

A Clinical Study on Early Complications of Thyroidectomy**M. Pavani¹, P. Vinay², J. Ramanaiyah³**¹Associate Professor of Surgery²Associate Professor of Surgery, GMC, Pulivendula³Associate Professor of Surgery, GMC, Pulivendula

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Conflict of interest: Nil

Abstract:

Background: Thyroid surgeries comprise one among the ordinarily performed procedures by a general surgeon. It is associated with specific morbidities which are related to the experience of surgeon. Nerves, vessels, parathyroid and surrounding structures are all at risk of injury during thyroid surgery. The common postoperative complications include post-operative haemorrhage, recurrent laryngeal nerve paralysis & voice change, thyroid insufficiency, parathyroid insufficiency, thyroid crisis (storm), wound infection, superior laryngeal nerve injury

Aim of the Study: is to know the occurrence of various post-operative complications following various thyroid surgeries at tertiary care hospital.

Patients And Methods: A Prospective cohort study done in 60 cases undergoing thyroidectomy for various reasons admitted in the general hospital over a period of 2 years.

Results: In this study complications seen in hemithyroidectomy are hypocalcaemia (1.6%), wound infection (1.7%). Complications seen in subtotal thyroidectomy were hypocalcaemia (3.3%), immediate haemorrhage (3.3%), seroma formation (1.7%), oedema of the flap (1.7%). No Complications seen in near total thyroidectomy. Complications in total thyroidectomy are hypocalcaemia (8.3%), immediate haemorrhage (1.6%), RLN palsy (1.7%), and SLN palsy (1.7%). Complication rate in benign diseases (21.75%) is more than malignant diseases (5.02%).

Conclusion: Since the beginning of 20th century, there has been a significant decline in the incidence of complications and mortality in thyroid surgery, probably due to safer general anaesthesia, development of fine haemostatic instruments, better antisepsis. Other factors contributing to decreased incidence of complications in thyroid surgery include good knowledge of regional anatomy, proper evaluation, and adequate haemostasis, meticulous dissection with intraoperative identification of structure and to prevent damage to these structures.

Keyword: Thyroid swelling, Thyroidectomy, Post-Operative Complication

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Introduction

Thyroid disorders are the most common cause of metabolic disturbances with surgery forming the mainstay of treatment of many thyroid swellings (1). Thyroid surgeries comprise one among the ordinarily performed procedures by a general surgeon (2). It is associated with specific morbidities which are related to the experience of surgeon [3] however there is extremely low mortality.[4]

Nerves, vessels, parathyroid and surrounding structures are all at risk of injury during thyroid surgery. The common postoperative complications include post-operative haemorrhage, recurrent laryngeal nerve paralysis & voice change, thyroid insufficiency, parathyroid insufficiency, thyroid crisis(storm), wound infection, superior laryngeal nerve injury [5,6,7, 8]. Other possible complications include hypertrophic scar or keloid formation – more likely to form if the incision overlies the

sternum, stitch granuloma which is seen after the use of non- absorbable suture material particularly silk, injury to carotid artery & jugular vein.

Occurrence of various complications can be reduced by adequate preoperative patient preparation in case of complications like thyroid storm, careful meticulous surgical technique in case of postoperative haemorrhage and parathyroid insufficiency, early recognition of postoperative complications with the prompt institution of treatment like in case of post-operative hematoma. This helps in reducing morbidity and providing the patient with the best chance of a satisfactory outcome. The present study reports the clinical audit of thyroid surgery for adult patients undertaken at the Government Medical College and General Hospital, Kadapa. The complications of

Thyroidectomy are highlighted and compared to published data.

Aims and Objectives

Aim of the Study: To study the occurrence of various post-operative complications following various thyroid surgeries at tertiary care hospital.

Objectives:

To study:

1. Associated complications with different operative procedures.
2. To compare complication after the thyroidectomy for benign, malignant diseases.
3. To identify ways to avoid postoperative complications.

Patients and Methods

Study Design: Prospective cohort study

Sample size: Study was conducted on 60 patients

Study setting:

Study consists of patients undergoing thyroid surgery for various thyroid disorders in the Department of General Surgery, in Government General Hospital for 2 years.

Inclusion criteria:

1. Patients between the age group of 20-70 years.
2. Patients giving written and informed consent.
3. Patients who undergo thyroid surgery for various thyroid disorders.

Exclusion criteria:

1. Patients less than 20 years and more than 60 years of age.
2. Patients with preoperative recurrent laryngeal nerve paralysis.

3. Patients with lymph node metastasis, extra thyroidal extension.

Methodology:

Institutional ethical committee clearance was obtained before the start of the study. 60 Patients who underwent thyroid surgery for various thyroid disorders in the Department of General surgery, in Government General Hospital were studied. Indications for surgery in this group include toxic multinodular goitre, non-toxic multinodular goitre, solitary nodular goitre, carcinoma thyroid, recurrent goitre. For all the selected patients a thorough history was elicited followed by complete physical examination. Basic haematological and biochemical investigations including the thyroid profile and serum calcium estimation were done. Radiological investigations like x-ray neck, neck ultrasound was done. CT scan of the neck was done in patients with large goitres presenting with symptoms of respiratory discomfort to rule out the retrosternal extension. Fine needle aspiration cytology was done. Vocal cords are examined preoperatively by indirect laryngoscope in all the patients. Postoperative vocal cord examination was performed following extubating and documented. The types of surgeries done were total thyroidectomy, subtotal thyroidectomy, near total thyroidectomy, hemithyroidectomy. Among these procedures postoperative complications are compared and analysed.

