

## Original Article

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# Evaluation of Hypoparathyroidism following Total Thyroidectomy

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### Abstract:

*The most common cause of hypoparathyroidism is damage to the glands during thyroid surgery. Parathyroid gland preservation during thyroidectomy is not only desirable, but essential for the effective management of surgical diseases of the thyroid gland*

**Objective:** To find out the incidence rate of hypoparathyroidism after total thyroidectomy.

**Methods:** Study Period: 2 years from Jan 2017 to December 2018

**Place of Study :** National Institute of ENT, Tejgaon, Dhaka

**Study Design:** Prospective Observational Study

**Sample size:** 107

**Sampling Technique:** Convenient Sampling technique

**Results:** Among the 107 cases 39 cases were malignant comprising 36.45% of the cases. toxic multinodular goitre were 6 cases among 107 cases (5.6%) and rest 62 cases were benign multinodular goitre with or without cystic change and follicular adenomas (57.94 %). 29 cases out of 39 malignant cases were papillary carcinoma of thyroid (74.36% of malignant lesions), 2 cases of medullary Ca thyroid (5.12 % of malignant lesions) rest 8 were follicular carcinoma (20.51% of malignant lesions). 26 out of 107 (24.30%) cases suffered from postoperative hypocalcaemic tetany within 1<sup>st</sup>-5<sup>th</sup> POD. Their parathyroid hormones were significantly reduced and serum calcium were also reduced and they required calcium supplementation. In 5 (4.67%) cases there was no sign and symptoms of tetany but their serum parathormone levels were little below normal level but serum calcium levels were normal and therefore no calcium supplementation were given. The rest 76 (71.03%) cases did not show any sign or symptoms of tetany and did not require calcium supplementation. Among the patients who suffered from tetany majority were cases of Carcinoma of thyroid (18 out of 26 patients of hypoparathyroidism) 69.23%, however lateral neck dissection did not seem to affect decline in parathyroid function as 10 out of 18 patients with thyroid malignancy who suffered from postoperative tetany undergone level II to level V neck dissection in addition to total thyroidectomy.

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**Introduction:**

The most common cause of hypoparathyroidism is damage to the glands during thyroid surgery. There are usually 4 parathyroid glands in the neck and they located next to the thyroid, with 2 glands on each side. These glands frequently get bruised during surgery and mild hypoparathyroidism is rather common after surgery but usually resolves after a few days to weeks<sup>1</sup>.

The immediate manifestations of hypocalcemia are mostly neuromuscular symptoms and occasionally psychotic states. Ectodermal changes leading on to alopecia, eczema, and cataract may occur as early as 6 months after operation. Persistent hypocalcemia may cause intracranial lesions and cardiac arrhythmias. Permanent hypocalcemia causes substantial impact on health of patient along with considerable financial loss<sup>2</sup>.

Careful meticulous dissection to identify and sparing at least 2 parathyroid glands under direct vision is mandatory to avoid post-operative reduced calcium levels and its complications. Post-operative hypocalcemia is more frequent following bilateral resection of lobes than unilateral 9% and 1.9% respectively<sup>3</sup>. Parathyroid gland preservation during thyroidectomy is not only desirable, but essential for the effective management of surgical diseases of the thyroid gland.<sup>4</sup>

**Objective:**

To find out the incidence rate of hypoparathyroidism after total thyroidectomy.

**Methods:**

Study Period: 2 years from Jan 2017 to December 2018

Study Place: National Institute of ENT, Tejgaon, Dhaka

Study Design: Prospective Observational Study

Sample size: 107

Sampling Technique: Convenient Sampling technique

Inclusion Criteria: Any case of Total thyroidectomy due to Multinodular goiter, Thyroid Malignancy and Grave's Disease.

Exclusion Criteria: Non Cooperative Patients, Cases of Completion thyroidectomy and patients who received calcium supplementation immediately after thyroid surgery were excluded from this study.

