

COMPARISON OF CONVENTIONAL THYROIDECTOMY AND HORIZONTAL LATERAL INCISION THYROIDECTOMY

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ABSTRACT

BACKGROUND

Objectives- Thyroid surgery, one of the most common surgeries done by a general surgeon has evolved over the years. Surgeons have strived to improve patient outcomes by evolving their surgical technique and thus reducing postoperative morbidity-pathophysiological and cosmetic. This study compared conventional thyroidectomy and horizontal lateral incision thyroidectomy.

MATERIALS AND METHODS

A prospective observational study was done between January 2015 and June 2016 in patients with thyroid swelling who had undergone thyroidectomy. Patients included in the study were those with Solitary nodule thyroid and Multinodular thyroid. Forty patients from both groups are selected. After obtaining Institutional Ethics Committee clearance, the study was carried out. Written informed consents were obtained from patients. Study questionnaire was administered at the onset and during post-operative follow up. Outcome variables such as cosmetic appearance, hypocalcaemia and recurrent laryngeal nerve palsy were compared. Scar was analysed using observer scar assessment scale and patient's scar assessment scale. Scar was assessed at 4 weeks, 8 weeks and 6 months. Hypocalcaemia was assessed by serum calcium and clinical features during postoperative period. Every patient was assessed for recurrent laryngeal nerve palsy by direct laryngoscopy in immediate post-operative period. Patients who have change in voice or stridor postoperatively were further assessed by indirect laryngoscopy.

RESULTS

There is statistically significant difference between the two groups with regards to the outcome of the scar in OSAS and PSAS. The scar was significantly better in thyroidectomy done through lateral incision thyroidectomy [p value- 0.003 and p value- 0.000 for OSAS and PSAS respectively]. Thus, scar in lateral incision thyroidectomy is found to be cosmetically far better compared to the conventional incision thyroidectomy.

CONCLUSION

Lateral or horizontal incision thyroidectomy is analogous and feasible alternative to conventional thyroidectomy in selected cases. The advantage of this technique is an enhanced aesthetic result. This technique is not recommended in huge thyroid, retrosternal thyroid, thyroiditis and malignancy, so it cannot be recommended as a standard therapy. Study on a large number of patients, preferably randomised double-blinded studies with longer followup periods is recommended.

KEYWORDS

Thyroidectomy, Lateral Thyroidectomy, Scar Assessment Scale, Hypocalcaemia, Recurrent Laryngeal Nerve Palsy, Cosmesis.

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BACKGROUND

Thyroid surgery has followed all the steps of evolution to reach the time of endoscopic surgery. Thyroidectomy is one of the common surgical interventions for thyroid disease. Modern thyroid surgery owes much to one man called Theodor Kocher, Professor of Surgery at Berne, Switzerland. He can be called Father of thyroid surgery.

In conventional thyroidectomy incision should be almost exactly transverse, extending well on to the borders of the sternocleidomastoid muscles (Kocher's neck collar incision), made about two fingers above the sternal notch. This millennium is of minimally invasive techniques. Patients are much more concerned about cosmesis. So surgeons are obliged to do cosmetic approach for every surgery. Horizontal incision thyroidectomy scar from 4.5 cm at lower crease extending from posterior (Lateral) border of sternocleidomastoid posterolaterally. Scar will be assessed at 4 weeks, 8 weeks and after 6 months.

Aims of the study are to compare the results of conventional thyroidectomy and horizontal lateral incision thyroidectomy in terms of cosmesis (Scar assessment score) and complications (hypocalcaemia, recurrent laryngeal nerve palsy).

Ethical Considerations

Study has been conducted after getting approval from Institutional Ethical Committee. A written informed consent

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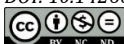
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has been taken from all the patients included in the study. Patients participating in the study did not have to incur any expenses. The anonymity of each individual has been maintained.

MATERIALS AND METHODS

Study Design

This is a prospective observational study.

Study Period and Duration

Study was conducted over a period of one and a half years from January 2015 to June 2016.

Study Setting

Study was conducted on patients with thyroid swelling who underwent thyroidectomy in general surgery ward, Government T. D. Medical College and Hospital, Vandanam, Kerala.

