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A Clinical Study On Post Operative Complications Of Thyroidectomy.

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ABSTRACT

Thyroidectomy is a common operation with an extremely low mortality. It is associated with specific morbidities which are related to the experience of the surgeon, however. Very low surgical morbidity rates for thyroidectomy are reported in specialized centers. In competent hands, thyroid surgery is associated with few complications and no fatality. Post operative complications may be as insignificant as edema of the flap or as dangerous and life threatening as hemorrhage or respiratory obstruction. The majority are avoidable with sound surgical technique and good preoperative preparation. With proper preoperative management, the patient will be euthyroid at the time of surgery. If the patient is hyperthyroid, laryngeal edema may result, producing respiratory obstruction. Lack of experience or of attention to technical details may involve removal of too little or too much thyroid tissue or possibly all parathyroids, resulting in myxedema, recurrent hyperthyroidism, or parathyroid deficiency. Complication rates associated with thyroid surgery can be evaluated only through analysis of case studies and follow up data. The present study reports the clinical audit of thyroid surgery for adult patients undertaken at the Tirunelveli Medical college hospital Tirunelveli. The complications of Thyroidectomy are highlighted and compared to published data. The aim of the study is to compare complication rates of Bilateral sub total thyroidectomy (SBT), near total thyroidectomy (NTT) Hemithyroidectomy (Total lobectomy and isthmusectomy), and Total thyroidectomy (TT) in cohort of patients undergoing surgery for various thyroid disorders. This is a prospective study conducted in the surgical unit at Tirunelveli Government medical college, Tirunelveli from the period of January 2017 to august 2018.Totally one hundred patients were studied. The patients were in age group from 18-70 years. Patients were scheduled for thyroidectomy – total thyroidectomy, hemithyroidectomy. From above observation, out of the 100 patients, 26 were diagnosed to have Solitary nodular goiter, 64 were Multi nodular goiter, 4 were Toxic goiter, 6 were Carcinoma thyroid.Out of 26 cases of solitary nodular goiter diagnosed, all underwent hemi thyroidectomy (100%).Out of 64 cases of multi nodular goiter all the cases underwent total thyroidectomy. Out of 4 cases of toxic goiter (controlled) all went total thyroidectomy. Out of 6 cases of carcinoma thyroid, all underwent total thyroidectomy (100%). The incidence of haemorrhage was 3%. The incidence of neural complications, recurrent laryngeal nerve was 9% and superior laryngeal nerve palsy was 3%. Incidence of hypocalcemia was 16%. Thyroid storm was nil. Wound infections were nil, and incidence of seroma was 2%. In the present study, haemorrhage with airway obstruction was documented only in 4.44 % of cases following total thyroidectomy.Out of 3 cases with post operative haemorrhage 2 cases developed respiratory obstruction. In the present study, postoperative hypocalcaemia was documented in 11.11% of cases following total thyroidectomy and in 8.33% of cases following near total thyroidectomy. The incidence of seroma was reported in 2% of cases. The incidence of wound infection was NIL in my study. In the present study, seroma was documented in 2% of cases following total thyroidectomy. Conclusively, complications after thyroid surgery depend on patient's condition and presence of comorbidities, thyroid pathology, surgeon's expertise, and extent of surgery. Hypoparathyroidism and RLNI are the commonest complications observed after thyroidectomies. Attempts must be made to identify and preserve parathyroid glands to avoid HPT. It is of paramount importance for careful postoperative observation and timely intervention should the hypocalcemia develop and manifest. Similarly, recurrent and superior laryngeal nerve injury can be prevented by correctly identifying and following these nerves

Keywords: Hypocalcemia, Hypoparathyroidism, Hypothyroidism, Recurrent laryngeal nerve injury, Superior laryngeal nerve injury (SLNI), Thyroidectomy.

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INTRODUCTION

The thyroid gland, shaped like a butterfly is located in the midline of the neck inferior and adjacent to our neck muscles, but anterior to the trachea or airway [1]. Although the thyroid is one single gland it is anatomically divided into right and left lobes, with the middle of the gland between the two lobes referred to as the isthmus [2]. Within the thyroid, there are four small independent glands that control calcium metabolism, known as the Parathyroid glands, due to their anatomical coexistence within the thyroid [3]. The principal function of the thyroid gland is the synthesis and secretion of thyroid hormones, which circulates in the body through the blood stream and exerts their effects through interaction with specific cellular proteins known as thyroid hormone receptors. Goiter is the simple swelling of the thyroid gland [4]. Thyroidectomy is one of the common surgical procedures. The morbidity and mortality is based on surgeons skill and anatomical knowledge. Through prospective analysis of the case study, the incidence of postoperative complications can be analysed and evaluated [5].

