Original Article

A prospective study of thyroid surgeries and their complications

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Abstract

Background and Objectives: Numerous complications may arise following surgical removal of the thyroid gland. These problems often result from either the surgical technique or from metabolic disturbances. Although the incidence of these complications is low, some problems are seen more frequently than others. Primary complications associated with thyroid surgeries include recurrent laryngeal nerve injury, parathyroid deficiency, postoperative bleeding and respiratory distress. Problems less frequently seen are infection and sympathetic nerve injury. While prevention of these complications is a primary goal during thyroid surgery, early recognition and management by the surgeon is essential for the safe recovery of the patient**. Methods:** Prospective analysis of 100 consecutive goitres underwent surgery for various indications were taken for the study in MIMS in department of General Surgery. These cases were studied in detail clinically and recorded as per proforma attached and specimen sent to HPE. Post operatively, patients were followed up for a period of 6 months. **Results:** The youngest age in present series was 18 years and the oldest was 60years. The peak age group of individuals undergoing thyroid surgery was in third to fourt decade, 83% of patients were distributed in 20 to 40 years range. Out of 100 cases studied, 82 cases were females and 18 cases were males with sex ratio of 4.5:1. Out of 100 cases who underwent surgery, 37 cases were multinodular goitre(37%), 10 cases were toxic MNG(10%), 8 Grave's disease(8%), 35 cases for solitary nodules of thyroid, 7 cases of hashimoto's thyroids and 1 for colloid goitre. Out of 100 cases 13 cases underwent Total Throidectomy(13%), 34 cases Hemithyroidectomy(34%) and 53 cases Subtotal Thyroidectomy(53%). There was no mortality and morbidity rate was 26% of which hypoparathyroidism(8%), wound infection(6%), RLN palsy(4%), hypothyroidism(4%), hematoma(2%), airway problem(1%) and seroma(1%). **Conclusions:** Non toxic MNG constituted most common thyroid disorder(37%), followed by solitary nodule of thyroid(34%). Subtotal thyroidectomy was the most common operative procedure performed. Post operative complication were hypoparathyroidism(8%) most common, wound infection(6%), RLN palsy(4%), hypothyroidism(4%), hematoma(2%), airway problem(1%) and seroma(1%) which were treated appropriately.

Keywords: MNG, HPE, Thyroidectomy, Hypoparathyroidism, RLN.

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Received Date: 15/11/2015 Revised Date: 10/12/2015 Accepted Date: 03/01/2016

Access this article online

Quick Response Code:

Website: www.statperson.com

DOI: 06 January 2016

INTRODUCTION

Thyroid gland is the only endocrine gland visible to the eye and palpable by hand when it is enlarged. Thyroid surgery has been and will always be the most common endocrine surgical operation performed in any Institution. Thyroid gland being related to vital structures poses a challenge for the operating surgeon. Leipizig (1848) stated "If we review all we know comparing operation on hard goitres we can only regard with tremendous aversion of these fool hardly performances". In 1866, Samuel D. Gross wrote "Can the thyroid in state of enlargement be removed? Emphatically experienced answers no. Should a surgeon be so fool hardly to undertake it, every stroke of his knife will be followed by a torrent of blood and lucky it would be for him, if his victim lived long enough for him to finish his horrid butchery. No honest and sensible surgeon would ever engage on it. The operative management of thyroid disease is one of major accomplishments in modern surgical technique. Three important events changed the

How to site this article: Parameshwara C M, Karthik B. A prospective study of thyroid surgeries and their complications. *International Journal of Recent Trends in Science and Technology*. January 2016; 17(3): 222-225. http://www.statperson.com (accessed 08 January 2016).

course of thyroid surgery- Lister's discovery of antisepsis, technical advances and refinements, of Theodor Kocher, the acclaimed "Father of Thyroid Surgery", work of Billroth, William S. Halsted, Miculickz and Wolfer. All their contributions have made thyroid surgery a less feared and better understood procedure.

Thyroid surgery is, rightly or wrongly, considered major surgery and is usually performed by endocrine or senior surgeons. Though mortality is rare morbidity continues to exist and is the major concern. Complications when they occur have severe implications for the patient.[32]

MATERIALS AND METHODS

Period of study is of 36 months from November 2008 to October 2011 at mandya institute of medical sciences, mandya, utilising cases admitted and treated in the Department of Surgery. Prospective analysis of 100 consecutive goitres underwent surgery for various indications were taken for the study. These cases were studied in detail clinically and recorded as per proforma attached.