Sample Size

This study was carried out as a part of fulfilment of PG course and hence had to be completed within one and a half years. Sample was selected on the basis of number of elective thyroidectomies to be done by a particular surgical unit from January 2015 to June 2016. As there is only one theatre day per week for a unit in our department, assuming one thyroidectomy per week, the maximum number of possible cases which can be done is 40. So, sample size was taken as 40.

Method of Allocation of Group

Patients admitted in surgical ward in our unit are counselled about the two types of surgical methods. Those who wish to undergo the particular procedure are selected after obtaining informed consent.

Group 1

Horizontal lateral incision thyroidectomy- 40 patients.

Group 2

Conventional large incision thyroidectomy- 40 patients.

Study Population

Inclusion Criteria

1. Solitary nodule thyroid.
2. Multinodular thyroid.

Exclusion Criteria

1. Malignancy.
2. Large retrosternal thyroid.
3. Thyroiditis.

Study Procedure

Protocol was initiated after obtaining Institutional Ethical Committee. After getting informed consent, patients were interviewed based on an appropriate semi-structured questionnaire and they were followed up after surgery.

Study Variables

The variables studied were age of the patient, gender, diagnosis, type of incision, type of surgery, complications (Hypocalcaemia, Recurrent laryngeal nerve palsy) and scar assessment scale- OSAS (Observer Scar Assessment Scale) and PSAS (Patient Scar Assessment Scale).

Data Analysis

Statistical Method- Mann-Whitney U Test.

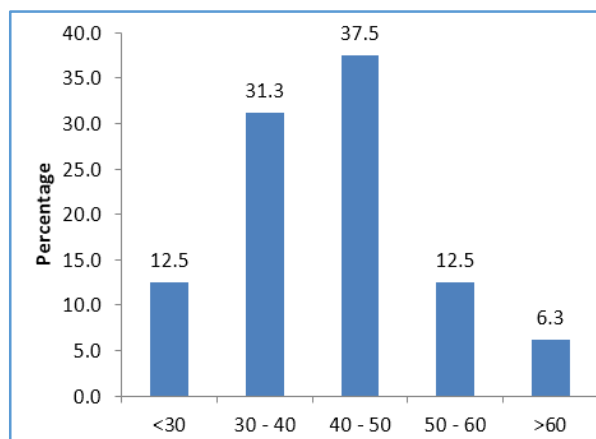
All the analysis was done using qualitative variables in Statistical Package for Social Sciences (SPSS) version 16.

RESULTS

1. Age

Age	Count	Percent
< 30	10	12.5
30 – 40	25	31.3
40 – 50	30	37.5
50 – 60	10	12.5
> 60	5	6.3

Table 1. Percentage Distribution of the Sample, According to Age



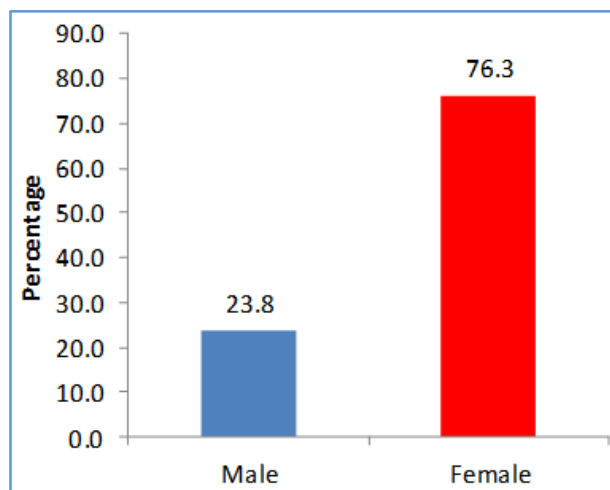
Graph 1. Percentage Distribution of the Sample, According to Age

Most of the patients in the study were in the age group 30 - 50 yrs., with that is 68.8% that is 30 patients in 40 - 50 and 25 in 30 - 40 years' group.

