

COMPLICATION TRENDS OF THYROID SURGERY IN A TEACHING INSTITUTESuJay R. Belgod¹, C. S. Chikkamath²**HOW TO CITE THIS ARTICLE:**

SuJay R. Belgod, C. S. Chikkamath. "Complication Trends of Thyroid Surgery in a Teaching Institute". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 16, February 23; Page: 2731-2738, DOI: 10.14260/jemds/2015/392

ABSTRACT: Today most complications of thyroid and parathyroid surgery are related to either metabolic derangements or injury to the recurrent laryngeal nerves. This is mainly due to anatomical variations in the course of recurrent laryngeal nerve and positions of parathyroids. Patients who develop complications such as permanent hypocalcemia and recurrent laryngeal nerve injury have a diminished quality of life and increased health costs and often require lifelong replacement therapy, further surgical procedures and rehabilitation. **OBJECTIVE:** To study the occurrence of various post-operative complications following thyroid surgeries, and its outcome in a teaching and research medical institution. **METHODOLOGY:** It is an observational study made over a period of 2 years. All the cases (total 55 cases) admitted within the first year of study period for thyroid surgery were included in the study. A prospective analysis of all the patients undergoing thyroid surgeries was done mainly focusing on the operative and postoperative events. **RESULTS & CONCLUSION:** The peak age group of individuals undergoing thyroid surgery was in the fourth decade accounting for 44% of patients. In the present series mortality was zero and morbidity was seen in 30% of the cases most of them being transient. Hypoparathyroidism was the most common complication encountered in our study noted in 7(14%) cases of which 5 cases (10%) were transient and 2 cases (4%) were permanent. There were 3 cases (6%) of recurrent laryngeal nerve palsy of which 2 were transient (4%) and unilateral (right side in both cases) and 1 was permanent and bilateral (2%). There was one case (2%) of SLN palsy on left side which developed after hemithyroidectomy for a thyroid nodule. Seroma developed in one patient (2%) after removal (Total thyroidectomy) of a longstanding MNG with retrosternal extension. Hematoma occurred in one case (2%). There was one case of stitch abscess which developed following hemithyroidectomy. There was one case (2%) of hypothyroidism which developed after total thyroidectomy for a case of Grave's disease in a young lady. Surgery of thyroid gland is a safe procedure as there was no mortality and the morbidity is minimum most of which were transient.

KEYWORDS: Thyroidectomy, Complications, RLN palsy, Hypoparathyroidism, Hematoma.

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

Today most complications of thyroid and parathyroid surgery are related to either metabolic derangements or injury to the recurrent laryngeal nerves. This is mainly due to anatomical variations in the course of recurrent laryngeal nerve (RLN) and positions of parathyroids. Other complications include superior laryngeal nerve injury (SLN), infection, airway compromise, bleeding and rarely thyrotoxic storm.

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Patients who develop complications such as permanent hypocalcemia and recurrent laryngeal nerve injury have a diminished quality of life and increased health costs and often require lifelong replacement therapy, further surgical procedures and rehabilitation.

This study intends to assess the occurrence of various postoperative complications following the different thyroidectomy procedures in a teaching and research medical institute and the role of adequate preoperative patient preparation, careful, 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.

OBJECTIVE: To study the occurrence of various post-operative complications following thyroid surgeries, and its outcome in a teaching and research medical institution.

METHODOLOGY: It is an observational study made over a period of 2 years at KIMS, Hubli. A prospective analysis of all the patients undergoing thyroid surgeries was done mainly focusing on the operative and postoperative events.

INCLUSION CRITERIA:

- All the patients admitted and positively diagnosed as having thyroid swellings during the study period and requiring surgical management and willing for surgery.
- Patients who underwent thyroidectomy and attended follow up for a minimum of 1 year after discharge.

EXCLUSION CRITERIA:

- Complications already existing prior to surgery.
- Recurrent diseases and revision surgery.
- Complications which cannot be attributed to surgery due to natural course of the disease.

SAMPLING METHOD: All the cases (Total 55 cases) admitted within the first year of study period for thyroid surgery were taken. Only those cases (50 cases) that met the inclusion criteria cited above were included in the study:

- Duration of study was two years.
- Institutional committee approval and written informed consent were obtained for all cases.
- The details of clinical history were recorded according to the proforma as soon as the patient with thyroid disease was admitted.
- Patients were monitored from the time of admission, up till the time of discharge from the hospital and were later followed up on OPD at 1 month, 6month and 1 year after discharge.
- Detailed analysis of these patients who underwent thyroidectomy was done regarding various aspects such as age, sex, diagnosis & indication for surgery, type of thyroidectomy procedure done, occurrence of individual complications, type of intervention and patient outcome, duration of stay and follow-up.

