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Research Article

**PARATHYROID INJURY LEADING TO HYPOCALCAEMIA
IN TOTAL VERSUS SUBTOTAL THYROIDECTOMY**¹Dr.Aqsa zahid, ²Dr.Anam Qadeer, ³Dr.Farkhanda Saleem¹Quaid e Azam Medical College bwp²Nishtar Medical College Multan³Dera Ghazi Khan Medical College, DG khan**Abstract:**

Objective: The objective of this study is to relate the occurrence of transient hypocalcaemia in subtotal versus total thyroidectomy due to parathyroid damage. **Study Scheme:** Pseudo Experimental Study. **Place and Time of Study:** This study was led in indoor Department of General Surgery Bahawalpur Victoria Hospital from March 2016 to June 2017. **Materials and Methods:** 60 patients of both the genders and 25-60 year of age admitted for thyroidectomy were included in this study. All patients were distributed into two sets. 30 patients were in total thyroidectomy set and 30 patients were in sub-total thyroidectomy set. Thyroidectomies were accomplished by a regular method of capsular dissection; the total thyroidectomy technique comprised the expulsion of entire gland from one tracheoesophageal section to other. In subtotal thyroidectomy technique, complete lobectomy was accomplished on prevailing part and couple of grams of thyroid tissue was left beside the posterior aspect of contralateral part. Each one of the surgical specimen was subject of histopathological exam with the purpose of evaluating the presence of parathyroid gland in surgical specimen. Parathyroid damage as well as transient hypocalcaemia was evident in both groups. **Results:** The presence of age in this study was from 25 to 60 years. Women were in majority in both sets. Postoperative parathyroid damage was evident in 36.7% of the total thyroidectomy group as compared to 10% in Sub-total thyroidectomy group ($P=0.014$). While transient hypocalcaemia was seen in Total thyroidectomy group 23.3 % as compared to 6.7% in sub-total thyroidectomy group ($P=0.070$). Majority of fleeting hypocalcaemia was realised in patients with postoperative parathyroid injury in both groups. **Conclusion:** The sub total thyroidectomy has low chance of damage for parathyroid gland and is better option for reducing risk of passing hypocalcaemia.

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INTRODUCTION:

Hypocalcaemia is a major difficulty arises after thyroidectomy which originates severe symptoms along with nervousness in patients through increased hospital stay time.¹ Transient hypocalcaemia, emerges after surgery, but it reacts fairly to replacement supplement treatment in a few days.² Hypocalcaemia is called everlasting when calcium levels stay abnormal for about 6 months.² The essential driver of hypocalcaemia is non-compulsory hypoparathyroidism after harm to at least one parathyroid gland, or devascularisation, during surgery[3].

Misguided parathyroid removal is one of the main reasons.³ Post-surgery hypocalcaemia after total thyroidectomy incorporates size of thyroid gland, substernal augmentation of the thyroid, kind of thyroid issue, degree of procedure, and if re-procedure is essential are reasons.³ The conceivable explanations for hypocalcaemia are damage to the parathyroid gland, broad resection, neck surgery with total thyroidectomy, Graves' illness, tumour, and hemo-dilution.[4].

Parathyroid gland damage is one of the most widely recognized variable in fashioning hypocalcemia [5]. An endeavour to search for all the parathyroid glands and safeguarded their blood supply ought to be made in the procedure to minimize parathyroid damage. Nonetheless, it is hard to discover all parathyroid glands and to protect these recognized parathyroid glands because of the high likelihood of perpetrating damage to blood circulation during the procedure and analyzation. Additionally, the extent of thyroidectomy and node surgery increases the likelihood of damaging the blood supply to the parathyroid glands [6,7].

Parathyroid glands may be found inside the post-operative specimen, when it was accidentally evacuated with the thyroid or lymph node throughout the procedure.⁸ It is fascinating to know the number of parathyroid glands ought to be saved in situ, keeping in observance as to avert postoperative hypocalcaemia.

One of the aims of this study to compare the frequency of transient hypocalcaemia due to parathyroid damage in subtotal contrasted with total thyroidectomy.

MATERIALS AND METHODS:

This experimental study was conducted in indoor Department of General surgery in BVH. 60 patients of each gender, aged between 25-60 years were

admitted for thyroidectomy comprised this study. Patients of anomalous serum albumin (who were not ranging in 3.4-4.8 g/dl), abnormal calcium level (not in range of 8.0-10.4 mg/dl; not normal pre-procedure parathyroid hormone levels (not in range of 9.5-75 pg/ml) were not included in the study.

All patients were disseminated in two sets. 30 patients were in total thyroidectomy group and 30 patients were in sub-total thyroidectomy group.

Before procedure calcium levels were measured to eliminate any other reason of abnormal calcium level. Thyroidectomies were executed by a regular technique of capsular dissection; the total thyroidectomy technique included the expulsion of entire gland from one tracheoesophageal section to other. In subtotal thyroidectomy process, complete lobectomy was done on prevailing part and around two grams of thyroid tissue was left along the later aspect of contralateral part. The measure of thyroid tissue was measured as 1 cm³=1gram. Intermittent laryngeal nerves were regularly recognized on both sides and each effort was made to differentiate and save the parathyroid glands.

All injuries were closed through suction drain and in absence of any post op difficulties patients were sent home on the fifth day of post operation. Every surgical case was subjected for histopathological examination to assess the presence of parathyroid gland in surgical specimen. Presence of any parathyroid gland in surgical specimen was labelled as parathyroid wound.

