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COMPARING SMALL INCISION & CONVENTIONAL LARGE INCISION THYROIDECTOMY

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ABSTRACT: The conventional technique of thyroidectomy normally requires a long skin incision and wide skin flaps on the anterior neck. The target of Minimal invasive surgery is to achieve the same results as those obtained with traditional surgery, less trauma, better postoperative course and improved cosmetic results. The aim of this Prospective Cohort study is to compare Small Incision (3.5-4cm) Thyroidectomy with conventional large incision Thyroidectomy with respect to post-op complications & Cosmesis. Most of the patients were in the age group 30-50yrs. There was no statistically significant difference between the two groups with respect to complications, which were Hematoma (6%), Seroma (25%), Hypocalcemia (52.5%)[Transient (37%), Permanent (15%)], Recurrent Laryngeal Nerve Involvement (33%) [Complete (6%)]. The scar in Small Incision surgery was cosmetically far better compared to the large incision Surgery & this difference was statistically significant. This technique not recommended in huge goiter, Retro-sternal goiter, thyroiditis and malignant thyroid. We believe that MINET can be an alternative to the classic approach in selected cases, but cannot be recommended as a standard therapy. Study on a large number of patients and longer follow up periods is recommended.

KEYWORDS: Thyroidectomy, Small Incision, Complications, Cosmetic Scar, Minimal Access Surgery, MINET (Minimally Invasive Non-Endoscopic Thyroidectomy).

MESHTERMS: Thyroidectomy.

INTRODUCTION: The conventional technique of thyroidectomy normally requires a long skin incision and wide skin flaps on the anterior neck. Driven by patients demand, surgeons have sought to perform operations with less pain and better cosmetic result for the patient¹. In neck surgery different modalities were developed to replace the conventional technique of thyroidectomy in order to improve cosmetic results. These modalities include minimal invasive video assisted thyroidectomy (MIVAT)², endoscopic thyroidectomy, and lastly mini-incision thyroidectomy.

This new technique is based on performing thyroid surgery through small conventional skin incision (from 3 to 4.5cm) using conventional instruments without any endoscopic instruments or videoscopic camera. The aim of this technique is to combine the advantage of better cosmetic results and better postoperative course gained by endoscopic surgery³⁻⁵.

To compare Small Incision (3.5-4cm) & Conventional Large Incision (6-8cm) Thyroidectomy with respect to

- Complications:
 - Hemorrhage
 - RLN Palsy
 - Hypoparathyroidism
- Cosmesis

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ETHICAL CONSIDERATIONS: Prior to study, permission obtained from the head of the departments & Institutional Ethical Committee. The informed consent was obtained from study participants before data collection. Assurance was given to the subjects that the anonymity of each individual will be maintained.

MATERIALS & METHODS:

STUDY DESIGN: Prospective Cohort Study.

STUDY PERIOD: March 2012 to February 2013.

STUDY PROCEDURE: Patients admitted with thyroid enlargement are examined clinically to make the provisional diagnosis. If the diagnosis falls within my inclusion criteria, the patient is made aware of my thesis & his consent is taken if he is willing to participate. Aside from basic investigations, a Thyroid Function Test is also done. FNAC of the thyroid is taken to make a Tissue diagnosis. USG neck to assess the size & rule out any lymph node enlargement.

An ENT evaluation of the vocal cords is performed. A pre-Anesthetic Check-up is performed to see if the patient is fit for General Anesthesia. The patient if fit for GA & Surgery, surgery is performed using the Procedure given below. In the post-operative period, he is monitored for any symptoms suggestive of any complications. An ENT evaluation of vocal cords. On review after 2 weeks, a S.calcium is done to assess hypocalcemia. Follow up is continued for 6 months.

STUDY POPULATION: All the patients admitted in the Surgery wards with thyroid Enlargement & Posted for Thyroidectomy.

Sample Size:

Group 1: Small Incision Thyroidectomy – 40 patients.

Group 2: Conventional Large Incision Thyroidectomy – 40 patients.

Inclusion Criteria:

- Thyroid Enlargement; Each lobe maximum size 4cm.
- Solitary Nodule Thyroid < 8cm.

Exclusion Criteria:

- Large Thyroid; Each Lobe > 4cm.
- Patients with Recurrent MNG.
- Thyroid Enlargement due to Malignancy with Positive Lymph nodes in neck.
- Patients with Known Bleeding Diathesis.
- Short Neck Individuals.
- Pre-operative Recurrent Laryngeal Nerve Palsy.
- Goitre with Retrosternal Extension.

