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PROSPECTIVE STUDY OF THYROIDECTOMY PATIENTS IN RELATION TO ITS OUTCOME OF PROCEDURE EMPLOYED AND TO ASCESS THE QUALITY OF LIFE CLINICALLY AND BIOCHEMICALLY

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ABSTRACT

Introduction: Thyroid disorder is most frequently encountered endocrine disorder in India. In recent years, the incidence of thyroid disorders, including thyroid malignancy, has increased rapidly because of more awareness amongst the population about the disorder and advanced diagnostic tools.Quality of life post thyroidectomy depends on the occurrence of complication post-operative e.g., Injury to Recurrent laryngeal nerve during surgery may have significant effect on quality of voice, accidental removal of all four parathyroid glands during total thyroidectomy may make the patient dependent on life-long calcium supplementation.

Materials and method: The study was conducted from the 1st june 2021 to 31st may 2022 in the Department of Otorhinolaryngology in a tertiary care center of Assam, India. A total of 30 patients were included, operated, and followed up.

Result: The most finding in FNAC was colloid goitre accounting for 50% and least common was medullary carcinoma accounting for 0%. When reports of HPE were obtained, FNAC and HPE had a specificity of 96.66% as shown in table 4.In our study we found that out of 26 cases of hemithyroidectomy out of which 17 were done by lateral approach and 7 were done by medial approach . Among these 26 cases we identified parathyroid glands in 20 cases of hemithyroidectomy .out of 26 cases of hemithyroidectomy done in 1 year, in 23 number of cases recurrent laryngeal nerve was identified and in 20 cases EBSLN was identified and

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preserved. In about 48% of cases middle thyroid vein was identified and in 20 cases parathyroid gland was identified

Conclusion: A good clinical examination with USG and FNAC of tumour are the main pre-operative assessment. Per operative findings of important structures like parathyroid glands, EBSLN, RLN and preserving them is of utmost necessity to prevent complications and to have better quality of life post-operatively. All thyroid surgeries can be managed by good pre-operative workup, excellent per operative exposure and equally good post-operative care.

Keywords: Thyroidectomy,Quality of life and Biochemically

INTRODUCTION

Thyroid disorder is most frequently encountered endocrine disorder in India[1,3.] In recent years, the incidence of thyroid disorders, including thyroid malignancy, has increased rapidly because of more awareness amongst the population about the disorder and advanced diagnostic tools[2]. Although, iodine deficiency disease {IDDs} are widespread cause of thyroid disorder, even after the nationwide introduction of mandatory UNIVERSAL SALT IODISATION {USI} programme in 1996, the incidence of thyroid swelling is still high.The mainstay of treatment for thyroid nodules, performed for both the benign as well as malignant nodules is SURGERY. THYROIDECTOMY is one of the major and most frequent operations performed in Otorhinolaryngology.

The ambitions of a thyroid surgeon have evolved along the timeline. In 1866 Samuel Gross wrote: “Can the thyroid in the state of enlargement be removed? Emphatically, experience answers no. Should the surgeon be so foolhardy to undertake it. Every stroke of the knife will be followed by a torrent of blood and lucky it would be for him if his victim lived long enough for him to finish his horrid butchery. No honest and sensible surgeon would ever engage in it.”

Thyroid surgery has travelled a long path since then, from a surgery that was once doomed to fail and even led to the death of the patient, to the present time where more stress is given upon QOL post thyroidectomy and even cosmesis.

Quality of life post thyroidectomy depends on the occurrence of complication post-operative e.g., Injury to Recurrent laryngeal nerve during surgery may have significant effect on quality of voice, accidental removal of all four parathyroid glands during total thyroidectomy may make the patient dependent on life-long calcium supplementation. Similarly considering

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hypothyroidism after total thyroidectomy or hemithyroidectomy patient is dependent on life-long thyroxine administration. Patients complained ofpost-thyroidectomy swallowing difficulties which was associated with the damage of laryngeal nerves, recurrent laryngeal nerve (RLN), and superior laryngeal nerve (SLN).

