

Subtotal Thyroidectomy Postoperative Complications with Unplanned Thyroid Surgery

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Abstract

Original Research Article

Background: The surgical treatment for bilateral multinodular nontoxic goiter (BMNG) is still debatable. Avoiding RLN harm during thyroid surgery if the pathology is not identified. Reduce the incidence of hypoparathyroidism by reducing the rate of parathyroid gland damage during excision. **Objective:** To see the complications of subtotal thyroidectomy in random thyroid surgery. **Materials and Methods:** This was a prospective, observational study conducted in the Department of ENT & Head- Neck surgery, Rangamati Medical College, Rangamati for a period of 2 years from January 2019 and December 2020. Total 100 patients were operated for benign and malignant thyroid disorders. This study was done to assess complications after various types of thyroid surgeries indicated for benign as well as malignant thyroid lesions. **Results:** Ten (10.0%) patients had transient hypocalcemia followed by 4(4.0%) had transient recurrent nerve palsy, 1(1.0%) had permanent hypocalcemia, 1(1.0%) had permanent recurrent nerve palsy and 1(1.0%) had neck hematoma. Mean weight of the resected thyroid was found 62.4±14.1 gram in euthyroidism group and 74.2±26.4 gram in hypothyroidism group. Mean proportion of weight of the thyroid remnant in total weight of the thyroid was found 5.1±2.2 percent in euthyroidism group and 3.9±2.1 percent in hypothyroidism group. **Conclusion:** Transient hypocalcemia, transient recurrent nerve palsy, chronic hypocalcemia, permanent recurrent nerve palsy, and neck hematoma were the most frequent postoperative complications. **Keywords:** Hypoparathyroidism, Hypothyroidism, Recurrent laryngeal nerve injury, Superior laryngeal, nerve injury (SLNI), Thyroidectomy.

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INTRODUCTION

The surgical procedure for bilateral multinodular nontoxic goiter (BMNG) remains controversial. Delbridge [1] reported that subtotal thyroidectomy for benign thyroid disease has been performed for more than a century and that it may reduce the associated risk of postoperative hypocalcemia and recurrent laryngeal nerve (RLN) palsy.

Thyroid disorders warranting surgical intervention can be either benign tumors or malignant ones. Another reason for thyroid surgery is the swelling or enlargement of thyroid in the form of nodular or colloid goiter, when enlarged, causing difficulties in breathing, voice production, and swallowing. Thyroidectomy is also indicated in cases where an enlarged thyroid gland exhibits toxic symptoms, or where there is a high index of suspicion of malignancy,

albeit cosmesis is the most common indication [2]. Avoiding RLN injury during thyroid surgery in case of failure to identify its course. Decrease the rate of hypoparathyroidism by lowering the rate of injury to parathyroid glands during excision [3]. The incidence of regrowth of thyroid tissue after partial or less than total thyroidectomy for multinodular goiter is between 12 and 20 percent [4]. Re operation for recurrent goiter has an increased risk of complications, such as recurrent laryngeal nerve (RLN) injury and hypoparathyroidism, when compared with thyroid surgery at the first time [5].

METHODS

This was a prospective, observational study conducted in the Department of ENT & Head- Neck surgery, Rangamati Medical College, Rangamati for a period of 2 years from January 2019 and December 2020. Total 100 patients were operated for benign and

malignant thyroid disorders. This study was done to assess complications after various types of thyroid surgeries indicated for benign as well as malignant thyroid lesions. A thorough preoperative work-up was done in all cases and it included complete ear, nose, and throat (ENT) examination, indirect laryngeal examination, blood tests, thyroid profile, neck ultrasound, and needle aspiration cytology. Special investigations like computed tomography, or magnetic resonance imaging, were done in those cases where there was suspicious consistency, retrosternal extension, and extra-large thyroid masses causing compressive symptoms. Patients who presented with hoarseness of voice, respiratory difficulty, and swallowing problems were assessed by laryngoscopic examination and documented. All surgeries were performed by ENT surgeons. Genuine efforts were exercised in each and every surgery to identify and save recurrent and superior laryngeal nerves. Similarly, measures were taken to visualize and preserve parathyroid glands (at least two). In two cases of accidental parathyroid removal, autotransplantation into ipsilateral sternomastoid muscle was done. In two cases, recurrent laryngeal nerve (RLN) was accidentally transected, which was intraoperatively identified and end-to-end anastomosis was done. The types of surgeries done were total thyroidectomy (TT) with or without neck dissection, near-total thyroidectomy (NTT), subtotal thyroidectomy (STT), hemithyroidectomy, and isthmusectomy. The pathologies observed were colloid goiter, nodular goiter, hyperplastic nodule, and papillary and follicular carcinoma.

Laryngeal endoscopy was done and documented in patients who developed hoarseness

postoperatively. Vocal cord dysfunction existing after 6 months was labeled as a permanent paralysis. Serum calcium levels were measured on next postoperative day in all operated cases except isthmusectomy cases. Temporary hypoparathyroidism (HPT) was considered when total serum calcium level was less than 8.5 mg/dL associated with muscle spasms, perioral numbness, and tingling sensation and which responded to exogenous calcium supplementation. Likewise, permanent HPT was considered when hypocalcemia persisted for more than 6 months despite regular calcium and vitamin D supplementation. The patients were followed up regularly for at least 6 to 9 months. This study was approved by the Ethics in Research Committee of the institute.