INCLUSION CRITERIA

Patients more than 18 years of age and of both sex; No previous thyroid surgery; No associated parathyroid pathology.

EXCLUSION CRITERIA

1. Patients with age less than 18 years.
2. Patients who are not willing to participate in the study.
3. Patients with previous thyroid surgery.
4. Patients with parathyroid pathology.

METHODS

The details of clinical history were recorded according to the pro-forma as soon as the patient with thyroid disease was admitted. The presenting symptoms were recorded in chronological order, a relevant past history, drug history, family history, etc. were enquired into every case. A detailed history for compressive (pressure) symptoms such as dysphagia, dysphonia, dyspnea were recorded. Local examination of thyroid (swelling) was done in particular paying attention to size of the swelling, shape, surface, evidence of retrosternal extension, presence of lymphadenopathy.

OBSERVATION AND RESULTS

The total number of general surgical major operation during November 2010 to October 2012 was 10,100 of which 920 were thyroid surgeries constituting 9.12%?.

The total number of cases included in this study was 100 consecutive cases during the study period from nov 2008 to Nov 2011.

Table 1: Age distribution and Sex distribution

Age in years	Females	Males	Total	Percentage
10-19	6	2	8	8
20-29	24	4	28	28
31-39	24	4	31	31
40-49	22	2	24	24
50-59	10	3	13	13
60-69	1	-	1	1
Total	**82**	**18**	**100**	**100**

Table 2: Clinical diagnosis

Diagnosis	Number of Patients	Percent
Multinodular goiters	37	37
Toxic multinodular goitres	10	10
Grave's disease	8	8
Benign Solitary nodules	35	35
Malignant goiters	7	7
Hashimotos throiditis	2	2
Colloid goiter	1	1
Total	**100**	**100**

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Table 3: Radioilogical Findings

X-ray neck	Number of Patients	Percent
Pretracheal soft tissue	100	100
Anteroposterior compression	6	6
Tracheal deviation	12	12
Retrosternal extension	3	3
Calcification	-	-

Table 4: Type of Surgical Procedures

Operative Procedures	Number of Patients	Percent
Hemithyroidectomies	34	34
Sub-total thyroidectomy	53	53
Total throidectomy	13	13

Table 5: Complications of thyroid surgery

Type of Complications	Number of Patients	Percent
Hematoma	2	2
Airway Problem	1	1
Recurrent laryngeal nerve palsy	4	4
Hypoparathyrodisim	8	8
Hypothyroidism	4	4
Rec.thyrotoxicosis	-	-
Wound Infection	6	6
Seroma	1	1

DISCUSSION

The thyroid gland being located in neck is related to important vital structures such as vessels, nerves, trachea, esophagus and thoracic duct hence surgery on thyroid gland tests the dexterity skill and finesse of any surgeon.

An accurate performance of operation on thyroid requires experience and technical ability. Though mortality in many institution approaches to zero morbidity continues. Some may be life threatening, some

though benign quite disturbing particularly in permanent form.

Of the 100 cases who underwent surgery, hemithyroidectomy was carried out in 34 cases, most of which were solitary benign thyroid nodules and 53 cases underwent bilateral subtotal thyroidectomy with ligation of inferior thyroid artery on one side along with identification and preservation of ligation of inferior thyroid artery close to gland and on only one side in cases of bilateral procedure like subtotal thyroidectomy. The incidence of post-operative hematoma varies from 0.1-2.7% in the reported various series. In the present series hematoma occurred in 2% cases and accounted for 7.5% morbidity. In the present study, local hemorrhage/hematoma occurred in 29% cases and required reexploration. This is comparable to Catell (1949)[5] series.

Hematoma occurred in one patient, operated for multinodular goitre with substernal extension. Bleeding occurred from cut surface of the remnant. Hemostasis was achieved by under-running the remnant with catgut. The second case presented with no signs of respiratory distress as hematoma was superficial to strap muscle. Patient had fullness in neck with 300 ml of blood collected in the suction drain. On exploration there was hematoma formed due to slippage of ligature from the anterior jugular vein, which was secured. Both patients recovered without significant difference in hospital stay. In the present series none of our patients had permanent recurrent laryngeal nerve palsy or bilateral recurrent laryngeal nerve palsy.

Four cases of temporary recurrent laryngeal nerve injury occurred in this study. All four recurrent laryngeal nerve paralysis occurred on the right side. In three of these cases, there was transient impaired abduction of the right vocal cord on extubation. These patients did not have any post-operative stridor, but had mild dysphonia. These patients received neurotrophic vitamins and steroids. All patients had vocal cord movements recovered prior to discharge from hospital. These cases may be attributed to neuropraxia which could have occurred during mobilisation of the gland.