Swallowing impairments after uncomplicated thyroid surgery are still not very well studied and are often under-diagnosed.[4]Swallowing impairment scores (SIS) were obtained preoperatively, and at 1 week and 3 months postoperatively.

JMCH caters to around 1.2 million patients annually as per data over a year. Out of that department of otorhinolaryngology has around -- patients out of which different thyroid pathology comprises around -----patients.In this study we aimed to see outcome of different surgical procedure done for different thyroid tumour and to assess quality of life post thyroidectomy in regard to--CLINICAL SYMPTOMS and SIGNS--BIOCHEMICAL PARAMETER.

Materials and Methods

The study was conducted from the 1st june 2021 to 31st may 2022 in the Department of Otorhinolaryngology in a tertiary care center of Assam, India. A total of 30 patients were included, operated, and followed up.

The inclusion criteria were all the patients coming to our OPD with thyroid swelling in an euthyroid state, surgically fit patients. Our exclusion criteria were retrosternal goitre, recurrent goitre, history of neck irradiation, and inoperable malignant thyroid disease by TNM staging.

Different types of thyroid surgeries were undertaken for different thyroid tumours:

TOTAL THYROIDECTOMY: - excision of entire thyroid gland.

NEAR TOTAL THYROIDECTOMY OR DUNHILL'STHYROIDECTOMY: - Excision of 90% of the glands, leaving a small remnant of tissue on one side at the level of the Berry's ligament.

SUBTOTAL THYROIDECTOMY: - Bilateral excision of more than one half of the thyroid gland on each side together with the isthmus.

THYROID ISTHMUSECTOMY: - The excision of the thyroid isthmus, often with pyramidal lobe of the gland, a procedure that should be reserved for nodule in the isthmus

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which measure no more than 4cm in diameter and do not encroach significantly on either lobe.

LOBECTOMY: - The removal of the one lobe, often performed with a thyroid isthmectomy.

PHOTOSGRAPHS

Fig1: showing midline fascia split in medial approach

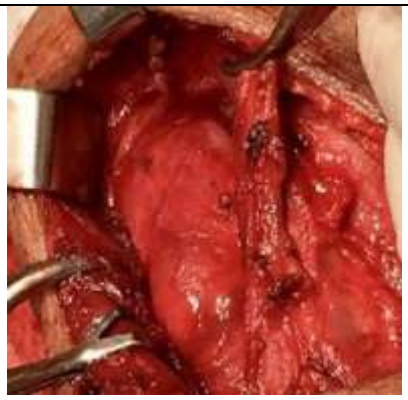

Fig 2: showing proposed triangle in lateral approach

Fig 3: identification of superior belly of omohyoid muscle in lateral approach

Fig4: identification of superior pedicle

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Fig 5: showing Superior Laryngeal Nerve

Fig 6: identification of Superior Parathyroid Gland

Fig 7: showing RLN in trachea-esophageal groove by lateral approach

Fig 8: showing high location of RLN

Fig 9 : identification of middle thyroid vein

Fig10: showing central compartment clearance in lateral neck dissection

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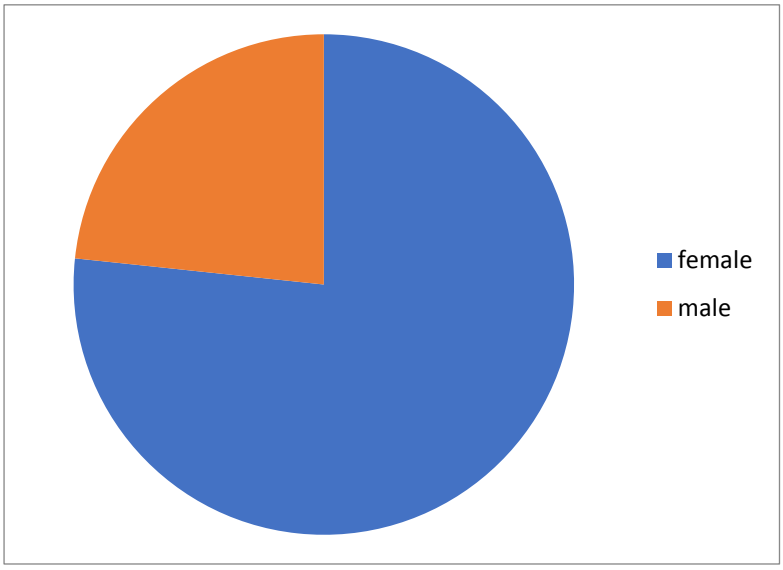
RESULTS