RESULTS: The total number of admissions for thyroid disorders during the study period was 55 which accounted for 1% of all surgical admissions and 3.9% of all elective general surgical

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operations. 5 patients were excluded from study as per exclusion criteria. 2 patients had RLN palsy at the time of admission and 1 patient admitted for reoperation. 3 patients were lost during follow up. The youngest age in the present series was 20 years and the oldest was 62 years. The peak age group of individuals undergoing thyroid surgery was in the fourth decade accounting for 44% of patients. Out of 50 cases studied, 44 cases were females and 6 cases were males, with sex ratio of 7.3:1. Out of 50 cases, 23 were benign solitary nodules of thyroid, 17 cases were simple multinodular goitre (MNG), 2 cases were Grave's disease, 4 cases were neoplastic goitres, 1 case was Hashimoto's thyroiditis, 1 case was Riedel's thyroiditis and 2 cases were colloid goitre. Out of 4 neoplastic goitres, 2 cases were papillary carcinoma, one case was follicular adenoma and one case was follicular carcinoma. Out of 17 multinodular goitres operated, 2 cases had retrosternal extension.

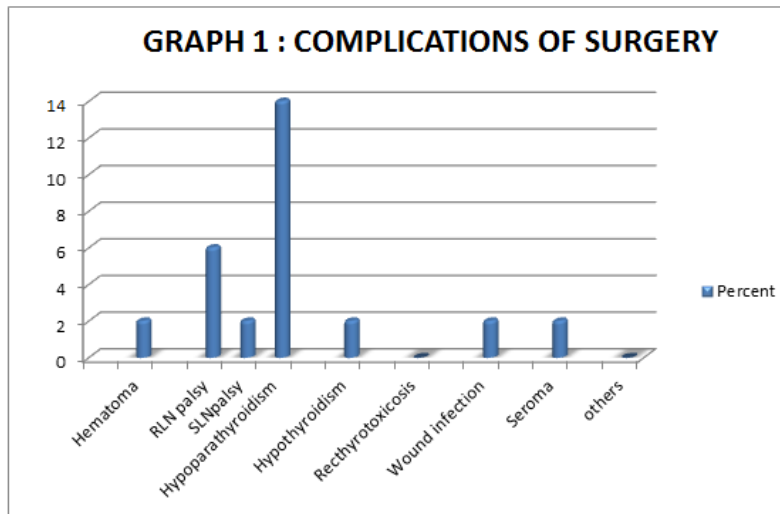
| Sl. No. | Type of surgery | Number of patients | Percent |
|---------|--------------------------|--------------------|------------|
| 1 | Hemithyroidectomies | 30 | 60 |
| 2 | Total thyroidectomy | 14 | 28 |
| 3 | Near total thyroidectomy | 1 | 2 |
| 4 | Subtotal thyroidectomy | 4 | 8 |
| 5 | Isthmusectomy | 1 | 2 |
| | Total | 50 | 100 |

TABLE 1: TYPE OF SURGICAL PROCEDURE:

| Sl. no. | COMPLICATIONS | Number of patients | Percent |
|---------|---------------------------------|--------------------|-----------|
| 1 | Hematoma | 1 | 2 |
| 2 | Recurrent laryngeal nerve palsy | 3 | 6 |
| 3 | Superior laryngeal nerve palsy | 1 | 2 |
| 4 | Hypo parathyroidism | 7 | 14 |
| 5 | Hypothyroidism | 1 | 2 |
| 6 | Recurrent thyrotoxicosis | - | - |
| 7 | Wound infection | 1 | 2 |
| 8 | Seroma | 1 | 2 |
| 9 | Others | - | - |
| | Total | 15 | 30 |

TABLE 2: COMPLICATIONS OF SURGERY

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Graph 1

| | No. of Cases | Hematoma | Hypocalcemia | Thyrotoxic storm | RLN paralysis | SLN paralysis | Wound infection | Hypo-thyroidism | Seroma |
|--------------------------|--------------|----------|--------------|------------------|---------------|---------------|-----------------|-----------------|--------|
| Hemithyroidectomy | 30 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| Subtotal thyroidectomy | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Near total thyroidectomy | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total thyroidectomy | 14 | 1 | 7 | 0 | 2 | 0 | 0 | - | 1 |
| Isthmusectomy | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 3: OPERATIVE PROCEDURES AND ASSOCIATED COMPLICATIONS

Total thyroidectomy was the procedure most commonly associated with complications in our study. Hypocalcemia was seen in 7 of the cases, RLN paralysis was seen in 2 cases and wound hematoma and seroma was noted in one each case.