RESULTS

Mean age was found 34.9±8.1 years with range from 25-63 years. More than three fourth (68.0%) patients were female and 32(32.0%) were male. Male female ratio was 1:2.1 (Table-I). Ten (10.0%) patients had transient hypocalcemia followed by 4(4.0%) had transient recurrent nerve palsy, 1(1.0%) had permanent hypocalcemia, 1(1.0%) had permanent recurrent nerve palsy and 1(1.0%) had neck hematoma (Table-II). Mean weight of the resected thyroid was found 62.4±14.1 gram in euthyroidism group and 74.2±26.4 gram in hypothyroidism group. Mean proportion of weight of the thyroid remnant in total weight of the thyroid was found 5.1±2.2 percent in euthyroidism group and 3.9±2.1 percent in hypothyroidism group. Which were statistically significant (p<0.05) but weight of the thyroid remnant was not statistically significant (p>0.05) between two groups (Table-III).

Table I: Demographic characteristics of the study population (n=100)

Demographic characteristics	Number of patients	Percentage
Mean age (years)	34.9	±8.1
Range (min-max)	25	-63
Sex		
Male	32	32.0
Female	68	68.0

Table II: Postoperative complications after surgery (n=100)

Postoperative complications	Number of patients	Percentage
Transient hypocalcemia	10	10.0
Permanent hypocalcemia	1	1.0
Transient recurrent nerve palsy	4	4.0
Permanent recurrent nerve palsy	1	1.0
Neck hematoma	1	1.0

Table III: Peri and postoperative findings in the patients treated by subtotal thyroidectomy (n=100)

	Euthyroidism (n=36)	Hypothyroidism (n=64)	P value
Mean weight of the resected thyroid (g)	62.4±14.1	74.2±26.4	0.015 ^s
Mean weight of the thyroid remnant (g)	3.3±1.1	3.0±0.9	0.143 ^{ns}
Mean proportion of weight of the thyroid remnant in total weight of the thyroid (%)	5.1±2.2	3.9±2.1	0.008 ^s

DISCUSSION

In this study observed that the mean age was found 34.9 ± 8.1 years with range from 25-63 years. More than three fourth (68.0%) patients were female and 32(32.0%) were male. Male female ratio was 1:2.1. Lepner *et al.*, [6] reported 41 women (83.7%) and 8 men (16.3%), with a mean age of 42.4 ± 15.2 years (range 14–75), were included in the study. Limonard *et al.*, [7] also observed the median age at diagnosis was found 34.5 (19-63) years. 56 (90.3%) patients were female and 6(9.7%) were male. Liu *et al.*, [8] observed that the mean age was found 34.3 ± 7.8 years and 55 were female. Hu *et al.*, [9] observed total of 714 men and 4845 women in this study, with a mean age of 55 (range 9–87) years.

In this study observed (10.0%) patients had transient hypocalcemia followed by 4(4.0%) had transient recurrent nerve palsy, 1(1.0%) had permanent hypocalcemia, 1(1.0%) had permanent recurrent nerve palsy and 1(1.0%) had neck hematoma. Similar observation was found Lepner *et al.*, [6] they reported 2(9.5%) patients had transient hypocalcemia and 1(4.8%) had transient recurrent nerve palsy. Li *et al.*, [1] observed the prevalence of transient hypoparathyroidism was 11.0% in the TT group versus 4.9% in the BST group, and this difference was statistically significant (OR = 2.59, 95% CI [1.58–4.24], $p = 0.0002$). According to the research of Randolph [10], the incidence of transient/permanent RLN palsy was 0–6% and <1%, respectively. Giles *et al.*, [11]; Alimoglu *et al.*, [12]; De Toma *et al.*, [13]; Muller *et al.*, [14]; Koyuncu *et al.*, [15]; Thomusch *et al.*, [16] were summarized by Agarwal and Aggarwal [17]: only Thomusch *et al.*, [16] study reported that the permanent RLN palsy rate was significantly higher and merely 2 studies (Alimoglu *et al.*, [12]; Thomusch *et al.*, [16]) showed that the permanent hypocalcemia rate was significantly higher. Gough and Wilkinson [18] have reported that recurrent laryngeal nerve palsy and permanent hypoparathyroidism are the most common complications following total thyroidectomy surgery which account for 0.7% and 2.2%, respectively. The incidences of recurrent laryngeal nerve palsy and permanent hypoparathyroidism in such cases are found to be as high as 20.0% and 3.4% [19, 20]. In a study done by Pradeep *et al.*, [21] incidences of complications of thyroidectomy were temporary hypocalcemia (24%), permanent hypocalcemia (3%), and permanent vocal cord palsy (1%). Liu *et al.*, [8] reported 2(2.53%) patients experienced transient hypocalcemia.

In this study observed that the mean weight of the resected thyroid was found 62.4 ± 14.1 gram in euthyroidism group and 74.2 ± 26.4 gram in hypothyroidism group. Mean proportion of weight of the thyroid remnant in total weight of the thyroid was found 5.1 ± 2.2 percent in euthyroidism group and 3.9 ± 2.1 percent in hypothyroidism group. Which were statistically significant ($p < 0.05$) but weight of the

thyroid remnant was not statistically significant ($p > 0.05$) between two groups. Lepner *et al.*, [6] reported comparison of the euthyroid patients and the hypothyroid patients revealed no difference in the weight of the remnant (3.3 g vs. 2.8 g), but a statistically significant difference occurred in the weight of the resected gland (61.0 g vs. 94.4 g, $P = 0.026$) and in the proportion of the remnant (5.6% vs. 3.3%, $P = 0.030$). According to literature data, the weight of thyroid remnant should be less than 4.0 g to avoid postoperative hyperthyroidism [22, 23].

CONCLUSION

Transient hypocalcemia, transient recurrent nerve palsy, chronic hypocalcemia, permanent recurrent nerve palsy, and neck hematoma were the most frequent postoperative complications. There was a significant relationship between the mean weight of the resected thyroid and the mean weight of the thyroid remnant in relation to the total weight of the thyroid (percent).

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