The current study was a prospective hospital-based study, carried out from June 1 2021 to may 31 2022 (1 year) involving 30 subjects where we established different outcome of various surgical procedure done for different thyroid tumour and assessment of quality of life post thyroidectomy in regard to clinical sign and symptoms and biochemical parameter

Table 1: GENDER DISTRIBUTION

GENDER	NUMBER(n)	PERCENTAGE (%)	RATIO
Female	23	76.66	3.9:1
Male	7	23.33	
Total	30	100	

Fig 1: PIE DIAGRAM DEPICTING GENDER DISTRIBUTION OF THYROID TUMOUR



In this study, out of which 23 were females and 7 males. With sex ratio female to male of 3.9 : 1 as shown in table 1.

Table 2: INCIDENCE ACCORDING TO AGE

AGE	NO. OF CASES	PERCENTAGE (%)
0-10	0	0

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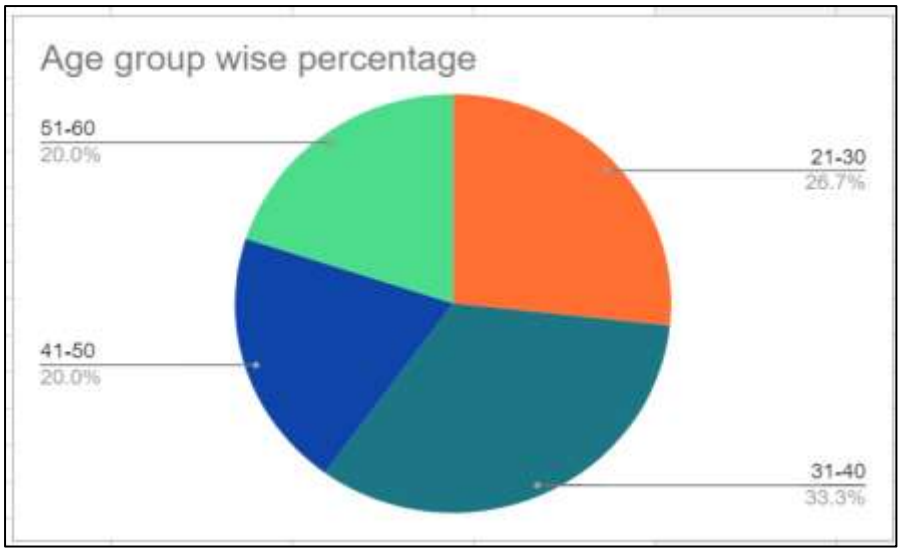
11-20	0	0
21-30	8	26.66
31-40	10	33.33
41-50	6	20
51-60	6	20
61-70	0	0

Fig 2: PIE DIAGRAM SHOWING AGE WISE DISTRIBUTION OF TYROID TUMOURS



The distribution of thyroid cases according to age ranged from 21 years to 58 years.No patients were found in age group 0-20 years. Of total thyroid cases 8 patients were between 21-30 years, 10 patients were from 31-40 years, 6 patients between 41-50 years and between 51-60 years each. The prevalence of thyroid tumour was highest 33.33% in age group 31-40 years. The distribution of thyroid tumours is summarized in table 2.

Table 3 : DISTRIBUTION OF TUMOUR ACCORDING TO LOCATION

LATERALITY	NO. OF CASES	PERCENTAGE %
Right	12	40%
Left	15	50
Both	3	10

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In this study we have observed that left lobe was most frequently involved accounting 50% followed by right lobe 40%.both the lobes were involved in 3 cases accounting for 10%.