MATERIALS AND METHODS

This is a prospective study conducted in the surgical unit at Tirunelveli Government medical college, Tirunelveli from the period of January 2017 to august 2018.Totally one hundred patients were studied. The patients were in age group from 18-70 years. Patients were scheduled for thyroidectomy – total thyroidectomy, hemithyroidectomy.

Following study groups were included for surgery:

- Solitary thyroid nodule
- Multi nodular goiter (MNG)
- Toxic nodular goiter
- Carcinoma thyroid

Exclusion criteria

- Carcinoma thyroid with secondaries
- Uncontrolled toxic nodular goiter
- Patients with co-morbid illness

All the patients in study population undergo thorough clinical and physical examination. The following investigations were taken

- Complete blood count
- Serum calcium3.Thyroid profile
- Preoperative indirect laryngoscopy to assess the vocal cord status
- USG- Ultrasound neck to assess the size of the gland and to assess whether the thyroid swelling is solid or cystic
- FNAC- Fine needle aspiration cytology to assess the histopathological nature of the swelling
- CT neck – Done only in indicated cases

Follow Up

The first follow up of the patient is after 2 weeks. Patients with confirmed benign disease are referred to medical endocrinologists. Patients with confirmed malignancy are followed up for once in 6 months for the next 2 years and then annually, for the estimation of thyroglobulin level, radioactive iodine uptake scans, cervical ultra-sonogram, clinical follow upfor any recurrence.

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OBSERVATION AND RESULTS

Table 1: Age Incidence of Thyroid Disease:

S. NO.	AGE	NO. OF PATIENTS	PERCENTAGE
1	18-30	23	23%
2	31-40	34	34%
3	41-50	27	27%
4	51-60	12	12%
5	61-70	4	4%

In the Present study, 100 patients were observed. 34% of thyroid disease occurred during the age between 31-40 years. The highest incidence of thyroid disease was recorded during the third and fourth decades of life with 34% and 27% respectively.

Table 2" Gender Incidence of Thyroid Disease:

S.NO.	SEX	NO. OF PATIENTS	PERCENTAGE
1	MALE	8	8%
2	FEMALE	92	92%

Out of 100 patients, 92 were females and 8 were males. From the table, male and female ratio was 1:11. In the present study, females were more commonly affected by thyroid diseases.

Table 3: Clinical Diagnosis and Types of Surgery Performed:

DIAGNOSIS	HEMITHYROIDECTOMY	TOTAL THYROIDECTOMY	INCIDENCE
SNT	26	-	26%
MNG	-	64	64%
CARCINOMA THYROID	-	6	6%
TOXIC GOITRE (CONTROLLED)	-	4	4%

From above observation, out of the 100 patients, 26 were diagnosed to have Solitary nodular goiter, 64 were Multi nodular goiter, 4 were Toxic goiter, 6 were Carcinoma thyroid.Out of 26 cases of solitary nodular goiter diagnosed, all underwent hemi thyroidectomy (100%).Out of 64 cases of multi nodular goiter all the cases underwent total thyroidectomy. Out of 4 cases of toxic goiter (controlled) all went total thyroidectomy. Out of 6 cases of carcinoma thyroid, all underwent total thyroidectomy (100%).

Table 4: Incidence of Post-Operative Complications following thyroidectomy

S.NO.	COMPLICATIONS	NO. OF PATIENTS	INCIDENCE
1	HEMORRHAGE	3	3%
2	HYPOCALCEMIA	16	16%
3	RLN PALSY	9	9%
4	SLN PALSY	3	3%
5	THYROID STROM	-	-
6	SEROMA	2	2%
7	WOUND INFECTION	-	-

Above table showed the incidence of early postoperative complications following thyroidectomy. The incidence of haemorrhage was 3%. The incidence of neural complications, recurrent

laryngeal nerve was 9% and superior laryngeal nerve palsy was 3%. Incidence of hypocalcemia was 16%. Thyroid storm was nil. Wound infections were nil, and incidenceof seroma was 2%.

Table 5: Incidence of Complications in Various Thyroid Disorders

COMPLICATION	SNT	MNG	CARCINOMA THYROID	TOXIC GOITRE
HEMORRHAGE	-	2	1	-
HYPOCALCEMIA	-	14	2	-
RLN PALSY	-	7	2	-
SLN PALSY	-	3	-	-
THYROID STROM	-	-	-	-
SEROMA	-	2	-	-
WOUND INFECTION	-	-	-	-
INCIDENCE	-	43%	83%	-

This table showed the incidence of complications was reported in various thyroid disorders. In case of MNG incidence of complication was 43%. In case of carcinoma of thyroid, incidence of complication was 83%.

