INCIDENCE AND TYPES OF MALIGNANCY AMONG GOITRE IN CHENGALPATTU MEDICAL COLLEGE

A DISSERTATION SUBMITTED TO

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY

In partial fulfillment of the regulations for the award of the

M.S., (GENERAL SURGERY) BRANCH – I

DEPARTMENT OF GENERAL SURGERY

CHENGALPET MEDICAL COLLEGE AND HOSPITAL

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY

CHENNAI

MAY 2020

DECLARATION

I, **DR. DEEPAK KARANAM** solemnly declare that this dissertation titled "**INCIDENCE AND TYPES OF MALIGNANCY AMONG GOITRE IN CHENGALPATTU MEDICAL COLLEGE**" is a bonafide work done by me in the Department of General Surgery, Government Chengalpattu Medical College and Hospital under the guidance and supervision of my assistant professors Dr. Sankarlingam. MS, Dr. Karthik. MS, Dr. Charan. MS and my unit chief and HOD Prof. J. SELVARAJ, M.S.,

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Instances where selected sources appear:

11

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I am extremely thankful to my patients who consented and participated to make this study possible.

CONTENTS

INTRODUCTION

Goitre is defined as generalised enlargement of thyroid

Solitary thyroid nodule can be defined as a goitre which on clinical examination appears to be a single nodule in an otherwise normal thyroid gland. Solitary thyroid nodule remains a common clinical problem.

Virtually any disease of the thyroid can present as a solitary nodule. A solitary nodule has a high risk of being malignant (10-20%) than the multiple palpable nodules of a multinodular goitre (5%).

A solitary nodule may become cosmetically distressing to a patient and occasionally causes pressure symptoms. Less frequently, an autonomously hyperfunctioning single nodule may cause hyperthyroidism. However, in the greater proportion of patients the major concern relates to the potential of malignancy with in such a nodule.

Until recently, many clinicians have advised and practiced the routine surgical resection of all solitary thyroid nodules for definitive histological assessment. Thyroid surgery, even in experienced hands is associated with definite morbidity and should not be undertaken lightly. It is logical to propose a more selective surgical policy for a patient with a solitary thyroid nodule, advising operation only for those individuals in whom cancer has been diagnosed or suspected or who are otherwise at risk of their goitre.

The incidence of thyroid cancer in patients with solitary thyroid nodule ranges from 11 to 20% (Kendall & Condon, 1969) 20. The vast majority of thyroid nodules are benign and do not require removal. The physician or surgeon should be able to perform an accurate clinical assessment of any thyroid nodule, appreciate the risk factors for thyroid cancer, and be able to evaluate which patient would benefit from surgery.

Conservative management is appropriate when malignancy can be reasonably excluded.

AIM OF STUDY:

- ✓ To find out the incidence of malignancy among Goitre
- ✓ To find out the different types of malignancy among goitre
- ✓ To evaluate the risk factors associated with occurrence of malignancy in a goitre

MATERIALS AND METHODS

This is a prospective study of randomly selected patients with clinically palpable goitre diagnosed and treated at Chengalpattu medical college. Total duration of study was two years from 2017 December to 2019 December.

All patients were subjected to basic investigations like complete hemogram blood sugar, blood urea serum cholesterol, urine analysis, chest radiogram and radiogram of neck.

Tissue diagnosis was obtained by fine needle aspiration cytology in all the patients and tabulated

Thyroid profile was done in selected patients with features of hyper and hypo - thyroidism. Radioisotope scan was not done since facility was not available at our hospital All Operated specimen were subjected to histopathological examination.

- ✓ Type of study: Prospective study
- ✓ Place of study: Chengalpattu medical college and hospital
- ✓ Period of study: Two years duration starting from December 2017 to December 2019
- ✓ Sample size :160 cases

INCLUSION CRITERIA

Patient presenting with goitre

Age group 20-60

Both sex

EXCLUSION CRITERIA

Female patient not attained menarche

Age less than 19 years

History of radiation in childhood

REVIEW OF LITERATURE

Thyroid nodules are a common entity and their clinical significance has been a point of discussion since 19th century. Palpable thyroid nodules are encountered in about 8% of the adult population. With the use of imaging techniques, particularly ultrasound, the chance of detection of thyroid nodules has increased many folds.

The prevalence of palpable thyroid nodule in South India is about 12.2%. However, the reported incidence of thyroid cancer in general population is low, being only about 1%. Thyroid cancers occur in approximately 5% of all thyroid nodules independent of their size. The recent data suggest that the incidence of thyroid malignancy is increasing over the years. The occurrence of malignancy is more in solitary thyroid nodules (SNT) compared to multinodular goiter. The preoperative evaluation of thyroid nodules to distinguish between benign and malignant nodules is very important. It helps to avoid unnecessary extensive surgery and potential surgery related adverse effects, such as hypothyroidism, hypocalcemia, and recurrent laryngeal nerve injury.