Statistics: The collected data was analysed with SPSS 16.0 version. To describe about the data descriptive statistics frequency analysis, percentage analysis was used for categorical variables and for continuous variables the mean and S.D were used.

Results

Table 1: Distribution According To Age

Age group	Frequency	Percentage
21- 30 years	14	23.3
31- 40 years	12	20
41- 50 years	19	31.7
51- 60 years	11	18.3
>60 years	4	6.7
Total	60	100
Mean age: 43.5± 13.02 years		

Table 2: Distribution According To Gender

Gender	Frequency	Percentage
Male	7	11.7
Female	53	88.3
Total	60	100
Sex ratio: 0.13: 1 [M: F]		

Table 3: Distribution According To Diagnosis

Diagnosis	Frequency	Percentage
Multi- nodular goitre	23	38.8
Toxic multinodular goitre	13	21.7
Solitary thyroid nodule	17	28.3
Colloid goitre	3	5
Papillary carcinoma thyroid	2	3.3
Follicular neoplasm of thyroid	2	3.4
Total	60	100

Table 4: Type Of Surgeries

Surgery	Frequency	Percentage
Subtotal thyroidectomy	31	51.7%
Total thyroidectomy	10	16.6%
Hemi thyroidectomy	17	29.9%
Near total thyroidectomy	1	1.7%
Total	60	100%

Table 5: Post- Operative Complications

Complications	Frequency	Percent
Immediate haemorrhage		
Yes	3	5%
No	57	95%
Respiratory obstructions		
Yes	-	-
No	60	100%
Recurrent laryngeal palsy		
Yes	1	1.7%
No	59	98.3%
Superior laryngeal palsy		
Yes	1	1.7%
No	59	98.3%
Hypocalcaemia		
Yes	8	13.3%
No	52	86.7%
Thyroid storm		
Yes	-	-
No	60	100%
Oedema of the flap		
Yes	1	1.7%
No	59	98.3%
Seroma and hematoma		
Yes	1	1.7%
No	59	98.3%
Wound infection		
Yes	1	1.7%
No	59	98.3%

Table 6: Complications Seen In Different Thyroid Surgeries

	Thyroidectomy Type			Total
	Hemi	Near Total	Sub Total	
Hypocalcaemia	1		2	5
Immediate haemorrhage			2	1
Respiratory obstruction				
RLN Palsy				1
SLN Palsy				1
Seroma formation			1	
Oedema of flap			1	
Wound infection	1			

Table 7: Complications Seen In Surgery Done For Benign and Malignant Conditions

	Surgery For	
	Malignancy	Benign Conditions
Hypocalcaemia	1	7
Immediate Haemorrhage		3
Respiratory Obstruction		
RLN PALSY	1	
SLN PALSY	1	
Seroma Formation		1
Oedema Of Flap		1
Wound Infection		1

Discussion

After diabetes mellitus, disorders of thyroid gland are the predominant endocrine disorders [9]. Benign and malignant conditions of the gland require surgical intervention. Thyroid surgery is the one of the commonly performed surgeries. As thyroid gland is closely associated with many vital structures, it is a challenging procedure to perform. Thyroidectomy is one of the common surgical procedures done by a resident in the training period. Expertise and skills are needed to avoid intraoperative and postoperative complications. In order to achieve better results, surgeon should have a good knowledge on anatomy and pathologic disorders of thyroid gland [10]. Failure to follow good surgical principles results in morbidity in patients which could be avoided [11]. Thyroidectomy is rarely associated with mortality [12,13]. Complications in thyroid surgery are directly related to extent of surgery and inversely related to experience of surgeon [14].

Majority of thyroid disorders are seen in females. Simple goitres are common in females than in males. Thyrotoxicosis is eight times common in females than in males. Thyroid carcinomas are seen in ratio of 3:1 in females and males. Simple goitre is seen in puberty. Iodine deficiency, goitrogens, dysmorphogenesis are other causes of simple goitre. Multinodular goitre, solitary nodular goitre, colloid goitre are seen in women of 20-30 years age group. Papillary carcinoma is seen in young girls and follicular carcinoma is seen in middle aged women. Anaplastic carcinoma is seen in old age. Primary toxic goitre is seen in young age group, secondary thyrotoxicosis is seen in old age group. Hashimoto's disease is seen in middle aged women.

Procedures performed include: Total thyroidectomy, Subtotal thyroidectomy, Near total thyroidectomy, Hemithyroidectomy. Indications for thyroid surgery include goitre either colloid goitre or nodular goitre, presence of pressure symptoms like difficulty in swallowing, breathing, hoarseness of voice, toxic adenoma, when there is a suspicion of malignancy, cosmesis is another common indication [15].