Table 4: FNAC and HPE findings:

Findings	No. of cases in FNAC	HPE Finding	Percentage
Colloid goitre	15	15	50%
Follicular neoplasm	13	12	40%
Papillary carcinoma	1	2	6.66%
Hurthle cell carcinoma	1	1	3.33%
Medullary carcinoma	0	0	0%
Total	30	30	~100%

The most finding in FNAC was colloid goitre accounting for 50% and least common was medullary carcinoma accounting for 0%. . When reports of HPE were obtained, FNAC and HPE had a specificity of 96.66% as shown in table 4.

Table 5: BETHESDA GRADING OF DIFFERENT THYROID TUMOURS

BETHESDA GRADING	NO. OF PATIENTS
GRADEI (NON-DIAGNOSTIC/UNSATISFACTORY)	0
GRADE II (BENIGN)	19
GRADE III (ATYPIA OF UNDETERMINED SIGNIFICANCE OR FOLLICULAR LESION OF UNDERTERMINED SIGNIFICANCE)	9
GRADE IV (FOLLICULAR NEOPLASM ORSUSPICIOUS OF FOLLICULAR NEOPLASM)	1
GRADE V (SUSPICIOUS FOR	1

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MALIGNANCY)	
GRADE VI (MALIGNANT)	0

Table 6: DIAGNOSIS WISE AGE DISTRIBUTION OF CASES

Pre-operative diagnosis	AGE GROUP (in years)					
	21-30	31-40	41-50	51-60	Total cases	Percentage of cases
Colloid goiter cat-II	4	3	3	2	12	40
Multinodulargoiter Cat- III	1	0	1	1	3	10
Follicular neoplasm cat-II	1	5	0	1	7	23.33
Follicular neoplasm cat-III	1	1	1	1	4	13.33
Follicular neoplasm cat-IV	1	0	0	0	1	3.33
Papillary ca. cat-V	0	1	0	0	2	6.66
Hurtle cell N. CAT-III	0	0	1	0	1	3.33
Total(n)	8	10	6	6	30	100
Percentage(%)	26.66	23.33	20	20	100	

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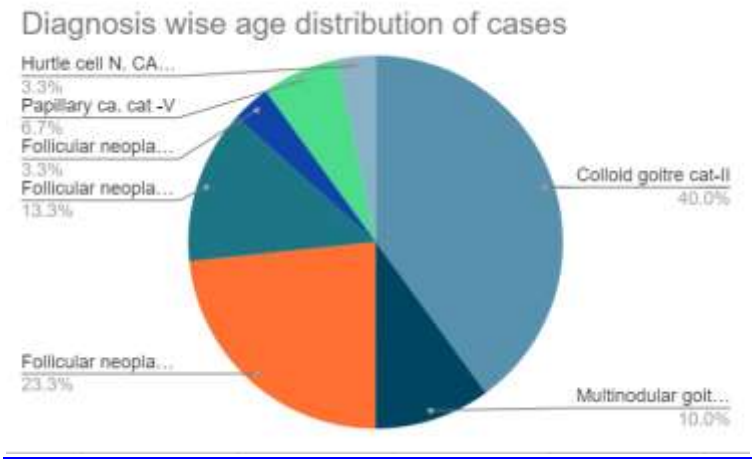
Fig 3: PIE DIAGRAM DEPICTING DIGNOSIS WISE AGE DISTRIBUTION



In our study we found that most common tumour of thyroid is colloid goitre 40% among all tumours and 10% were multinodular goitre and less common being the follicular neoplasm of category-IV, Medullary carcinoma of thyroid accounting for 0% of cases. We also found that colloid goitre is the most common tumour 21-30 years of age. The study is summerized in table no. 5.

TABLE 7: OPERATIVE PROCEDURE PERFORMED FOR DIFFERENT THYROID SURGERY

Type of surgery	Approach	No. of cases
Hemithyroidectomy	Lateral	17
	Medial	9
Near total thyroidectomy	Lateral	1
	Medial	0
Total thyroidectomy	Lateral	0
	Medial	1
TT with CND	Lateral	0
	Medial	1
Completion thyroidectomy with CND	Lateral	1
	Medial	0

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The most common surgery done during this study was hemithyroidectomy in almost 26 cases 86.66% and most commonly lateral approach was adopted which gave us more clear anatomy when compared with medial approach for superior pedicle and for easy identification of parathyroid gland, considering superior belly of omohyoid as surgical landmark to extract out thyroid gland and provided access to the lateral neck for lymph node clearance without any extra need to split fascia.