Hypothyroidism was seen in one patient following subtotal thyroidectomy.

One each case of RLN palsy, SLN palsy and wound infection was seen in association with hemithyroidectomy.

No complications were seen with the procedure of near total thyroidectomy and isthmusectomy.

DISCUSSION: The majority of patients in the study were females i.e., 44 cases, with a sex ratio of 7.3:1 (F: M). The peak age group of individuals undergoing thyroid surgery was in the fourth decade accounting for 44% of patients. The mean age was 36.8 years.

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TYPE OF SURGERY: Of the 50 patients who underwent surgery, hemithyroidectomy was carried out in 30 patients, most of which were solitary benign thyroid nodules and 14 patients underwent total thyroidectomy with identification and preservation of recurrent laryngeal nerves. In remaining six patients, subtotal thyroidectomy was carried out in three cases, near total thyroidectomy was done in one case and isthumusectomy was done in one case.

In the present series mortality was zero and morbidity was minimal. This was possible because of stress being laid on preoperative preparation of cases, careful attention and respect to anatomy of structures like recurrent laryngeal nerves and parathyroids.

COMPLICATIONS:

Hematoma: The incidence of postoperative hematoma varies from 0.5 – 1.6% in various study series. In the present series, hematoma occurred in 2% of the cases. This is comparable to study results of Bergamaschi R et al¹ which showed an incidence rate of 1.6%.

The patient had no signs of respiratory distress as the hematoma was superficial to strap muscles. The patient had fullness in the neck which was noticed on the first postoperative day and also the drain was not working and hence required re-exploration. There was slippage of ligature from the anterior jugular vein which was secured. This accounted for 6.7% of total morbidity.

RLN palsy: The incidence of post-operative transient RLN palsy varies from 0.9 to 17% in various study groups. The incidence in our study group is 6% which is comparable to study results of Chiang FY et al² (5.1%).

The incidence of post-operative permanent RLN palsy varies from 0.4 to 2.1% in various study group. The incidence in our study group is 2% which is comparable to study results of Osmolski A et al³ (2.1%).

In the present study, there were 3 cases (6%) of recurrent laryngeal nerve palsy of which 2 were transient (4%) and unilateral(right side in both cases) and 1 was permanent and bilateral(2%). This accounted for 20% of the total morbidity.

Difficult dissection was encountered in all the 3 of the cases due to large goitre in 2 cases and fixation of strap muscles in 1 case. There was impaired abduction of right vocal cord on extubation in all the 3 cases.

All the 3 patients developed hoarseness of voice postoperatively. All the 3 patients were treated with steroids and neurotrophic vitamins.

Out of 2 cases of transient paralysis, 1 case recovered within 5 days and 1 case took 3 months for recovery.

Bilateral permanent recurrent laryngeal nerve palsy occurred in one case of large multinodular goitre. Both cords were in the midline. The patient developed stridor in the immediate post-operative period and was reintubated. Later tracheostomy was done. The palsy persisted even after one year.

Hypoparathyroidism: Hypoparathyroidism was the most common complication encountered in our study noted in 7(14%) cases of which 5 cases (10%) were transient and 2 cases (4%) were permanent. This accounted for 46.7% of the total morbidity.

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The incidence of transient hypoparathyroidism in various study groups ranges from 0.9 - 20%. The incidence in our study group is 12% which is comparable to study results of Filho JG et al⁴ (13.1%).

The incidence of permanent hypoparathyroidism in various study groups ranges from 0.1-4%. The incidence in our study group is 4% which is comparable to study results of Filho JG et al⁴ (4%).

Transient hypoparathyroidism developed in patients undergoing total thyroidectomy for Grave's disease (1), a large MNG (1), a follicular adenoma (1), a follicular carcinoma (1) and a large colloid goiter (1). Parathyroid glands were identified and preserved in all the 5 cases. The reason for hypoparathyroidism could be due to handling of the glands and transient ischemic injury.

Permanent hypoparathyroidism developed in one case of Grave's disease and in one case of papillary carcinoma thyroid in which total thyroidectomy was done along with radical neck dissection. Parathyroids appeared ischemic during surgery and hence auto transplantation to sternocleidomastoid muscle was done in case of Grave's disease. But still then, patient developed features of hypoparathyroidism. Hypoparathyroidism in case of papillary carcinoma could be due to ischemic injury secondary to extensive dissection.

