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A STUDY ON INCIDENCE OF POST OPERATIVE COMPLICATIONS OF THYROIDECTOMY

General Surgery

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ABSTRACT

BACKGROUND: The aim of this study is to assess the incidence of complications in various thyroid surgeries and to identify the risk of complication associated with type of disease and procedure.

MATERIALS AND METHODS: One hundred fifty patients who underwent thyroid surgery between August 2017 to December 2019 were studied. Patients with various thyroid diseases were included in this study. These patients were thoroughly evaluated and were planned for surgery.

RESULTS: Incidence of complications were higher in toxic goitre followed by malignancy and multinodular goitre. Complications were observed following total thyroidectomy, subtotal and near total thyroidectomy. Among the complications incidence of postoperative hypocalcaemia and recurrent laryngeal nerve palsy were the commonly occurring followed by haemorrhage.

CONCLUSION: Hypocalcaemia and recurrent laryngeal nerve palsy were the commonly occurring complications. It is essential to have knowledge about the complications following thyroid surgery and good surgical expertise is essential to avoid such complications.

KEYWORDS

Thyroidectomy, Post thyroidectomy complications, Hypocalcaemia, Laryngeal nerve palsy

INTRODUCTION

Theodor Kocher developed the safe technique for thyroidectomy and this allowed continuing progress and evolution in the surgery. Thyroidectomy is performed in case of thyroid swellings causing obstructive symptoms, toxicity, malignancy and for cosmetic reasons. Although there is significant improvement in thyroid surgery, complications are still not uncommon. Complications that lead to serious morbidity following thyroidectomy are bleeding, nerve injury causing vocal cord palsy and temporary or permanent hypocalcaemia. Unavoidable complications like laryngeal oedema causing airway obstruction can also occur. Occurrence of these complications can be due to type of disease, surgical technique, extension of surgery, resurgery, neck dissection and experience. These can be prevented by proper preoperative assessment of the patient, preoperative preparation and good knowledge about the anatomy and correct surgical technique.

It has become essential to have thorough knowledge of the complications, their prevention and the ability to recognise and manage them early.

This research will evaluate the thyroid surgeries performed at Sree Balaji Medical College Hospital, Chromepet and the occurrence of complications after thyroidectomy.

AIMS AND OBJECTIVES

1. To study the incidence of complications in thyroidectomy
2. To identify the relationship between the risk of complication associated with the type of disease and the procedure.

MATERIALS AND METHODS

This study conducted in the Department of General Surgery at Sree Balaji Medical College Hospital included 150 patients who underwent thyroid surgery between August 2017 to December 2019.

Out of the 150 patients 125 patients were female and 25 patients were male between the age group of 20 to 70 years.

INCLUSION CRITERIA

Patients presenting with
1. Multi nodular goitre
2. Solitary nodular goitre
3. Toxic goitre
4. Diffuse goitre
5. Malignancy

Within the age group of 20 to 70 years

EXCLUSION CRITERIA

1. Malignancy with secondaries
2. Uncontrollable toxic goitre
3. Patients with severe comorbidities not fit for surgery.

All the eligible patients were examined thoroughly and evaluated. All the basic surgical routine investigations were done including the following

1. Thyroid function test
2. Ultrasonography of the neck
3. Serum calcium
4. Indirect laryngoscopy to assess the vocal cord status
5. Fine needle aspiration cytology of the swelling for preoperative provisional diagnosis.

Based on the diagnosis, surgery - Total thyroidectomy with or without lymph node dissection/ hemi thyroidectomy/ completion thyroidectomy was planned and performed by the expert team.

Cases with toxic goitre were well controlled with anti-thyroid drugs an beta blockers. These patients were given Lugol's iodine 10 days prior to surgery to reduce the vascularity of the gland.

Patient who developed postoperative complications were documented, managed and analysed.

Patients were followed up during the study period and reviewed.

RESULTS

In this study 150 patients were studied. Out of 150 patients 125 patients 83.3% were females and the rest 25 patients 16.6% were males. Thyroid disease is most prevalent between 30 to 50 years of age – 4 and 5th decades of life. About 20% of patients also presented before the age of 30 years.

Out of 150 patients included in this study 63 patients were diagnosed with Multi nodular goitre, 51 patients had solitary nodular goitre, 12 had toxic goitre, 16 had malignancy and 3 had colloid goitre.

Out of the 63 patients diagnosed with multinodular goitre 25% (16 cases) patients underwent subtotal thyroidectomy 33% (21 cases) patients underwent near total thyroidectomy and 41% (26 cases) patients underwent total thyroidectomy. Out of 51 patients with solitary nodular goitre 48 patients 94% underwent hemi thyroidectomy and 3 patients 5% underwent completion thyroidectomy.