2. Gender

Gender	Count	Percent
Male	19	23.8
Female	61	76.3

Table 2. Percentage Distribution of the Sample, According to Gender



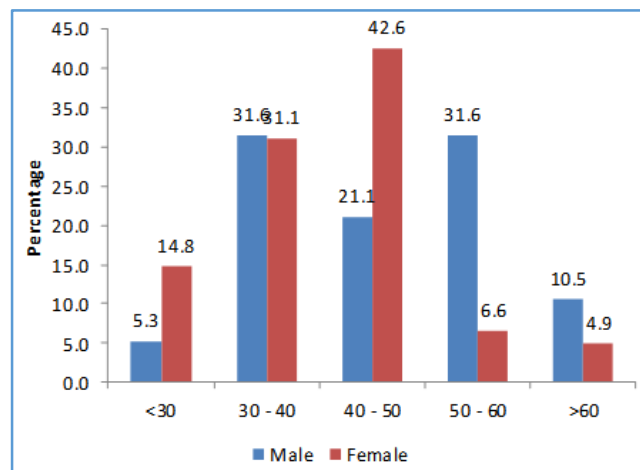
Graph 2. Percentage Distribution of the Sample, According to Gender

In the study population, the percentage of female patients was 61% and the percentage of male was 19%.

3. Distribution of Age and Gender

Age	Male		Female	
	Count	Percent	Count	Percent
< 30	1	5.3	9	14.8
30 - 40	6	31.6	19	31.1
40 - 50	4	21.1	26	42.6
50 - 60	6	31.6	4	6.6
> 60	2	10.5	3	4.9

Table 3. Distribution of Age and Gender

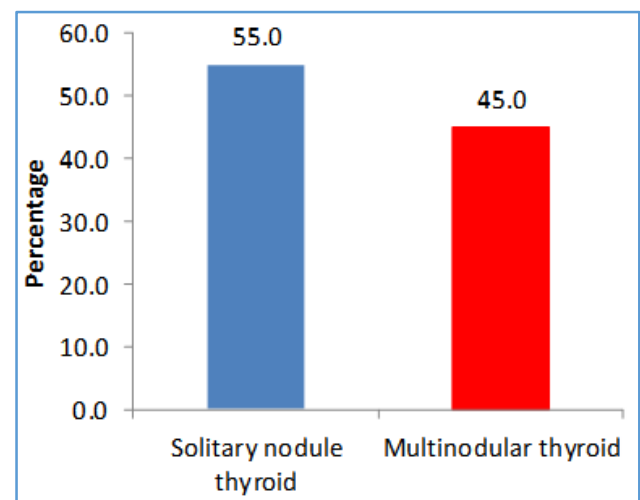


Graph 3. Distribution of Age and Gender

4. Diagnosis

Diagnosis	Count	Percent
Solitary nodule thyroid	44	55.0
Multinodular thyroid	36	45.0

Table 4. Percentage Distribution of the Sample, According to Diagnosis



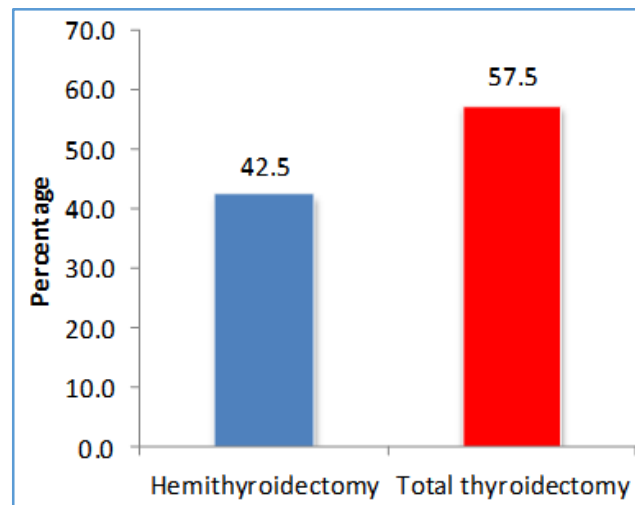
Graph 4. Percentage Distribution of the Sample, According to Diagnosis

In the study population, 55% that is 44 patients were diagnosed as SNT and 45% that is 36 patients were diagnosed as MNG.

