All patients were assured of anonymity and confidentiality of their data. The entire collected data was compiled and analyzed using Microsoft Excel. Categorical data was presented as frequencies and proportions. Tables and graphs were used to represent data. Continuous variables were presented as means and standard deviations.

RESULTS

A total of 75 patients had undergone thyroidectomy in 1-year duration. Majority of the study participants were females (n=65; 86.6%). Females to males (n=10; 13.3%) ratio in present study was 6.5:1.

The mean age of study participants was 38.4 + 5 years, with the majority of them being in 31-40 years of age group.

Patients with hypo or hyperthyroidism were corrected and surgery was planned after they achieved euthyroid state. [Table 1]

Most of the patients had colloid goiter (40%). Malignancy accounted for 9.3% of the total cases. [Table 1]

Hemithyroidectomies were the most commonly performed surgeries (42.6%), followed by total thyroidectomies. 3 patients on whom hemithyroidectomies were performed initially in view of follicular adenoma on FNAC, turned out to be malignancy on post-operative histopathological examination. Later, they underwent total thyroidectomies. [Table 3]

Complications

Out of the 75 patients who had undergone thyroidectomies, 5 patients had developed intra-operative complications in form of blood loss. The rest of 70 patients didn't have any intra-operative complications.

In the post-operative period, out of the 75 patients, 20 patients had developed complications (26.6%). The most common post-operative complication in the immediate post-operative period was hoarseness of voice (n = 9; 12%), followed by symptomatic hypocalcemia.

No mortalities were reported. All patients were discharged after 1 week- 10 days of hospital stay and were asked to follow-up after 1 week after surgery for suture-removal. [Table 4]

Table 1: Demographic characteristics and presenting complaints

Variable		Frequency	percentage
Sex	males	10	13.3%
	females	65	86.7%
Age group	<20 years	6	8%
	21-30 years	15	20%
	31-40 years	29	38.6%
	41-50 years	10	13.3%
	51- 60 years	9	12%
	>60 years	6	8%
Anterior neck swelling	Present	71	94.6%
	Absent	4	5.3%
Features of thyrotoxicosis	Present	20	26.6%
	Absent	55	73.3%
Hoarseness of voice	Present	10	13.3%
	Absent	65	86.7%

Table 2: Pre-operative diagnosis

Diagnosis	No. of persons
Nodulargoiter/colloid goiter	30 (40%)
Multinodulargoiter	22 (29.3%)
Follicularadenoma	10 (13.3%)
Hashimotothyroiditiswith multinodular goiter	6 (8%)
Follicularvariantof papillarycarcinoma	3 (4%)
Papillarycarcinoma	2 (2.67%)
Medullarycarcinoma	2 (2.67%)
Total	75 (100%)

Table 3: type of surgery

Type of surgery	No. of patients
Hemithyroidectomy	32 (42.67%)
Near total thyroidectomy	15 (20%)
Total thyroidectomy	26(34.6%)
Total thyroidectomy with neck dissection	2 (2.67%)

Table 4: post-operative complications depending upon the type of surgery

Complication		No. of patients (N = 20)	hemithyroidectomy	Near-total thyroidectomy	Total thyroidectomy
Hoarseness of voice (n = 13; 65%)	Temporary	10 (13.3%)	3	2	5
	permanent	3 (4%)	1	0	2
Symptomatic hypocalcemia		10 (13.3%)		1	9
Wound infection	Surgical site infection	4 (5.3%)		1	
	hematoma	4 (5.3%)	1	2	1
Difficulty in swallowing		2 (2.6%)		1	1
Airway obstruction		1 (1.3%)			1
Hypothyroidism		6 (8%)		2	4

DISCUSSION

Any operative procedure comes with the risk of intra-operative and post-operative complications. Thyroidectomy is one such procedure demanding extensive skill during surgery and a complete knowledge of head and neck anatomy. In present study, 75 patients who underwent thyroidectomy were assessed for complications during and after the surgery.

Majority of the study population were females. This is similar to studies done by Dabaet al,[7] and Soni et al.[8] This is attributable to the high incidence of thyroid disorders in females.

The mean age of study group was 38.4 $\pm$ 5 years, with the majority of the study participants being below 40 years of age. However, Du et al,[9] reported a higher mean age of study population (47.8 years).

The incidence of complications in present study is 26.6%.

