

**DISSERTATION ON**  
**A STUDY ON**  
**SOLITARY NODULE OF THE THYROID**

*Dissertation submitted to*

**THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY**

*In partial fulfillment of the regulations  
for the award of the degree of*

**M.S.-GENERAL SURGERY- BRANCH – I**



**THANJAVUR MEDICAL COLLEGE,  
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**APRIL – 2017**

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This is to certify that the dissertation titled “**A STUDY ON SOLITARY NODULE OF THE THYROID**“ is a bonafide research work done By **Dr. M. MURALIDHARAN** under the guidance of **Dr.ANTONY PRABAKAR M.S.**, ( Professor, Department of General Surgery) Thanjavur Government Medical College Hospital, Thanjavur.

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### **A STUDY ON SOLITARY NODULE OF THE THYROID**

#### **AIM OF THE STUDY**

1. To study the epidemiology of the solitary nodule of the thyroid.
2. To study the role of fine needle aspiration cytology in the management of solitary nodule of the thyroid.
3. To study the incidence of malignancy in solitary nodule of the thyroid.

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## **DECLARATION BY THE CANDIDATE**

I solemnly declare that this Dissertation **“A STUDY ON SOLITARY NODULE OF THE THYROID”** was done by me in the Department of General Surgery, Thanjavur Medical College, and Hospital, Thanjavur. Under the Guidance and Supervision of my Professor Dr. ANTONY PRABAKAR M.S. Department of General Surgery, Thanjavur Medical College, Thanjavur between 2014 and 2016.

This Dissertation is submitted to The TAMILNADU Dr. M.G.R Medical University, Chennai in partial fulfilment of University requirements for the award of M.S Degree (GENERAL SURGERY).

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**Dr.M. MURALIDHARAN**



## CONTENTS

<b>S.NO.</b>	<b>CHAPTERS</b>	<b>PAGE NO.</b>
1	INTRODUCTION	1
2	AIM OF STUDY	2
3.	MATERIALS AND METHODS	3
4.	REVIEW OF LITERATURE	4
5.	OBSERVATION & ANALYSIS OF RESULTS	37
6.	DISCUSSION	57
7.	RELATED STUDIES	72
8.	CONCLUSION	74
9.	SUMMARY	75
10.	PROFORMA	76
11.	BIBLIOGRAPHY	80
12.	MASTER CHART	83

## **INTRODUCTION**

Solitary nodule of the thyroid of discrete thyroid swelling is a common clinical entity and the incidence increases with age.

About half of the patients with palpable nodular goitre are diagnosed as multinodular goitre. The importance of this clinical entity is that 10-20% of solitary nodules of the thyroid could be malignant.

The approach to thyroid nodule management is a selective one, utilizing continually Improving diagnostic techniques to reliably identify patients with malignancy and certain benign conditions that require surgery thereby avoiding unnecessary thyroidectomy for all nodules.

A potentially curable cancer normally presents as a thyroid nodule and thereby the study of a solitary nodule gains importance.

## **AIM OF THE STUDY**

1. To study the epidemiology of the solitary nodule of the thyroid.
2. To study the role of fine needle aspiration cytology in the management of solitary nodule of the thyroid.
3. To study the incidence of malignancy in solitary nodule of the thyroid.

## **MATERIALS AND METHODS**

### **CASE SELECTION**

All patients admitted with a solitary nodule of the thyroid.

### **EXCLUSION CRITERIA**

1. Patients with severe comorbid illness.
2. Patients with solitary nodule of thyroid and regional lymph adenopathy.

### **MATERIALS AND METHODS**

**Place of study :** Thanjavur medical college hospital, Thanjavur.

**Period of study :** 01.09.2014 to 31.08.2016 2 years

**No of patients :** 100

A total of (110) consecutive patients admitted at TMCH, Thanjavur with solitary nodule of the thyroid and only 100 of the patients who satisfied the above criteria were included in the study.

### **LIMITATION OF THE STUDY**

Many patients are lost to follow up after 2 reviews and the exact incidence of post operative hypothyroidism could not be evaluated.

## **REVIEW OF LITERATURE**

### **HISTORICAL BACKGROUND**

The word Goitre comes from latin word meaning as gutter,throat and have been described since 2700 B.C.

Hieronimus Fabricius ab Aquapendente a famous anatomist described that goiters arose from the thyroid gland.

The word thyroid gland comes from Greek meaning as shield-like is however coined by Thomas Wharton in his Adrenographia.

In the year 1776, Albrecht Von Haller said that thyroid gland is a ductless gland.

Surgery for thyroid gland in patient having goitre was first introduced by Roger Frugardi in the year 1170.

Emil Theodor Kocher a swiss physician and Christian albert Theodor Billroth a surgeon had done various thyroid surgeries with increasingly successful outcome.

In the year 1909, Kocher was given the Nobel Prize for his work in “the Physiology, Pathology and Surgery of the thyroid gland”.

## **EMBRYOLOGY**

The thyroid gland arises as an outpouching of the primitive foregut around the third week of gestation, in the vicinity of the foramen cecum of tongue.

From the floor of the pharyngeal anlage the endodermal cells thicken to form the medial thyroid anlage which gives rise to the hyoid bone and larynx after descend in anterior region of neck where it is connected to the foramen cecum by an epithelial lined duct named thyroglossal duct.

Thyroid follicular cells are arises from epithelial cells anlage. Paired lateral anlages arises from the fourth branchial pouch which fuses with the median anlage at approximately the 5<sup>th</sup> week of gestation.

Calcitonin producing parafollicular or C cells which is arises from lateral anlages(neuroectodermal origin), which lie in the postero – superior region of the gland. Thyroid follicles are appears by eighth week and colloid formation begins by the eleventh week of gestational period.

## ANATOMY

### MORPHOLOGY

The thyroid gland occupies the centre of the visceral compartment of the neck lying over the trachea just above the thoracic inlet. Normal gland weighs 20 - 25g.

The gland has two lobes connected by an isthmus shaped like butterfly in the midline just inferior to cricoid cartilage, adherent to the anterolateral aspect of the cervical trachea from the level of the thyroid cartilage to the fifth or sixth tracheal ring.

The most distal end of the thyroglossal duct persists as pyramidal lobe and is present in about one half of the normal individuals.

The upper part of thyroid lobes arises at level of middle of the thyroid cartilage and lie near to the carotid sheaths and sternocleidomastoid muscles which lies laterally. It is enveloped by the deep cervical fascia that forms the false capsule. The true capsule of thyroid is a thin, densely adherent fibrous layer that sends out septa that invaginate into the gland forming pseudolobules, and is condensed into the posterior suspensory or Berry's ligament near the cricoid cartilage and upper tracheal rings.

The infrahyoid muscles(strap muscles) which is a group of four muscles sternohyoid,thyrohyoid, sternothyroid and superior belly of the omohyoid which is placed anteriorly and are innervated by the ansacervicalis except thyrohyoid muscles which is supplied by hypoglossal nerve.

## **BLOOD SUPPLY**

### **ARTERIAL SUPPLY**

The Superior thyroid arteries arise from the external carotid arteries of same side which later divide into anterior and posterior branches at the apex of the thyroid gland.

The inferior thyroid arteries are derived from the thyrocervical trunk.

A thyroidea ima artery arises directly from the aorta in 1 -4% of individuals.

Extensive anastomoses occur between the main thyroid arteries and branches of the tracheal arteries and the oesophageal arteries.

### **VENOUS DRAINAGE**

Multiple tiny surface veins over the thyroid gland which unites to form three sets of veins, the superior, middle and inferior thyroid veins.



Of which superior and middle thyroid veins drain directly into the internal jugular veins whereas the inferior veins often form a plexus, which drains into the brachiocephalic veins.

## **NERVE SUPPLY**

Sympathetic innervations of the thyroid gland is derived from the superior and middle cervical sympathetic ganglia, which enter the gland with the blood vessels and are vasomotor in action.

Parasympathetic fibers are arises from the vagus nerve and reached the gland via branches the laryngeal nerves.

## **LYMPHATIC DRAINAGE**

The thyroid gland is supplied by more of lymphatics vessels. Both thyroid lobes are communicated by intraglandular lymphatic vessels through the isthmus of thyroid and which also drain the perithyroidal structures and the surrounding lymph nodes.

Regional lymph nodes of thyroid gland includes pretracheal, paratracheal, perithyroidal, superior mediastinal, retro pharyngeal, esophageal , posterior triangle of neck, submaxillary triangle nodes, upper, middle and lower jugular chain nodes may gets involved in the metastatic activity of the malignancies of thyroid gland.

## **THE IMPORTANT SURGICAL RELATIONS OF THE THYROID GLAND**

### **The External Laryngeal Nerve**

Superior laryngeal nerve gives arises a branch named as external laryngeal nerve which further descends over the fascia of the inferior pharyngeal constrictor, which runs near the superior vascular pedicle of the thyroid gland and then leaves this at a variable height above the gland to travel medially to pierces the cricothyroid muscle viz the tensor of the vocal cord.

### **The Recurrent Laryngeal Nerve**

Vagus nerve gives arises to recurrent laryngeal nerve which embryologically related to vessels of the fourth aortic arch. Because of the descent of these vessels which later forms the subclavian artery on the right side and the aortic arch on the left side, the recurrent nerves runs distally an upward direction to reach their vocal cord. The nerves usually lie in the trachea – oesophageal groove and bear a numerous relationship to the branches of the inferior thyroid artery before entering into the larynx.

## **The Parathyroid glands**

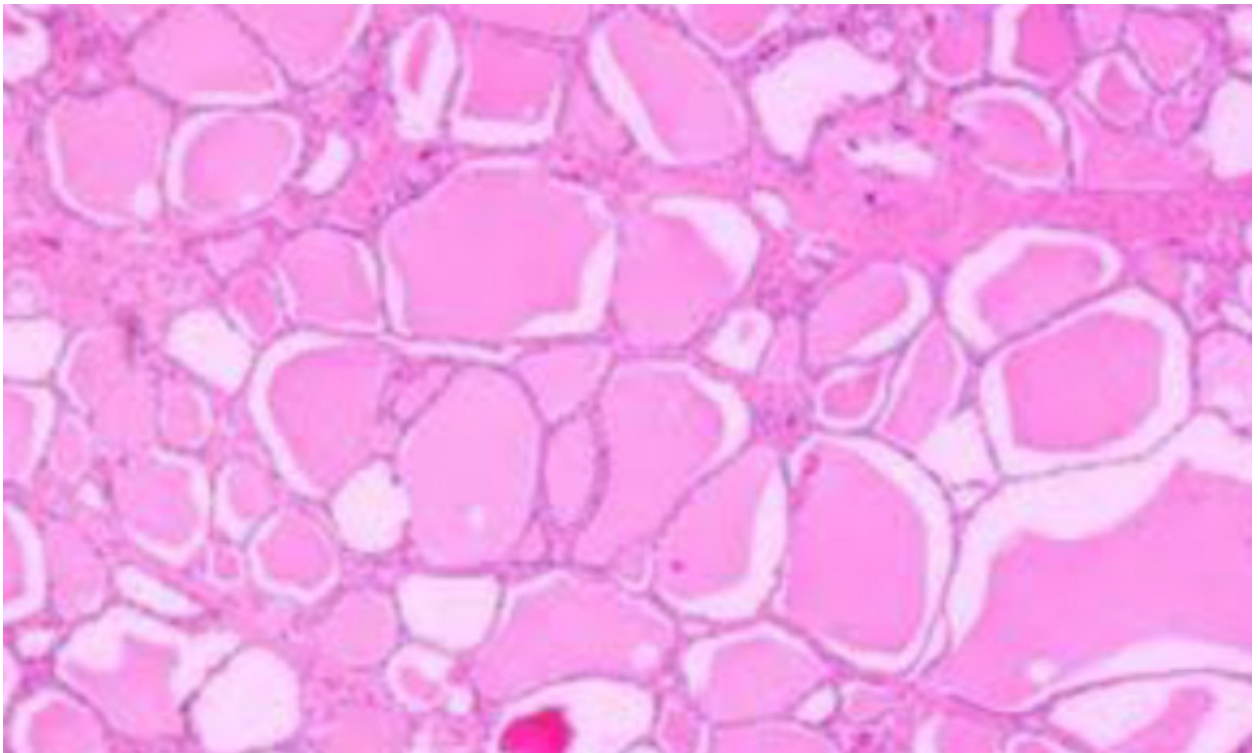
The number of parathyroids vary from 2 – 6, but in 80 percent of cases there are 4 (2 on each side) where most of the blood supply comes from the branches of the inferior thyroid artery. Parathyroid glands usually seen around 1cm of the junction of the inferior thyroid artery and the recurrent laryngeal nerve. The superior glands are usually seen posterior to the recurrent laryngeal nerve whereas the inferior glands are seen anterior to the recurrent laryngeal nerve.