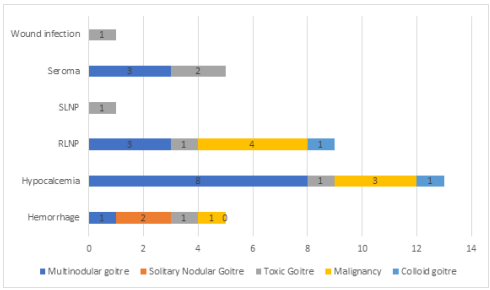

Fig.1 RLNP- Recurrent Laryngeal Nerve Palsy ; SLNP- Superior Laryngeal Nerve Palsy

Out of 15 cases of toxic goitre 6% (1 case) underwent hemi thyroidectomy, 13% (2 cases) underwent subtotal, 26% (4 cases) underwent near total thyroidectomy and 53% (8 cases) of cases underwent total thyroidectomy. All patients diagnosed with malignancy underwent total thyroidectomy (100%). Out of 5 patients diagnosed with colloid goitre 60% (3 cases) underwent total thyroidectomy and 40% (2 cases) underwent near total thyroidectomy.

Incidence of complications in various thyroid disorders. 53.3% complications were observed in toxic goitre followed by 23.8 % in multinodular goitre, 40% in colloid goitre, 50% in carcinoma thyroid and 3.9% in solitary nodular goitre.

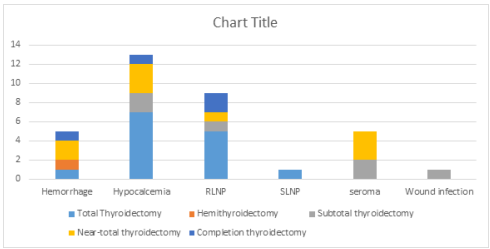

Fig.2 RLNP- Recurrent Laryngeal Nerve Palsy ; SLNP- Superior Laryngeal Nerve Palsy

Incidence of haemorrhage was 3.3% (5 cases) following near total thyroidectomy 7.4%, total thyroidectomy 1.8% and hemi thyroidectomy 2%. Haemorrhage occurred following hemi thyroidectomy done in case of solitary nodular goitre, near total thyroidectomy performed in case of toxic goitre and multinodular goitre, and in total thyroidectomy performed in case of malignancy caused airway obstruction.

Hypocalcaemia occurred following total thyroidectomy, near total thyroidectomy, subtotal and completion thyroidectomy, was the most common complication post-surgery. It's incidence was reported to be 8.6% — 13.2% following total thyroidectomy in case malignancy, multinodular goitre and toxic goitre, 11% following subtotal thyroidectomy In case of multinodular goitre, 11% following near total thyroidectomy in case of multinodular and toxic goitre and 33% following completion thyroidectomy. All were transient hypocalcaemia and became asymptomatic within 2-4 days.

Incidence of recurrent laryngeal nerve palsy was 6% and superior laryngeal nerve palsy was 0.6% following thyroidectomy. It was documented that recurrent laryngeal nerve palsy was the second most commonly occurring. It was frequently occurring following total thyroidectomy in case of malignancy 9.4% (5 cases) and in case of completion thyroidectomy (2 cases). All cases were transient and eventually recovered.

Seroma occurred in 2 cases 25% following subtotal thyroidectomy and in 3 cases 11% of near total thyroidectomy. Minor wound infection occurred in 1 case of subtotal thyroidectomy.

DISCUSSION

The overall rates of thyroid surgery complications are higher relative to previous data.

In this study 150 patients were observed and out of it 83% were females and 25% were males with thyroid disorders most commonly occurring between the age group of 30 to 50 years.

Most frequently performed thyroid surgery in our study is total thyroidectomy followed by hemi thyroidectomy and most frequent complications were observed in total thyroidectomy.

Overall incidence of complications in this study was 25%.

Hypocalcaemia was the most common complication accounting for 8.6% (13 cases). All were transient hypocalcaemia. Patients who are at risk are middle aged, patients with multinodular goitre and carcinoma and patients undergoing bilateral thyroid surgery and extensive resection.

According to a report of British Association of Endocrine and Thyroid Surgeons (BAETS) after total thyroidectomy 30% of the patients have temporary hypocalcaemia and around 7% of the patients are using oral vitamin D and calcium therapy for a long time.