1. **Hoarseness of voice:** Recurrent laryngeal nerve lies in close proximity to the posterior surface of the thyroid gland. Utmost care must be taken while separating the gland from fascia and while ligating the arteries so as to avoid damage to this nerve. Recurrent laryngeal nerve damage can lead to temporary or permanent vocal cord palsy, depending upon the type of nerve injury. In present study 13 patients, had developed RLN palsy making it the most commonly observed post-operative complication in present study (17.3%). This can be prevented by carefully dissecting the nerve before ligating the blood vessels. The incidence of temporary RLN palsy and permanent RLN palsy is higher with total thyroidectomy. This is accordance with studies done by Erbil et al,[10] Pandey et al,[11] and Soni et al.[8]
2. **Hypocalcemia:** serum calcium levels <8.5 mg/dL (after corrected for the serum albumin levels) is defined as hypocalcemia. Presence of carpopedal spams indicates symptomatic hypocalcemia. In present study the second most common complication reported is hypocalcemia. It occurs due to accidental removal of parathyroid glands, along with the thyroid gland. The incidence of hypoparathyroidism is higher in total thyroidectomy and near total thyroidectomy. Hypocalcemia is usually not seen with hemithyroidectomy. This is in concordance with study done by Filho et al,[12] Dinc et al,[13] and Soni et al.[14]
3. **Wound infection:** post-operative surgical site infections are common, but the severity depends on the sterility of the procedure and host factors such as presence of diabetes or anemia (which can delay wound healing). 5 patients had developed wound related complications such as wound infection with discharge and hematoma. Anbalagan et al reported that 2.9% of patients who had underwent thyroidectomy developed wound site infections.

Hypothyroidism: it is more common in patients who had undergone total thyroidectomy. And almost all of the patients in present study required levothyroxine supplementation. Dabaet al,[7] followed up patients upto 6 months and found that most of the patients had developed hypothyroidism.

CONCLUSION

Thyroid gland surgeries pose quite a challenge to the operating surgeon owing to its complex anatomical environment. Patients who have undergone total thyroidectomy have to take levothyroxine supplementation for the rest of their lives, and if in case all four of the parathyroid glands have been removed, they will develop permanent hypoparathyroidism and will be requiring calcium supplementation.

Acknowledgement: the authors would like to extend their gratitude towards the eneitre staff at Department of Surgery for providing with all the necessary facilties required to conduct this study.
Conflicts of Interest: Nil.

REFERENCES

1. Ravikumar S, Vasantha WE. A Study of Incidence of Complications in Thyroid Surgery. Indian J Applied Res. 2018;8(9).
2. Suga Y, Abebe E. Patterns of Surgically Treated Thyroid Disease… Patterns of Surgically Treated Thyroid Disease: A Two Years Review at St. Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia Addis Ababa, Ethiopia. Ethiopian J Health Sci. 2020;30(1):31. doi10.4314/ ejhs.v30i1.5
3. Lukinović J, Bilić M. Overview of Thyroid Surgery Complications. ActaClin Croat. 2020 Jun;59(Suppl 1):81-86. doi: 10.20471/acc.2020.59. s1.10. PMID: 34219888; PMCID: PMC8212606.
4. Dadan J, nowacka A. A journey into the past- the history of thyroid surgery. wiadlek 2008;61(lXi):88–92.
5. Kocher T. in: Textbook of Operative Surgery. 2nd ed. Black C, editor. Stiles hJ; london: 1985,99–105. doi: 10.9738/CC185.1
6. Becker wf. presidential address: pioneers in thyroid surgery. Ann Surg 1977;185(5):493–504. doi: 10.1097/00000658-197705000-00001.
7. Daba SA, Teklewold B, Suga Y, Biratu TD, Hassen IK. Post-Thyroidectomy Complications at St Paul's Hospital Millennium Medical College, Ethiopia: Associated Factors and Outcomes. Open Access Surgery. 2023; 16:77-86https://doi.org/10.2147/OAS.S428155.
8. Soni N, Gedam BS, Akhtar M. Thyroidectomy: post-operative complications and management. IntSurg J 2019; 6:1659-63
9. Du, W., Liu, S., Li, P., Sun, L., Zhao, M., Qi, J. ... Liu, F. (2012). Intra- and postoperative complications in 137 cases of giant thyroid gland tumor. Oncology Letters, 4, 965-969. https://doi.org/10.3892/ol.2012.847
10. Erbil Y, Barbaros U, Işsever H, Borucu I, Salmaslıoğlu A, Mete Ö, et al. Predictive FactorsFor Recurrent Laryngeal Nerve Palsy and Hypoparathyroidism After Thyroid Surg. ClinOtolaryngol. 2007;32(1):32-7.
11. Pandey AK, Maithani T, Agrahari A, Varma A, Bansal C, Bhardwaj A, et al. Postoperative Complications of Thyroid Surg: A Corroborative Study With An Overview Of Evolution Of Thyroid Surg. Int J Head Neck Surg. 2015;6(4):149-54.