Table 6: Incidence of Haemorrhage with Respiratory Obstruction in VariousThyroidectomy Procedures

COMPLICATION	HEMITHYROIDECTOMY	TOTAL THYROIDECTOMY	NO. OF PATIENTS
POST OP HEMORRHAGE WITH RESPIRATORY OBSTRUCTION	0	2	2

Above table showed the incidence of haemorrhage following variousthyroidectomy procedures. The incidence of haemorrhage causing respiratory obstruction was reported in 1.28% of cases (2cases).

In the present study, haemorrhage with airway obstruction was documented only in 4.44 % of cases following total thyroidectomy.

Out of 3 cases with post operative haemorrhage 2 cases developed respiratory obstruction.

COMPLICATION	NO. OF PATIENTS
PRIMARY HEMORRHAGE	0
SECONDARY HEMORRHAGE	0
REACTIONARY HEMORRHAGE	3

Out of 3 cases all the 3 were reactionary haemorrhage

CAUSES OF HEMORRHAGE	NO. OF PATIENTS
SUPERIOR PEDICLE	0
INFERIOR PEDICLE	1
STRAP MUSCLE	2

Out of 3 cases 2 cases haemorrhage is from strap muscles and 1 casefrom inferior pedicle.

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Table 7: Incidence of Hypocalcemia in Various Thyroidectomy Procedures

COMPLICATION	HEMITHYROIDECTOMY	TOTAL THYROIDECTOMY	TOTAL NO. OF PATIENTS
TRANSIENT HYPOCALCEMIA	0	14	14
PERMANENT HYPOCALCEMIA	0	2	2

This table showed the incidence of hypocalcaemia following variousthyroidectomy procedures.

Out of 16 patients 14 found to be transient hypocalcaemia and 2 found to be permanent hypocalcaemia.

In the present study, postoperative hypocalcaemia was documented in11.11% of cases following total thyroidectomy and in 8.33% of cases following near total thyroidectomy.

Table 8: Incidence of Neural Complications in Various ThyroidectomyProcedures

COMPLICATION	HEMITHYROIDECTOMY	TOTAL THYROIDECTOMY	NO. OF PATIENTS
RLN PALSY	-	9	9
SLN PALSY	-	3	3

This table showed the incidence of recurrent laryngeal nerve palsy and superior laryngeal nerve palsy following various thyroidectomy procedures.

The incidence of recurrent laryngeal nerve palsy was reported in 9% of cases. The incidence of superior laryngeal nerve palsy was reported in 3%.

In the present study, recurrent laryngeal nerve palsy was documentedin 9% of cases following total thyroidectomy and nil following hemithyroidectomy. The superior laryngeal nerve palsy was documented only in 3% of cases following total thyroidectomy.

COMPLICATION	NO. OF PATIENTS
UNILATERAL RLN PALSY	8
BILATERAL RLN PALSY	1

Out of 9 patients 8 were unilateral RLN palsy and one case of bilateral RLN palsy

Table 10: Incidence of Wound Complications in Various thyroidectomyprocedures

COMPLICATION	HEMITHYROIDECTOMY	TOTAL THYROIDECTOMY	NO. OF PATIENTS
SEROMA	-	2	2
WOUND INFECTION	-	-	-

This table showed the incidence of wound complications following various thyroidectomy procedures. The incidence of seroma was reported in2% of cases. The incidence of wound infection was NIL in my study. In the present study, seroma was documented in 2% of cases following total thyroidectomy. Mortality following thyroidectomy is 2%.

DISCUSSION

In present study 100 patients were observed 92 were females 8 were males. Females were commonly affected by thyroid disease. 34% of thyroid disease occured during the age 31-40 Most