## **Thyroid Histology**

Microscopically, the thyroid is divided into lobules that contain 20 to 40 follicles. The follicles are 30  $\mu\text{m}$  in diameter and  $3 \times 10^6$  in number and lined by cuboidal epithelial cells and it contains a central pool of colloid. Calcitonin is hormone secreted by C cells or parafollicular cells which is in the interfollicular stroma in the upper poles of the thyroid gland.

# HISTOLOGY

## NORMAL THYROID



# **THYROID PHYSIOLOGY**

## **IODINE METABOLISM**

The average daily iodine requirement is 0.1mg, which can be derived from foods such as fish, milk and eggs. Iodine is absorbed in the stomach and jejunum after conversion of iodine to iodide and into the blood stream. 90% of the body's iodine stored in the thyroid gland which accounts for one-third of the plasma iodine loss. The remaining plasma iodine is cleared via renal excretion.

## **NORMAL THYROID PHYSIOLOGY**

Tri-iodothyronine(T3) and thyroxine(T4) are the hormone secreted by the thyroid gland. Dietary requirement of iodine per day is 100-200 mcg. Sources of iodine are milk , dairy products and sea food including fish.

## **STEPS INVOLVED IN THE SYNTHESIS OF THESE HORMONES**

- 1.Iodide trapping from the blood into the thyroid, is the first step in the formation of T3 andT4.
- 2.Oxidation of iodide to inorganic iodine. This step need the enzyme peroxidase.

Drugs which block this stage are sulfonamide, PAS,carbimazole, propylthiouracil, etc.

### 3. Formation of iodotyrosines

Iodine+thyrosine=Moniodotyrosine and Diiodotyrosine.

This step is inhibited by thiourea group of drugs i.e carbimazole.

### 4. Coupling reactions

Coupling of two molecules of DIT results in T<sub>4</sub> and one molecule of DIT and MIT results in T<sub>3</sub>. This stage is blocked by carbimazole. The hormone combine with globulin to form a colloid- thyroglobulin. They are stored in the thyroid gland and released as and when required.

T<sub>3</sub> is an important physiological hormone and fast acting. T<sub>4</sub> is slow acting hormone and takes about 4-14 days to act.

## **THYROID HORMONE FUNCTION**

Thyroid hormones affect almost every system in the body.

They are important for fetal brain development and skeletal maturation. It increases the basal metabolic rate.

## **FUNCTIONS OF THYROID HORMONES**

Thyroid hormones act predominantly via a nuclear thyroid receptor (TR), which modulates gene synthesis of the cell which in turn increases protein synthesis. They are essentially catabolic in nature and

- ❖ Increase the glucose absorption from gut
- ❖ Mobilize the liver glycogen
- ❖ Promote gluconeogenesis
- ❖ Increase appetite
- ❖ Increase heart rate
- ❖ Increase gut motility
- ❖ Decrease body weight
- ❖ Decrease menstrual flow

# **SOLITARY NODULE OF THE THYROID**

## **DEFINITION**

Solitary nodule of the thyroid is defined as the only nodule that is detectable clinically and by other means in an otherwise morphologically normal thyroid gland.

## **EPIDEMIOLOGY**

### **INCIDENCE**

3-4% of adult

More common in females, = 1:3. 15% are malignant which is more common after 50yrs.

30-40% are follicular Adenomas.



## **CLINICAL AND PATHOLOGICAL CLASSIFICATION OF THYROID NODULES**

- **NON – NEOPLASTIC NODULES**

### **HYPERPLASTIC**

Spontaneous

Compensatory after partial thyroidectomy

Hemiogenesis with contralateral lobe hyperplasia

### **INFLAMMATORY**

Acute bacterial thyroiditis

Subacute thyroiditis

Lymphocytic thyroiditis

- **NEOPLASTIC NODULES**

### **BENIGN**

Adenoma

Cyst

Simple

Complex

## **MALIGNANT**

### Primary

Papillary Carcinoma

Follicular Carcinoma

Anaplastic Carcinoma

Medullary Carcinoma

Lymphoma

Thyroid Metastasis From Other Primaries

(Kidney, Breast, Lung, Melanoma)

- **Toxic nodules**

## **CLINICAL HISTORY**

- ❖ Age and Sex of the patient
- ❖ Details regarding the nodule such as the time of onset, progression of size and associated symptoms such as pain, fever, difficulty in swallowing, breathlessness.
- ❖ Pain is an unusual symptom, occurs in intrathyroidal hemorrhage in a benign nodule, thyroiditis or malignancy.
- ❖ Hoarseness of voice is a ominous symptom
- ❖ History suggestive of hypo functioning or hyper functioning of the thyroid gland.
- ❖ Patient having high chance of malignancy if childhood exposure of ionizing radiation, family history of thyroid malignancies and other malignancies associated with thyroid.

## **PHYSICAL EXAMINATION**

1. Visible and palpable swelling in the thyroid region.
2. Rest of the gland not enlarged.
3. Moves up with deglutition.
4. Nature of the Nodule – site, size, shape, consistency.
5. Regional lymph nodes
6. Features of thyroid dysfunction
7. Clinical features suggestive of pathological change in nodule like tenderness.

## **EVALUATION OF PATIENTS WITH THYROID NODULE TESTS OF THYROID FUNCTION**

### **Serum TSH**

Serum TSH assay is the best marker for the diagnosing hyperthyroidism and hypothyroidism and also for managing T<sub>4</sub> replacement and suppressive therapy, the normal level being 0.5 – 5 uU/ml.

### **SERUM T<sub>4</sub> & T<sub>3</sub>**

Total T<sub>4</sub> level reflects the output from the thyroid gland and increase in hyperthyroid, normal level being 55 – 150 nmol/L.

Total T<sub>3</sub> level in the non-stimulated gland represents the peripheral thyroid hormone metabolism and not suitable as a general screening test. It is important in clinically hyperthyroid patients with normal T<sub>4</sub> levels who may have T<sub>3</sub> thyrotoxicosis. Total T<sub>3</sub> levels are often increased in early hypothyroidism & normal level being 1.5 – 3.5 nmol/L.

### **Free T<sub>4</sub> and Free T<sub>3</sub>**

Normal value being,

Free T<sub>4</sub> – 12 – 28 pmol/L

Free T<sub>3</sub> – 3 – 9 pmol/L

## **Thyrotropin – Releasing Hormone (TRH)**

This test is useful to evaluate pituitary TSH secretory function and is performed by administering 500ug of TRH intravenously and measuring TSH levels after 30& 60 minutes. In a normal individual TSH levels should increase at least 6 uIU/mL from the baseline.

## **Thyroid Antibodies**

Thyroid antibodies includes antimicrosomal or antithyroid peroxidase, anti thyroglobulin and thyroid stimulating immunoglobulin.

Anti – Tg and anti – TPO antibody levels indicate an autoimmune thyroiditis. They are increased in 80% of patients with Hashimoto's thyroiditis, toxic diffuse goitre, multi- nodular goiter and occasionally with thyroid neoplasms. Thyroid stimulating immunoglobulin is elevated in toxic diffuse goitre.

Excessive Thyroglobulin level seen in cases of thyroiditis, Graves' disease and toxic nodular goiter. Serum thyroglobulin levels is best marker in cases of patient with recurrence of diseases differentiated thyroid malignancies particularly after total thyroidectomy and radioactive iodine ablation.

## **THYROID IMAGING**

### **ULTRA SOUND**

Ultrasound is an best, non invasive method of imaging the thyroid gland and it has a another advantage of no radiation exposure. Ultrasound imaging helpful in differentiating solid from cystic lesion and also providing information about size and multicentricity and can be used to assess for cervical lymphadenopathy and to USG guided fine – needle aspiration cytology.

### **CT / MRI SCAN**

These studies provide excellent imaging of the thyroid gland and adjacent nodes and are particularly useful in diagnosing the substernal goiters and their relationship to the trachea and vascular structures. Non contrast CT scans should be obtained in patients who are likely to require subsequent radioactive iodine therapy.

### **RADIO ISOTOPE IMAGING**

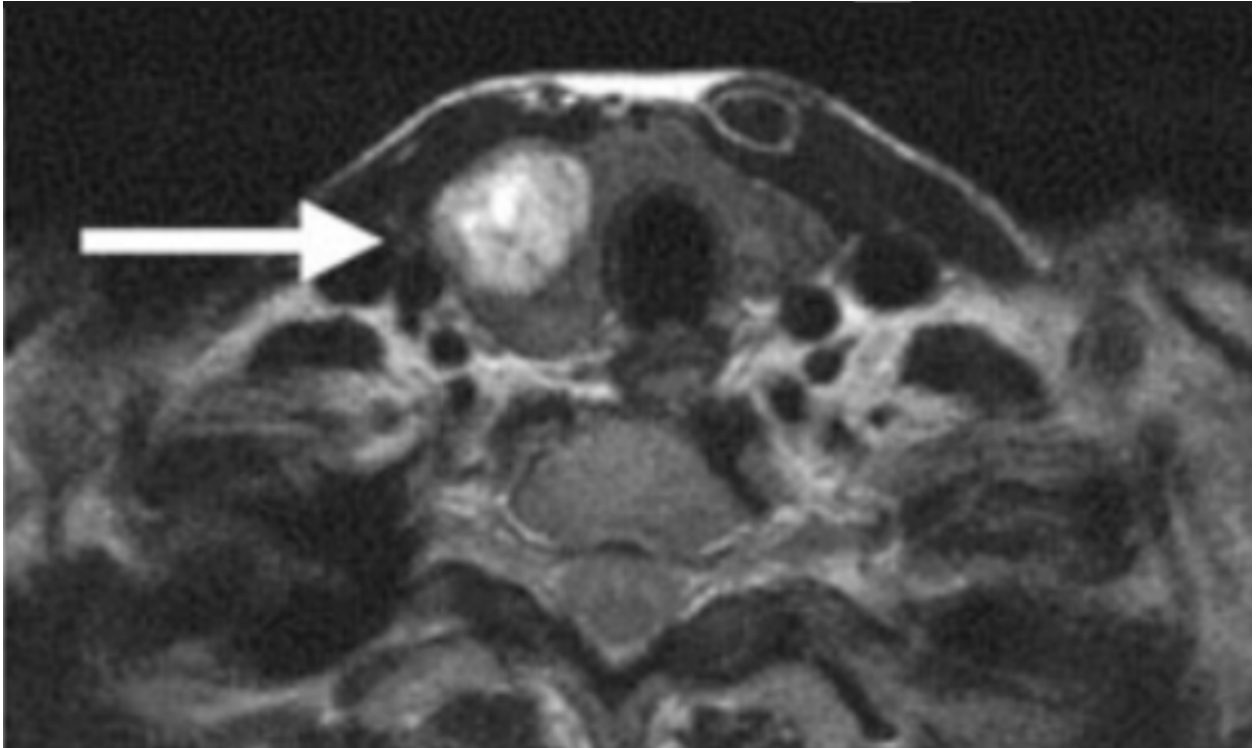
Radioisotopes imaging used to screen and also treat mestastatic diseases of well differentiated carcinoma of thyroid. The images provide details regarding size,shape of the gland and also functional activity of the thyroid gland.

Areas of the thyroid gland shows less radioactivity than the surrounding area are termed as “cold”, whereas areas that shows more radioactivity are termed as “hot”. The risk of malignancy is more in case of cold lesions ( 20%) than in hot or warm lesions (<5%).