HISTORY

The thyroid gland was previously referred to as a laryngeal gland and was subsequently named thyroid by Wharton in 1645, because of thyroid cartilage with which it is closed associated. Existence of thyroid gland was known to Galen (2 A.D), who thought that it provided fluid for lubrication of larynx. Sir Astley Cooper (1768-1841) said it has the function of secretion.

Thyroxine (T4) was isolated by Kendall in 1965 and it was synthesized by Harrington and Banger in 1927. In 1953 the important discovery of 3, 5, 3 Tri-iodothyronine was made by Cross and Pitt-rivers and by Roche, Liesitsky and Michel simultaneously. This was proved to be more effective than thyroxine itself. With the introduction of radioactive iodine in 1934, it was possible for the clear understanding of thyroid physiology. In 1986 Bouman discovered Iodine in considerable amount in thyroid gland. Iodine was first identified by French Chemist Courtisis in 1812 who found it in ash of burnt seaweed.

But Chatin during 1850-1876 was the first to conclude iodine deficiency as a principle cause of goitre. Experimental goitre was produced by Chesney (1888) by John Hopkins University in Rabbits, by feeding them with cabbage and established, cabbage as one of the goitrogenic agents. Potassium 4 thiocyanate was found to produce goitre, in some of the hypertensive patients. Paracelsus (1492-1541) showed relationship between endemic goitre and

cretinism. In 1850 Curling, a Surgeon at London hospital gave account of cretinism in two children and recorded complete absence of thyroid gland at postmortem in both the cases. Gull in 1874 described cretinoid change in adults. In 1878 Ord suggested the term Myxoedema to describe the condition occurring after total or partial thyroidectomy.

EARLY OPERATIONS

The first credible account of thyroid surgery was given in 1170, by Roger Frugardi of Salerno, in the Bamberg manuscripts. Goitres which failed to respond were removed by finger dissection, insertion of setons, ligation en masse, and application of caustic powder. All such procedures were liable to major complications and increased mortality. The first well-documented partial thyroidectomy was undertaken in Paris in1791 by Pierre Joseph Desault (1744-1795), during the terror of French Revolution.Guillaume Dupuytren (1777-1835) also in Paris, undertook total thyroidectomy in 1808 for a Goitre weighing 1.2 kgs, but the patient died. In 1821, Johann Hedenus (1760-1836) of Dresden, successfully removed six “suffocating goitre”, by dissection and ligation of all the arteries.

This achievement was not equalled for next forty years. The 5 results of most thyroid operations were disastrous until the second half of19th century. Bleeding, which could not be controlled, and sepsis, cause of which was not known, often proved fatal. By the 19th century the usual indications for

surgery were suffocation and dysphagia. The overall mortality was over 40% and many surgeons advised against operating on goitres and considered it as one of the most thankless, most perilous undertakings. The advances, which followed the advent of general anaesthesia (1840's), antisepsis (1860's) and haemostasis (1870's), enabled surgeons to undertake more thyroid operations, and device new ones, with greatly reduced mortality.

Between 1850 and 1977, the world wide operative mortality fell to around 20%. The leading thyroid surgeons at this time were Theodor Kocher (1841-1917) and Theodor Billroth (1829-1894). Both of them performed thousands of thyroidectomies, with progressively better results. By 1883, operative mortality had fallen to 12% and by the end of the century to 3%.Theodor Kocher was Professor of Surgery in Berne, Switzerland. Kocher operated on more than 500 patients. He advocated gentle meticulous surgery that spared yet to be discovered parathyroid glands and anatomical appreciation of recurrent laryngeal nerve.

With application of these principles mortality of thyroid surgery decreased 6 from more than 59% to approximately 0.2%. Even more important was the discovery by Kocher that total thyroidectomy was followed by development of myxoedema and he demonstrated that this complication could be prevented by subtotal thyroidectomy. For this work in medical understanding and care in diseases of thyroid gland Kocher was awarded

Nobel Prize in 1909. THEODER KOCHER IS REGARDED AS FATHER OF THYROID SURGERY. Because operations were now safe, many goitres were removed mainly for cosmetic reasons.

Usually general anaesthesia with ether or chloroform was used; but local anaesthesia with cocaine was sometimes used. The Collar incision introduced by Tules Boeckel (1848-1927) of Strasbourg was adopted widely. Europe was the Cradle of thyroid Surgery in 19th century. In 1890's American Surgeons visited the main European centres and began to make important contributions in the early twentieth century. Notable among these were Halsted, Charles Maya (1865-1939) and George Crile (1864-1943).

The indications of operation were extended to include the prevention of complications, especially in patients with thyrotoxicosis and thyroid cancer. The latter was sometimes an unexpected discovery after operation. For this reason total lobectomy with removal of the isthmus and pyramidal lobe came to be used. This reduced the need for further operations when malignancy was found. The first transplantation of 7 thyroid was recorded by Payr in 1906. He transplanted a portion of the thyroid gland from a woman into the spleen of her myxoedemic daughter.