common complication following thyroid surgery is transient hypocalcemia 16%. Followed by RLN palsy with 9%, followed by haemorrhage and SLN palsy 3%, seroma 2% Incidence of complications arecommon in total thyroidectomy [6]. Incidence of complication is most frequent in carcinoma of thyroid (85%). The patients became symptomatic within 12 hours of postoperative period. Immediately wound exploration was done and the arterial bleed was identified in the thyroid bed and was ligated. Endo tracheal tube intubation failed due to laryngeal edema and hence tracheostomy was performed. Following variables were identified as risk factors in this study:Bilateral thyroid surgery, which doubled the risk compared with a unilateral surgery. Extensive thyroid resection [7]. About 73.8% of these patients required surgical exploration [8]. 10 patients (0.96%) with post thyroidectomy haemorrhage required surgical evacuation. Six of them had bleeding deep to the strap muscles and the other 4 cases had bleeding superficial to the muscles. Two cases with deep haematoma were developed respiratory distress [9,10]. The incidence of post operative hemorrhagein the present study was correlated with the above studies.In the present study, the incidence of postoperative hypocalcaemia was 5.13% (8 cases). Out of 8 cases being operated, 7 cases of post operative hypocalcaemia occurred in patients who were operated for multinodular goiter and one case occurred in a patient who was operated for carcinoma thyroid. All were transient type of hypocalcaemia. Out of 45 cases of total thyroidectomy operated, 11.11% of them developed hypocalcaemia and 8.33% who underwent neartotal thyroidectomy were developed this complication. (Table 5&7). The patients became symptomatic within the period of 2-4 days postoperatively. Farrar W B. et al stated that the rate of temporary hypoparathyroidism in toxic goiter was 8% and 2% in malignant diseases. They stated that subtotal thyroidectomy was the treatment of choice in multinodular goiter, but it had a high recurrent rate about 10-30%. According to their study, total thyroidectomy did not have these problems and does have high risk of complications [11]. They evaluated a multivariate analysis reported various risk factors that includes extensive surgical resection, Grave's disease, female gender and recurrent goiters. In the present study, the incidence of hypocalcaemia was compared with published results. The rate of transient hypocalcaemia was 4.44 % in the present study which was compared with Bhattacharyya study (6.2%) and the rate of hypocalcaemia following total thyroidectomy was found to be almost same. Permanent hypocalcaemia was not documented in both of these studies [12]. In the Present study, the incidence of Postoperative Recurrent Laryngeal Nerve Palsy occurred in 3.21% (5cases). The postoperative recurrent laryngeal nerve palsy was reported in 3 cases operated for multinodular goiter, 1 case operated for toxic nodular goiter and one case ofcarcinoma thyroid. It was observed in 6.66% of cases who underwent total thyroidectomy and 5.55% of patients who underwent neartotal thyroidectomy. All were unilateral and transient type of nerve palsy. Temporary paralysis is due to neuropraxia [13]. Bilateral vocal cord paralysis developed in 0.58% cases. Secondary operations were done in 6.8% of cases and they were observed 12.8% of nerve palsy occurred in thyroid carcinoma and 2.9% occurred in benign diseases. They also observed that nerve injury occurred in 7.2% following total thyroidectomy and 1.9% occurred following subtotal thyroidectomy [14]. Incidence of Superior Laryngeal Nerve Palsy reported was 0.64% in a patient who was operated for toxic nodular goiter. Out of 45 cases of total thyroidectomy done, only 2.22% of them developed nerve palsy. The patients had increased voice pitch and vocal fatigue within a day. No effective therapy is available. Intensive phonotherapy is recommended [15]. Incidence of Thyroid Storm was reported in 1 case (0.64%) of toxic multi nodular goiter for whom total thyroidectomy was done. Complication was reported within 4hours.The patient was restless, agitated and hyperpyrexia with tachycardia [16]. In the present study the incidence of thyroid storm following thyroidectomy was correlated with Nelson and becker's series (1969), Out of 4 cases reported, 3 cases were operated for multinodular goiter and one case was operated for toxic nodular goiter. Seroma developed in 8.33% of patients who underwent neartotal thyroidectomy and 5.26% of cases who underwent subtotal thyroidectomy [17]. Incidence of wound infection was documented in 1.92% (3 cases). Out of 3 cases, one was operated for colloid goiter and two cases were operated for multinodular goiter. About 5.55% of patients who underwent neartotal thyroidectomy and 5.26% of patients who underwent subtotal thyroidectomy were developed this complication. The patient with wound Infection commonly presented as Cellulitis –Erythema, Warmth and tenderness around the wound. Patient was treated with appropriate antibiotics. In the present study the incidence of wound complications was correlated with above published series. There were no case reports of other wound complications like haematoma of the flap, edema of the flap, skin necrosis, hypertrophic scar or keloid andstitch granuloma [18-20].

CONCLUSION

The following conclusions are drawn from this study

- Incidence of hypocalcaemia is a relatively common complication thanrecurrent laryngeal nerve injury after total thyroidectomy.
- Complications occur after Total Thyroidectomy. No complications occurred after hemithyroidectomy.
- Multi nodular goiter, Toxic multi nodular goiter, Carcinoma thyroid are risk factors for post-operative complication.
- Post-operative complications can be reduced by a careful clinical evaluation, a thorough knowledge of the surgical anatomy, a systematic dissection of parathyroid gland and recurrent laryngeal nerve during the surgery.

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