5. Surgery

Surgery	Count	Percent
Hemithyroidectomy	34	42.5
Total thyroidectomy	46	57.5

Table 5. Percentage Distribution of the Sample, According to Surgery



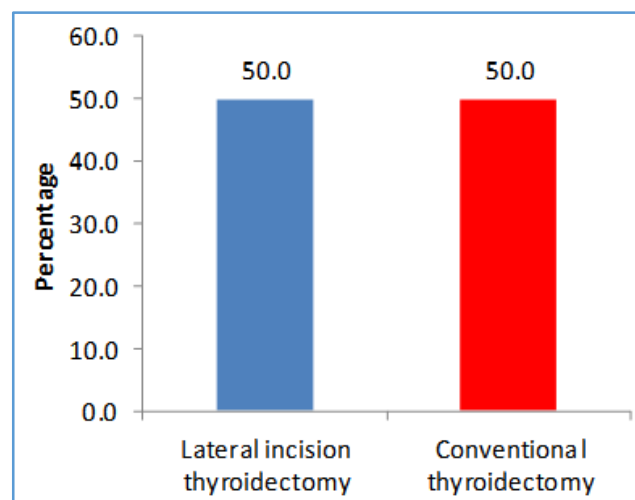
Graph 5. Percentage Distribution of the Sample, According to Surgery

In the study population 42.5% i.e. 34 patients underwent hemithyroidectomy and 57.5% i.e. 46 underwent total thyroidectomy.

6. Incision

Incision	Count	Percent
Lateral incision thyroidectomy	40	50.0
Conventional thyroidectomy	40	50.0

Table 6. Percentage Distribution of the Sample, According to Incision



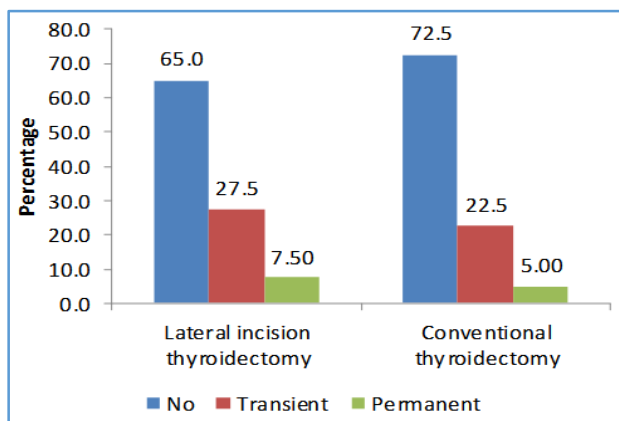
Graph 6. Percentage Distribution of the Sample, According to Incision

7. Association of Complications with Incision

Incision	Hypocalcaemia						Z*	P
	No		Transient		Permanent			
	Count	Percent	Count	Percent	Count	Percent		
Lateral incision thyroidectomy	26	65.0	11	27.5	3	7.5	0.74	0.459
Conventional thyroidectomy	29	72.5	9	22.5	2	5.0		

Table 7. Comparison of Incision based on Hypocalcaemia

*Mann-Whitney U Test



Graph 7. Comparison of Incision based on Hypocalcaemia

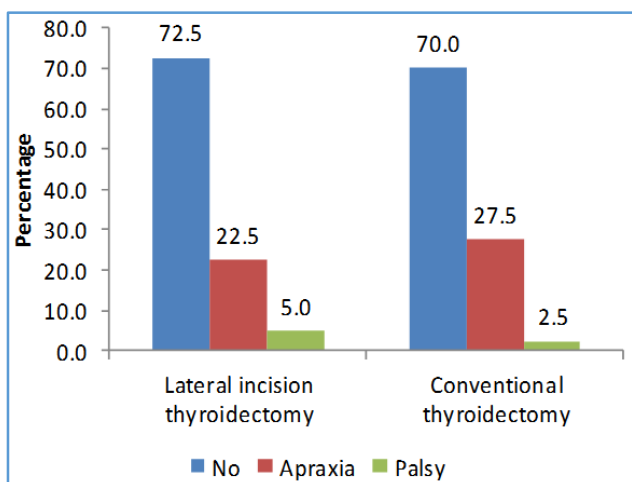
Occurrences of hypocalcaemia in both groups were analysed; 27.5% of patients in lateral incision group developed transient hypocalcaemia and 7.5% were permanent; 22.5% of patients in conventional thyroidectomy group developed transient hypocalcaemia and 5% developed permanent hypocalcaemia. There is no statistically significant difference between the two groups with regard to occurrence of post-op hypocalcaemia [p value- 0.459].

