

A STUDY ON POST SURGICAL COMPLICATIONS OF TOTAL THYROIDECTOMY

Surgery

Lakshmi Meena Jasti	Assistant Professor of General Surgery, ACSR Govt. Medical College, Nellore, Andhra Pradesh.
Varikuti Aparna*	Assistant Professor of Pulmonary Medicine , ACSR Govt. Medical College, Nellore, Andhra Pradesh. *Corresponding Author
Obed Ahmed Sheik	Senior Resident In Department of General Surgery, ACSR Govt. Medical College, Nellore, Andhra Pradesh.
Beenaboina Venkata Ramana Murthy	Assistant Professor of General Medicine , ACSR Govt. Medical College, Nellore, Andhra Pradesh.

ABSTRACT

AIM :- To Study the Post Operative Complications Following the Surgical Treatment of Thyrotoxicosis, any tuberculous infection and to know the overt thyroid dysfunction at the time they completed the questionnaire post operatively

Background :- Thyrotoxicosis refers to a clinical state that results from inappropriately high thyroid hormone action in tissues generally due to inappropriately high tissue thyroid hormone levels 'Hyperthyroidism refers to over activity of the thyroid gland leading to high synthesis and excessive production of thyroid hormones'.

Materials and methods: This is a prospective study in the surgical department of the ACSR Govt. medical college and Hospital from December 2017 to December 2018. Totally THIRTY patients with varied clinical presentations are confirmed to be suffering from the Thyrotoxicosis and tests were appropriately evaluated and Thyrotoxicosis controlled and consented patients were operated.

Results: Surgical management of hyperthyroidism enables good endocrinal control if surgery is complete. Long-term follow-up is necessary to detect recurrence, which can occur more than 20 years after partial thyroidectomy surgery, here possibility of which is ruled out by total thyroidectomy. Total thyroidectomy is reserved for patients with severe disease or large goiters in whom recurrences would be highly problematic, but carries an increased risk of hyperparathyroidism and laryngeal nerve damage. There was no tuberculous infection.

Conclusion: Surgery should be proposed as an immediate and completely effective solution for thyrotoxicosis, especially when compared with prolonged medical therapy, and post operative complications are very minimal.

KEYWORDS

Thyrotoxicosis, hypocalcaemia, recurrent laryngeal nerve.

BACKGROUND

Kocher encountered the striking malady of exophthalmicgoiter, as describe by Grave's² preoperatively. Whereas his contemporaries would shy away from such risky thyrotoxic patients, Kocher designed staged surgery for them. He promoted a first stage of ligation of several named thyroid arteries to diminish the gland's blood supply, then a second stage of one-sided lobectomy. If thyrotoxicosis remained or recurred, then a third stage would be considered to reduce the size of the remaining lobe, but ensuring residual tissue to offset myxoedema. Kocher's mortality rate for such cases was only 4.5%, which was extraordinary, especially when recalling that this was a time before preoperative preparation with iodine or antithyroid drugs³.

Charles mayo was dramatically introduced to thyroid surgery in 1890, and he moved to tackle feared problem of hyperthyroidism. Mayo had performed 278 successful surgeries for Graves's disease with mortality less than 1%⁴. With highest no. of surgeries and lowest mortality, hence was titled "father of American thyroid surgery".

The most notable thyroid surgeons were Emil Theodor Kocher (1841-1917) & Theodor Billroth (1829 – 1894). *Emil Theodor Kocher* of Berne is regarded by many as *Father OF Thyroid Surgery*.

In 1909, *Kocher Received The Nobel Prize* for medicine in recognition "for his works on physiology, pathology & surgery of thyroid gland"⁵.

Although toxic nodular goiter is less common than Graves' disease, its prevalence increases with age and in the presence of iodine deficiency.

Therefore, toxic nodular goiter may actually be more common than Graves' disease in older patients from regions of iodinedeficiency⁶.

Tuberculosis of the thyroid gland is an extremely rare disease. According to the literature, the frequency of thyroid tuberculosis is 0.1%–0.4%⁷.

MATERIALS AND METHODS

This is a prospective study in the surgical department of the ACSR Govt. Medical College and Hospital from December 2017 to December 2018.

This study was carried out in collaboration with department of general medicine

MODE OF ADMISSION

1. Patients admitted with signs and symptoms of thyrotoxicosis and with confirmed elevated thyroid hormone levels.
2. Patients with clinical features of thyrotoxicosis with or without treatment.

A total of 30 patients were included in this study

Pre-operative assessment

All the patients were subjected to basic investigations like complete hemogram, blood sugar, urea, urine analysis, chest x-ray, ultrasound and other specific investigations like Indirect laryngoscopy, serum calcium, cervical x-ray and CT scan for suspicious of intra-thoracic extension.

Indirect laryngoscopy done for all patients as routine work up.