Table 8: FINDING DURING SURGICAL PROCEDURE

FINDINGS	Hemithyroidectomy	near total thyroidectomy	Total thyroidectomy	Total thyroidectomy with CND	Completion thyroidectomy with CND
Parathyroid gland identified	20	1	1	1	1
RLN identified	23	1	1	1	1
EBSLN identified	20	1	1	1	1
Middle thyroid vein present	14	1	1	1	1
Lateral Approach	17	1	0	0	1
Medial approach	9	0	1	1	0

In our study we found that out of 26 cases of hemithyroidectomy out of which 17 were done by lateral approach and 7 were done by medial approach . Among these 26 cases we identified parathyroid glands in 20 cases of hemithyroidectomy .out of 26 cases of hemithyroidectomy done in 1 year, in 23 number of cases recurrent laryngeal nerve was identified and in 20 cases EBSLN was identified and preserved. In about 48% of cases

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middle thyroid vein was identified and in 20 cases parathyroid gland was identified and preserved as shown in table 7.

TABLE 9: POST OPERATIVE FINDINGS

Findings	Hemithyroidectomy	Near total thyroidectomy	TT	TT With CND	Completion thyroidectomy with CND
No. of cases with Hoarseness	4	0	0	0	0
Time of drain removal(hrs)	48	48	72	72	72
No. of cases with Hypocalcaemia(clinical+biochemical) immediate post op	0	0	1	1	1
No. of cases with hypothyroidism (biochemically)	0	0	1	1	1

In our study we found that hoarseness of voice was present in 4 cases of hemithyroidectomy out of which 3 could be because of handling and or manipulation of recurrent laryngeal nerve. They have symptoms of hoarseness of voice which improved subsequently by 6 weeks with speech therapy combined with a short course of steroid therapy supplemented by Neurotropics. Cause of hoarseness in 1 case of hemithyroidectomy was inconclusive which improved by 2nd week of post op without any speech therapy. In majority of cases the timing of drain removal in our study was 48 hrs in all the cases of hemithyroidectomy as there was serous collection in drain tube and in cases of total thyroidectomy drain was removed at 72hrs post operatively. Out of 30 cases 3 patients had hypothyroidism biochemically who underwent total thyroidectomy and completion thyroidectomy. In our study it was found that patient undergoing total thyroidectomy and completion thyroidectomy were having hypocalcaemia both biochemically and clinically and they were managed by Inj. Calcium gluconate 5 vial of 10 ml each in 450ml of PD runned at a rate of 50ml per hour for minimum of 50 hours. It was supplemented by tab calcium

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carbonate 2 Gms + vitamin D3 0.5 microgram per day. The findings are summarized in Table 8.

Table 10: complication post thyroidectomy

Complication	Hemithyroidectomy	Near TT	TT	TT with CND	Completion thyroidectomy with CND
Haematoma formation	0	0	0	0	0
Seroma	0	0	0	0	0
tracheomalacia	0	0	0	0	0
keloid formation	0	0	0	1	0
injury to rln(transient+ permanent)	3	0	0	0	0
injury to sln	1	0	0	0	0
u/l palsy of V.C	3	0	0	0	0

In our study there was no case of hematoma formation, no seroma collection and no case of tracheomalacia seen. There was one case of keloid formation in case of total TT with CND and Mrnd which was treated with intralesional steroid post-operatively after stitch removal. Incidence of transient EBSLN palsy was 3.33% but 10% cases of transient RLN injury.

