

## A STUDY ON COMPLICATIONS OF THYROID SURGERY AT GOVERNMENT GENERAL HOSPITAL KAKINADA

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### ABSTRACT

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#### BACKGROUND

Thyroid disorders are one of the most common causes of metabolic disturbances with surgery forming the main stay of treatment of thyroid swellings. Thyroid surgery in the hands of experienced surgeons is currently one of the safest procedures performed. While complications following thyroidectomy are rare, their consequences can often be debilitating and even life-threatening when they occur. This prospective study intends to assess the occurrence of various postoperative complications following different thyroidectomy procedures and the role of adequate preoperative patient preparation, careful and meticulous surgical technique and early recognition of postoperative complications with the prompt institution of treatment in reducing morbidity and providing the patient with the best chance of a satisfactory outcome.

#### MATERIALS AND METHODS

The present clinical study on complications of thyroid surgery has been made over a period of 24 months from August 2014 to August 2016 at Government General Hospital, Kakinada, utilising the cases admitted and treated in the Department of General Surgery. 441 cases were operated during this span of period (n=441), among them 55 complications were observed.

#### RESULTS

Thyroid surgeries constituted 8.3% of major surgical procedures carried out at our institution. Solitary thyroid nodule constituted most common thyroid disorder in this study forming 54% of cases followed by MNG (29%). Most of the cases were prevalent in the age group of third and fourth decade. The youngest patient of this series was 18 years and oldest was 65 years. Airway problems in postoperative period were found in 2.3% cases. Haematoma, recurrent laryngeal nerve injury and tracheal collapse secondary to the tracheomalacia were the contributory factors. In this study, 3 cases had permanent/bilateral RLN injury, tracheostomy was done. Postoperative hypocalcaemia constituted the most common complication in this study. Permanent hypocalcaemia was seen in 5 cases and were advised lifelong calcium therapy. Postoperative hypothyroidism/thyroid insufficiency occurred in 2.3% cases, which underwent total thyroidectomy. This is the second most common complication. Postoperative wound infection occurred in 1% cases. Haematoma requiring re-exploration of the neck occurred 1.1% cases, which required evacuation. Two cases of tracheal collapse following thyroidectomy were encountered. This complication although uncommon can prove fatal unless treated immediately.

#### CONCLUSION

Thyroid surgery is safe and can be performed with minimal morbidity and mortality for a wide range of diseases of the gland. Thyroidectomy often offers the best means of permanent cure with properly selected cases. Though mortality has decreased morbidity continues to exist by virtue of anatomical variations of structures. Complications are prone to occur in best of surgical hands, which can be minimised by meticulous attention, identification and preservation of structural details.

#### KEYWORDS

Thyroid Neoplasms C04.588.322.894. Thyroidectomy E04.270.856. Vocal Cord Paralysis C08.360.931.

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#### BACKGROUND

Thyroidectomy is a common operation with extremely low mortality. It is associated with specific morbidities, which are related to the experience of the surgeon. Haemorrhage, respiratory obstruction, thyrotoxic crisis (storm), recurrent laryngeal nerve paralysis and voice change, superior laryngeal nerve injury, hypocalcaemia, parathyroid insufficiency, thyroid insufficiency, wound infection, stitch granuloma, hypertrophic or keloid scar and tracheomalacia were the known complications. This study considered all of them in each case and analysed statistically.

**AIM**

The aim of this study is to assess the outcome of patients who have been treated surgically for thyroid disorders.

**Objectives**

1. Determine the incidence of various disease of the thyroid gland.
2. Determine the frequency of performing various types of thyroidectomy.
3. Compare the outcomes of total thyroidectomy to subtotal and other thyroidectomy procedures.
4. Assess the complications associated with various types of the thyroidectomy procedures.

**MATERIALS AND METHODS**

A total number of 441 thyroid surgeries were performed in the Department of General Surgery during the period from August 1, 2014, to August 30, 2016. All the cases were followed for a period of six months to one year postoperatively. All the immediate and delayed complications were studied and they were analysed in the present study. Management of all the complications was done. The details of clinical history were recorded. As soon as the patient with thyroid disease was admitted, the presenting symptoms were recorded in chronological order, relevant past history, drug history, family history, etc. were enquired into every case. A detailed history for compressive (pressure) symptoms such as dysphagia and dysphonia were recorded. History suggestive of altered hormonal status for e.g. hypothyroidism and hyperthyroidism were enquired and recorded. The patients were then examined and various signs were recorded. A thorough general examination to note the built, nutritional status, pulse for tachycardia, blood pressure and tremors if any were examined. Local examination of thyroid swelling was done in particular paying attention to size of the swelling, shape, surface, evidence of retrosternal extension and presence of lymphadenopathy. The consistency of nodules and evidence of intrinsic mobility, the position of trachea was ascertained for evidence of tracheal displacement or compression (Kocher's test). Once clinical diagnosis of type of goiter was made, only essential few specific investigations were done to exclude other conditions. Routine investigations like blood examination for Hb%, blood grouping, bleeding time and clotting time was done. Plain x-rays of neck AP and lateral were taken to know the tracheal displacement/compression and calcification in soft tissues. Chest x-ray was taken for retrosternal extension. Investigations such as thyroid profile (T3, T4 and TSH) were done for evidence of hypo/hyperthyroidism. FNAC was done routinely in most of the cases. Indirect laryngoscopy was carried out in all cases that underwent surgery to assess the vocal cord status prior to surgery. The preoperative treatment consisted of correction of anaemia and control of toxicity and maintenance of euthyroid state in patients with thyrotoxicosis. During surgery, utmost care was taken to preserve parathyroid glands. Nerves were routinely exposed and handled to bare minimum. Attention was paid to

