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## A prospective study of incidence of hypocalcemia following total thyroidectomy

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### Abstract

**Aims & Objectives of the study:** This is a prospective study to evaluate the incidence of hypocalcemia (both transient and permanent) following total thyroidectomy. About 120 patients were included over a period of 3 years from January 2018 to December 2021 admitted in department of general surgery, Trichy SRM Medical College and Research centre.

**Observation and Conclusion:** Postoperative hypocalcemia is the most common and sometimes the most severe and potentially debilitating complication observed after Near total thyroidectomy and Total thyroidectomy. Regarding the sex distribution in this study, there were 23 males (19.2%) and 117 females (81.8%), thus we can infer that thyroid disorders are overwhelmingly more common in the fairer sex. But malignancy of thyroid gland was more common in male gender (60% of cases), probably male gender being in a greater risk for malignancy as per the AGES/AMES Criteria for thyroid malignancies. But the benign disorders of thyroid were more common among females in age group of 20-50 yrs (60%). Malignant disorders of thyroid were more common after 50 yrs of age. The incidence of hypocalcemia (transient) in our study is 21.6% and permanent hypocalcemia requiring lifelong calcium and/or vitamin D3 supplementation is 7.5%.

**Keywords:** hypocalcemia, total thyroidectomy, post op complications of thyroid surgeries

### Introduction

Despite the advances that have been made in thyroid surgery with the use of latest equipment and techniques the danger of hypocalcaemia tetany is still real and every surgeon should be thorough about the anatomy of thyroid and parathyroid and be ready to deal with its complications. This dire complication represents a major concern for thyroid surgeons as the consequences of chronic hypocalcaemia are often insidious and potentially severe. Permanent hypocalcaemia is a common cause of malpractice litigation after endocrine surgery.

### Aim of the study

This study aims to evaluate the incidence of hypocalcemia (both transient and permanent) following total thyroidectomy.

This study will include the following;

1. Incidence of hypocalcaemia following Total thyroidectomy
2. Follow up of patients' up to a period of 6 months.
3. Broad overview of literature about the merits and demerits of surgical procedures used, early detection and prediction of post-operative hypocalcaemia, treatment of hypocalcaemia and measures to prevent its occurrence.

### Materials and Methods

This study was carried out in 120 patients who underwent Total thyroidectomy in the department of general surgery, Trichy SRM Medical college and Research during the period from 2018 January to December 2021.

Inclusion criteria for patients in this study consist of -Patients of both sex and any age presenting with enlargement of both lobes of thyroid (includes both benign and malignant enlargement) proved by ultrasound (US) to be nodular & by laboratory investigations (Thyroid function test) to be eu-thyroid. Patients excluded were those with contra-indications for surgery and general anesthesia and those who were not in a euthyroid state.

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Data on patient’s demographics, operative aspects, postoperative recovery, complications (post thyroidectomy hypokalemia) and results were collected.

Patients in this study underwent a pre-operative assessment to confirm the diagnosis which included,

1. Full clinical History
2. Clinical examination
3. Fine Needle Aspiration Cytology
4. Thyroid function test (TFT)
5. Ultrasound Neck
6. Indirect laryngoscopy to assess vocal cord status.

All patients included in this study were to be followed up for period of 6 months. Postoperative assessment will include the

following:

- **Immediate post-op period:** in the hospital looking for numbness and other manifestations of hypocalcaemia along \*with serum calcium on the second post-op day.
- **After one month:** Serum calcium\*
- **After six months:** Serum calcium levels\*

\*In our study a free/ionised calcium assay was not done due to non availability of this test in our institution and in private labs in Trichy.

**Observation & Results**

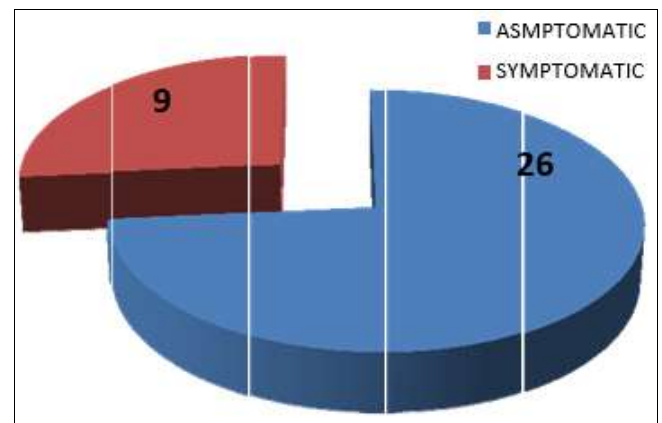
The findings of the study can be tabulated as follows.