Serum calcium was assessed pre-operatively and were in normal limits. Normal range 8.10-10.40 mg/dl. This is to have base line value against which it can be compared in post-operative period for diagnosing cases of hypocalcemia.

After the preoperative assessment was done patients were posted for total thyroidectomy.

Surgery was in all cases performed under general anesthesia with intubation.

Indications for surgery

- Large goiter with or without compressive symptoms
- Failure of ongoing medical treatment
- Recurrence after anti thyroid medication
- Preference for surgery

All patients controlled with anti-thyroid medication and those patients taken up for surgery if antithyroid drugs was ineffective for primary thyrotoxicosis or After controlling thyrotoxicosis symptoms with medical therapy in case of toxic multinodular goiter; those with large goiter with or without compressive symptoms.

Post-operative care

Drainage and dressing was inspected for soakage on the night of surgery.

Drainage tube is removed 24-48 hours after surgery if no active bleeding in noted.

Serum calcium levels post-operatively were monitored 12hrs, 24hrs with preoperative values. If found to be less than 8.0 mg/dl were started on oral calcium if asymptomatic and oral or intravenous calcium supplementations if symptomatic. Postoperatively thyroid hormones levels were monitored and thyroxine supplementation was started by 1.7mcg/kg body weight.

All 30 patients were confirmed to be in a condition of hyperthyroidism when the surgical option was proposed, and underwent total thyroidectomy in a state of clinical or biological euthyroidism after medical therapy like antithyroid medications (methimazole) and also received propranolol for control of cardiac associated thyrotoxic symptoms

Aspirated sample from excised thyroid lobes was sent for CB-NAAT to rule out any tuberculous pathology

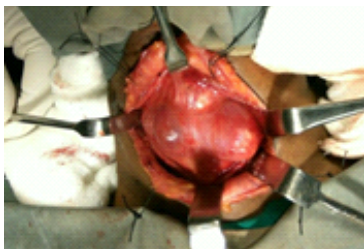
PHOTOGRAPHS

FIGURE 1: FLAPS RAISED AND EXPOSURE OF THE GLAND AFTER SEPERATION OF STRAP MUSCLES



FIGURE 2: IDENTIFICATION OFF RECURRENT LARYNGEAL NERVE

RESULTS

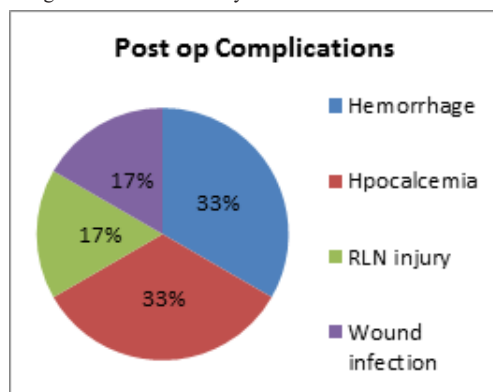
Post operative complications like

- 1 Hemorrhage
- 2 Hypocalcaemia
- 3 Recurrent laryngeal nerve injuries
- 4 Wound infections
- 5 Hypertrophic scars

Table 1: Post-operative Complications(N=30)

S NO	COMPLICATIONS	NO OF CASES N=30	PERCENTAGE
1	Hemorrhage	2	6.67%
2	Hypocalcemia	2	6.67%
3	RLN injury	1	3.33%
4	Wound infection	1	3.33%

In this study postoperatively complication most commonly being HYPOCALCEMIA. 2ND most common being RLN injury was noted in this study (3.33%). Both hypocalcemia and RLN injury are transient and no case of permanent hypocalcemia or RLN injury was noticed. Only 1 case of wound infection was seen. No case of reactionary hemorrhage was seen in this study.



Graph 1: Postoperative complications following surgery (N=30)

HEMORRHAGE

Per Operative hemorrhage in this study was due to large goiter which is due to high vascularity.

There were no case of wound hematoma or reactionary hemorrhage documented post operatively in this study period.

Table 2: Frequency of Hemorrhage (N=30)

S NO	TYPE	NO OF CASES	PERCENTAGE
1	INTRA OP	2	6.6%
2	POST OP	0	0%

Intra operative hemorrhage accounts for 6.6% in my study due to large goiter and its high vascularity.

HYPOCALCEMIA

Table 3: OVERALL INCIDENCE OF HYPOCALCEMIA (N=30)

S NO	TYPE	NO OF CASES	PERCENTAGE
1	TRANSIENT	2	6.67%
2	PERMENANT	0	0%

OVERAL INCIDENCE OF HYPOCALCEMIA stands at 6.67% in this study. Though All are transient non are permanent.

Hypocalcemia was due to large goiter and more extensive surgery.

