

Clinical Study of Post Operative Complications of Thyroidectomy

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Abstract:

Background and Objectives: Thyroid surgeries comprise one of the more commonly performed procedures by a general surgeon. Today most of the complications of thyroid surgery are related to either metabolic derangements or injury to the recurrent laryngeal nerve injury. Other complications include superior laryngeal nerve injury, infection, airway compromise, and bleeding. This study intends to examine the incidence, natural history and the factors contributing to the various complications following thyroidectomy and the effect of timely and prompt recognition and intervention in minimizing morbidity.

Methods: This randomized prospective study conducted between June 2013 and May 2015 includes 50 consecutive patients undergoing various thyroidectomy procedures and meeting the inclusion criteria, after presenting to the surgical OPDs of our hospital. All cases were followed up for a period of 1 year.

Results: 30% of the patients were seen to be in the third decade of life with the female: male ratio being 9.6:0.4. Lobectomy was the procedure done in 38% of the patients and Multinodular goiter was the most common diagnosis. The incidence of post-operative hypocalcemia was 16%, and that of RLN paralysis, wound infection, Seroma, and haematoma were 2%, 4%, 2% and 2% respectively. The incidence of bleeding and thyrotoxic storm was nil. None of the patients developed permanent hypocalcemia. Complications were more common with total thyroidectomy.

Interpretation and Conclusion: An adequate pre-operative preparation, thorough knowledge of anatomy and operative steps with meticulous attention to hemostasis and dissection is essential in ensuring an uneventful post-operative recovery. Identification of the RLN and parathyroid glands and careful preservation was related to the rate of post-operative complications. A careful patient monitoring in the post-operative period ensures intervention procedures to be instituted quickly and enables a better outcome for the patient.

Keywords: Thyroidectomy; postoperative complications; hypocalcaemia; RLN injury.

I. Introduction:

After obesity, thyroid disorders are the most common cause of metabolic disturbances, with surgery forming the mainstay of treatment of many thyroid swellings. Thyroid surgery in the hands of experienced surgeons is currently one of the safest procedures performed. While complications following surgical removal of thyroid gland are rare, their consequences can often be debilitating and even life-threatening. The major complications include postoperative hemorrhage, respiratory obstruction, hyperthyroid storm, hypoparathyroidism, and laryngeal nerve injuries.

Thyroidectomy remains the third most common cause of bilateral vocal fold immobility and also a significant number of unilateral vocal cord paralysis are caused by it. Patients who develop complications such as permanent hypocalcaemia 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 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.

Objectives:

- To study the occurrence of various post-operative complications following the use of various thyroidectomies.
- To study the effect of management and follow up of the patients up to 1 year postoperative period in patients undergoing thyroidectomy

II. Methodology

This study was conducted on 50 patients undergoing various thyroidectomy procedures in our hospital, during the study period of June 2013 to May 2015.

Inclusion criteria:

- Patients admitted and positively diagnosed as having thyroid swellings requiring surgical management and willing for surgery. □
- Patients who underwent thyroidectomy and attended follow up for 1 year after discharge. □

Exclusion criteria:

- Patients with thyroid swellings with an already damaged RLN as diagnosed by pre-operative IDL examination. □
- Patients undergoing thyroidectomy for recurrent thyroid disease, concomitant lymph node dissection and hyperparathyroidism. □
- Patients who have undergone thyroidectomy and who were lost for follow-up. □

Sampling procedures:

A total of 50 consecutive cases were taken from our hospital. The cases that met the inclusion criteria cited above were included in the study.

- Duration of study was from June 2013 to May 2015. □
- Institutional committee approval and written informed consent were obtained for all cases. □
- Patients were monitored from the time of admission, up till the time of discharge from the hospital and were later followed up during the period of study at interval of 3 months in the OPD. □
- 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. □

III. Results:

Table-1 Age Wise Distribution

Age group (years)	No. of cases	Percentage
11-20	6	12
21-30	15	30
31-40	14	28
41-50	10	20
51-60	3	6
61-70	1	2
71-80	1	2
Total	50	100

Table-2 Mode Of Presenting Symptoms

Symptoms	No. of cases	Percentage
Swelling	41	82
Swelling + pain	6	12
Swelling + palpitations	1	2
Swelling + pain + palpitations	2	4

Table-3 Histopathological Diagnosis

Diagnosis	No. of cases	Percentage
Solitary thyroid nodule	13	26
Multinodular goiter	19	38
Diffuse colloid goiter	2	4
Primary thyrotoxicosis	2	4
Hashimoto's thyroiditis	4	8
Papillary carcinoma	3	6
Follicular carcinoma	2	4
Follicular adenoma	5	10