Technetium – 99m pertechnetate is taken up by the thyroid and quickly washes out of the gland before being organified. It has a shorter half life and is particularly sensitive for nodal metastases.



## **MAGNETIC RESONANCE IMAGING**



**HYPERINTENSE LESION RIGHT LOBE – ADENOMA**

## **TECHNETIUM 99 M NUCLEAR SCAN**



**COLD NODULE – RIGHT LOBE OF THYROID**

Recently Thallium – 201 scan was reported as best diagnostic method in differentiating benign and malignant thyroid lesion.

More recently, 18F – fluorodeoxy glucose positron emission tomography is the best diagnostic modality to diagnose metastatic diseases in whom other imaging studies are negative. This method is not widely available and is more expensive.

### **FINE NEEDLE ASPIRATION CYTOLOGY**

Fine needle aspiration cytology (FNAC) has best tool for diagnosing the thyroid lesion under ultrasound guidance.

FNAC results classified into benign, suspicious, malignant and non diagnostic lesion. Non diagnostic cytology is to be repeated and often indicates a follicular neoplasm.

Risk of malignancy in the benign lesion of thyroid such as cyst and nodule is <3% but in suspicious cytology the risk varies from 10 – 20%. FNA cytology is less reliable in follicular or hurthle cell neoplasm and in patients with history of head and neck irradiation or a family history of thyroid cancer because of a higher likelihood of multifocal lesions.

## **OTHER INVESTIGATIONS**

### **Serum calcitonin**

Serum Calcitonin levels is investigation of choice in patients with medullary thyroid cancer or a family history of MEN II (Multiple Endocrine Neoplasia).

## **TUMOR MARKERS**

Sr. TSH

Sr. Thyroglobulin

Sr. Calcitonin

Tumor markers have diagnostic and prognostic value.

## **URINE ANALYSIS**

A 24-hour urine collection with measurement of levels of vanillyl mandelic acid, meta – nephrine and catecholamine in patients with medullary thyroid cancer to rule out coexisting pheochromocytoma.

### **RET Oncogene mutation**

Approximately 10% of patients with familiar MTC and MEN 2A have a denovo RET mutation so that their children are at risk for thyroid cancer.

## **MANAGEMENT**

### **1. Thyroid cysts**

Simple thyroid cysts < 4 cm in diameter –aspiration

75% of cysts completely resolve.

Simple cyst > 4 cm in diameter, complex cysts and if cyst persists after 3 attempts of aspiration, ipsilateral hemi thyroidectomy is recommended.

### **2. Colloid Nodule**

Colloid Nodule < 3cm in diameter – observation

(or) suppression therapy with L – thyroxine

To maintain serum TSH between

0.1 and 1.0 uU/ml

Large nodules and when the nodule enlarges, causes pressure symptoms or for cosmetically poor appearance, either hemi thyroidectomy or isthmusectomy depending on the site of nodule is done.

3. Adenomas are managed by ipsilateral hemi thyroidectomy and frozen section analysis to rule out malignancy and if positive, total thyroidectomy is done.

4. Malignant tumors are treated by total thyroidectomy. During thyroidectomy enlarged ipsilateral neck nodes should be removed. Lymph node metastasis in the lateral neck should be managed with modified radical or functional neck dissection. Prophylactic neck node dissection is not necessary in patients with papillary thyroid cancer.

In case of medullary thyroid carcinoma central compartment nodes are frequently involved and a bilateral central neck node dissection should be routinely performed.

In Anaplastic carcinoma in which the tumor may be fixed to surrounding structures causing pressure symptoms, tracheostomy may be needed to alleviate airway obstruction.

## **5. Lymphoma**

Combination Chemo therapy with CHOP regimen that includes cyclophosphamide, Doxorubicin, vincristine and prednisolone ensures a rapid response and an improved survival.

## **6. Metastatic carcinoma**

Ipsilateral hemi thyroidectomy is helpful in many patients depending on the status of their primary tumor.

7. An exception to the General rule is the patient who has had previous irradiation of the thyroid gland or has a family history of thyroid cancer. Total or near-total thyroidectomy is recommended in these patients as the incidence of thyroid cancer is high (40%) and the reliability of FNAC is decreased on this setting.

## **8. Toxic nodules**

Small nodules < 3 cm size can be managed with antithyroid medications and Radioactive Iodine ablation.

Larger nodules and toxic nodules in young patients are treated by surgery (ipsilateral hemi thyroidectomy) after adequate preparation of the patient before surgery.

Indications for surgery in solitary nodule of the thyroid

- NEOPLASIA (FNAC Positive, Clinical Suspicion)

Age (younger than 20 or older than 45)

Male sex

Hard texture

Fixity

Recurrent laryngeal nerve palsy

Lymphadenopathy

Large nodule >4cm

- TOXIC ADENOMA
- PRESSURE SYMPTOMS
- COSMESIS
- PATIENT'S WISHES

## **Thyroid surgery**

### **Pre operative preparation**

1. Vocal cord assessment by indirect laryngoscopy
2. Hyperthyroid patients are rendered euthyroid before surgery with anti-thyroid drugs that should be continued up to the day of surgery.
3. Prophylactic antibiotics are not used routinely

### **Conduct of thyroidectomy**

- ❖ Performed under general anaesthesia
- ❖ Position of the patient

Supine with a sand bag between the scapulae.

Head is placed on a donut cushion and neck is extended.



## **Incisions**

1. Kocher transverse collar incision about 4 – 5cm skin incision along a skin crease just 1 cm below the cricoid cartilage.

2. Low collar incision made 2 finger breaths above the suprasternal notch along a skin crease.

## **TECHNIQUE**

1. The subcutaneous tissues and platysma are incised sharply sub platysmal flaps are raised superiorly upto the level of thyroid cartilage and inferiorly upto the level of suprasternal notch.
2. A self retaining retractor Jolls is applied
3. The deep cervical fascia are divided in the midline along the entire length of the mobilized flaps and the thyroid gland is exposed and delivered using blunt dissection.
4. On the side of the lesion, the sternohyoid muscle is separated from the sternothyroid by blunt dissection until the internal jugular vein and ansacervicalis nerve are identified. If needed, the strap muscles can be divided high avoiding injury to ansacervicalis and if infiltrated by tumor the muscle involved can be excised.

5. The Sternothyroid muscle is dissected off the underlying thyroid exposing the middle thyroid veins which are ligated & divided after retracting the thyroid lobe anteromedially.
6. The fascia just cephalad to the isthmus is divided. The superior thyroid pole is identified by inferomedial retraction of the lobe and superior pole vessels are individually identified, skeletonized, ligated and divided low on the thyroid gland to avoid injury to the external branch of superior laryngeal nerve. The recurrent laryngeal nerve should be identified at the level of cricoid cartilage and the parathyroids within 1cm of crossing of the inferior thyroid artery and the recurrent laryngeal nerve.
7. The lower pole is mobilized by gently sweeping all tissues dorsally. Inferior thyroid vessels are dissected, skeletonized, ligated and divided close to the surface of the thyroid gland as possible to minimize devascularization of the Parathyroids or injury to the recurrent laryngeal nerve.
8. If a lobectomy is to be performed, the isthmus is divided flush with the trachea on the contralateral side and suture ligated. For a total thyroidectomy the procedure is repeated on the opposite side.

9. After adequate hemostasis and drain placement viz optional, the strap muscles are reapproximated in the midline using absorbable sutures. After approximation of platysma, skin closure is done with sub cuticular sutures or clips.

Several approaches to minimally – invasive thyroidectomy such as video assisted thyroidectomy and endoscopic thyroidectomy via axillary incisions have been proposed. These methods are feasible but clear benefits over the traditional open approach have not been established.

## **COMPLICATIONS OF THYROID SURGERY**

1. Primary and reactionary hemorrhage
2. Airway compromise due to tracheal collapse
3. Injury to recurrent laryngeal nerve – vocal cord dysfunction.
4. Injury to external laryngeal nerve – Dysphonia
5. Injury to Parathyroid glands-hypo calcemia
6. Seromas
7. Wound cellulitis and infection
8. Post operative hypothyroidism.
9. Keloid formation at incision site.

## **FOLLOW UP OF THE PATIENTS**

1. Physical Examination
2. Hormone Assay
3. Thyroid auto antibody assay in patients with lymphocytic thyroiditis.
4. Radioactive Iodine scan for malignancies, to rule out local recurrence or lymph node metastasis and bone scan to rule out skeletal metastasis.

5. Post operative thyroxine support for 3 months to enable the remaining thyroid to take over and to prevent compensatory hypertrophy.

6. Any delayed occurrence of goiter in the remaining lobe must be investigated to rule out carcinoma. Mostly it is compensatory hypertrophy and responds to thyroxine supplementations.

## **OBSERVATIONS AND ANALYSIS OF RESULTS**

In the present study 100 patients were included and majority of the patients were in their third, fourth and fifth decades of life.

### **AGE DISTRIBUTION**

<b>AGE IN YEARS</b>	<b>NO. OF PATIENTS</b>	<b>PERCENTAGE</b>
11-20	1	1%
21-30	39	39%
31-40	31	31%
41-50	23	23%
51-60	6	6%

The age of the patients studied ranged from 20 years to 60 years.

### **GENDER DISTRIBUTION**

<b>GENDER</b>	<b>NO OF PATIENTS</b>	<b>PERCENTAGE</b>
Females	89	89%
Males	11	11%

89 females and 11 males out of 100 were included in this study.

## FREQUENCY OF SYMPTOMS

<b>SYMPTOMS</b>	<b>NO OF PATIENTS</b>	<b>PERCENTAGE</b>
SWELLING	64	64%
SWELLING & PAIN	4	4%
Swelling & dysphagia	23	23%
Swelling, Pain & dysphagia	9	9%

All the 100 patients complained of a swelling in the front of their neck. 13 patients had pain, 32 complained of some difficulty in swallowing.

## PHYSICAL EXAMINATION

- ❖ Size of the nodule varied from 4 to 7cm
- ❖ Nature of the nodule – smooth, firm, no fixity & confined to right/left lobe +/-isthmus.
- ❖ No regional lymph node enlargement
- ❖ No signs of thyroid dysfunction

## THYROID FUNCTION

<b>THYROID FUNCTION</b>	<b>NO. OF PATIENTS</b>	<b>PERCENTAGE</b>
Euthyroid	96	96%
Hypo thyroid	4	4%
Hyper thyroid	0	0



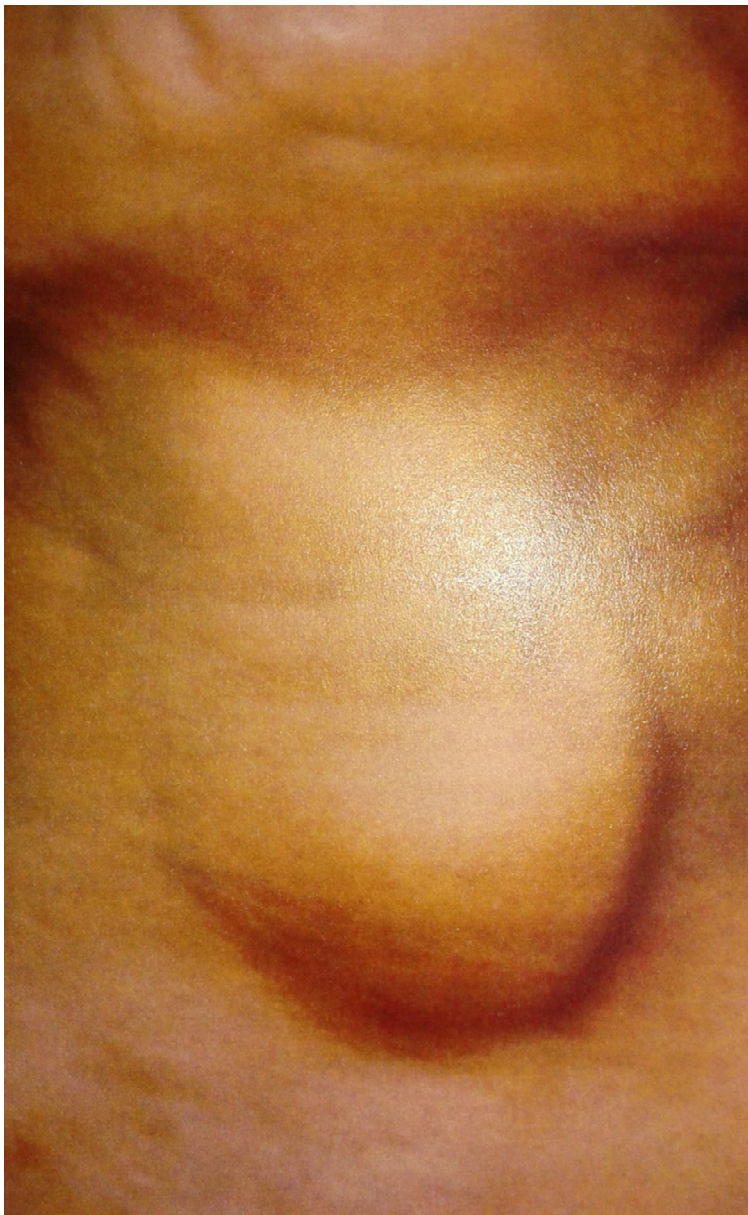
## SOLITARY NODULE OF THE THYROID



## SOLITARY NODULE OF THE THYROID



## **SOLITARY NODULE OF THE THYROID**



## **SOLITARY NODULE OF THE THYROID**



Among the 100 patients 96 were euthyroid and 4 patients had mild elevation of the level of Sr. TSH. No case of hyperthyroidism was noted.