There was one case in which cord was completely immobile after surgery-at extubation. This case was operated for papillary carcinoma thyroid. During operation patient had paratracheal lymphnodes enlarged which was simultaneous excised with difficulty, patient had a difficult thyroidectomy due to tracheal invasion from the primary tumour. In post-operative period this patient had unilateral complete cord paralysis and laryngeal odema which required temporary intubation and steroids for 36 hours. Patient had clinical dysphonia, her vocal cord movements returned to normal after a period of three months.

- The rate of temporary RLN paralysis is comparable to Martenson's[9] study and McIntosh[12] series.
- In this series we have not encountered bilateral recurrent laryngeal nerve paralysis or permanent laryngeal nerve paralysis probably due to small (100) number of cases studied and it is comparable to Wade[5] series.

In this series this was the most common presentation occurring in eight cases accounted for 30.7% morbidity. Six cases (75%) occurred in toxic goitres (Grave's) subjected to subtotal thyroidectomy and two cases occurred in total thyroidectomy for malignant goitres.

Most of them manifested as clinical tetany and had serum calcium below the reference range. Seven of them were transient and responded promptly to calcium supplementation and recovered with normal calcium levels prior to discharge from hospital. There was one case of hypocalcemia which required calcium and vitamin D3 supplementation for two months and patient subsequently was normalised. In this case total thyroidectomy was the procedure carried out for malignant goitre. The hypocalcemia may be due to ischemic damage to parathyroid glands which subsequently recovered.

In the six cases of hypocalcemia that occurred in patients who were operated for toxic goitre, may be due to dilution hypocalcemia or due to hungry bone syndrome, which responded to calcium administration.

The present study shows incidence of 8% and closely correlates with Gonzales[10] and Cormelin[13] study. The rates of permanent hypocalcemia is lower in this group probably due to small number of patients undergoing bilateral procedures like subtotal and total thyroidectomy.

In our series hypothyroidism occurred in four cases of toxic goitres, 3 of which occurred in Grave's disease and 1 case in a toxic nodular goitre. The incidence in our series is comparable to Wade[5] series whose study group is almost similar to our study. The incidence of hypothyroidism is higher in operations for Grave's disease as most of surgeons aim towards excess removal rather than risking recurrent toxicity which is difficult to manage compared to hypothyroidism.

The diagnosis of post-operative hypothyroidism was based on clinical assessment and thyroid profile estimation. Patients were started on thyroxine replacement.

Post-operative causes of respiratory obstruction includes deep hematoma, bilateral recurrent laryngeal

nerve palsy, laryngeal edema and - rarely tracheal collapse due to trecheomalacia.

In present series three cases of airway complications were encountered one of which was secondary to hematoma which was relieved after re-exploration and evacuation of hematoma.

Another case was due to transient complete cord paralysis which had co-existing laryngeal odema which required temporary nasotracheal intubation and steroids for 36 hours.

Airway obstruction secondary to tracheomalacia due to the long standing multinodular goitre occurred in one patient This patient had huge goitre with substernal extension and softening of tracheal cartilages, patient recovered from anaesthesia uneventfully and patient was extubated. Complete airway obstruction occurred immediately and patient was reintubated without difficulty during which time both vocal cords were seen to move normally.

Subsequently, patient underwent emergency tracheostomy and portex cuffed trachostomy tube was introduced and patient recovered uneventfully and discharged after decanulation on 20th day.

Tracheomalacia is a rare complication occurring in less than 1 % cases. However in our series there was one case of tracheomalacia which is slightly higher.

The incidence of wound infection was higher(6%) in our series compared to other series. All of these were superficial infections, of which one of them occurred in a case of tracheostomy. All cases eventually healed well but had slight prolongation of hospital stay. Though the incidence of infection is higher compared to other series it is comparable to other clean surgeries done in our hospital.

There was one case of seroma in our series. This patient had removal of large multinodular goitre.

There were no cases of recurrent hyperthyroidism. Horner's syndrome or Chyle leaks in our series. Other minor wound complications like Keloid formation did not occur in this study.

Follow-up

All 100 cases were followed-up. The duration of follow-up varied from - three months to two years. Follow-up consisted of clinical examination and investigation as found necessary (depicted in proforma).

SUMMARY AND CONCLUSIONS

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 minimized by meticulous attention, identification and preservation of structural details.

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Source of Support: None Declared
Conflict of Interest: None Declared