Transient hypocalcaemia was defined as if there was no past of hypocalcaemia before process but displayed any one or more symptoms;

1. Circumoral & digital numbness
2. Paraesthesia.
3. Carpopedal spasm.
4. Laryngeal spasm.
5. Fits.

After surgery for 1-5 days were defined as transient hypocalcaemia. It will be confirmed by serum calcium level < 8.5 mg/dl. Information concerning parathyroid injury and Transient hypocalcaemia was distinguished in both groups.

Data was statistically analysed with SPSS V22. Rate and percentage was calculated for qualitative variables like gender, parathyroid wound and hypocalcaemia. Chi-square test was applied to compare hypocalcaemia in both groups taken $p \leq 0.05$ as important. Effect convertor like parathyroid grievance was measured by stratification to see its

consequence on hypocalcaemia. Post stratification chi-square test was applied; p-value ≤ 0.05 and was reserved as important.

In this study age range was from 25 to 60 years with average age of 44.233 ± 6.77 years in Total thyroidectomy group while 44.466 ± 7.19 years in Sub-total thyroidectomy group. Females were in majority in both groups as shown in Table -I.

RESULTS:

Table No.I: Basic Demographics

Demographics	Total thyroidectomy group n=30	Sub-total thyroidectomy group n=30
Mean Age (years)	44.233 \pm 6.77	44.466 \pm 7.19
Gender	n(%)	n(%)
Male	7(23.3%)	9(30%)

Postoperative parathyroid injury was 36.7% in Total thyroidectomy group relate to 10% in Sub-total thyroidectomy set (P=0.014) as shown in Table - 2

Table No.2: Comparison of Parathyroid Injury in both groups n=60

Parathyroid Injury	Total thyroidectomy group n=30	Sub-total thyroidectomy group n=30	p value
Yes	11(36.7%)	3(10%)	0.014
No	19(63.3%)	27(90%)	

While transient hypocalcaemia was seen 23.3 % in Total thyroidectomy group as compare to 6.7% in Sub-total thyroidectomy group (P=0.070) as shown in Table 3.

Table No.3: Comparison of transient hypocalcaemia in both groups n=60

Transient hypocalcaemia	Total thyroidectomy group n=30	Sub-total thyroidectomy group n=30	p value
Yes	7(23.3%)	2(6.7%)	0.070
No	23(76.7%)	28(93.3%)	

Table No.4: Stratification of transient hypocalcaemia with respect to parathyroid injury in both groups With parathyroid injury

Group	Hypocalcaemia		P value
	Yes	No	
Total thyroidectomy	7(63.6%)	4(36.4%)	0.922
Sub-total thyroidectomy	2(66.7%)	1(33.3%)	

Without parathyroid injury			
Group	Hypocalcaemia		P value
	Yes	No	
Total thyroidectomy	0(0%)	19(100%)	1.000
Sub-total thyroidectomy	0(0%)	27(100%)	

Majority of transient hypocalcaemia was seen in patients with postoperative parathyroid injury in both groups. 7(63.6%) out of 11 patients of parathyroid injury show transient hypocalcaemia in Total thyroidectomy group while 2(66.7%) out 3 patients of parathyroid injury show transient hypocalcaemia in Sub-total thyroidectomy group as shown in Table-4.

DISCUSSION:

Transient hypocalcaemia 23.3 % in total thyroidectomy group as compared to 6.7% in subtotal thyroidectomy (P=0.070). Hypocalcaemia after total thyroidectomy is generally transitory. A low frequency of 3 to 8 % has been accounted for constant hypocalcaemia in studies [9].

In a study, out of 310 patients 17 patients (5.55%) had transient hypocalcaemia with total thyroidectomy.¹⁰ Subtotal thyroidectomy in which little pieces of thyroid tissue are left, helps correcting more serious risks of parathyroid failure with extra focal welfares that remains may have some function of thyroid post-operatively [11].

The brilliance of this approach is by all accounts unclear when we visualise repeating procedure. On the likelihood that if reappearance happened because of left over thyroid tissue and likely challenges that may be provoked. But when we go through the studies there is no more prominent distinction in recurrence after total and subtotal thyroidectomy within thyroid substitution treatment for entire life of patients [12]. There is critical reduction in the rate of difficulties of transient parathyroid failure that reduces indoor stay after process.

The transient hypocalcaemia after subtotal thyroidectomy is around 2 to 3 % and most extreme recorded is 8% as indicated by few studies.⁹ These figures are fundamentally not as much as that found after total thyroidectomy. We also presented comparable consequences in our study; 6.7% recurrence of transient hypocalcaemia after total thyroidectomy and 23.3% after subtotal thyroidectomy.

In the current study, the main cause of postoperative

hypocalcaemia was failed conservation of the parathyroid gland. Extensive dissection of central node has been recognized as a hazard figure for hypocalcaemia by Thompson et al.¹³ The analyzation may expand the danger of damage to the inferior parathyroid glands and its blood supply. The parathyroid glands and their blood supply can be isolated from the thyroid organ and the node inside the fat by careful dissection. There is a limit, precisely analysing the overlying belt, between the parathyroid gland and blood supply inside the thymic tissue and the node inside fat. Extreme care ought to be utilized when a central node procedure is to be directed.

There are many reasons why endeavours at saving the parathyroid gland may not succeed. Parathyroid gland may not be effectively saved in case of them being in the anterior to or within thyroid gland. Parathyroid glands that were expatriated deliberately and afterwards embedded into muscle cannot survive. Direct injury to the parathyroid gland that causes organ staining tend to bring about the parathyroid gland unpreserved [14].

CONCLUSION:

The study concludes with the result that the sub total thyroidectomy helps in the reduction of injury to the parathyroid gland is the better option for reducing the risk of hypokalaemia.

Conflict of Interest:

The study has no conflict of interest to declare by any author.

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