### **ULTRA SONOGRAM NECK**

All 100 patients were subjected to ultrasonogram neck and all 100 nodules were reported as solid areas. No area of cystic lesion or multi nodular lesion identified.

### **CYTOLOGICAL ANALYSIS – FNAC**

<b>Cytology</b>	<b>No. of patients</b>	<b>Percentage</b>
Colloid nodule	53	53%
Adenoma	47	47%

53 cases were reported to have a colloid nodule on FNAC and 47 cases reported as adenomatous goiter. No case of malignancy was reported on cytological analysis.

## ULTRASONOGRAPHY NECK



**ISOECHOIC INTRA THYROIDAL MASS – ADENOMA**

Computerized Tomography of neck was done in one patient, the youngest patient in this study, which identified the solitary nodule as a adenoma thyroid. Only one among the patients who was affordable was subjected to Radio active iodine uptake study which revealed a cold nodule.

All the 100 patients were assessed for hemi thyroidectomy under general anaesthesia and per operative evaluation by palpation of the contralateral lobe done and no evidence of nodularity in the contralateral lobe or no regional lymph node metastasis identified and hemithyroidectomy proceeded with in all patients.

### **HISTOPATHOLOGICAL EXAMINATION**

All the 100 patients underwent Hemithyroidectomy and the histopathology of the excised specimens tabulated.

The incidence of malignancy was found to be 16%.

30% of the patients had benign adenomas of papillary and follicular types.

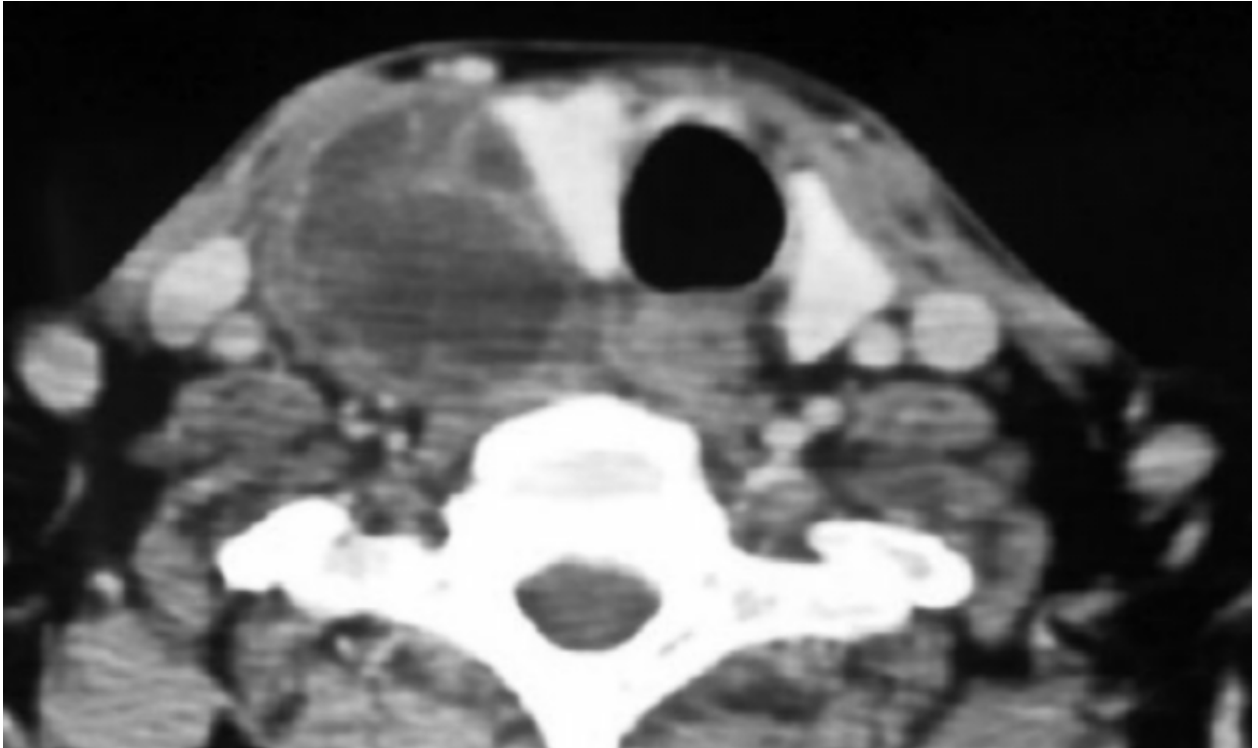
**COMPUTERIZED TOMOGRAM NECK**



**HYPODENSE LESION RIGHT LOBE – ADENOMA**



**CONTRAST ENHANCED COMPUTERIZED TOMOGRAM NECK**



**HETEROGENEOUSLY ENHANCED LESION IN RIGHT LOBE OF  
THYROID**

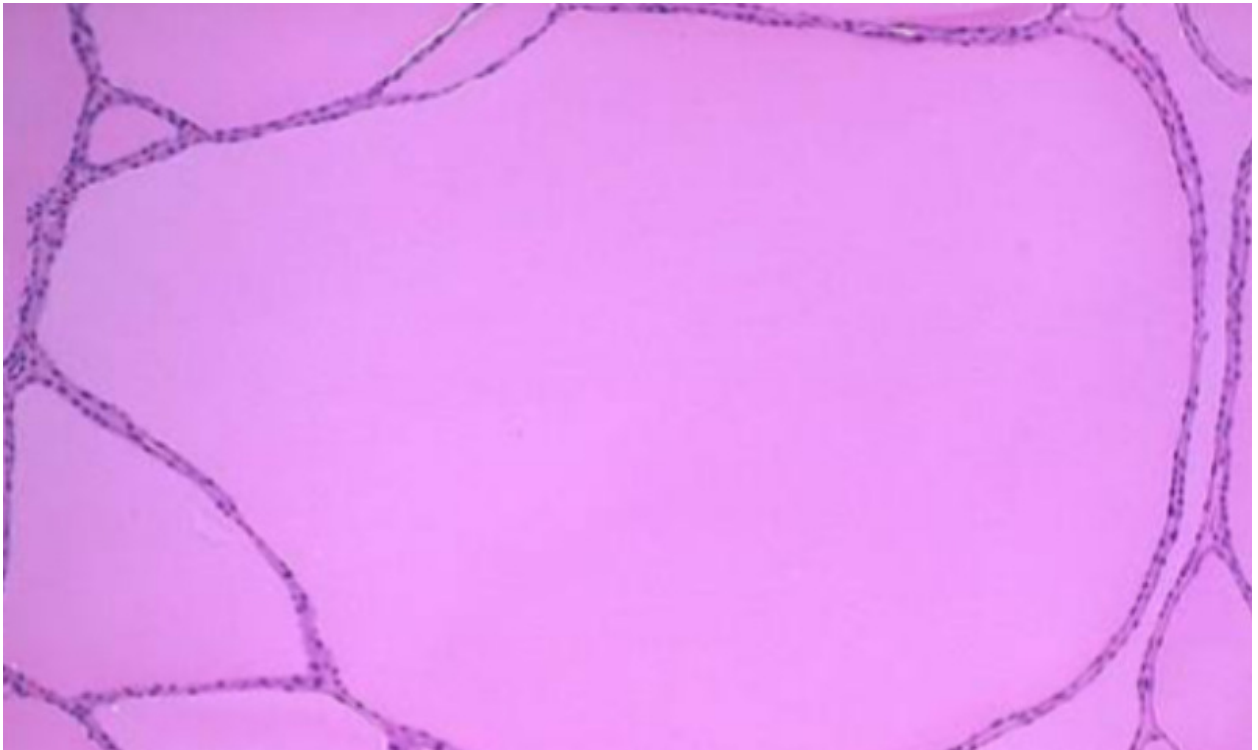
The incidence of inflammatory goiter was 3% and 4 patients showed evidence of toxicity in the excised specimen.

### HISTOPATHOLOGICAL EXAMINATION

<b>SOLITARY NODULE OF THE THYROID</b>	<b>SOLITARY NODULE OF THE THYROID</b>	<b>SOLITARY NODULE OF THE THYROID</b>	<b>SOLITARY NODULE OF THE THYROID</b>
1.	Dominant nodule of multi nodular goitre	47	47%
2.	Papillary adenoma	17	17%
3.	Follicular adenoma	13	13%
4.	Papillary carcinoma	14	14%
5.	Follicular carcinoma	2	2%
6.	Thyroiditis	3	3%
7.	Toxicity	4	4%