Table-4 Operative Procedure Done

Procedure	No. of cases	Percentage
Total thyroidectomy	8	16
Total thyroidectomy + parathyroid autotransplantation	3	6
Total thyroidectomy+Berry picking of lymph nodes	1	2
Near total thyroidectomy	4	8
Subtotal thyroidectomy	15	30
Lobectomy	19	38

Table-5 Incidence of Operative Complications

Post-operative complication	No. of cases	Incidence in percentage
Bleeding	0	0
Haematoma	1	2
Hypocalcemia	8	16
RLN paralysis	1	2
SLN paralysis	0	0
Thyrotoxic storm	0	0
Airway obstruction	0	0
Seroma	1	2
Wound infection	2	4
Hypothyroidism	0	0
Recurrent hyperthyroidism	0	0
Hypertrophic scar/keloid	0	0

Table-6 Intervention Procedures Performed

Procedure	No. of cases	Percentage
Oral Calcium+ Vitamin D+	8	16
Calcium gluconate i.v		
Antibiotic therapy	2	4
Needle aspiration	2	4
No intervention required	38	76

Diagnosis	Type of complication											
	Bleeding	Hematoma	Hypocalcemia	Thyrototoxicosis	RLN paralysis	SLN paralysis	Thyroiditis	Seroma	Wound infection	Hypothyroidism	Recurrent hyperparathyroidism	Hyperboplastic
Malignancy-Follicular 1& Papillary	0	1	1	0	0	0	0	0	1	0	0	0
Solitary & multinodular goiter	0	0	5	0	1	0	0	0	1	0	0	0
Primary thyrotoxicosis	0	0	0	0	0	0	0	1	0	0	0	0
Hashimoto's thyroiditis	0	0	2	0	0	0	0	0	0	0	0	0
Follicular adenoma	0	0	0	0	0	0	0	0	0	0	0	0
Diffuse colloid goiter	0	0	0	0	0	0	0	0	0	0	0	0

Table-7 Diagnosis Versus Complications

Table -8 Evaluation of All Patients At Follow-Up

Complaint	No. of cases	Duration
Hypocalcemia	7	upto 3 mnths
RLN paralysis hypocalcemia	+	1 upto 3 months
Hematoma	1	Relieved within 1 day
Wound infection	2	Relieved within 1 week
Seroma	1	Relieved within 3 days
No complaints	38	-

IV. Discussion

Fifty patients who underwent various thyroidectomy procedures were studied to analyze the occurrence of different early post-operative complications following surgery from June 2013 to May 2015 in our hospital. Statistical analysis of these cases has been made which is mentioned in the observation tables with reference to several parameters and conclusions are drawn from them. A comparison with the series of others has also been made. In our study, it was found that the minimum patient age was 14 years and maximum age was 75 years. The average age was 38 years. The male: female ratio was 0.4:9.6. In our study, 41 out 50 patients presented

with a neck swelling as the sole complaint i.e. 82%. 6 patients had both swelling and pain during the initial presentation and only 2 patients had palpitations as an additional symptom.

Histological Diagnosis

Authors	Histological diagnosis	
	Malignancy	Benign
Rix ³²	10%	90%
Sakorafas ³⁵	27%	83%
Sasson ¹⁰	52%	48%
Present study	10%	90%

The most common diagnosis in our study was Multinodular goiter seen in 19 patients (38%), followed by Solitary thyroid nodule (n=13) and Follicular adenoma (n=5). Of the 50 patients, 5 (10%) were operated on for malignant disease.

Among the post-operative complications, Hypocalcaemia was the most common post-operative complication and was seen 16% of the patients. The second most common post-operative complication was wound infection occurring in 4% of the 50 patients. The incidence of haematoma, RLN paralysis and seroma was 2%, each complication being seen only in 1 patient. Bleeding and thyrotoxic storm did not occur in any of our patients. Steurer series found 3.4%, 7.2%, and 2.5% of temporary RLN palsy in the benign thyroid nodule, thyroid malignancy and hyperparathyroidism groups respectively.

Richmond series shows the rate post-operative hypocalcemia to be 20% and this parameter is comparable with our series (16%) with a difference of 4%.

Corresponding to the 38 out 50 patients whose recovery was uneventful; Of the 8 patients who developed hypocalcaemia patients had normal serum calcium levels at discharge. None of the patients had hyperparathyroidism at the end of our study.