Following the development of non-surgical measures to manage most cases of hyperthyroidism and colloid goitre due to availability of radioactive iodine, antithyroid drugs and iodination of salt, surgical attention was directed

to nodules, both benign and malignant but with emphasis on the latter. In the 1940's and 1950's, attempts were initiated to determine the frequency of carcinoma producing thyroid nodules and criteria for operation for thyroid nodules.

Thyroid scans using I131 became available and assumed a frequently used role in identifying hypo functional nodules. However it soon became evident that this procedure was of little help in separating the malignant from the numerous benign thyroid nodules. With the development of techniques such as FNAC and ultrasound, the performance of thyroidectomy has become selective, unlike in the past when surgery was recommended for nearly all multinodular goitres.

SURGICAL ANATOMY

The thyroid gland occupies an important position in the centre of the visceral compartment of the neck, lying astride the trachea, just above the thoracic inlet. It normally weighs about 25 g.

The gland consists of two symmetrical lobes, united in front of the second, third and fourth tracheal rings by an isthmus of gland tissue. The extent of the gland is from the thyroid cartilage to the 5th or 6th tracheal ring or from C3 to T12.

Each lobe is pear shaped, consisting of a narrow upper pole and a broader lower pole.

The right lobe is often larger than the left. The Thyroid gland is covered by fascia and the strap muscles, and more laterally, it is tucked under the diverging anterior borders of the sternomastoid muscles and adjacent to the lobes on the medial side, is the carotid sheath.

Because of its fascial attachments, the gland moves upwards with swallowing. The normal gland is impalpable - though can be felt in thin necks. It is soft and supple and the tracheal rings can be palpated through it.

THE MUSCULO FASCIAL COVERINGS

The strap muscles are ensheathed by the general investing layer of cervical fascia, and this unites them in the midline.

These muscles are applied to the anterior surface of the gland, but separated from it, by a loose condensation of fascia derived from the pretracheal fascia. This false capsule covers the gland which is enclosed by its diaphonous true capsule with its very rich blood supply, clearly visible just beneath its surface. The pretracheal fascia is attached above to the thyroid cartilage and cricoid cartilage and this suspension of the gland from the larynx is responsible for its movement with deglutition.

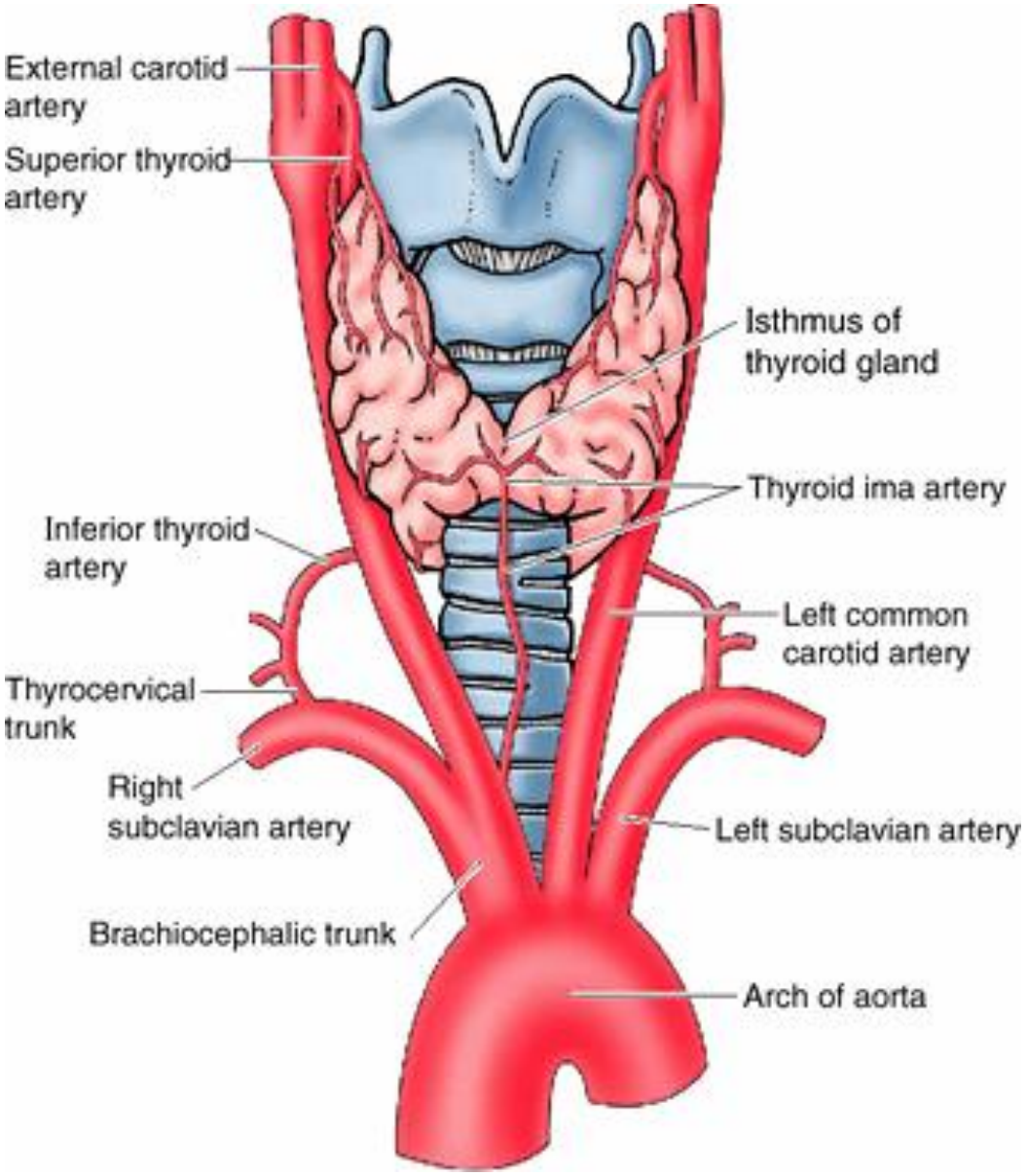
In the surgical approach to the thyroid gland, the musculo fascial envelope is incised down the midline, which is relatively avascular, and the space between the two capsules of the gland is entered. This loose plane is easily developed and the gland exposed by retracting the strap muscles.