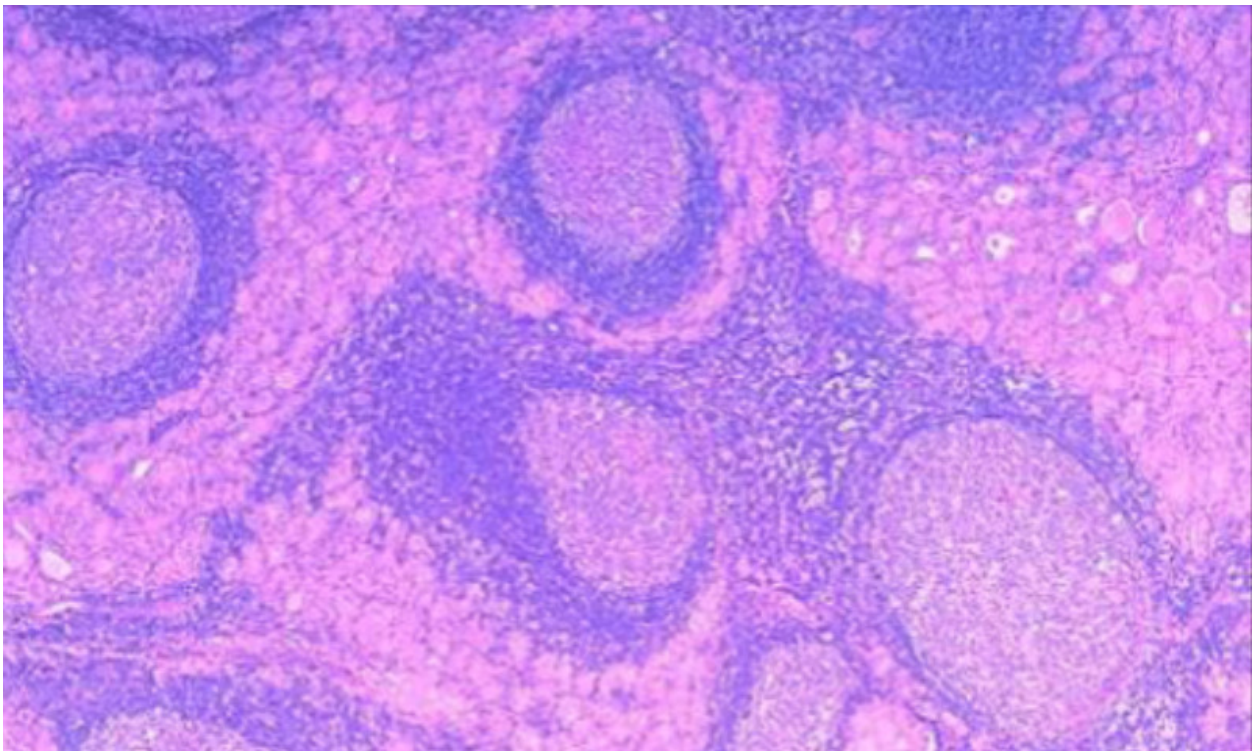
# HISTOPATHOLOGY

## COLLOID NODULE



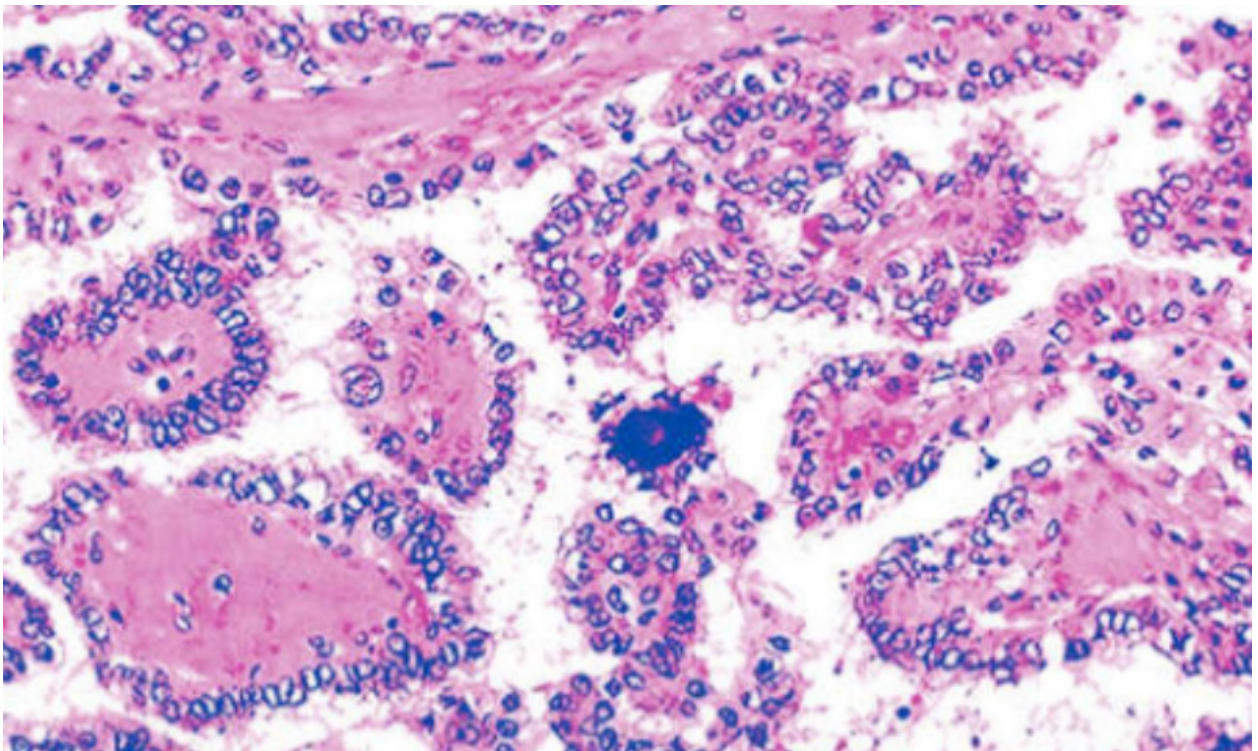
## **HISTOPATHOLOGY**

### **LYMPHOCYtic THYROIDITIS**



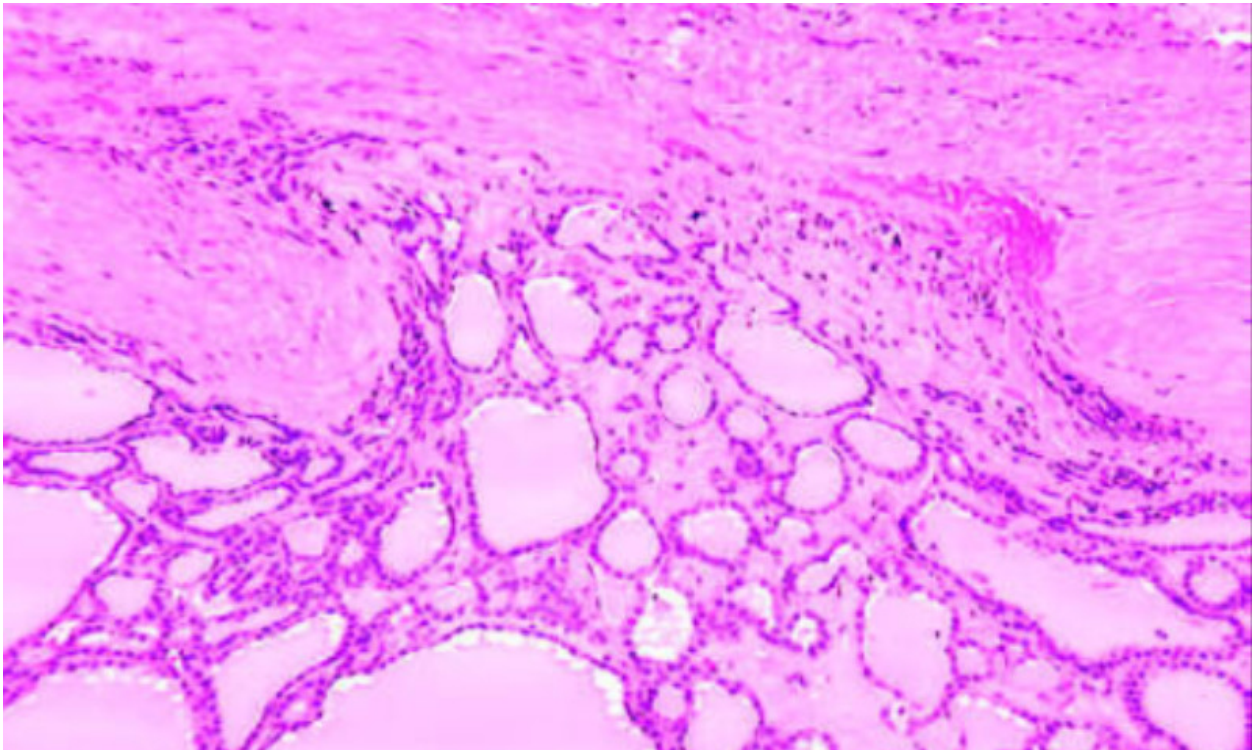
# HISTOPATHOLOGY

## PAPILLARY CARCINOMA



# HISTOPATHOLOGY

## FOLLICULAR CARCINOMA



### AGE DISTRIBUTION OF MALIGNANT NODULES

Age in yrs	No. of Patients	Percentage
11 – 20	0	0
21 – 30	6	37.5%
31 – 40	4	25%
41 – 50	4	25%
51 – 60	2	12.5%

Malignancy most common in the 3<sup>rd</sup> decade of life in this study.

### SEX DISTRIBUTION OF SOLITARY THYROID NODULE

Sex	Benign	Malignant	Total
M	9	2	11
F	75	14	89
Total	84	16	100

18.18% of nodules in males were malignant and 15.73% of nodules were malignant in females.

## POST – OPERATIVE COMPLICATIONS

Majority of Patients 84% had an uneventful post operative period.

<b>Complication</b>	<b>No. of patients</b>	<b>Percentage</b>
Hemorrhage	1	1%
Dysphonia	4	4%
Wound infection	1	1%
Hypothyroidism	10	10%

One among the patients had reactionary hemorrhage and the hematoma was let out in the post operative period.

4 had transient dysphonia in the form of loss of pitch of voice which improved subsequently.

1 had wound infection and pus culture & sensitivity revealed staphylococci sensitive to Cephalexin.

10 patients among developed postoperative hypothyroidism and were given L – thyroxine therapy.



## **FOLLOW UP**

The follow up period of the patients varied from 3 months to 12 months. First review after 2 weeks and second review after 6 weeks thyroid function tests done in all patients all at 6 weeks. More than 70 patients lost follow up after 3 months.

Patients with lymphocytic thyroiditis had thyroid auto antibody assay and were given tablet L – thyroxine therapy.

Patients with post operative hypothyroidism were managed with L – thyroxine.

Among patients with malignancy, 2 lost their follow up, 8 were referred to higher centers for further evaluation and treatment, 2 had complete metastatic workup (CT Scan neck and radioactive iodine uptake study done) and completion thyroidectomy done. 4 patients who were not willing for further evaluation were managed by L- thyroxine suppression therapy.

## **DISCUSSION**

Solitary nodule of the thyroids are common clinical entities which needs careful evaluation to correctly identify patients who need thyroidectomy.

### **AGE**

Age group in the present study ranges from 20 – 60yrs.

Majority of the patients, 97% were young and middle aged 21 – 50 of age.

The incidence of malignancy was found to be high in the 21 – 50 yrs age group.

### **GENDER**

There were 89 females and 11 males in this study.

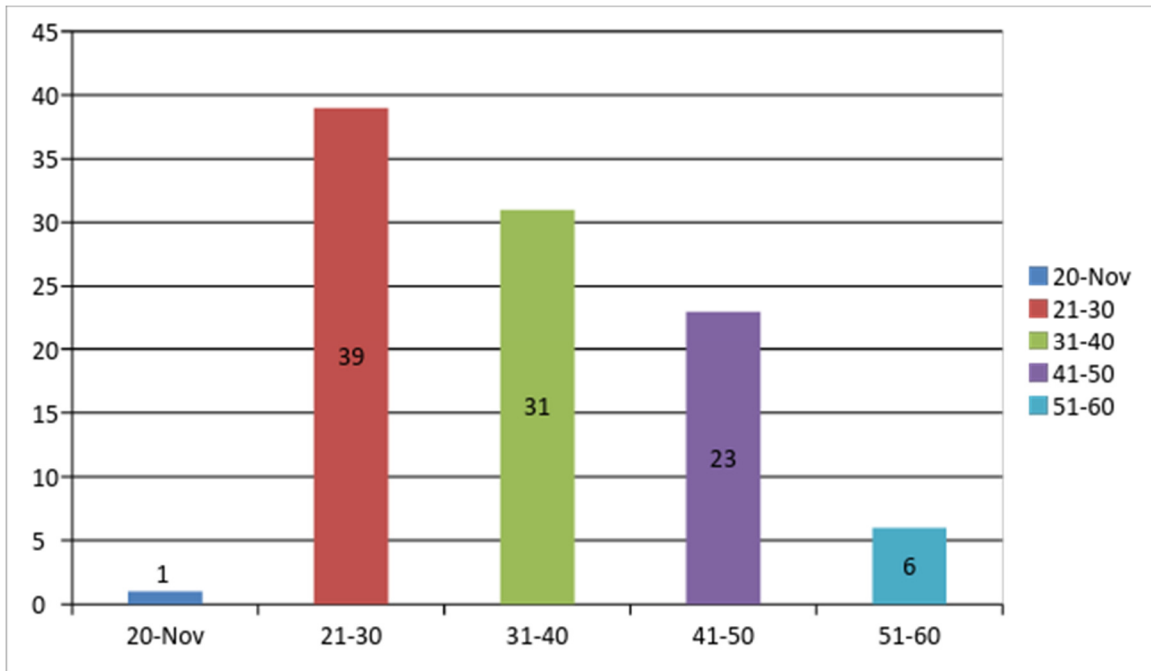
The solitary nodule of the thyroid was 8 times more common in females than males which is very high in comparison to world statistics which show a male to female ratio of 1:3.