meticulous haemostasis and intraoperative assessment for softening of trachea in case of longstanding goiters was done. The operated specimens were sent for histopathological examination for confirmation of clinical diagnosis was done in every case. Movements of vocal cords were noted at the end of operation during extubation. For those patients who showed features of vocal cord palsy, further laryngoscopic examinations were carried out. All patients were managed postoperatively with special watch kept for reactionary haemorrhage and respiratory distress. Patients were also examined and investigated for hypocalcaemia. All patients were treated with antibiotics. Suction drains were placed in all cases and removed usually after 48 hours. Routinely, sutures were removed in all cases on fifth or sixth postoperative day and patients were discharged on same day regular follow up was done. IDL was carried out regularly in those patients who had evidence of voice change/hoarseness. Replacement doses of thyroxine were started in those who underwent surgery for malignancy. Those patients who underwent STT for toxic goiter were followed up for development of hypothyroidism and recurrence of symptoms.

**Anaesthesia, Surgical Approach and Technique**

General anaesthesia with endotracheal intubation and muscle relaxation was routine for all patients. The patient was placed supine on the operating table with the table tilted up 15° at the head end to reduce venous engorgement (reverse Trendelenburg). A gel pad or sandbag was placed transversely under the shoulders and the neck was extended (with care particularly in the elderly) to make the thyroid gland more prominent and apply tension to skin, platysma and strap muscles (rose position). A gently curved skin crease incision was made midway between the notch of the thyroid cartilage and the suprasternal notch. Flaps of skin, subcutaneous tissue and platysma are raised upwards to the superior thyroid notch and downwards to the suprasternal notch. The deep cervical fascia was divided in the midline between the sternothyroid muscles down to the plane of the thyroid capsule. The strap muscles were not divided as a routine. The sternothyroid muscle was mobilised off the thyroid lobes taking care to stay close to the muscle and outside the capsule. In 30 percent of patients, middle thyroid veins passing directly into the internal jugular vein required ligation and division. The plane between the medial aspect of the upper pole and the cricothyroid muscle was developed by keeping close to the thyroid to minimise the risk of trauma to the external branch of the superior laryngeal nerve. The branches of the superior thyroid artery splay out over the upper pole and were ligated individually. This permits progressive downward delivery of even the highest upper pole. The lobe is then free to rotate medially out of its bed. The inferior thyroid arteries were not routinely ligated to preserve parathyroid blood supply. The recurrent laryngeal nerve has been identified. The thymus was detached by serially dividing the inferior thyroid veins. In subtotal thyroidectomy, the isthmus was transacted and the lobe resected obliquely from the medial and lateral aspects to

produce a V-shaped surface. Subtotal resection of each lobe was carried out leaving a remnant of 4-5 g on each side. Absolute haemostasis was secured by ligation of individual vessels and by suturing of the thyroid remnants to the tracheal fascia. The pretracheal muscles and cervical fascia were sutured and the wound closed over suction drain.

### Inclusion Criteria

1. Patients more than 18 years of age and of both sexes were included.
2. No associated parathyroid pathology.

### Exclusion Criteria

1. Patients with age less than 18 years.
2. Patients with parathyroid pathology.

### RESULTS

The youngest patient age in the present study was 18 years and oldest was 65 years. The peak age group of individuals undergoing thyroid surgery was in the third to fourth decade (Table 1).

Age (yrs.)	Females	Males	Total	Percentage
10-19	50	4	54	12.2
20-29	85	8	93	21
30-39	96	12	108	24.4
40-49	94	14	108	24.4
50-59	45	10	55	12.4
60-69	21	2	23	5.20
<b>Total</b>	<b>391</b>	<b>50</b>	<b>441</b>	<b>100</b>

**Table 1. Age Distribution**

Out of 441 cases, 391 were females and 50 cases were males with sex ratio 7.82:1. Out of 441 cases, 128 were multinodular goiter, 36 were diffuse colloid goiter, 6 cases were Hashimoto's disease, 238 STN, 5 Grave's disease, 18 papillary carcinoma, 8 follicular carcinoma, 2 anaplastic carcinoma cases were seen, which underwent isthmectomy for respiratory obstruction (Table 2).