The nerve supply of these muscles, the sternohyoid and sternothyroid, comes from Cervical roots 1, 2 and 3 via branches from the ansa cervicalis. This branches enter the muscle at its lateral border and on the deep surface and the muscles may be divided transversely to facilitate access to the gland, provided they are resutured, there does not appear to be any impairment of function.

The other important implication of the musculofascial covering of the gland is that at the end of thyroid operations, the divided fascial envelope is resutured in the midline and this again closes the visceral space.

If there is post operative haemorrhage into this closed space, respiratory embarrassment from tracheal compression results and requires release of sutures to restore the airway.

BLOOD SUPPLY



Superior thyroid artery is the first branch from the anterior aspect of the external carotid artery, after giving off its sternomastoid and superior laryngeal branches, pierces the pretracheal fascia as a single vessel to reach the summit of the upper pole. It divides on the gland into an anterior branch that runs down to the isthmus and a posterior branch that runs down the back of the lobe and anastomoses with an ascending branch of the inferior thyroid artery from the lower pole.

The inferior thyroid artery, arises from the thyrocervical trunk, and passes behind the carotid sheath, and then runs transversely across the space between this and the Thyroid gland to enter the deep surface of the gland as several separate branches close to the trachea thyroid groove.

The recurrent laryngeal nerve lies normally behind this branches or may be related anteriorly or posteriorily to the branches.

The Thyroideima artery enters the lower part of the isthmus in 3 percent of individuals. It springs from the branchiocephalic trunk (or) direct from the arch of aorta.

The venous return from the upper pole follows superior thyroid artery. This superior thyroid vein, enters either internal jugular vein (or) common facial vein.

The middle thyroid vein, short and wide, passes from the middle of the lobe, directly into the internal jugular vein.

From the isthmus and lower poles the inferior thyroid veins form a plexus that lies in the pretracheal fascia, in front of the cervical part of the trachea and drain into the brachiocephalic veins