The incidence of malignancy was more in males than in females.

Males                      18.18%

Females                    15.73%

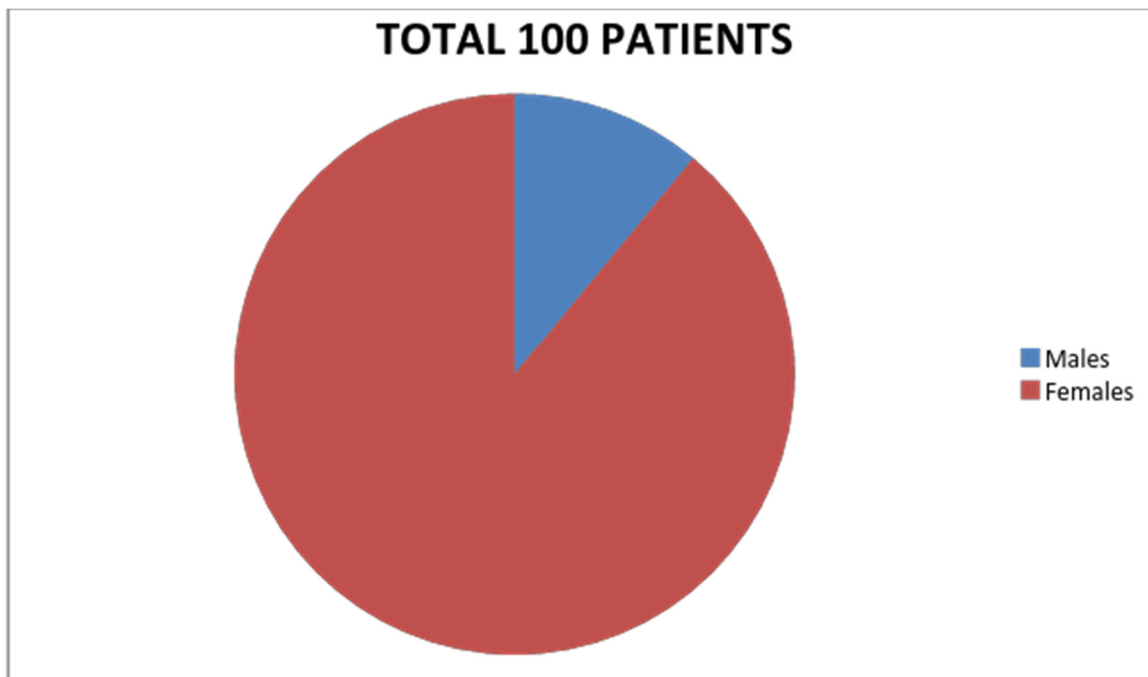
## SOLITARY NODULE OF THE THYROID



- ❖ Mean age at presentation – 36 years
- ❖ More common in 3<sup>rd</sup>, 4<sup>th</sup> & 5<sup>th</sup> decades of life

## **SOLITARY NODULE OF THE THYROID**

### **GENDER DISTRIBUTION**



**Solitary Nodule of the thyroid 8 times**

**More common in females than males**

**RISK FACTORS – no significant risk factor was identified**

## **CLINICAL ASPECTS**

At the time of admission all the patients presented with a swelling in the anterior aspect of the neck.

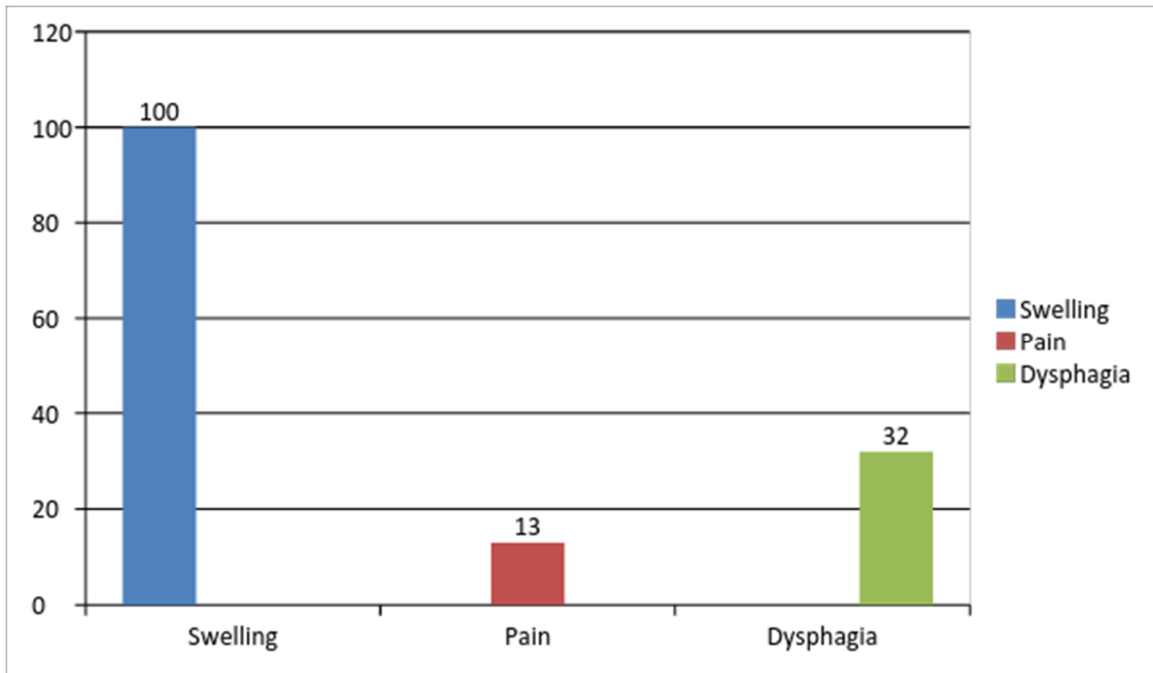
13 patients had complaints of pain over the swelling which post operative, retrospective evaluation with the help of histopathology was attributed to thyroiditis and cystic degeneration or hemorrhage into a nodule.

32 patients complained of vague discomfort in neck during swallowing which could not be attributed to any pathology or size of the swelling.

On physical examination solitary nodules of thyroid of varying sizes from 4 – 7cm confined to right or left lobe with or without involvement of the isthmus of thyroid were noted. All patients were clinically euthyroid.

## SOLITARY NODULE OF THE THYROID

### FREQUENCY OF SYMPTOMS



### CLINICAL SYMPTOMS

## **HORMONE ASSAY FOR THYROID FUNCTION**

Only 4 patients had hypothyroidism which was attributed to lymphocytic thyroiditis and multi nodular goiter diagnosed on histopathological examination post operatively and these patients benefited by post operative L – thyroxine supplementation.

Majority, about 96% were euthyroid at the time of admission.

## **ULTRA SONOGRAM NECK**

All 100 patients were subjected to ultrasonogram neck and all 100 nodules were reported as solid areas. No area of cystic lesion or multi nodular lesion identified.

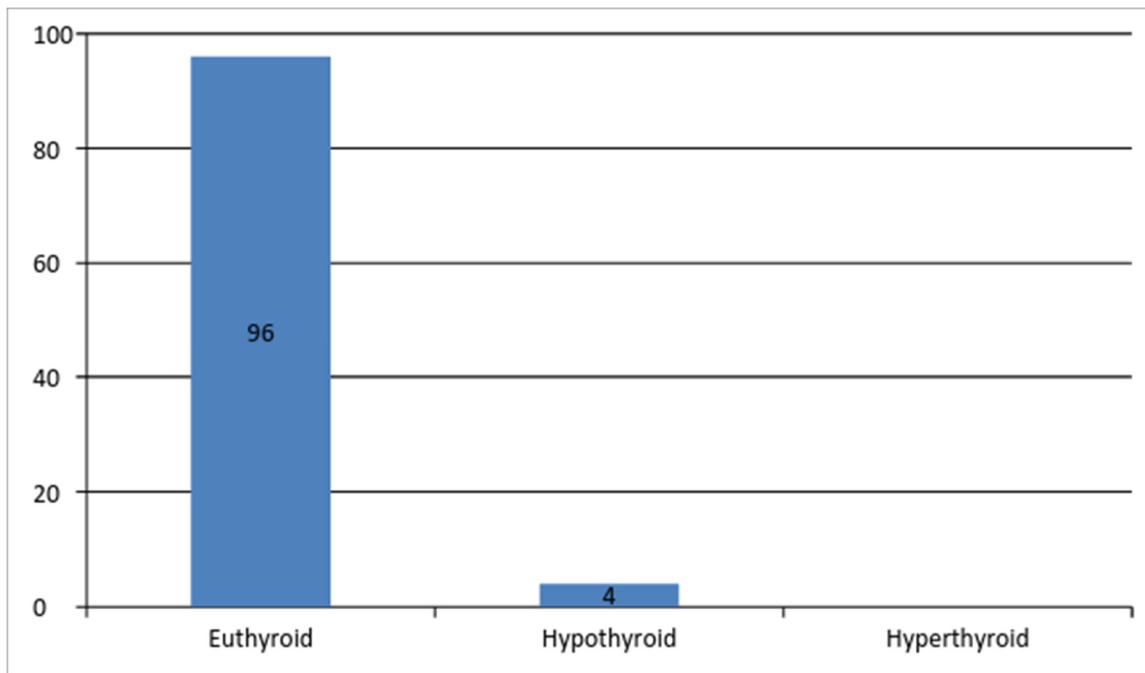
## **CYTOLOGICAL ANALYSIS**

In fine needle aspiration cytology, the Gold standard investigation in the evaluation of solitary nodule of the thyroid, all 100 cases were reported as benign and 53 were colloid nodules and 47 were adenomas.

Retrospective comparison with Histopathology of excised specimen revealed a false negative report in FNAC in detecting malignancy in 16 cases of malignant nodules.

## SOLITARY NODULE OF THE THYROID

### THYROID FUNCTION

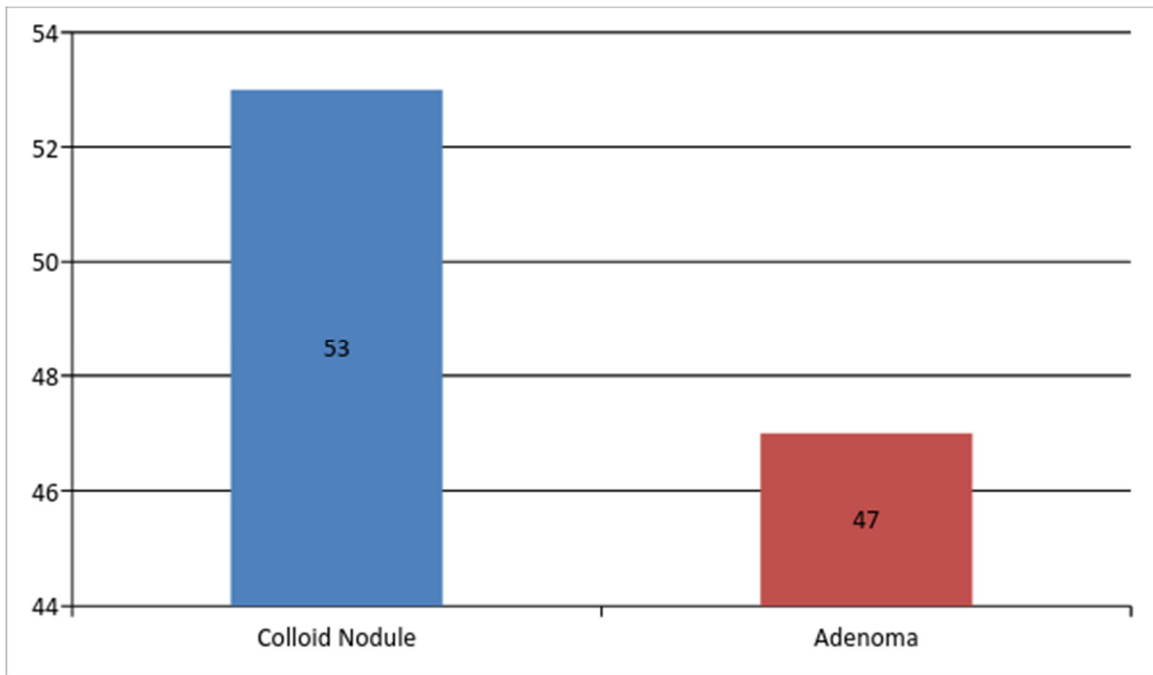


### **THYROID FUNCTION**



## SOLITARY NODULE OF THE THYROID

### FINE NEEDLE ASPIRATION CYTOLOGY



CYTOLOGY

3 colloid nodules diagnosed by FNAC revealed foci of thyroiditis in Histopathology.