Extent of thyroidectomy depends upon diagnosis, risk of thyroid failure, risk of recurrence, risk of

RLN injury, risk of hypocalcaemia, presence of Grave's disease, MNG, thyroid cancer. Following total and near total thyroidectomy, thyroid hormone replacement therapy is needed as they do not conserve sufficient thyroid tissue for normal thyroid function. In subtotal thyroidectomy, thyroid tissue is preserved for normal function, so risk of thyroid failure is less. But subtotal thyroidectomy done in Grave's disease, colloid goitre, malignancy is associated with increased risk of recurrence of disease and may require reoperation. Reoperation is associated with increased risk of complications like injury to RLN and parathyroid glands [16]. Among the surgical procedures performed in 60 patients hypocalcaemia and immediate haemorrhage were the common complications occurred in the present study. Total complication rate in the study was 26.8%. Complication rate occurred in the benign diseases (21.75%) was more than malignant diseases (5.02%).

Study consists of patients with mean age group of 43.5 years. Sex ratio in this study was 0.13:1, with 53 females and 7 males. Diagnosis in the study was MNG in 23 patients, toxic MNG in 13 patients, STN in 17 patients, colloid goitre in 3 patients, papillary carcinoma thyroid in 2 patients, follicular neoplasm of thyroid in 2 patients.

Surgical procedures performed in the study were subtotal thyroidectomy in 31 patients, total thyroidectomy in 10 patients. Hemithyroidectomy in 17 patients, Near total thyroidectomy in 1 patient. Complications noted in the study was hypocalcaemia in 8 patients, immediate haemorrhage in 3 patients, RLN palsy in 1 patient, SLN palsy in 1 patient, edema of the flap in 1 patient, seroma formation in 1 patient, wound infection in 1 patient

Hypocalcaemia: -

Hypocalcaemia was the most common complication occurred in 8 out of 60 patients (13.3%). My study results were consistent with the study conducted by Panthi N et al [17] with 13.3%. In a study conducted by A.K. Pandey et al [18] hypocalcaemia rate was 7.5%. In a study conducted by Chahardahasumi et al [19], hypocalcaemia rate was 54.4%. In a study conducted by ES Kumar et al [20] incidence of

hypocalcaemia was 8%. In a study conducted by Kompally et al [21] the incidence of hypocalcaemia

was 5%. In a study conducted by Alam et al(22) the hypocalcaemia rate was 12%.

Table 8: Comparison of Incidence of Hypocalcaemia in the Different Procedures in the Study Groups

Hypocalcaemia	Our study	ES Kumar et al(20)	AK Pandey et al(18)	Alam et al (22)
Hemithyroidectomy	1.60%	0%	0%	1%
Subtotal thyroidectomy	3.30%	1.25%	0%	1%
Total thyroidectomy	8.31%	3.75%	7.50%	4%

Immediate Haemorrhage: Immediate haemorrhage occurred in 3 patients with incidence of 5%. Results were consistent with the ES Kumar et al [20] study with incidence of 4%. In Kompally et al [21] study incidence of haemorrhage was 1.66% seen in 1 patient who underwent total thyroidectomy for multinodular goitre. Drain was found to be high

when patient was in operation theatre. Wound was reexplored, bleeding was noted from superior pedicle on left side and it was controlled. Wound closed with a drain. In ES Kumar et al [20] study the incidence of haemorrhage in total thyroidectomy was 4% when compared to subtotal thyroidectomy where the incidence is 0%.

Table 9: Comparison of Recurrent Laryngeal Nerve Palsy in the Study Groups

Studies	RLN palsy
Panthi et al [17]	6.67%
AK Pandey et al [18]	5%
ES Kumar et al [20]	6%
Alam et al [22]	2%
Our study	1.70%

Table 10: Comparison of SLN Palsy in the Study Groups

Studies	SLN palsy
AK Pandey et al [18]	0.80%
ES Kumar et al [20]	2%
Our study	1.70%

Table 11: Comparison of Seroma Formation in the Study Groups

Studies	Seroma
AK Pandey et al [18]	1.25%
ES Kumar et al [20]	2%
Our study	1.70%

Edema of the FLAP: -

Edema of the flap is seen in 1 patient who underwent subtotal thyroidectomy for toxic multinodular goitre and the incidence is 1.75%. Division or trauma to prethyroid muscles increases the risk of edema of the flap.

Wound Infection: -

Wound infection is seen in 1 patient and the incidence is 1.75%. Results are consistent with the ES Kumar et al [20] study in which the incidence is 4%, in Kompally et al [21] study the incidence is 13.3%,

Conclusion

Since the beginning of 20th century, there has been a significant decline in the incidence of complications and mortality in thyroid surgery, probably due to safer general anaesthesia,

development of fine haemostatic instruments, better antisepsis.

Other factors contributing to decreased incidence of complications in thyroid surgery include good knowledge of regional anatomy, proper evaluation, and adequate haemostasis, meticulous dissection with intraoperative identification of structure and to prevent damage to these structures.

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