STUDY VARIABLES:

1. Age of patient
2. Sex
3. Diagnosis

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4. Incision
5. Surgery
6. Complications
 - a. Hematoma
 - b. Seroma
 - c. Infection
 - d. Hypocalcemia
 - e. RLN Palsy
 - f. ELN Palsy
7. Days as IP
8. Scar Assessment Scale [SAS]
 - a. OSAS [Observer SAS]⁶
 - b. PSAS [Patient SAS]⁶

STUDY TOOLS:

1. History.
2. Clinical Assessment – thorough clinical examination.
3. Pre-op Evaluation.
4. Surgery.
5. Scar Assessment Scale – POSAS obtained from a study by Daniel et al.⁶ The Patients were divided into 3 groups, Excellent Scar (1), Good Scar (2) & Poor Scar (3).

ANALYSIS: All the analysis was done using Qualitative Variables. Association between variables was found using Pearson Chi-Square Test. Strength of Association was determined using Odd's Ratio. All the analysis was done in Statistical Package for Social Sciences [SPSS] Ver.16. Alpha error was kept as 5% for all the analysis.

1. AGE:

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NUMBER	AGE GROUP [yrs]
1	<20
2	20-30
3	30-40
4	40-50
5	50-60
6	>60

Table 1: Age Groups

Most of the patients in the study were in the age group 30-50yrs, with 46% i.e. 37 patients in the 30-40yrs & 27.5% i.e. 22 patients in the 40-50yrs group.

1	Small Incision	40
2	Conventional	40

Table 2: Color Coding & Numbering of Study Groups

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SEX:

In the study population, the percentage of Female patients was 65% & the percentage of Males was 35%. In the females, 44% underwent Small Incision Thyroidectomy & 56% underwent Conventional Thyroidectomy. In the males, 60% underwent Small Incision Thyroidectomy & 40% underwent Conventional Thyroidectomy.

DIAGNOSIS:

In the group of patients with SNT as diagnosis, 57% i.e. 24 patients underwent Small Incision Thyroidectomy & 43% i.e. 18 patients underwent Conventional Thyroidectomy. In the group of

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patients with MNG as diagnosis, 42% i.e. 16 patients underwent Small Incision Thyroidectomy & 58% i.e. 22 patients underwent Conventional Thyroidectomy.

SURGERY:

In the patients who underwent NTT, 47% i.e. 26 patients had a Small Incision & 53% i.e. 29 patients had a Conventional Incision. In the patients who underwent TT, 59% i.e. 10 patients had a Small Incision & 41% i.e. 7 patients had a Conventional Incision. In the patients who underwent Lobectomy, 50% i.e. 4 patients had a Small Incision & 50% i.e. 4 patients had a Conventional Incision.

COMPLICATIONS:

HEMATOMA

		Hematoma		Total
		YES	NO	
Incision	SMALL	2	38	40
	LARGE	3	37	40
Total		5	75	80

Table 3: Incision * Hematoma Cross tabulation

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There is no statistically significant difference between the two groups with regard to occurrence of post-op hematoma [p value – 0.644].

DIAGNOSIS

SNT:

		Hematoma		Total
		YES	NO	
Incision	SMALL	2	22	24
	LARGE	1	17	18
Total		3	39	42

Table 4: Incision * Hematoma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op hematoma when the diagnosis was SNT [p value – 0.729]

MNG:

		Hematoma		Total
		YES	NO	
Incision	SMALL	0	16	16
	LARGE	2	20	22
Total		5	2	36

Table 5: Incision * Hematoma Cross tabulation

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There is no statistically significant difference between the two groups with regard to occurrence of post-op hematoma when the diagnosis was MNG [p value – 0.215].

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LOBECTOMY:

		Hematoma		Total
		YES	NO	
Incision	SMALL	0	4	4
	LARGE	1	3	4
Total		1	7	8

Table 6: Incision * Hematoma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op hematoma when Lobectomy was performed [p value – 0.215].

NEAR TOTAL THYROIDECTOMY:

		Hematoma		Total
		YES	NO	
Incision	SMALL	1	25	26
	LARGE	2	27	29
Total		1	3	52

Table 7: Incision * Hematoma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op hematoma when NTT was performed [p value – 0.619].

TOTAL THYROIDECTOMY:

		Hematoma		Total
		1	2	
Incision	SMALL	1	9	10
	LARGE	0	7	7
Total		1	16	17

Table 8: Incision * Hematoma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op hematoma when TT was performed [0.388].

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These findings were in concordance with the findings in the previous studies Ahmed et al¹ & Essam et al.⁷

SEROMA:

		Seroma		Total
		YES	NO	
Incision	SMALL	7	33	40
	LARGE	13	27	40
Total		20	60	80

Table 9: Incision * Seroma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op seroma [p value – 0.121].

DIAGNOSIS

SNT:

		Seroma		Total
		YES	NO	
Incision	SMALL	4	20	24
	LARGE	6	12	18
Total		10	32	42

Table 10: Incision * Seroma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op seroma when the diagnosis was SNT [p value – 0.209].