3 colloid nodules and 1 case of adenomatous goiter diagnosed by FNAC revealed features of toxicity in Histopathology.

## **HISTOPATHOLOGY**

47 cases out of 100 were dominant nodules of a multinodular goitre.

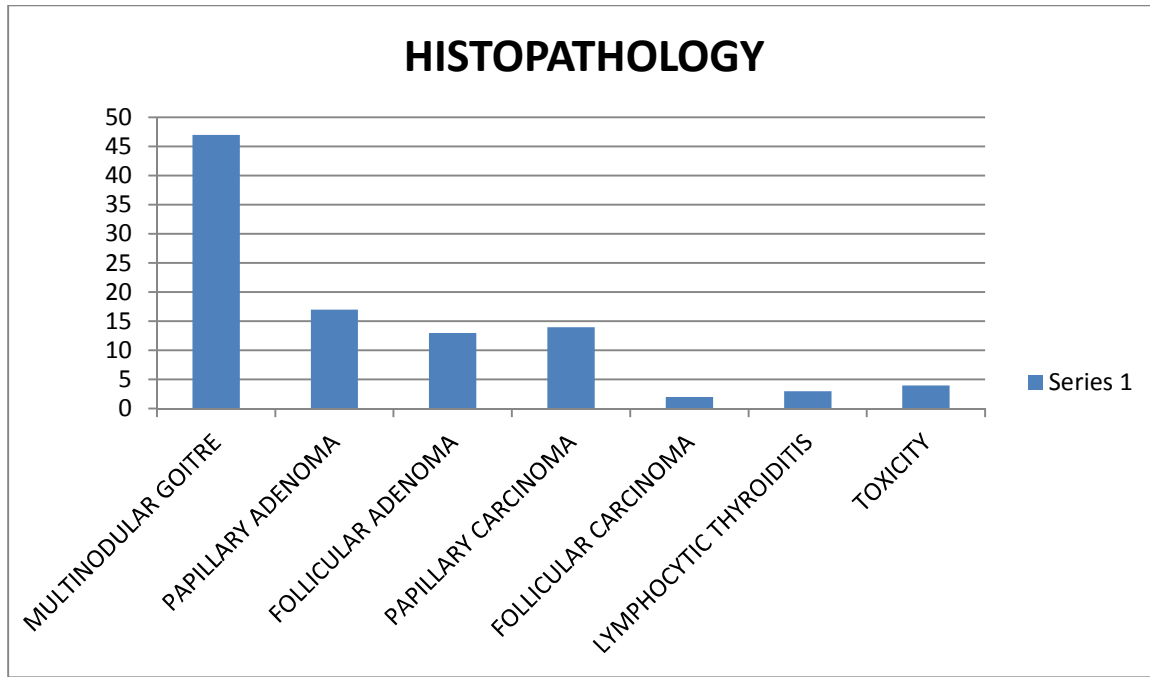
30 cases of adenomas, 17 papillary adenomas and 13 follicular adenomas were noted.

16 cases of malignant nodules among which 14 revealed a papillary carcinoma and 2 cases of follicular carcinoma were diagnosed.

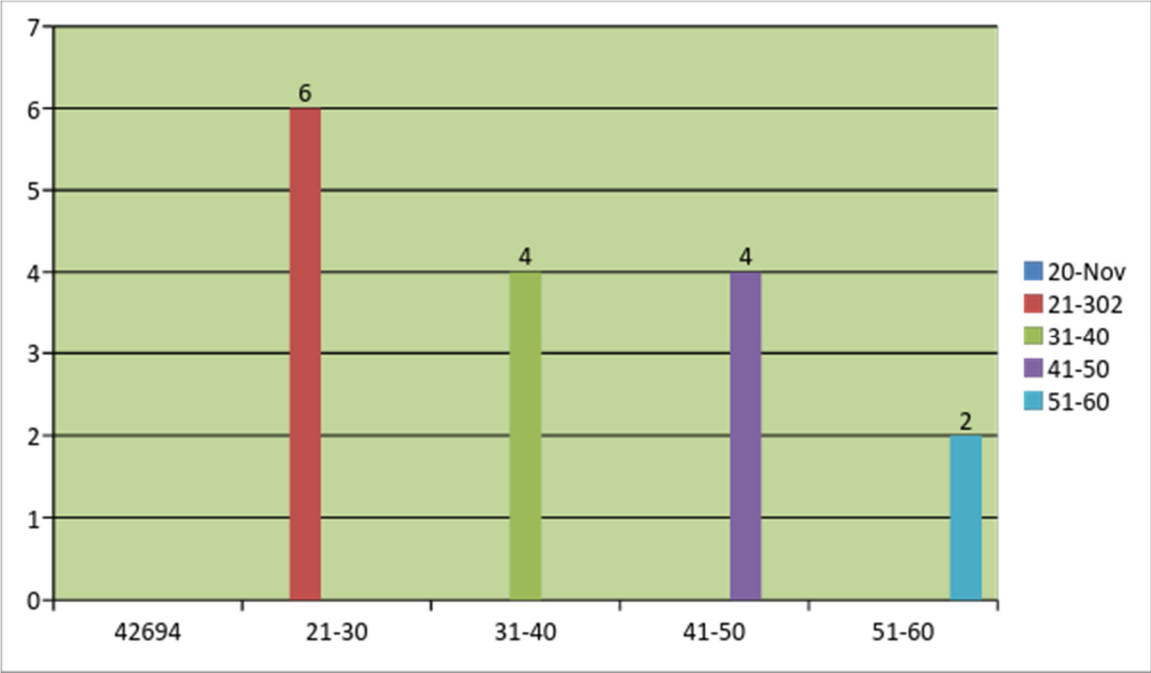
The incidence of inflammatory goiter was 3% and toxic features in colloid nodules and an adenoma were noted in 4 patients.

# SPECTRUM OF SOLITARY THYROID NODULE

## HISTOPATHOLOGICAL EXAMINATION



**SOLITARY NODULE OF THE THYROID**  
**AGE DISTRIBUTION OF MALIGNANT NODULES**

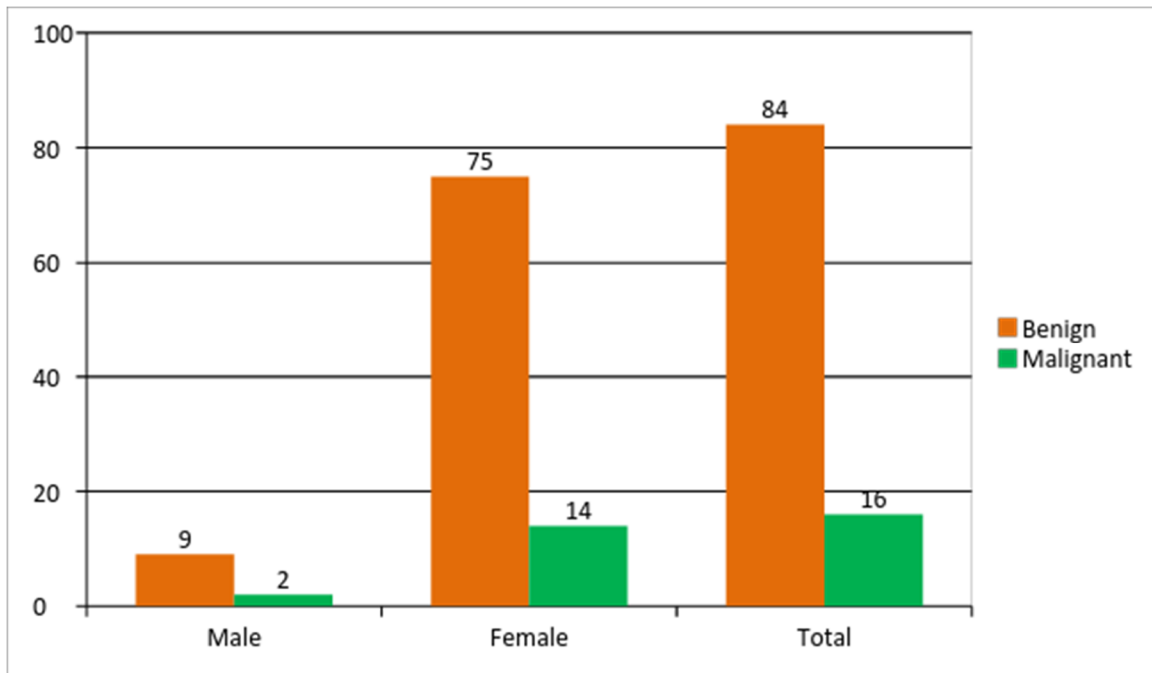


Age in years

**MALIGNANCY MOST COMMON IN THE THIRD DECADE  
OF LIFE IN THIS STUDY**

## SOLITARY NODULE OF THE THYROID

### SEX DISTRIBUTION OF SOLITARY THYROID NODULE



### GENDER

#### Malignant nodules

Males 18.18%

Females 15.73%

## **SURGERY**

All 100 patients were posted for surgery after fitness for anaesthesia and per operative palpation of contralateral lobe showed no evidence of nodules and ipsilateral hemithyroidectomy was done.

## **POST OPERATIVE COMPLICATIONS**

84 Patients had an uneventful post operative period.

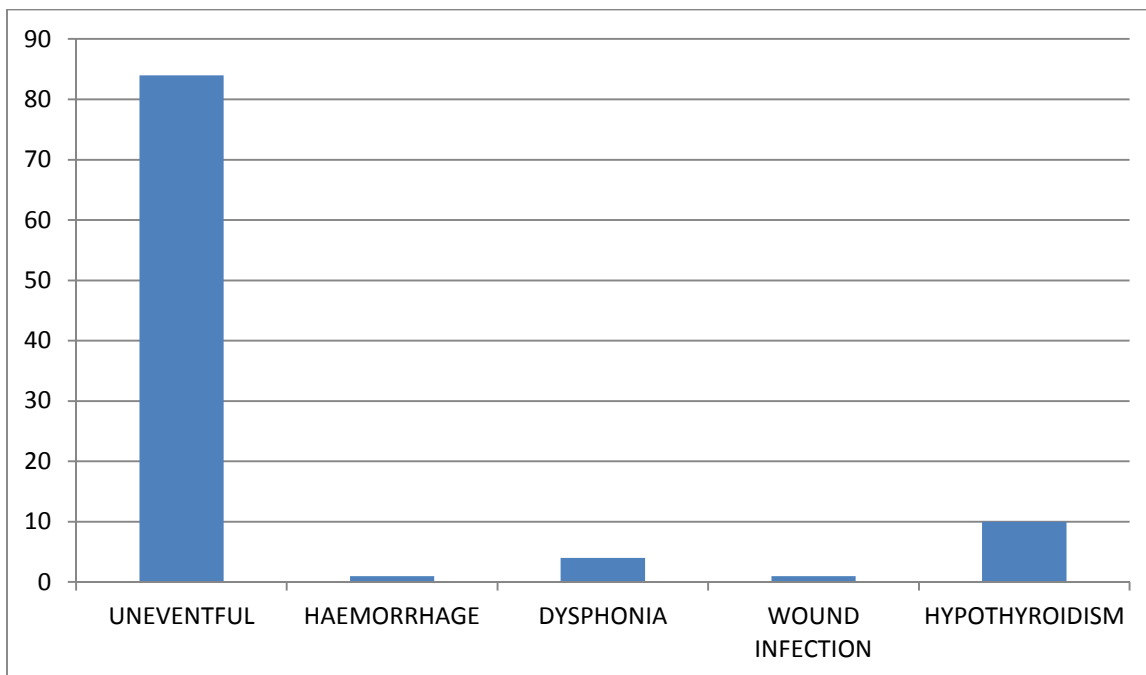
1 had reactionary hemorrhage and another one had wound infection which were managed appropriately.