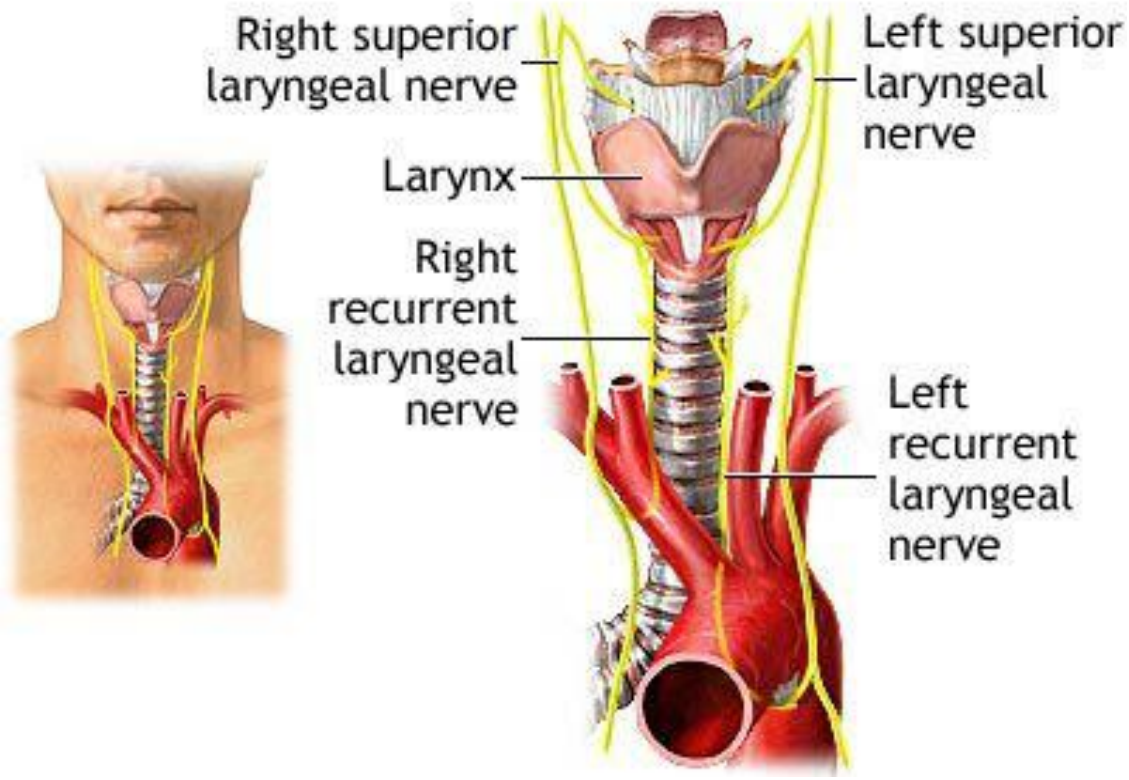
LYMPHATIC DRAINAGE

The lymphatics follow the arteries.

From the upper pole, they enter the antero superior group of deep cervical lymph nodes.

From the lower pole, they pass with the inferior thyroid artery back to its point of origin from the subclavian behind the carotid sheath, into the posteroinferior group. A few pass downwards into pretracheal nodes, following the course of thyroidea ima artery.

NERVE SUPPLY



The gland receives its innervation from the sympathetic and parasympathetic divisions of the autonomic nervous system. The sympathetic fibres arise from the cervical ganglion and enter with blood vessels and are vasomotor in action. While the parasympathetic fibres are derived from the vagus and reach the gland via branches of the vagus and reach the gland via branches of the laryngeal nerves

The Thyroid gland's relation to the recurrent laryngeal Nerve and to the external branch of superior laryngeal nerve is of major surgical significance.

Hunt reported the anatomy of recurrent laryngeal nerve in 100 cases. The right recurrent laryngeal nerve resided in the tracheoesophageal groove in 64% of cases, whereas the left nerve was similarly located in the left side in 77% of cases.

The nerve was lateral to the trachea in 33% of cases on the right side and 22% on the left side. On one occasion on the right side, a direct recurrent laryngeal nerve was given off in the neck without looping around the subclavian artery. Sometimes the nerves can run anterolateral to trachea (Tr. 8%, Lt 6%), with a maximum risk of injury during surgery.

The inferior thyroid artery is often used as a landmark for demonstration of recurrent laryngeal nerve. In most of the cases, the recurrent laryngeal nerve passes posterior to the inferior thyroid artery or its branches. (60% of cases), in about 30% of cases, the nerves pass anterior to the artery and the rest, between the branches of the artery.

In 50% of cases, the nerve is embedded in the ligament of Berry, which is of importance, because traction on the gland will put the nerve on stretch and make it subject to section. Damage to the recurrent laryngeal nerve results in paresis or paralysis of the intrinsic musculature of the larynx on that side which results in vocal cord paralysis.

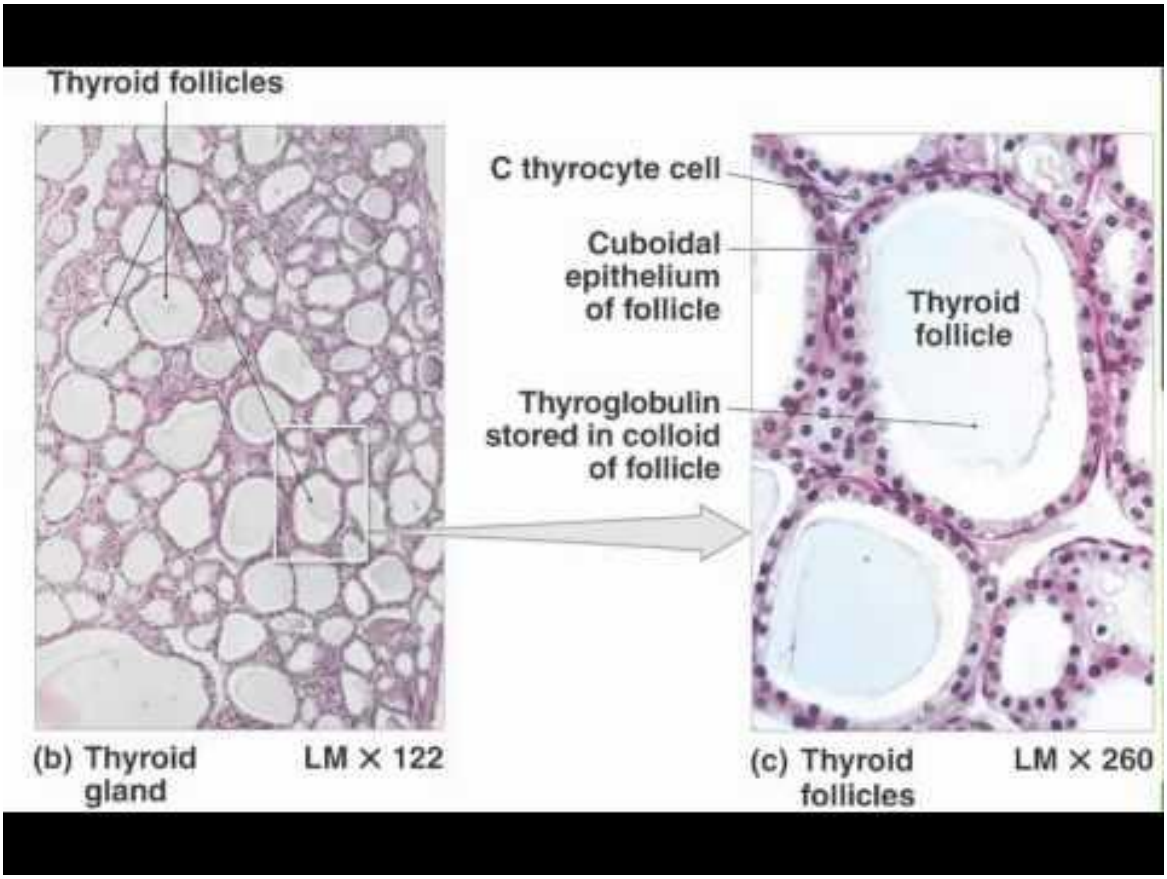
The non recurrent laryngeal nerves occurs in 1% of cases and almost invariably on the right side; the nerve from the vagus, runs directly to the gland along the superior thyroid pedicle, and may be at a risk, when this is transected.