**Surgical Technique:** Total Thyroidectomy in all the selected patients with at least two identified parathyroid glands in all the patients. If neck nodes were present, then level II to level V neck dissections were carried out. In all malignant cases, central compartment neck node removal was carried out.

**Data Collection technique:** Randomly 120 cases of total thyroidectomy by senior surgeons of this hospital were selected in 2 year study period. Then patients who fit in the sampling criteria and gave consent were selected by convenient sampling and the final sample size was 107 (some patients received injection calcium gluconate before giving blood samples for estimation of serum calcium and parathormone and they were excluded). Serum parathyroid hormone level and serum calcium levels were estimated within 1<sup>st</sup> post-operative day (POD) and tetany symptoms were documented. The Reference value of Serum PTH was 1.59-7.23pmol/L and Serum Calcium 2.12-2.62 mmol/L (all the tests were done from ICDDR,B and their reference values were taken).

**Results:**

In this study, among the 107 patients 73 (68.22%) were female and 34 were male patients (31.78%). Age range from 18 years to 66 years with majority from 31-50 year

age group. Among the 107 cases 39 cases were malignant comprising 36.45% of the cases. Toxic Multinodular Goitre were 6 cases among 107 cases (5.6%) and rest 62 cases were benign Multinodular goiter with or without cystic change and follicular adenomas (57.94 %). 29 cases out of 39 malignant cases were Papillary carcinoma of thyroid (74.36% of malignant lesions), 2 cases of Medullary Ca thyroid (5.12 % of malignant lesions) rest 8 were Follicular Carcinoma (20.51%of malignant lesions). 16 out of 39 Cases of Malignancy required Selective Neck Dissection (LII to LV). Among the nontoxic Benign 62 cases of Thyroid enlargement 8 were follicular adenoma (12.90%) and (87.1%) were multinodular goiters. 26 out of 107 (24.30%) cases suffered from postoperative hypocalcaemic tetany within 1<sup>st</sup>-5<sup>th</sup> POD. Their parathyroid hormones were significantly reduced and serum calcium were also reduced and they required calcium supplementation. In 5 (4.67%) cases there was no sign and symptoms of tetany but their serum parathormone levels were little below normal level but serum calcium levels were normal and therefore no calcium supplementation were given. The rest 76 (71.03%) cases did not show any sign or symptoms of tetany and did not require calcium supplementation. Among the patients who suffered from tetany majority were cases of Carcinoma of thyroid (18 out of 26 patients of hypoparathyroidism) 69.23%, however lateral neck dissection did not seem to affect decline in parathyroid function as 10 out of 18 patients with thyroid malignancy who suffered from postoperative tetany undergone LII to LV Neck dissection in addition to total thyroidectomy.

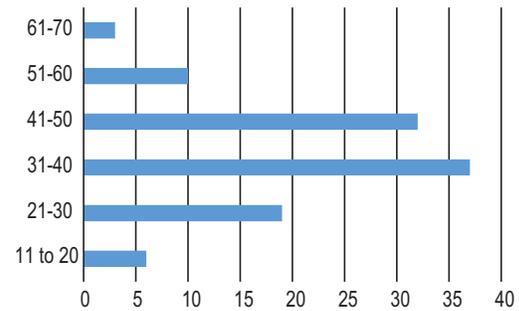
**Table-I :**  
*Number of Patients*

Male	34 (31.78%)
Female	73 (68.22%)
<b>Total</b>	<b>107</b>

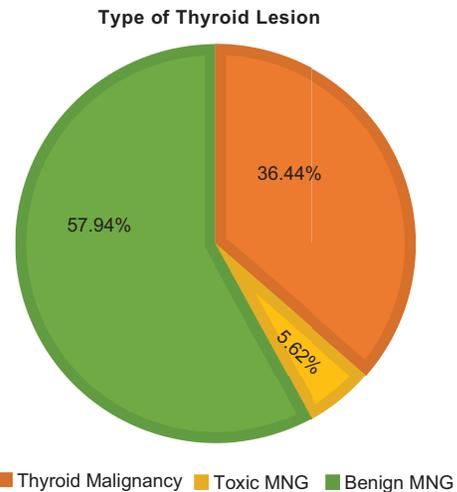
**Table-II :**

*Number of Patients in different age groups*

Age Group	Number of patients
11 to 20	6
21-30	19
31-40	31
41-50	34
51-60	14
61-70	3