Sl. No.	Diagnosis	Number of Patients	Percentage
1.	Multinodular goitre	128	29
2.	Diffuse colloid goitre	36	8.1
3.	Hashimoto's disease	6	1.4
4.	Benign solitary nodule	238	54
5.	Grave's disease	5	1.2
6.	Thyroid malignancies	28	6.3
	<b>Total</b>	<b>441</b>	<b>100</b>

**Table 2. Diagnosis**

### Complications

In present study, postoperative haematoma was seen in 5 cases, which accounting for 1.1% of the complications. Re-exploration was done in cases of intraoperative haemorrhage. Intraoperative haemorrhage was noted in 4 cases (0.9%). All these patients were resuscitated with blood transfusions. 8 cases of vocal cord paralysis were seen. Among them, 2 cases with loss of timbre of voice were

seen (SLN palsy) accounting to 0.5% of cases. 3 cases had transient impaired abduction of unilateral vocal cord (0.7%). Another 3 cases of bilateral vocal cord paralysis were seen (0.7%). In present study, hypothyroidism was seen in 10 cases (2.3%). Transient hypocalcaemia was seen in 15 cases (3.5%) and 5 cases presented with permanent hypocalcaemia (1.1%). Wound infection occurred in 4 cases (0.9%). Tracheomalacia was seen in 2 cases of longstanding multinodular goiter (0.5%). In one of them, there was retrosternal extension (Table 3).

Sl. No.	Type of Complications	Number of Patients	Percent
1.	Haematoma	5	1.1
2.	Intraoperative haemorrhage	4	0.9
3.	Hypocalcaemia Transient Permanent	15 5	3.5 1.1
4.	Hypothyroidism	10	2.3
5.	SLN palsy	2	0.5
6.	Transient vocal cord palsy	3	0.7
7.	Permanent vocal cord palsy	3	0.7
8.	Wound infection	4	0.9
9.	Tracheomalacia	2	0.5
10.	Death	2	0.5

**Table 3. Complications of Thyroid Surgery**

### DISCUSSION

Comelin J.H. et al in their study of 405 patients reported 1.2% haematoma, which was similar to our study.<sup>1</sup> The incidence of postoperative haematoma varies from 0.1 to 1.6% in the reported various series. In present study, haematoma occurred in 1.13% cases. The incidence of bleeding in the neck does not seem to be related to the number of operations performed by a surgeon on a regular basis, but is more closely related to the surgeon's training in thyroid surgery.<sup>2</sup> In present study, 3 cases (0.7%) had bilateral recurrent laryngeal nerve palsy resulting in the need for tracheostomy. Goncalves et al reported 1.4% incidence of recurrent laryngeal nerve palsy.<sup>3</sup> In a study conducted by Thomas W. J. Lenard on complications of thyroid surgery showed a 0.4% incidence of recurrent laryngeal nerve palsy.<sup>4</sup> Postoperative vocal cord palsy was defined as the presence of immobile vocal cords or decreased movement of the vocal cord during phonation. The RLN palsy is regarded as permanent if it persists for more than 1 year after the surgery.<sup>5</sup> The risk of permanent vocal cord paralysis varies from 0.2-5% in literature.<sup>6</sup> Intraoperative verification of anatomical and functional integrity of the RLN is important to avoid potential nerve injury and vocal cord palsy.<sup>7</sup> Wade advocated that the RLN is very vulnerable and the nerve should not be visualised or touched.<sup>8</sup> Intraoperative nerve monitoring device helps to monitor RLN during surgery by providing both auditory and visual evoked waveform information.<sup>7</sup> 2 cases (0.5%) presented with loss of timbre of voice due to SLN palsy. Voice change occurred in 3.7% due to damage to the superior laryngeal nerve. In three of these cases, there was transient impaired abduction of the vocal cord on extubation. These patients had

postoperative mild dysphonia. These patients received neurotrophic vitamins and steroids. All vocal cord movements recovered prior to discharge from hospital. In the present study, most common complication was transient hypocalcaemia accounted for 3.4% cases. This occurred in 12 cases of subtotal thyroidectomy and in 3 cases of total thyroidectomy. In present study, 5 cases showed permanent hypocalcaemia, which accounts for 1.13%. Permanent hypoparathyroidism rates quoted in the literature range from 0.7% to 3% of operations. JG Fillo et al and Rosato et al reported 2.5% and 1.7% of permanent hypoparathyroidism consecutively.<sup>9,10</sup> The incidence of tracheomalacia in the present study was 0.45% comparable to the study done by Green. They reported an incidence of 0.5% tracheomalacia in their study.<sup>11</sup> The incidence of infection was 0.9% comparable to the Gould et al study.<sup>12</sup>

### CONCLUSION

Thyroid surgery is safe and can be performed with minimal morbidity and mortality for a wide range of diseases of the gland. Thyroidectomy often offers the best means of permanent cure with properly selected cases. Though mortality has decreased, morbidity continues to exist by virtue of anatomical variations of structures. Complications are prone to occur in best of surgical hands, which can be minimised by meticulous attention, identification and preservation of structural details. The incidence of complications does not seem to correlate with the surgical experience as the surgeries were performed by more than twenty surgeons.

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