The superior laryngeal nerves arises from the vagus, near the base of the skull, runs medial to carotid sheath, divides at the level of hyoid bone into external (muscular) and internal (sensory) branches.

External branch of superior laryngeal nerve innervates the cricothyroid muscle which is a tensor of the vocal cord. In most cases the superior laryngeal nerve lies adjacent to the vascular pedicles of the superior poles of the Thyroid gland, requiring that the vessels to be ligated with care to avoid injury, which are individually ligated and divided low on the gland, dissected laterally to the cricothyroid muscle.

HISTOLOGY OF THYROID GLAND

The thyroid gland is enclosed by a dense connective tissue capsule. The lobes are divided into multiple lobules formed of follicles variable in size and shape. There is an average of about 3 x 106 follicles in each gland, each measuring 30 micro m. Within the follicles is the clear viscid colloid. The follicles are lined by flattened cuboidal or columnar epithelium depending on glandular activity. Sparsely intermingled between the follicular cells and also within the interfollicular spaces are the parafollicular cells (the calcitonin secreting C cells). They are slightly larger than the follicular cells and have large nuclei and cytoplasmic granules. They are located in the upper poles of the thyroid lobes, reflecting their origin as neuroectodermal cells derived from the ultimobranchial bodies and part of the APUD series. The follicles are supported by a heavily vascularised connective tissue frame work.


Thyroid follicles
C thyrocyte cell
Cuboidal epithelium of follicle
Thyroid follicle
Thyroglobulin stored in colloid of follicle
(b) Thyroid gland
LM × 122
(c) Thyroid follicles
LM × 260

EMBRYOLOGY

The Thyroid develops as an endodermal tubular structure from the posterior aspect of the fetal tongue, and grows downwards in front of the developing hyoid and larynx, bifurcating and fusing with growth elements from the 4th branchial pouch. The stem of the down growth forms the thyroglossal duct whose upper end remains as the foramen caecum of the tongue; the lower end forms the pyramidal lobe of the thyroid. Thyroglossal duct usually atrophies but may remain in whole or in part and produce abnormalities in later life. The transient ultimobranchial pouches (part of 4th) contribute to the development of thyroid, an element which becomes parafollicular (Calcitonin Secreting) cells. It is a matter of surgical importance that the 4th branchial pouches also produce the superior parathyroids which maintain close relationship to the superormedial aspect of thyroid lobes. The inferior parathyroids develop from 3rd branchial pouches and their relationship is more to thymus than thyroid. They normally come to lie between the apex of the thymus and the lower pole of the thyroid or along the fibrous band, the thyrothymic ligament which unites them.

PHYSIOLOGY

Iodine Metabolism

The average daily requirement of Iodine is 0.1 mg. Iodine is converted to iodide in the stomach and duodenum and after absorption, distributed uniformly, actively transported into the thyroid, by an ATP - dependent process. The normal serum - thyroid 12 - ratio is about 1:5. But can be as high as 1:500.

Thyroid hormones T3 and T4 are bound to thyroglobulin within the colloid. Synthesis within the thyroglobulin complex is controlled by several enzymes in distinct steps.

(i) Trapping of inorganic iodide

(ii) Oxidation of iodide to iodine

(iii) Binding of iodine with tyrosine to form iodotyronine

(iv) Coupling of monoiodtyronines and diodotyronines to form T3 and T4, rT3.