**Table 1:** Distribution of hypocalcemia among age groups of patients in the study

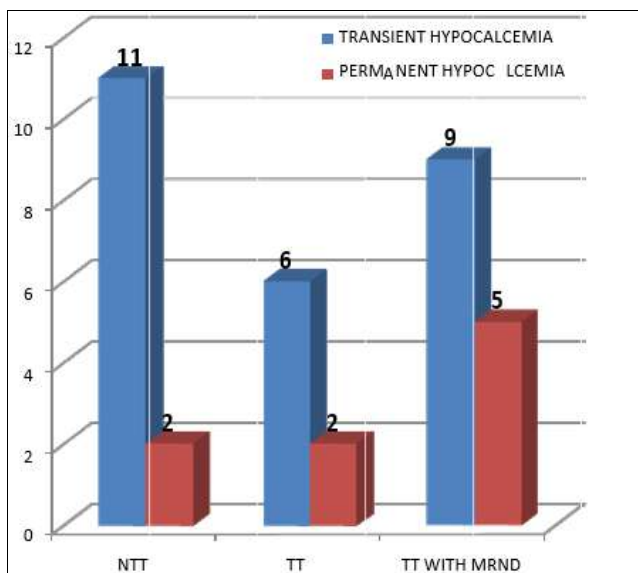
Age (years)	Hypocalcemia	
	Transient	Permanent
10-20	1	1
20-30	3	-
30-40	2	2
40-50	5	1
>50	15	5
Total	26	9

**Table 2:** Distribution of hypocalcemia in the study among the diagnosis & procedures performed

	Hypocalcemia	
	Transient	Permanent
<b>Diagnosis</b>		
Multinodular goitre	8	1
Colloid goitre	1	-
Toxic goitre	2	2
Carcinoma thyroid	15	6
<b>Procedure</b>		
Near-total thyroidectomy	11	2
Total thyroidectomy	6	2
Total thyroidectomy with MRND	9	5
Total	26	9



**Fig 2:** Post operative hypo calcemia



**Fig 1:** Hypocalcemia and extent of surgery performed

**Table 3:** Distribution of signs and symptoms of 9 symptomatic patients

Chvostek	3
Paraesthesia & Numbness	5
Trousseau	3
Myalgias	5
Facial spasms	4
Carpal spasms	2
Pedal spasms	1

Total patients with hypocalcemia, n=26 Symptomatic patients=9 (34%)

**Conclusion**

Postoperative hypocalcemia is the most common and sometimes the most severe and potentially debilitating complication observed after Near total thyroidectomy and Total thyroidectomy. The incidence of hypocalcemia (transient) in our study is 21.6% and permanent hypocalcemia requiring lifelong calcium and/or vitamin D3 supplementation is 7.5%.

So proper planning and meticulous surgical technique with special emphasis in localization and preserving the vascularity of atleast one para- thyroid gland will go a long way in reducing this complication.

We should employ newer techniques like auto-transplantation of parathyroids, use of Ultra sonic shears and enhanced bipolar diathermy which may help in bringing down the incidence of post-operative hypocalcemia. We can avoid Transient / Permanent hypocalcemia or hypoparathyroidism by searching for parathyroid glands in the post-operative specimen, if detected immediate auto-transplantation of parathyroids will reduce the incidence of transient/permanent hypocalcemia following thyroidectomies.

Proper post-operative monitoring and early detection by performing a serum calcium assay and even an intact-iPTH assay (if available and affordable) is mandatory to prevent post-operative distress to patients.

Adequate and timely calcium and /or vitamin D3 supplementation is advised in patients at risk for developing post-operative hypocalcemia and for treatment of all symptomatic patients.

Finally a proper follow-up schedule is mandatory in all patients undergoing Near-Total Thyroidectomy and Total Thyroidectomy.

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