TABLE 11:- SERUM CALCIUM ESTIMATION POST-OPERATIVELY AT 2ND WEEK

TYPE OF SURGERY	CLINICAL HYPOCALCEMIA	BIOCHEMICAL HYPOCALCEMIA
Hemithyroidectomy	0	0
Near total thyroidectomy	0	0
TT	1	1
TT with CND	0	0
Completion thyroidectomy with CND	0	1

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In this study, we have found that with oral tab calcium carbonate 500mg(2gms per day) with vitamin D3 0.5 micrograms during post-operative follow up period improved the symptoms of hypocalcaemia clinically as well as bio-chemically except in one case of total thyroidectomy .

TABLE 12:- SERUM CALCIUM ESTIMATION POST-OPERATIVELY AT 6TH WEEK

TYPE OF SURGERY	CLINICAL HYPOCALCEMIA	BIOCHEMICAL HYPOCALCEMIA
Hemithyroidectomy	0	0
Near total thyroidectomy	0	0
TT	0	1
TT with CND	0	0
Completion thyroidectomy with CND	0	0

At 6th week of follow-up there was no clinical or biochemical hypocalcaemia. These patients were on oral calcium supplementationwith vitamin D3. However, only one patient showed biochemical hypocalcaemia who underwent total thyroidectomy. It was dealt by giving3gram of calcium supplementation with vitamin D3 and other calcium binder.

Table 12: SIS SCORING ASSOCIATED TO TYPE OF SURGERY

Type of surgery	PRE-OPERATIVE SIS SCORE	POST-OPERATIVE SIS SCORE	PAIRED T-TEST P VALUE
Hemithyroidectomy	0.85±1.26	0.11±0.33	0.002
Neartotal thyroidectomy	-	-	-
Total thyroidectomy	-	-	-
TT with CND	-	-	-

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Completion thyroidectomy with CND	-	-	-

It was seen that post-operatively 4 patients complained of increased dysphagia measured by Swallowing increment scale (SIS) Scale which improved subsequently by 3rd month post-operatively.

In this study, we found that the mean Pre-operative SIS score was less than mean post-operative SIS score which was significant using the paired T-test and it was maximum seen after hemithyroidectomy patients

Further it was seen in this study that maximum cases with left sided tumours pre-operatively were complaining of swallowing difficulties which could be because of left sided tumour having more proximity to esophagus.

DISCUSSION:

SEX DISTRIBUTION:

In this we observed that majority of patients presenting were female accounting for 76.66% with only 23.33% being male, with sex ratio of 3.9:1 which conforms the incidence as in all over the world.

Dr. K G SudrashanBabu, and Dr. Lakshmi Shantharam in their study observed that 44 of the 50 patients were female, with the female: male ratio sex ratio of 7.3:1. [5]

AGE DISTRIBUTION:

In our study we found that the distribution of thyroid cases according to age ranged from 21 to 58 years;. The prevalence of thyroid tumours was highest in 31-40 years accounting for 33.33%. Although we have taken age group from 0-20 years but the cases were zero in this age group. Despite the fact that the study was a hospital-based study it only represented a cross- section of the society as many patients deviate to private hospitals during study period.

Karthikeyan et al in their study of 1 year period in a tertiary care centre of Tamil Nadu India found that out of total 86 cases of thyroidectomy 2 cases less than 20 years, 36 cases 20-40 year, 29 cases 40-50 years and 6 cases more than 50 years .[6]

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DISTRIBUTION OF LOBES:

In this study we have observed that left lobe was most frequently involved accounting 50% followed by right lobe 40%.both the lobes were involved in 3 cases accounting for 10%.

T. Chitra, Dorai D, Aarthy G in their study unlike our study found that most frequently right lobe was involved in 35 patients(70%) and left lobe in 15 patients (30%) showing predominant right lobe involvement.

COMPARISON OF FNAC AND HPE FINDINGS:

The most common finding in this study on FNAC was colloid goitre accounting for 50% and less common being the follicular neoplasm of category-IV . We also found that colloid goitre is the most common tumour between 21-30 years of age. The differentiation between follicular adenoma and follicular carcinoma was not possible on FNAC. FNAC has been the best diagnostic tool for thyroid tumours, with a 96.66%% specificity which was later confirmed by HPE of the tumours post surgery. In this study in almost all cases the histopathological report concurred with the preoperative diagnosis except for 1 case that was pre-operatively diagnosed as right multinodular goitre cat-III but the histopathological report came to be Papillary carcinoma with nodal involvement.