Table 4: Incidence of nerve injury (N=30)

S NO	TYPE	No OF Cases(N=30)	%
1	RLN UNILATERAL	1	3.33%
	BILATERAL	0	0%
2	SLN	0	0%

There was case of cord palsy due to recurrent laryngeal nerve (unilateral) in injury with overall incidence being 3.33% in this study. Though it was case of transient RLN palsy which recovered over a period of 3-6 months.

INCIDENCE OF WOUND INFECTION

Only one case of wound infection was seen and documented in this study with overall incidence of 3.33%.

INCIDENCE OF SCAR HYPERTROPHY

There were zero case of scar hypertrophy was noted of this 30 cases.

Most of the patients in my study return to the activity mainly after 14th pod. There was not much difference in 7th to 9th pod. Ability to attend work mainly depends on occupation status

Table 5: Occupations Status (N=30)

S. no	Occupation	No of cases
1	Students/ unemployed	5
2	Employed	7
3	House wife's	18

Table 6: Continued medications(N=30)

Medications	No of cases	
	Pre-op	Post-op
Multiple	30	2
Single	0	28

In my study earlier before surgery all patients were on antithyroid medications and medications for control of thyrotoxic symptoms but after surgery 2 of my patients who had hypocalcemia remain to be on calcium supplements and as well as thyroxine. Rest of the patients remain on thyroxinesupplements.

Frequent hospital admissions on persistence of symptoms.

Post operatively symptoms improved for all the patients in this study. None of the patients had overt thyroid dysfunction at the time they completed the questionnaire. Only one patient had taken frequent visits and admissions for symptoms of hypocalcemia. Though none of these patients developed any permanent morbidity following surgery.

DISCUSSION

In this patients the indications for total thyroidectomy were: 8 large goiters with compressive symptoms, 15 patients with failure or intolerance of previous treatment, 2 recurrent hyperthyroidism after medical treatment; 5 patients with preference for surgery.

The mean postoperative hospital stay was 7 days (range: 5-9). Transient hypocalcaemia occurred in 2 patients (6.6%) and transient unilateral recurrent laryngeal nerve injury in another 2 patients (3.3%). None of the patients had permanent hypocalcaemia or permanent recurrent laryngeal nerve injury.

All 30 treated patients relieved their symptoms and became biochemically hypothyroid after the operation. All patients after Total thyroidectomy medication were kept on single medication on thyroxine only except 2 patients additionally were on calcium supplements for hypocalcemia.

Thus after total thyroidectomy results are rapid, reliable resolution of hyperthyroidism and removal of multinodulargoitre, requires no re-treatment, removes any coexisting malignancy, and post-surgical hypothyroidism is simple to treat.

Total thyroidectomy is reserved for patients with severe disease or large goiters in whom recurrences would be highly problematic, but carries an increased risk of hyperparathyroidism and laryngeal nerve damage.

By AM Fam physicians of American family physicians of hyperthyroidism stated that Risk of hypothyroidism (25 percent) or hyperthyroid relapse (8 percent); temporary or permanent hypoparathyroidism or laryngeal paralysis (less than 1 percent); higher morbidity and cost thanradioactive iodine; requires patient to be euthyroid preoperatively with antithyroid drugs or iodides to avoid thyrotoxic crisis⁸.

Ahmed Al-Adhami, et al., Of 71 AF procedures: one developed acute airway obstruction; one permanent RLN palsy; four permanent hypocalcaemia; and none developed recurrent toxicity. There were no deaths within a year of surgery the shift to ablative surgery virtually eliminated the need for lifelong specialist follow-up, albeit with an insignificant rise in permanent hypocalcaemia⁹.

Postoperative complications comprised 4% permanent recurrent laryngeal nerve palsy (1 year follow-up), 9% hematoma requiring surgical revision, and 3% definitive hypocalcemia. Normalization of thyroid hormone levels was observed in 198 patients. Two recurrences occurred due to incomplete resection (1 case of Graves' disease and 1 intrathoracic toxic goiter that occurred respectively 18 and 5 months after resection). Postoperative complications were more frequent in multinodular goiter (23%) than in Graves' disease.

Pisanu A et al., surgical indications and the effectiveness of total thyroidectomy in the treatment of 70 toxic multinodulargoitres.

In 46 patients (65.7%) the indications for total thyroidectomy were: 25 compressive goiters, in 24 patients (34.3%) with failure or intolerance of previous treatment, surgical indications were: 9 persistent and 5 recurrent hyperthyroidism after medical treatment; 6 patients with

cardiotoxicity; 3 patients with recurrent disease after percutaneous ethanol injection; 1 patient with antithyroid drug intolerance. The mean postoperative hospital stay was 3.2 days.