All the steps are accelerated by TSH acting through a specific membrane receptor, via the cAMP second messenger system. The coupling

and oxidation of iodide are catalysed by a peroxidase enzyme, in the presence of H2O2.

When hormones are required the complex is reabsorbed in to the cell by endocytosis and thyroglobulin broken down by lysosomal action. This results in formation of T3, T4, rT3, MIT & DIT; the MIT & DIT are deiodinated and 12 reused T3 & T4 enter the circulation and are transported bound to thyroxine binding globulin (TBG), thyroxine binding pre-albumin (TBPA) and albumin. About 99.98% of hormones are protein bound.

The circulating plasma levels of T3-T4 are in a ratio of 1:20, but T3 is less protein - bound, So is the more potent hormone, with a half life of 1 day compared to about 7 days for T4. T3 is the more important physiological harmone. Approximately 85% of T3 is produced by mono-deiodination of T4 in other tissues such as liver, muscle and Kidney.

Pituary Thyroid Axis

Synthesis and liberation of thyroid hormones is controlled by TSH from anterior pituitary. Secretion of TSH depends on the level of circulating thyroid hormones and is modified in a classical negative feed back manner. Regulation of TSH secretion also results from the action of thyrotropin releasing hormone (TRH) produced in the hypothalamus.

Action of Thyroid Hormones

Thyroid hormones influence and speed up many metabolic processes in the body.

They are essential for normal growth, mental development and sexual maturation. They also increase the sensitivity of the cardiovascular and central nervous systems to catecholamines and so influence cardiac output and heart rate. many of these actions are mediated by T3 which by binding to specific receptors in cell nuclei alters the expression of some genes.

The thyroid hormones are deiodinated and the rest are excreted as glucoronide conjugates.

Thyroid Function Tests

There are variety of tests available to assess the function of thyroid. No single test is diagnostic and therefore a combination of tests are indicated

1.Measurement of Thyroid hormones in the serum

Total T4 and T3 represents total protein bound T4 an T3 and are not measurements of free active thyroid hormones. Total T4 and T3 are influenced by the thyroxine binding proteins in the serum. False high levels are seen in pregnancy and those who are taking oral contraceptive pills. False low values are seen in hypoproteinaemic states such as nephrotic syndrome. Drugs such as salicylates, penicillin compete with T3 and T4 for protein binding. So measurements of free T3 and T4 by Radioimmunoassay is specific

FT4 measurement helps in detecting early toxicity, when TT4 levels are normal. In patients with end-organ resistance to T4 (Refetoffs sndrome). T4 levels are raised, but TSH levels are usually normal. T3 levels may be low in patients with reduced peripheral conversion of T4 to T3 due to starvation

(low T3 syndrome) or due to drugs (eg. Propranolol). T3 thyrotoxicosis is a rare condition, in which levels of TT4 in the hyperthyroid patient are normal and RATU is normal, but TT3 levels are raised. It is seen in patients with endemic goitres and small solitary thyroid nodules.

2**. Serum Protein Bound Iodine (PBI)**

Normal range 3-5.8 mg/ 100 ml. It lacks specificity in that it measures non hormonal forms of iodine in the blood. False positive results are seen inpregnancy, persons taking iodides, expectorants containing potassium iodide and in those taking oral contraceptive pills.

T3 Resin uptake:

Patients serum is incubated with radioactive T3 so that the latter becomes fixed to unoccupied sites of Thyroid binding globulin. Naturally in hypethyrodism the unoccupied sites are low and in hypothyroidism the unoccupied sites are high. Then a secondary binder, a resin is added to the system, Resin uptake of T3 is more in thyrotoxicosis and low in

hypothyroidism. The test serves as indirect measurements of unbound T4. From this free Thyroxin index can be calculated.

Free Thyroxine Index = Serum T4 x T3 uptake %26.

Measurement of Serum TSII:

Normal range is upto 0.15-4.2 micro u/mi. Levels over 40 micro u/mi are present in gross thyroid deficiency. The test is invaluable in the early detection of mild degrees of hypothyroidism seen after surgery for thyrotoxicosis or after radioiodine. Old RIA methods have been replaced with more sophisticated immunometric assays using monoclonal antibodies that target two separate sites on TSH molecule allowing reading with an accuracy down to 0.005 micro u/mi. Estimation of these low concentrations aids the distinction of hyperthryoidism from euthyroidism.

TRH Test

When thyroid hormones are high as in hyperthyroidism, TSH is suppressed and I.V. Injection of TRH does not result in rise of TSH. When thyroid hormones are normal or low, TRH injection increases TSH level. Serum TSH is estimated at the beginning of the test and again 20 minutes and 60 minutes after injection of 200 micro gram of TRR. In euthyroid TSH level

increases just above the basal level. In hypothyroidism there is an exaggerated response. This test is infrequently used but it is useful if thyroid hormones and TSH levels are discrepant, in Grave' diseases, hypothyroidism due to pituitary or hypothalamic disease.