Hypocalcaemia may result due to accidental injury, removal or devascularisation. Transient hypocalcaemia responds to calcium replacement therapy. It considered permanent when calcium does not return to normal within 6 months. [2]

If the parathyroid glands are well protected in the capsule anatomically the surgeon may preserve them easily. On the other hand if they are fused with the thyroid capsule meticulous dissection is needed to preserve them. Pericapsular ligation of inferior thyroid artery and careful ligation of posterolateral branch of superior thyroid artery after confirming that it does not supply superior parathyroid must be done. [1]

Despite good surgical technique and preservation of parathyroid glands and their blood supply, Graves' disease patients and malignancy cases exhibit a delayed but rapid fall in calcium 2 to 3 days post thyroidectomy. In a study conducted by Vinod Kumar et al and Richmond et al incidence of transient hypocalcaemia was frequent accounting for 12% and 13% respectively.[4]

Hansraj et al study had 12% incidence with 6 delayed presentations during follow up, higher than our study. [5]

Many studies have reported 5% to 30% incidence rate. M.A.Majid et al reported parathyroid insufficiency was higher in bilateral procedures than unilateral procedure (9.52% and 5.21%). [7] some stated that transient hypocalcaemia is due to nonspecific hemodilution with surgical stress or may be due to decreased renal absorption post-surgery [7]

Joao Gonçalves Filho et al reported hypocalcaemia incidence as 27% transient and 5% permanent out of 123 patients studied commonly associated with thyroidectomy and neck dissection. Neck dissection and paratracheal dissection were the risk factors. [8]

Pattou et al reported in a prospective study that all patients with transitory hypocalcaemia became normocalcaemic within 1 week to 6 months post surgery with treatment. Incidence of permanent hypocalcaemia is lower (0% - 8%). [9]

Anbalagan et al reported 7% incidence and stated most published reports quoted a figure below 10% in the last 5 years. Capsular dissection technique may be useful in reducing the incidence. [11]

Recurrent laryngeal nerve palsy was 6% in this study. This complication occurred in patients with multinodular goitre, toxic goitre and malignancy more frequently following total thyroidectomy and completion thyroidectomy. The prevalence from other studies is up to 14%. Ajmal Hussain et al reported 3% incidence out of 230 patients lower than our study. Usually it is a transient neuropraxia and recovery will be within few weeks to months. They also reported nerve is susceptible to injury during resurgery ranging between 3% to 8% [1] Transient nerve palsy may occur due to excessive skeletonization of the nerve, neuropraxia, neuritis due to scar tissue, excessive traction or diathermy heat injury. Hansraj et al reported only case of permanent nerve palsy occurred in malignancy [5]

Unilateral palsy cause hoarseness of voice and bilateral palsy causes partial airway obstruction leading to stridor or respiratory distress or both. A non recurrent, recurrent laryngeal nerve can occur often on the right and is at risk during surgery. [7] Identification of the nerve and ligation in continuity inferior thyroid artery is the key step to avoid

nerve damage. Incidence of superior laryngeal nerve palsy in this study is 0.6% in a patient with malignancy. Patients had increase in voice pitch and voice fatigue within a day. Intensive phototherapy is recommended for these patients.

Post operative bleeding is a serious complication. Most commonly occurred in case of bilateral thyroid surgery and when there is extensive thyroid resection. When there is haemorrhage after thyroid surgery immediate exploration is necessary as it can cause respiratory compromise due to laryngeal oedema. In this study incidence of haemorrhage was 3.3% which required re exploration. Ajmal Hussain et al reported 1.4% incidence and found it was within the range of other studies up to 5%. [1]

Complications like seroma, wound infections also occurred but there incidence is less and are easily treatable by frequent aspiration and wound dressings respectively. Other rare complications like tracheo oesophageal injury, chalks fistula , arytenoid dislocation and thyroid storm can also occur. Thyroid storm where symptoms occur in 4 hours post surgery is more common in young women, Graves' disease and toxic goitre. The mortality rate is high from 20% to 30%.

Postoperative are not uncommon with many thyroid surgery. Evidence based quality initiatives should be implemented to improve thyroid surgical care and minimise postoperative complications in vulnerable patients. At risk patients should be referred to high volume thyroid surgeon to improve outcomes.

There is a need for both physician and patient education.

Physician education focus on effectively training low volume surgeons to adopt best practice strategies, minimise practice variation and implement early recognition and prompt initial management of postoperative complications. Patients also should be educated on possible thyroid surgery risks and complications and encouraged to participate in shared decision making.

CONCLUSION

In this study incidence of hypocalcaemia and recurrent laryngeal nerve palsy were common complications than haemorrhage. Complications are frequent following total, subtotal and near total thyroidectomy in cases of toxic goitre, carcinoma and multinodular goitre. Post operative complications can be reduced by careful clinical evaluation, thorough clinical knowledge of the surgical anatomy, a systematic dissection to protect the vital structures.

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