Transient hypocalcaemia occurred in 6 patients (8.6%) and transient unilateral recurrent laryngeal nerve injury in another 3 patients (4.2%). None of the patients had permanent hypocalcaemia or permanent recurrent laryngeal nerve injury. All 70 treated patients relieved their symptoms and became biochemically hypothyroid after the operation. Total thyroidectomy results in a rapid, reliable resolution of hyperthyroidism and removal of multinodular goitre, requires no re-treatment, treat¹⁰.

Branka Bukvic, MD et al., The QoL of the GD patients was worse than that of the TNG patients, with significant differences in eye symptoms, anxiety, and sex life domain, preoperatively, and in eye symptoms, anxiety, emotional susceptibility, and overall QoL ($P = 0.001$, $P = 0.027$, $P = 0.005$ and $P = 0.013$, respectively), postoperatively.

The improvement in QoL in the GD patients was significant after surgical treatment in all ThyPRO domains. In the TNG patients, the improvement was significant in all but one ThyPRO domain, sex life. The QoL of GD patients is worse than those of TNG patients. Surgery may improve QoL in patients with GD and TNG even if they have achieved satisfying thyroid status with medication treatment, preoperatively¹¹.

None of the patients were positive for tuberculous infection. The description of thyrotoxicosis due to tuberculous thyroiditis is reported as "a clinical syndrome of hyperthyroidism" which occurs generally at the beginning of glandular involvement due to its destruction¹².

CONCLUSION AND SUMMARY

The management of thyrotoxicosis is based on three treatment modalities, namely anti-thyroid medication, radioactive iodine ablation or surgery.

Surgery increasingly plays an important role in the management of thyrotoxicosis with immediate and has evolved into a cost-effective treatment with minimal associated morbidity and mortality. Total thyroidectomy is the surgery of choice in Graves' disease, while a total thyroidectomy or thyroid lobectomy are utilized in patients with toxic nodular goiters.

Although thyroid surgery can be associated with significant complications, in high volume operative centers surgery provides effective long-lasting resolution of hyperthyroidism and therefore should be considered an integral component of treatment rather than the last resort of clinicians.

Surgery should be proposed as an immediate and completely effective solution for thyrotoxicosis, especially when compared with prolonged medical therapy, because it can provide a demonstrable improvement in the quality of life (QOL) of the patients.

In conclusion, Thyroid tuberculosis is rare, but should be considered as differential diagnosis of thyroid masses, where there is a high prevalence of tuberculosis. Past history of tuberculosis elsewhere in the body or presence of cervical lymphadenopathy and high ESR values may help in the diagnosis, but thyroid tuberculosis can occur even in the absence of these features. FNA is the main diagnostic method to diagnose the disease. The treatment is mainly based on the antituberculous agents, but surgery or drainage may be required for large abscess along with antituberculous drug therapy.

REFERENCES

1. BahnRs, Burch Hb, Cooper Ds, Et Al. Hyperthyroidism and Other Causes of Thyrotoxicosis: Management Guidelines of the American Thyroid Association and American Association of Clinical Endocrinologists. *EndocrPract*. 2011;17:456-520
2. Newly Observed Affection Of The Thyroid Gland In Females *Lond Med Surg J*, 7 (1835), P. 516
3. *International Journal Of Surgery* Volume 4, Issue 3, 2006, Pages 187-191
4. *Surgery Of The Thyroid: Observations On 5000 Operations* *Jama*, 61 (1913), P. 10
5. *Becker WfAnn Surg*. 1977 May; 185(5):493-504
6. Laurberg P, Pedersen Km, Vestergaard H, Sigurdsson G.High Incidence Of Multinodular Toxic Goitre In The Elderly Population In A Low Iodine Intake Area Vs. High Incidence Of Graves' Disease In The Young In A High Iodine Intake Area: Comparative Surveys Of Thyrotoxicosis Epidem-iology In East-Jutland Denmark And Iceland. *J Intern Med*. 1991;229:415-420
7. F. W. Rankin and A. S. Graham, "Tuberculosis of the thyroid gland," *Annals of Surgery*, vol. 96, no. 4, pp. 625-648, 1932. View at Google Scholar
8. *By Am Fam Physician* 2005; 72:623-30, 635-6. Copyright© 2005 American Academy

-
- Of Family Physicians Hyperthyroidism: Diagnosis and Treatment
9. Journal of Otolaryngology - Head & Neck Surgery 2013;42:37
 10. European Annals Of Otorhinolaryngology, Head And Neck Diseases Volume 32, Issue 2 April 2015, Pages 63-66.
 11. Branka Bukvic Md Et Al., February 2015 volume 193, Issue 2, Pages 724-730.
 12. V. K. Kapoor, K. Subramani, and S. K. Das, "Tuberculosis of the thyroid gland associated with thyrotoxicosis," Postgraduate Medical Journal, vol. 61, no. 714, pp. 339-340, 1985. [View at Google Scholar](#) • [View at Scopus](#)