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MNG:

		Seroma		Total
		YES	NO	
Incision	SMALL	3	13	16
	LARGE	7	15	22
Total		10	28	38

Table 11: Incision * Seroma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op seroma when the diagnosis was MNG [p value – 0.366].

SURGERY

LOBECTOMY:

		Seroma		Total
		YES	NO	
Incision	SMALL	0	4	4
	LARGE	1	3	4
Total		1	7	8

Table 12: Incision * Seroma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op seroma when Lobectomy was performed [p value – 0.285].

NEAR TOTAL THYROIDECTOMY:

		Seroma		Total
		YES	NO	
Incision	SMALL	5	21	26
	LARGE	12	17	29
Total		17	38	55

Table 13: Incision * Seroma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op seroma when NTT was performed [p value – 0.076].

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TOTAL THYROIDECTOMY:

		Seroma		Total
		YES	NO	
Incision	SMALL	2	8	10
	LARGE	0	7	7
Total		2	15	17

Table 14: Incision * Seroma Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op seroma when TT was performed [p value – 0.208].

These findings were in concordance with the findings in the previous studies Ahmed et al¹ & Essam et al.⁷

INFECTION:

		Seroma		Total
		YES	NO	
Incision	SMALL	0	40	40
	LARGE	1	39	40
Total		1	79	80

Table 15: Incision * Infection Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op Infection [p value – 0.314]. This finding was in concordance with the findings in the previous studies Ahmed et al¹ & Essam et al.⁷

HYPOCALCEMIA:

		Hypocalcemia			Total
		No	Transient	Permanent	
Incision	SMALL	21	14	5	40
	LARGE	17	16	7	40
Total		38	30	12	80

Table 16: Incision * Hypocalcemia Cross tabulation

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There is no statistically significant difference between the two groups with regard to occurrence of post-op Hypocalcemia [p value - 0.642].

DIAGNOSIS

SNT:

		Hypocalcemia			Total
		No	Transient	Permanent	
Incision	Small	15	6	3	24
	Large	9	7	2	18
Total		24	13	5	42

Table 17: Incision * Hypocalcemia Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op Hypocalcemia when the diagnosis was SNT [p value - 0.625].

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MNG:

		Hypocalcemia			Total
		No	Transient	Permanent	
Incision	Small	6	8	2	16
	Large	8	9	5	22
Total		14	17	7	38

Table 18: Incision * Hypocalcemia Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op Hypocalcemia when the diagnosis was MNG [p value – 0.705].

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LOBECTOMY:

		Hypocalcemia		Total
		No	Transient	
Incision	Small	3	1	4
	Large	3	1	4
Total		6	2	8

Table 19: Incision * Hypocalcemia Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of post-op Hypocalcemia when Lobectomy was performed [p value - 1].

NEAR TOTAL THYROIDECTOMY:

		Hypocalcemia			Total
		No	Transient	Permanent	
Incision	Small	13	10	3	26
	Large	12	12	5	29
Total		25	22	8	55

Table 20: Incision * Hypocalcemia Cross tabulation

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There is no statistically significant difference between the two groups with regard to occurrence of post-op Hypocalcemia when NTT was performed [p value – 0.756].

TOTAL THYROIDECTOMY:

		Hypocalcemia			Total
		No	Transient	Permanent	
Incision	Small	3	4	3	10
	Large	2	2	3	7
Total		5	6	6	17

Table 21: Incision Hypocalcemia Crosstabulation

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There is no statistically significant difference between the two groups with regard to occurrence of post-op Hypocalcemia when TT was performed [p value – 0.840].

These findings were in concordance with the findings in the previous studies Ahmed et al¹ & Essam et al.⁷

RECURRENT LARYNGEAL NERVE INVOLVEMENT:

		RLN			Total
		No	Apraxia	Palsy	
Incision	Small	30	8	2	40
	Large	23	14	3	40
Total		53	22	5	80

Table 22: Incision * RLN Crosstabulation

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There is no statistically significant difference between the two groups with regard to occurrence of RLN Injury [p value – 0.251].

DIAGNOSIS

SNT:

		RLN			Total
		No	Apraxia	Palsy	
Incision	Small	18	4	2	24
	Large	10	8	0	18
Total		28	12	2	42

Table 23: Incision * RLN Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of RLN Injury when the diagnosis was SNT [p value – 0.088].

MNG:

		RLN			Total
		No	Apraxia	Palsy	
Incision	Small	12	4	0	16
	Large	13	6	3	22
Total		25	10	3	38

Table 24: Incision * RLN Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of RLN Injury when the diagnosis was MNG [p value – 0.279].