DIGNOSIS WISE AGE DISTRIBUTION OF CASES

In our study distribution of thyroid tumours according to their diagnosis. Out of the 30 cases, 12 were colloid goitre, 3 were multi nodular goitre, 1 was follicular neoplasm category IV, 2 papillary thyroid carcinoma, 4 follicular neoplasm category III, 0 cases of follicular neoplasm category V, 7 cases of follicular neoplasm category II ,0 cases of medullary thyroid carcinoma ,0 cases of undifferentiated carcinoma ;1 case of hurtle cell neoplasm & 0 case of granulomatous thyroiditis.

Katz and Bronsonin their study found that out of all the patients undergoing thyroidectomy, the diagnosis in 19% patients was Graves disease, 62% patients had nodules, while 19% had malignancy of thyroid gland like papillary carcinoma, medullary carcinoma, follicular carcinoma, and anaplastic carcinoma. Similarly, in our study,the indication for thyroidectomy was nodular goiter in 40%, malignancy in 9.66%,follicular neoplasm in 39.99% .[7]

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OPERATIVE PROCEDURE PERFORMED AND INTRAOPERATIVE FINDINGS AND COMPLICATIONS:

In our study we did 19 cases with lateral approach and 11 cases with medial approach. In our study we have seen that the identification of RLN, EBSLN and middle thyroid vein was easier with lateral approach when compared to medial approach. The parathyroid gland was indentified in maximum cases of surgeries with lateral approach. In lateral approach by using superior belly of omohyoid as a landmark we identified middle thyroid vein, EBSLN, RLN and superior parathyroid glands in posteromedial aspect of thyroid lobe and were preserved. In cases of thyroid malignancy lateral compartment neck dissection of lymph nodes can also be carried out with this approach without any extra dissection of strap muscles.

JyotirmoyPhookan, shilpiguptaet al in their study of 30 cases described a single compartment surgery that is the vascular compartment and identified a new landmark triangle of external branch of superior laryngeal nerve and superior thyroid pedicle in between the omohyoid, sternothyroid muscle and upper pole of the thyroid as the lower border, that is the triangle of sternothyroid omohyoid (of JP).[8]We followed the same landmarks in all cases of lateral approach

The procedure performed in 1 years. In our study, in 86.66% cases hemithyroidectomy was done, 3.33% total thyroidectomy, 3.33% total thyroidectomy with CND done.

In our study there was intraoperative identification of EBSLN in 20 cases out of which 11 cases were done by lateral approach and 9 were done by medial approach.

It was seen our study that almost all thyroid cases, after 48 hrs of post- operative period drain collection was serous in character and drain could be removed but in cases of malignant tumours drain collection were sero-sanguinous in character and therefore drain removal in malignant cases were done by 72hrs of surgery.

Following discharge the patients were followed up at an interval of 2weeks and 6th week post operatively. The histopathological diagnosis was compared with the pre-operative diagnosis.

There was no recurrence of swelling, cervical lymphadenopathy, hoarseness of voice or features of hypothyroidism seen in any of cases during follow-up.

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CONCLUSION

Goitre is endemic in this part of country and it is almost always managed surgically. In this study quite a few observations were made about a newer surgical landmark in identifying important structures and the overall surgical outcome and quality of life post operatively.

A good clinical examination with USG and FNAC of tumour are the main pre-operative assessment. Per operative findings of important structures like parathyroid glands, EBSLN, RLN and preserving them is of utmost necessity to prevent complications and to have better quality of life post-operatively.

A good exposure of central compartment between both the IJVs is necessary to look for lymph nodal involvement in those patients with papillary carcinoma. The lateral approach was found to be more convenient in identifying important structures but a detailed study with much bigger sample size is needed to conclude the same.

All thyroid surgeries can be managed by good pre-operative workup, excellent per operative exposure and equally good post-operative care.

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