8. Comparison of Incision based on Recurrent Laryngeal Nerve Palsy

Incision	Recurrent Laryngeal Nerve Palsy						Z*	P
	No		Apraxia		Palsy			
	Count	Percent	Count	Percent	Count	Percent		
Lateral incision thyroidectomy	29	72.5	9	22.5	2	5.0	0.16	0.869
Conventional thyroidectomy	28	70.0	11	27.5	1	2.5		

Table 8. Comparison of Incision based on Recurrent Laryngeal Nerve Palsy

*Mann-Whitney U Test



Graph 8. Comparison of Incision based on Recurrent Laryngeal Nerve Palsy

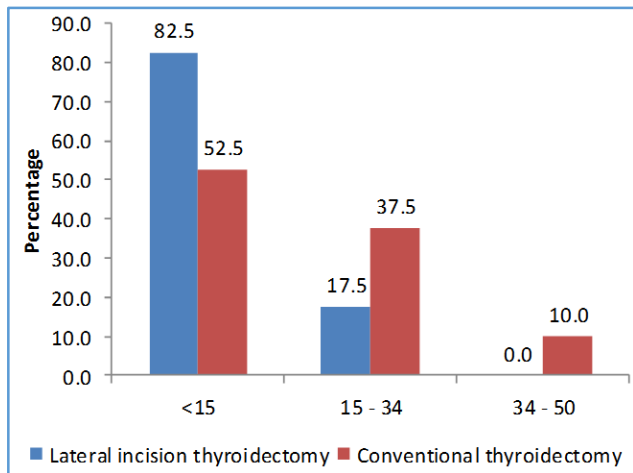
Occurrences of RLN palsy in both groups were analysed; 22.5% patients had RLN apraxia in lateral incision group and 5% had RLN palsy; 27.5% patients in conventional thyroidectomy developed RLN apraxia and 2.5% had palsy. There is no statistically significant difference between two groups with regard to occurrence of RLN injury [p value- 0.869].

9. Comparison of OSAS based on Incision

OSAS	Incision				Z*	P
	Lateral Incision Thyroidectomy		Conventional Thyroidectomy			
	Count	Percent	Count	Percent		
< 15	33	82.5	21	52.5	2.98	0.003†
15 - 34	7	17.5	15	37.5		
34 - 50	0	0.0	4	10.0		

Table 9. Comparison of OSAS based on Incision

*Mann-Whitney U Test †Significant at 0.01 level.



Graph 9. Comparison of OSAS based on Incision

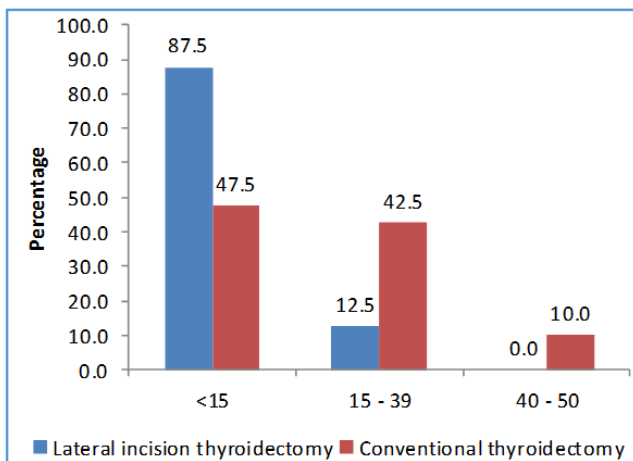
There is statistically significant difference between the two groups with regards to the outcome of the scar in OSAS. The scar was significantly better in thyroidectomy done through lateral incision thyroidectomy [p value- 0.003].