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LOBECTOMY:

		RLN		Total
		No	Apraxia	
Incision	Small	2	2	4
	Large	3	1	4
Total		5	3	8

Table 25: Incision * RLN Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of RLN Injury when Lobectomy was performed [p value – 0.465].

NEAR TOTAL THYROIDECTOMY:

		RLN			Total
		No	Apraxia	Paralysis	
Incision	Small	19	5	2	26
	Large	16	10	3	29
Total		35	15	5	55

Table 26: Incision * RLN Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of RLN Injury when NTT was performed [p value – 0.374].

TOTAL THYROIDECTOMY:

		RLN		Total
		No	Apraxia	
Incision	Small	9	1	10
	Large	4	3	7
Total		13	14	17

Table 27: Incision * RLN Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of RLN Injury when TT was performed [p value - 0.116].

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These findings were in concordance with the findings in the previous studies Ahmed et al¹ & Essam et al.⁷

EXTERNAL LARYNGEAL NERVE INVOLVEMENT:

		ELN		Total
		Yes	No	
Incision	Small	1	39	40
	Large	1	39	40
Total		2	78	80

Table 28: Incision * ELN Cross tabulation

There is no statistically significant difference between the two groups with regard to occurrence of ELN Injury [p value - 1].

SCAR ASSESSMENT SCALE

OBSERVER SCAR ASSESSMENT SCALE [OSAS]:

OSAS	Group No.
<15	1
15-34	2
35-50	3

Table 29: OSAS Groups

		OSAS			Total
		1	2	3	
Incision	Small	36	4	0	40
	Large	20	12	8	40
Total		56	16	8	80

Table 30: Incision * OSAS Cross tabulation

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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 a small incision [p value – 0.000]. This finding was in concordance with the findings in the previous studies Ahmed et al¹, Daniel et al⁶, Essam et al⁷, Therezia et al⁸ & Terris et al⁹.

PATIENT SCAR ASSESSMENT SCALE [PSAS]:

PSAS	Group no.
<15	1
15 - 39	2
40 - 60	3

Table 31: PSAS Groups

		PSAS			Total
		1	2	3	
Incision	Small	34	6	0	40
	Large	20	12	8	40
Total		54	18	8	80

Table 32: Incision * PSAS Cross tabulation

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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 a small incision [p value - 0.001]. This finding was in concordance with the findings in the previous studies Ahmed et al¹, Daniel et al⁶, Essam et al⁷, Therezia et al⁸ & Terris et al⁹.

DAYS AS IN-PATIENT:

		PSAS		Total
		<3 days	>3 days	
Incision	Small	40	0	40
	Large	38	2	40
Total		78	2	80

Table 33: Incision * IP Cross tabulation

There was no statistically significant difference between the two groups of patients with regards to the duration of stay in the hospital after Thyroidectomy [p value - 0.152]. This finding was in concordance with the findings in the previous studies Ahmed et al¹ & Essam et al.⁷

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SUMMARY: Most of the patients in this study were in the Age Group 30-50yrs. In this study, majority of the patients were females. Most of the female patients underwent Conventional Thyroidectomy. The most performed surgery in males was Small Incision Thyroidectomy. Most of the patients in this study underwent Near Total Thyroidectomy. The least performed surgery was Lobectomy.

COMPLICATIONS: Hematoma developed in only 6% patients in the study & there was no difference between Small & Large Incision Surgeries. There was no significant difference statistically with respect to Diagnosis or Extent of Surgery.

Seroma developed in about 25% patients & was more in the Conventional Large Incision Thyroidectomy, but statistically no significant difference was found between the two groups. There was no significant difference statistically with respect to diagnosis or Extent of Surgery.

Infection developed in just 1 patient in the study, which was in the Large Incision Group, but it is not statistically significant.^{10, 11}

Hypocalcemia developed in 52.5% patients in whom about 37% was Transient & only 15% was Permanent. There was no significant difference between the two study groups statistically. Hypocalcemia was more in the patients who underwent Total Thyroidectomy. But there was no significant difference statistically with respect to diagnosis or Extent of Surgery between the two groups.¹²

Recurrent Laryngeal Nerve Involvement developed in 33% patients of which only 6% had complete paralysis. There was no significant difference between the two study groups statistically. Complete paralysis was more common when Near Total Thyroidectomy was performed. But there was no significant difference statistically with respect to diagnosis or Extent of Surgery between the two groups.^{10, 11}

External Laryngeal Nerve Involvement developed in only 2 patients. No statistical significance was found.

There was no significant difference statistically with respect to the days of stay in hospital after surgery between the two groups.^{10, 11}

COSMESIS: Post-op scar was assessed based on the Patient's & Observer's point of view & there was a statistically significant difference found between the two groups. The scar in Small Incision surgery was cosmetically far better compared to the large incision Surgery.⁶

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