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FACTORS CONTRIBUTING TO UNINTENTIONAL PARATHYROIDECTOMY DURING THYROID SURGERY

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ABSTRACT

Hypoparathyroidism is one of the most common side effects of complete thyroid surgery, and it occurs when the parathyroid gland tissue is devascularized, directly injured, or removed unintentionally. Hypoparathyroidism is responsible for more than half of all hospital readmissions of patients that have had thyroid surgery. In 6% to 59 percent of cases, transient hypocalcemia lasts 6 months or less after surgery, whereas permanent hypoparathyroidism can last up to 5.5 percent of patients.Also in the presence of seasoned surgeons, unintentional parathyroidectomy happens in 1% to 31% of instances. The aim of this study was hypothesised that factors complicating dissection, such as inflammation and hypervascular states, would increase the rate of unintended parathyroidectomy.The involvement of hyperthyroidism (n 117, 46.8% 0.26), 0.72), or concomitant hyperparathyroidism (3, 1.2%, p= 0.25) had no effect on the incidence of accidental parathyroidectomy the central neck dissection has the greatest impact on parathyroid failure (odds ratio 4.72 (confidence interval 1.91–11.71], P 14 0.0008), according to multivariable analysis. Finally, performing a central neck dissection is the biggest risk factor for accidental parathyroidectomy. Unintentional parathyroidectomy does not seem to be more common in patients with lymphocytic thyroiditis, hyperthyroidism, or concomitant primary hyperparathyroidism.

Key words: Prathyroidectomy, Thyroid Surgery, Retrospective Study.

INTRODUCTION

Hypoparathyroidism is one of the most common side effects of complete thyroid surgery, and it occurs when the parathyroid gland tissue is devascularized, directly injured, or removed unintentionally [1, 2]. Hypoparathyroidism is responsible for more than half of all hospital readmissions of patients that have had thyroid surgery [3, 4]. In 6% to 59 percent of cases, transient hypocalcemia lasts 6 months or less after surgery, whereas permanent hypoparathyroidism can last up to 5.5 percent of patients. Also in the presence of seasoned surgeons, unintentional parathyroidectomy happens in 1% to 31% of instances. 3–25 % while only one functional gland is required to maintain eucalcemia, unplanned parathyroid removal should be avoided because subsequent neck explorations and/or radiation therapy can jeopardise the remaining glands' function. The involvement of malignancy, concurrent central neck dissection, thyroidectomy duration, and reoperative status are all known risk factors for accidental loss of parathyroid tissue[5].

Aim and objective:

The aim of this study was to hypothesised that factors complicating dissection, such as inflammation and hypervascular states, would increase the rate of unintended parathyroidectomy.

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Materials and methods:

On 250 patients, a retrospective examination was conductedbetween 2019 and 2021 who had thyroid surgery atDelhi University is a university in Delhi, India. Details about patient demographics, preoperative and postoperative diagnoses, and the prevalence of concomitant hyperparathyroidism are all factors to consider. Hyperthyroidism, thyroid surgery style, and thyroid surgery outcome. The final pathology was obtained after a central neck dissection.The study included patients who had a complete, subtotal, or partial thyroidectomy for benign or malignant disease. Patients who are suffering fromisolated isthmusectomy or concomitant subtotal isthmusectomy. Patients who had a parathyroidectomy for hyperparathyroidism were not included. Patients who lost or did not lose parathyroid tissue were also not included.The independent sample t test/median test was used to compare the two groups.For continuous and categorical variables, the chi-square test/exact Fisher's test is used. Logistic regression with multiple variables. To assess risk, backward variable selection was used.Unintentional parathyroidectomy is linked to a number of causes.In the multivariable model, independent variables are taken into account.Age, gender, race, and the total number of central neurons were all factors in the development. Lymph nodes, thyroid nodule number, and thyroid lobe sizescale, central neck dissection, and concomitantparathyroid autotransplantation, lymphocytic thyroiditis, andcancerous development. Variables with a significance level of less than 0.20 were excludedretained in the iteration of backward selection .The final design age, central neck dissection, largest thyroid nodule size, and parathyroid autotransplantation were all factors considered. SAS 9.4 was used for statistical analysis (SAS Institute, Cary, NC)computer applications P values less than 0.05 were considered statistically significant quite important [6,7].