10. Comparison of PSAS based on Incision

PSAS	Incision				Z*	P
	Lateral Incision Thyroidectomy		Conventional Thyroidectomy			
	Count	Percent	Count	Percent		
< 15	35	87.5	19	47.5	3.87	0.000†
15 - 39	5	12.5	17	42.5		
40 - 50	0	0.0	4	10.0		

Table 10. Comparison of PSAS based on Incision

*Mann-Whitney U Test †Significant at 0.01 level.



Graph 10. Comparison of PSAS based on Incision

There is statistically significant difference between the two groups with regards to the outcome of the scar in PSAS. The scar was significantly better in thyroidectomy done through lateral incision [p value- 0.000].



Figure 1



Figure 2



Figure 3

DISCUSSION

Age

Most of the patients in the study were in the age group 30 - 50 yrs., with that is 68.8% that is 30 patients in 40 - 50 and 25 in 30 - 40 years' group.

Sex

In the study population, the percentage of female patients was 61% and the percentage of male was 19%. In the study population 12 male patients included in age group 30 - 40 and 50 - 60, but in female patients 42.6% that is 26 patients included in age group 40 - 50. This finding was in concordance with the findings in the previous studies of horizontal lateral incision thyroidectomy by Thomas Varghese.¹

Diagnosis

In the study population, 55% that is 44 patients were diagnosed as SNT and 45% that is 36 patients were diagnosed as MNG.

Surgery

In the study population 42.5% i.e. 34 patients underwent hemithyroidectomy, 57.5% i.e. 46 underwent total thyroidectomy.

Complications

- Hypocalcaemia- Occurrences of hypocalcaemia² in both groups were analysed; 27.5% of patients in lateral incision group developed transient hypocalcaemia and 7.5% were permanent; 22.5% of patients in conventional thyroidectomy group developed transient hypocalcaemia and 5% developed permanent hypocalcaemia.² There is no statistically significant difference between the two groups with regard to occurrence of post-op hypocalcaemia [p value- 0.459]. In Thomas Varghese¹ study of horizontal lateral incision thyroidectomy, parathyroid deficiency was reported in 10/283 that is 0.035% only.
- Recurrent Laryngeal Nerve Palsy- Occurrences of RLN palsy^{3,4} in both groups were analysed; 22.5% patients had RLN apraxia in lateral incision group and 5% had RLN palsy; 27.5% patients in conventional thyroidectomy developed RLN apraxia and 2.5% had palsy. There is no statistically significant difference between two groups with regard to occurrence of RLN injury [p value- 0.869]. There were no nerve injury reported in horizontal lateral incision thyroidectomy according to Thomas Varghese.¹
- Cosmesis- Post-op scar was assessed based on the Patient's and Observer's point of view Observer scar assessment scale.^{5,6,7} There is statistically significant difference between the two groups with regards to the outcome of the scar in OSAS. The scar was significantly better in thyroidectomy done through lateral incision thyroidectomy [p value- 0.003].

This finding was in concordance with the previous studies of horizontal lateral incision thyroidectomy by Thomas Varghese,¹ Zhi Giang Chen,⁸ Lei Wang, Tao Li et al and Terris et al, patient's scar assessment scale. There is statistically significant difference between the two groups with regards to the outcome of the scar in PSAS.^{5,6,7} The scar was significantly better in thyroidectomy done through lateral incision [p value- 0.000].

This finding was in concordance with the previous studies of horizontal lateral incision thyroidectomy by Thomas Varghese¹, Zhi Giang Chen,⁸ Lei Wang, Tao Li et al and Terris et al. The scar in lateral incision thyroidectomy was cosmetically far better compared to the conventional incision thyroidectomy.

CONCLUSION

Lateral or horizontal incision thyroidectomy is analogous and feasible alternative to conventional thyroidectomy in selected cases. The advantage of this technique was an enhanced aesthetic result. This technique is not recommended in huge thyroid, retrosternal thyroid, thyroiditis and malignancy, so it cannot be recommended as a standard therapy. Study on a large number of patients, preferably randomised double-blinded studies with longer followup periods is recommended.

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