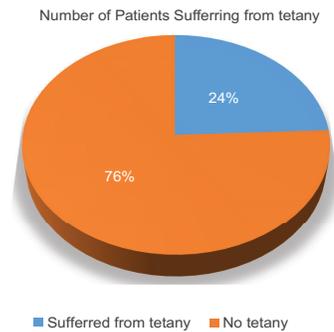
**Fig.-1: Different Age Groups of Patients**



**Fig.-2: Type of Thyroid Lesion**

**Table-III**  
*Type of Thyroid Malignancy*

Types of Malignancy	Number of Patients
Papillary	29 (74.36%)
Follicular	8 (20.51%)
Medullary	2 (5.12 %)
Anaplastic	0
Total	39



**Fig.-3: Tetany in Postoperative Patients**

**Table-IV**  
*Summary of the Study*

Thyroid Lesion		Number of Patients and their % among total number of patients	Tetany in Number of Patients
Benign	Multi Nodular Goitre, Follicular Adenoma	62(57.94 %)	08(7.48%)
	Toxic Multinodular Goitre	06 (5.61%)	
Malignant	Papillary Ca Thyroid	29(27.10%)	18(16.82%)
	Follicular Ca Thyroid	08 (7.48%)	*16 cases with LII to LV Neck Dissection
	Medullary Ca Thyroid	02 (1.86%)	*10 cases with Neck Dissection
Total	107	26 (24.30%)	

#### Discussion:

Postoperative hypocalcemia is a relatively common complication of thyroid surgery and is known as a major cause of postoperative morbidity. The result of this study showed that, 26 out of 107 (24.30%) cases suffered from postoperative hypocalcaemic tetany within 1<sup>st</sup>-5<sup>th</sup> POD despite identification and preservation of atleast two parathyroid glands. Their parathyroid hormones were significantly reduced and serum calcium was also reduced and they required calcium supplementation. Among the patients who suffered from tetany majority were cases of

Carcinoma of thyroid (18 out of 26 patients of hypoparathyroidism) 69.23%. But from this study we cannot really comment on whether lateral neck dissection has any impact on post-operative hypocalcaemia as 10 out of 18 patients with thyroid malignancy who suffered from postoperative tetany undergone LII to LV Neck dissection in addition to total thyroidectomy. But it can be stated that hypoparathyroidism may have occurred due to vascular deprivation of the glands. In the retrospective study by Gac E P & Cabané T P of 136 records, Clinical signs of hypocalcemia were registered in 14% of

patients and a low serum calcium level was detected in 50%. In the prospective study, 42% of patients had a postoperative low serum calcium level and seven patients (15%) had symptoms<sup>5</sup>. Another research stated Around (30%) of patients developed hypocalcaemia postoperatively (Ahmed Nafi Hassan, Mohammed Hillu Surriah).<sup>6</sup> These findings are in agreement with other studies showed that the thyroid cancer is a risk factor for accidental parathyroid excision.<sup>7-9</sup>

### Conclusion

Hypoparathyroidism after total thyroidectomy is very common specially in cases of carcinoma thyroid patients. Although in this study, atleast two parathyroid glands were saved during thyroid surgery, still there was significant number of hypoparathyroidism. It can be stated that the hypoparathyroidism may have occurred due to vascular impairment of the saved parathyroid glands. Long term follow up needed to find out whether patients had recovered or not. We cannot actually comment on whether Neck dissection from LII to LV contributed to parathyroid insufficiency or not.

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