4 suffered transient dysphonia that settled without specific therapy.

10 cases of post operative hypothyroidism was detected and the patients had either inflammatory goiter or a multinodular goiter and were managed with L – thyroxine therapy.

## **SOLITARY NODULE OF THE THYROID**

### **POST OPERATIVE PERIOD**



## **FOLLOW UP**

All patients were followed up for a period of 3 months to 1 year.

During the follow up patients had thorough physical examination, TSH and thyroxine assay and thyroxine therapy for selected patients.

Patients with lymphocytic thyroiditis had thyroid auto antibody assay and were given tablet L – thyroxine therapy. Among patients with malignancy, 2 lost their follow up, 8 were referred to higher centers for further evaluation and treatment, 2 had complete metastatic workup (CT Scan neck and radioactive iodine uptake study done) and completion thyroidectomy done. 4 patients who were not willing for further evaluation were managed by L – thyroxine suppression therapy.



## RELATED STUDIES

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Prevalence by Clinical palpation - 1 – 7% USG- 19 – 46%

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7. The solitary thyroid nodule, a review of 771 thyroidectomy specimen. G.T.C. Knoodson, BJS, vol 48, page 253 – 254, 2005.

A review of 771 thyroidectomy specimens showed incidence of carcinoma of 14.2%.

## CONCLUSION

1. Solitary nodule of the thyroid was found to be more common in young and middle aged patients.
2. Solitary nodule of the thyroid was 8 times more common in females than males.
3. Majority of the solitary nodule were dominant nodules of a multinodular goiter.
4. In the individuals admitted with solitary nodule of thyroid and managed by hemithyroidectomy, the incidence of malignancy was 16%.
5. The incidence of malignancy in solitary nodule of thyroid in males exceeds that of females the ratio being, 18:15.

## **SUMMARY**

A total of 100 consecutive patients with solitary nodule of the thyroid admitted were evaluated clinically, biochemically, radiologically and cytologically.

The patients underwent Hemithyroidectomy and the histopathology of the excised specimens were studied to evaluate the incidence of malignancy.

The incidence of malignancy in solitary nodule of the thyroid in the present study was 16% and incidence of malignancy in males exceeds that of females.

Fine needle aspiration cytology, now considered as the gold standard diagnostic test in the evaluation of a thyroid nodule revealed false negative report in 16 patients in this study. Ultra sonogram and nuclear scans are also useful tests, but are best used in conjunction with fine needle aspiration cytology.

Solitary nodule of the thyroid is a common entity whereas malignancy although rare needs a selective approach for further management and follow up.



Tremors / Sweating

Palpitations / Chest pain

Fever

Menstrual History in Females

Past History

Similar neck swelling

Head neck irradiation

Drug intake

Previous surgeries

General examination

Consciousness

Build

Pallor

Facies & Eyesigns

Skin

Tremors

Vital Signs

Local Examination: Neck

Nodule

-        Size            Firm / Hard            Fixity

Rest of the Gland – Palpable / Impalpable

Movement with Deglutition

Tracheal Position

Regional Lymph Nodes

### **Investigations**

#### **Routine**

1. Complete hemogram
2. Urine analysis
3. Biochemical investigations
4. Thyroid function tests – Sr TSH, T3 T4
5. Chest X – ray
6. ECG

#### **Specific**

- Erythrocyte sedimentation rate
- Thyroid Function Test
- Ultra sonogram neck
- X- ray neck AP, Lateral views
- Indirect Laryngoscopy
- CT Scan & MRI neck
- Radio Iodine uptake study

Surgery

Hemithyroidectomy R/L

Operative Notes

Histo Pathological Examination

Completion thyroidectomy

Post operative period

Follow up



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S.No	Name	I.P. No.	Age	Sex	Thyroid Function	F.N.A.C	Surgery Hemi Thyroidectomy	Histopathological Report	Post Operative Complications	Follow up 3 Months - 1 Year
1	SARASWATHI	239184	45	F	Eu Thyroid	Adenoma	Right	Papillary Adenoma	Uneventful	Routine
2	MEENAMBAL	224336	35	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Hypothyroidism	Routine
3	RANI	242411	39	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
4	JEYA	242426	24	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Uneventful	Routine
5	JAYAKODI	244122	25	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
6	SAROJA	241843	25	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Dysphonia	Routine
7	BANUMATHY	245249	40	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Routine
8	SAKTHI	246677	30	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Hypothyroidism	Routine
9	PAPATHY	248345	45	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Dysphonia	Routine
10	SUBBULAXMI	49575	44	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Higher Center Referral
11	ROSALIN	252882	40	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
12	RENGANAYAKI	254804	39	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
13	RAJESHWARI	254890	25	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
14	CHITRA	257199	25	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
15	SIVA BAKIYAM	268765	50	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Routine
16	SATHYABAMA	258414	20	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
17	KIRUBARANI	256957	23	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
18	BHOOMA DEVI	260704	30	F	Eu Thyroid	Adenoma	Left	Follicular Adenoma	Dysphonia	Completion Thyroidecton
19	JOSPINE MARY	262477	27	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
20	LAKSHMI	261714	50	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful	Routine
21	SELVI	264539	30	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Dysphonia	Routine
22	MEENAMBAL	265642	35	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Wound Infection	Routine
23	ROONIKAM	265329	35	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
24	SHANTHI	267932	24	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful	Routine
25	SIGAPPAYI	267413	40	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful	Routine
26	SARAMMAL	269497	33	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
27	POONGOTHAI	288184	24	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Routine
28	LOGAMBAL	276928	40	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Routine
29	AMSAVALLI	276972	45	F	Hypo Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful	Higher Center Referral
30	FATHIMA	278059	47	F	Eu Thyroid	Colloid Nodule	Left	Lymphoytic Thyroidits	Uneventful	L - Thyroxine
31	VASANTHA	280664	29	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine

32	SEMBU	282483	42	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Hypothyroidism	Routine
33	SOWHAR NISHA	289947	38	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
34	JANAKI AMMAL	269974	60	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Higher Center Referral
35	VELLAIAMMAL	272641	39	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
36	RENGANAYAKI	272624	60	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Reactionary Hemorrhage	Routine
37	MAHALAKSHMI	273195	22	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
38	SIVANANDHAM	273205	43	M	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
39	VAIRASELVI	273831	27	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
40	RATHI	274218	36	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
41	ROJA	275245	40	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful	Higher Center Referral
42	MANIMEGALAI	273940	38	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
43	JONES MARY	275572	28	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
44	SUDHA	276606	39	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Hypothyroidism	Routine
45	SOMYYA	276304	29	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful	Routine
46	RAJATHI	276318	31	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful	Routine
47	MALLIGA	276973	35	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Higher Center Referral
48	MADHAVI	276949	42	M	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful	Routine
49	KAVITHA	287280	25	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful	Routine
50	JANAKI	289370	43	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Hypothyroidism	Routine

S.No	Name	I.P. No.	Age	Sex	Thyroid Function	F.N.A.C	Surgery Hemi Thyroidectomy	Histopathological Report	Post Operative Complications
51	VIJAYA	289060	37	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful
52	DAMAYANTHI	291216	30	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful
53	SELLAMANI	201290	23	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful
54	SELVI	203090	33	F	Hypo Thyroid	Colloid Nodule	Left	Lymphoytic Thyroidits	Uneventful
55	KANAGAM	201004	38	F	Eu Thyroid	Adenoma	Left	Follicular Adenoma	Uneventful
56	JOTHI	203782	38	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Uneventful
57	AMARAVATHY	205499	60	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Uneventful
58	JEGANATHAN	208642	30	M	Eu Thyroid	Adenoma	Left	Follicular Adenoma	Uneventful
59	SOUNDARAJAN	215816	45	M	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful
60	NITHYADEVI	205039	25	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful
61	KARUPPAYEE	205603	30	F	Hypo Thyroid	Colloid Nodule	Right	Lymphoytic Thyroidits	Uneventful
62	SAVITHRI	205741	40	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful
63	PAPPATHI	206918	36	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Hypothyroidism
64	INDIRA	207881	29	F	Eu Thyroid	Colloid Nodule	Right	Toxicity	Hypothyroidism
65	MAHESHWARI	209035	35	F	Hypo Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Uneventful
66	VASANTHA	211232	38	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful
67	RENGANAYAKI	216002	45	F	Eu Thyroid	Adenoma	Left	Multi Nodular Goiter	Uneventful
68	VEERAMMAL	221240	60	F	Eu Thyroid	Adenoma	Right	Toxicity	Dysphonia
69	CHITRA	222466	30	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful
70	CHANDRA	221791	52	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful
71	SUMATHI	227333	28	F	Eu Thyroid	Adenoma	Left	Multi Nodular Goiter	Dysphonia
72	RAJALAKSHMI	226927	42	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Wound Infection
73	CHITRA	229336	26	F	Eu Thyroid	Adenoma	Right	Multi Nodular Goiter	Uneventful
74	MALARKODI	229681	49	F	Eu Thyroid	Adenoma	Left	Follicular Adenoma	Uneventful
75	SUNDARI	229429	30	F	Eu Thyroid	Adenoma	Left	Follicular Adenoma	Uneventful
76	MAHALAKSHMI	231241	25	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Uneventful
77	MUTHAMMAL	231185	25	F	Eu Thyroid	Colloid Nodule	Right	Multi Nodular Goiter	Hypothyroidism
78	SUMATHY	231442	30	F	Eu Thyroid	Colloid Nodule	Left	Multi Nodular Goiter	Uneventful

81	MUTHUSAMY	234286	45	M	Eu Thyroid	cc	Right	Multi Nodular Goiter	Hypothyroidism	Routine
82	REETA MARY	235277	50	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Lost Follow Up
83	MAHESWARI	233959	30	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	T4 - Suppression
84	VIJAYARANI	237367	23	F	Eu Thyroid	Adenoma	Right	Toxicity	Uneventful	Normal TFT - Follow Up
85	JEYASEELAN	238208	44	M	Eu Thyroid	c	Right	Toxicity	Uneventful	Normal TFT - Follow Up
86	GANESAN	236198	44	M	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Routine
87	SARAL	228177	39	F	Eu Thyroid	c	Left	Multi Nodular Goiter	Uneventful	Routine
88	NOORJAHAN	239351	48	F	Eu Thyroid	c	Right	Multi Nodular Goiter	Hypothyroidism	Routine
89	DHAVAMANI	234123	33	F	Eu Thyroid	c	Right	Multi Nodular Goiter	Uneventful	Routine
90	MALLIKA	240255	31	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Routine
91	KANNAN	244065	47	M	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Routine
92	SANTHOSH	241874	50	M	Eu Thyroid	c	Right	Multi Nodular Goiter	Uneventful	Routine
93	KALAISELVI	241992	35	F	Eu Thyroid	Adenoma	Right	Paillary Adenoma	Uneventful	T4 - Suppression
94	AARTHY	253434	40	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	Routine
95	RAMYA	247756	28	F	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	T4 - Suppression
96	VARSHA	246724	21	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Uneventful	Routine
97	SUMITHRA	246823	30	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Uneventful	Routine
98	RAJATHY	243847	21	F	Eu Thyroid	Adenoma	Left	Follicular Adenoma	Uneventful	Routine
99	RAJESH KUMAR	250401	24	M	Eu Thyroid	Adenoma	Left	Paillary Adenoma	Uneventful	T4 - Suppression
100	MEENAKSHI	245958	37	F	Eu Thyroid	Adenoma	Right	Follicular Adenoma	Uneventful	Routine