They developed circum oral tingling and numbness and also tetany which developed 2-3days post operatively. Serum calcium was low in all the cases. They were treated with oral calcium supplements. Those with tetany were treated with calcium gluconate injections. They were followed up in OPD for every 2 weeks. 3 patients became totally asymptomatic by the end of 1 week and another 2 patients by 2 weeks and in remaining 2 patients, the symptoms persisted even after 6 months and were treated symptomatically and with calcium supplements. Parathyroid autotransplantation was done in 2 other patients who later didn't develop any features of hypoparathyroidism.

Wound infection: The incidence of post-operative wound infection varies from 0.5-0.9% in various study groups. The incidence in our study group was 2%. Though it occurred in only one case, incidence appears higher compared to other study groups due to small sample size but the incidence is similar to other clean surgical procedures in our institute. The small sample size also attributed to the relative increase in the incidence though it occurred in only one case. There was one case of stitch abscess which developed following hemithyroidectomy. It responded to suture removal and antibiotics.

OTHER COMPLICATIONS: In the present study, there was one case (2%) of SLN palsy on left side which developed after hemithyroidectomy for a thyroid nodule. This accounted for 6.7% of the total morbidity. The reason for SLN palsy in this case could be due to accidental ligation of external branch of SLN due to anatomical variation. The patient developed husky voice and had voice fatigue postoperatively. He was advised voice rest and vitamin supplements. The problem persisted for two months after which patient didn't turn up for follow up.

There was one case of seroma (2%) which occurred after removal (total thyroidectomy) of a longstanding MNG with retrosternal extension. It was aspirated using a large bore needle. The seroma developed probably due to creation of dead space after removal of large goitre.

There was one case (2%) of hypothyroidism which developed after total thyroidectomy for a case of Grave's disease in a young lady. The patient had clinical as well as biochemical evidence of

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hypothyroidism at the end of 1 month. The patient was treated with thyroxine. Hypothyroidism in the present study could be due to more extensive removal of thyroid tissue or due to a change in immune response, leading to destruction of thyroid tissue.

There was no other case of airway obstruction than one with bilateral RLN palsy.

Other reported complications like recurrent thyrotoxicosis, chyle leak, tracheal collapse and Horner's syndrome were not seen in our study. This may be due to meticulousness during surgery and also due to less number of malignant cases and hence less number of extensive dissection in the study group.

There were no cases of hypertrophied scar during the study period.

| Author | Total cases | Hematoma | RLN Palsy | | Hypoparathyroidism | | Wound Infection |
|----------------------------------|-------------|-----------|-----------|-----------|--------------------|-----------|-----------------|
| | | | Transient | Permanent | Transient | Permanent | |
| Bliss RD et al ⁵ | 2110 | 0.9% | - | 0.7% | - | 0.2% | 0.5% |
| Bergamaschi R et al ¹ | 1192 | 1.6% | 2.9% | 0.5% | 20% | 4% | 0.5% |
| Ignjatovic M et al ⁶ | 675 | 0.5% | 4.4% | - | 5% | 0.7% | 0.9% |
| Osmolski A et al ³ | 847 | - | 3.2% | 2.1% | 4% | 0.1% | - |
| Penderson CW ⁷ | 294 | - | 2% | 0.7% | 4.9% | 3.1% | - |
| Filho JG et al ⁴ | 1020 | - | 1.4% | 0.4% | 13.1% | 2.5% | - |
| Dener C ⁸ | 102 | - | 0.9% | - | 0.9% | - | - |
| Thompson NW et al ⁹ | 411 | - | - | 0.7% | - | 0.4% | - |
| PRESENT STUDY | 50 | 2% | 6% | 2% | 12% | 4% | 2% |

TABLE 4: COMPARISON OF COMPLICATIONS WITH OTHER STUDIES

DURATION OF HOSPITAL STAY: Duration of postoperative stay varied from 4 days to 20 days. Most of the patients were discharged within 1 week. Only those patients with complications were kept for a long time in the hospital. The longest stay (20 days) was by patient with bilateral vocal cord palsy with intubation.

CONCLUSION: In our study, the most common complication occurring after thyroidectomy was hypocalcemia which is consistent with other studies.

Due to the improved pre-operative patient preparation and adequate control of blood pressure and adequate hemostasis intraoperatively, no cases of thyrotoxic storm or hemorrhage were seen in any of the patients in our study. A thorough knowledge of anatomy of the thyroid gland, a good preoperative preparation, intraoperative identification of RLN, SLN and parathyroids, and meticulousness in surgery are important factors in reducing the incidence of postoperative

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complications. Watchful expectancy, early identification of post-operative complications and its timely intervention results in decreased morbidity and improved quality of life.

Surgery of thyroid gland is a safe procedure as there was no mortality and the morbidity is minimum most of which were transient.

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