Results and discussion:

Thyroid surgery was performed on 250 patients, 45.6 percent of whom were white and 43.6 percent of whom were female; the patients ranged in age from 16 to 91 years old (mean 52.1 years) (Table 1). Total/subtotal thyroidectomy was performed on 55 patients (22%) while thyroid lobectomy was performed on 97 (38.8%) and completion thyroidectomy was performed on 85(34%) percent. In the 15 cases (30 percent), central neck dissection was performed. 29 (85.3%) of the 34 patients underwent systematic central node dissection.Unintentional removal of parathyroid tissue occurred in 87 patients (34.8%). There were no variations in patient demographics between those who had parathyroid tissue removed and those who did not. Malignancy (P 14 0.04), smaller dominant thyroid nodule size (P 14 0.002), central neck dissection (P 0.0001), and removal of four or more central lymph nodes (P 0.0001) were all correlated with accidental parathyroidectomy on bivariate examination (Table 1).

The involvement of hyperthyroidism (n 117, 46.8% 0.26), 0.72), or concomitant hyperparathyroidism (3, 1.2%, p= 0.25) had no effect on the incidence of accidental parathyroidectomythe central neck dissection has the greatest impact on parathyroid failure (odds ratio 4.72 (confidence interval 1.91–11.71), (P 14 0.0008), according to multivariable analysis.

Unintentional parathyroidectomy has been recorded in a variety of studies. A variety of institution-related variables are most likely to blame for this result. The pathological perception of parathyroid tissue on a specimen, for example, varies; some pathologists report the presence of parathyroid tissue in the specimen, while others report the size of parathyroid tissue missing. Our observations that malignancy and central neck dissection are linked to an increased risk of accidental parathyroidectomy are supported by several reports. The patient population in Zhou et al's research was similar to ours (malignancy rate 20%, concomitant central neck dissection 10%), and they registered a 20% rate of accidental parathyroidectomy.

Table 1: Bivariate Analysis of risk factors for unintentional parathyroidectomy in 250 patients

		Unintentional Parathyroidectomy		
Variable	Overall	Parathyroid Test (n=50)	No Parathyroid test (n=200)	P value
Age (years) mean + SD	96	45	51	0.11
Gender Female Male	 109 (43.6%) 141 (56.4%)	 20 (40%) 30 (60%)	 89 (44.5%) 111 (55.5%)	 0.43
Race White Black Other	 114(45.6%) 63 (25.2%) 73 (29.2%)	 25 (50%) 15 (30%) 20 (40%)	 89 (44.5%) 48 (24%) 63 (31.5%)	 0.38
Largest thyroid Nodule size (cm)	5.5	2.1	3.4	0.002

Largest lobe size (cm) mean SD	10.6	5.0	5.6	0.11
Thyroidectomy type Completion thyroidectomy Total lobectomy Total or near total or total with lateral neck Central Neck Dissecton	 85 (34%) 97 (38.8%) 55 (22%) 15 (30%)	 20 (40%) 15 (30%) 5 (10%) 10 (20%)	 65 (32.5%) 82 (41%) 50 (25%) 5 (10%)	 0.20
Total CLN (n) medial or total CLN (n) categorical 0 1 2-3 >4	 63 (25.2%) 50(20%) 50 (20%) 87 (34.8%)	 8 (16%) 10 (20%) 20 (40%) 12 (24%)	 55 (27.5%) 40 (20%) 30 (15%) 75 (37.5%)	 <0.0001
Concomitant PHPT	3(1.2%)	1 (2%)	2 (4%)	0.25
Thyroid function Euthyroid Hyperthyroid	 133 (53.2%) 117(46.8%)	 38 (76%) 12 (24%)	 95(47.5%) 105 (52.5%)	 0.26
Type of hyperthyroidism Graves Plummer disease	 147 (58.8%) 103 (41.2%)	 32(64%) 18 (36%)	 115 (57.5%) 85 (42.5%)	 1.00

CONCLUSION

Finally, performing a central neck dissection is the biggest risk factor for accidental parathyroidectomy. Unintentional parathyroidectomy does not seem to be more common in patients with lymphocytic thyroiditis, hyperthyroidism, or concomitant primary hyperparathyroidism.

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