Postoperative Complications Versus Other Studies

Authors	Post-operative complications						
	RLN paralysis	SLN paralysis	Transient Hypo-calcemia	Hypo-thyroidism	Woundinfectio n		WoundHematoma Thyrotoxicstorm
Bhattacharya ²	0.77%	NA	6.2%	NA	2.0%	1.0%	NA
Steurer ¹⁷	0.26%	NA	2.0%	NA	NA	NA	NA
Erbil ²⁵	1.8%	NA	6.6%	NA	NA	NA	NA
Chow ¹⁴	2.0%	NA	NA	NA	NA	NA	NA
Richmond ³¹	1.33%	NA	13%	NA	NA	NA	NA
Sasson ¹⁰	NA	NA	6.0%	NA	NA	NA	NA
Palestini ²⁶	NA	NA	NA	NA	NA	1.5%	NA
Palazzo ²⁷	NA	NA	9.8%	NA	NA	NA	NA
Lam ²⁸	NA	NA	30%	NA	NA	NA	NA
Page ¹²	NA	NA	35%	NA	NA	NA	NA
Dionigi ²⁹	NA	NA	NA	NA	2.0%	NA	NA

Testa ¹³	NA	NA	20%	NA	NA	NA	NA
Seiberling ³⁰	NA	NA	NA	24.1%	NA	NA	NA
Present study	2%	0%	16%	0%	4%	2%	0

Complications were most commonly associated with the procedure of total thyroidectomy, with 4 patients of the 8 patients (50%) who underwent total thyroidectomy developing hypocalcaemia one patient developed haematoma.

Two out of the three patients (66.6%) undergoing total thyroidectomy with parathyroid autotransplantation developed transient hypocalcaemia which improved with oral Calcium supplements.

15 patients who underwent subtotal thyroidectomy, two patients developed hypocalcaemia, wound infection occurred in one (6.66%), Seroma formation in one patient, RLN paralysis in one patient.

One out of four patients who underwent Near total thyroidectomy developed wound infection improved with oral antibiotics.

Nodular goiter (MNG+STN) was associated with a higher incidence hypocalcaemia (62.5% of cases) i.e. 5 out of the 8 hypocalcaemic patients operated for Nodular goiter. 1 out the same 2 patients developed wound site infection.

Wound site infection was noticed in one case of follicular carcinoma and one case in multinodular goiter.

Out of the 4 patients diagnosed with Hashimoto's thyroiditis, hypocalcaemia was seen in two patient (50%). No cases seen with hypothyroidism

No associated complications were seen with the diagnosis of follicular adenoma and Diffuse colloid goiter in our study.

The mean post-operative stay in our study was 7 days. Majority of the patients (76.6%) were discharged within 5-7 days following surgery. All the cases were operated under general anaesthesia.

All patients were followed up on outpatient basis at 1 week after surgery and subsequently at 3 month intervals for 1 year after surgery.

Both the patients developing wound site infection were followed up again at 1 week after discharge and were found to have clean, healthy scars.

38 out the 50 patients who had uneventful recovery following surgery were found to have no fresh complaints at follow-up.

V. Conclusion

A clinical study of post-operative complications in 50 patients undergoing various thyroidectomy procedures was done between June 2013 and May 2015 in our hospital All the cases were taken during the period of study i.e. between June 2013 up till May 2015 and the remaining period of study was devoted to follow-up of the patients. In our study, the most common complication occurring after thyroidectomy was hypocalcaemia seen in 16% of the cases. This can be attributed to total thyroidectomy forming almost half the number of the thyroidectomy procedures. All the cases of hypocalcaemia observed were temporary and no case of permanent hypocalcaemia was seen in our study.

The incidence of RLN paralysis was 2% and could be due to neuropraxia. The paralysis was temporary. The incidence of wound site hematoma was 2% in our study and could be attributed to a faulty drain system. The possibility of inadequate hemostasis was ruled out in this patient as the hematoma was small and located superficially and there were no associated symptoms of airway compromise. Wound site infection occurred in 4% of our patients. Seroma formation occurred in 2% of our patients. Due to the improved pre-operative patient preparation and adequate control of blood pressure and adequate hemostasis intraoperatively, no cases of thyrotoxic storm or bleeding were seen in any of the patients in our study.

Also due to improved knowledge about the thyroid gland anatomy and the variations in both course of the RLN and the position of the parathyroid glands combined with a meticulous dissection has gone a long way in reducing the incidence post-operative complications following thyroidectomy. Hence, it is in the hands of the surgeon to give a satisfactory outcome to the patient and ensure a better quality of life.

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