Radioactive Iodine Uptake Test (RAIU)

RAIU indicate rate of thyroid hormone synthesis and release. 5-25 mci of radioiodine 1231 is given orally. Then after 24 hours thyroid content of 1231 is measured by a counter. It is measured after 24 hrs because it is convenient to the patient and also the value at 24 hrs is usually near its plateau. But in very severe hyperthyroidism measurement is taken earlier since the uptake and release is rapid.

Increased RAIU

Inference is increased hormone synthesis, causes

i) Hyperthyroidism (except T3 toxicosis and increased body iodide)

ii) Ablation in hormones synthesis e.g. ineffectively or inefficiently used iodine.

iii) Acute or chronic iodine deficiency

iv) Withdrawal of factors that lead to thyroid hormone depletion e.g. withdrawal of antithyroid drugs, recovery from subacute thyroiditis, withdrawal of exogenous hormones.

v) Compensatory increase in hormone synthesis after hormone loss e.g. Nephrosis, chronic diarrhoea, soya bean ingestion.

Decreased RAIU:

i) Hypothyroidism

ii) Antithyroid agents

iii) Primary biosynthetic defects of hormone

iv) Hashimoto's disease

v) Subacute thyroiditis

vi) Increased availability of iodine

vii) Very severe hyperthyroidism due to increased release.

PATHOLOGY

A single palpable nodule in otherwise impalpable thyroid gland is called solitary nodule of thyroid. A single discrete nodule in a palpable thyroid gland is called dominant nodule.

The problem of solitary nodule of thyroid is that about 10-20 % of solitary nodule of thyroid is malignant and the physical signs of malignancy may not be evident in thyroid as noticed elsewhere.

Formation of nodules

A loss of co-ordination between iodine metabolism,. epithelial multiplication, thyroglobulin synthesis and coiloid endocytosis are important in the genesis of nodule.

Iodine deficiency and ingestion of goitrogens are the commonest cause of goitre formation. Iodine deficiency or goitrogens or hereditary factors lead to decrease in serum thyroid hormones with followed by increase in TSH

which will produce diffuse hyperplastic goitre. The patient will become euthyroid because of normal thyroid hormone level, TSH level drops down and goitre disappears.

If it persists after that it is a colloid goitre with inactive follicles. Because of fluctuation in TSH level, and varied response of cells to TSH, mixed active and inactive follicles are formed. In active follicles, because of high vascularity haemorrhage occurs with central necrosis. Growth stimulating antibodies are also responsible for multinodular goitre. Patient is usually euthyroid. Firm painless nodules are palpable; hardness may be due to calcification. Pain and sudden increase in size may be due to haemorrhage and simulate malignancy. Many thyroid disorders, both benign and malignant may manifest as solitary nodule.

CAUSES OF SOLITARY NODULE

A. CYST

Simple

Mixed - Cystic and Solid or Complex

B. PALPABLE NODULE OF TRUE MULTINODULAR GOITRE

C. THYROIDITIS .

Hashimoto’s

Sub acute

D. INFECTION

Granulomatous disease

Abscess

E. ADENOMA - 30%

F. TOXIC ADENOMA

G. MALIGNANCY Carcinoma -

Primary

Differentiated- Papillary

- Follicular-

-Medullary thyroid carcinoma

Undifferentiated-

- Anaplastic

- Metastatic

Clinically palpable nodule of a multinodular goitre is the most common cause of solitary nodule thyroid.

ADENOMA

Virtually all adenomas of thyroid present as a small discrete solitary nodule.

They occur most commonly in young and middle aged women. They rarely exceed 3 cm. Almost all adenomas are of follicular variety. Rare types are papillary cystadenoma and Hurthle cell adenoma.

The Differentiation of a nodule within a multinodular goitre from an adenoma is difficult not only clinically but also anatomically.

The morphologic criteria used to identify adenoma are.

1. Complete fibrous encapsulation.

2. A clear distinction between the architecture inside and outside the capsule.

3. Compression of the thyroid parenchyma around the adenoma

4. Lack of multinodularity in the remaining gland.

Histological classification of Adenoma

Type-I

A. Embryonal Adenoma

The follicles are premature, very cellular and arranged in the form of cords

B. Fetal Adenoma

Small follicles are arranged closely packed with a abundant connective tissue stroma.

C. SIMPLE ADENOMA

Composed of closely packed follicles of normal size.

D. Colloid Adenoma

Contains dilated follicles filled with colloid.

E. Hurthle Cell Adenoma

Composed of large granular cells identical to those encountered in various non - neoplastic thyroid lesions usually arranged in trabecular pattern.

Type II

A. Microfollicular

B. Macrofollicular

C. Atypical adenoma

Exhibits nuclear atypia, variability in cell morphology, including the presence of spindle shaped cells.

Follicular adenoma are differentiated from follicular carcinoma by the absence of capsular or vascular invasion. Thus careful sampling of capsule is required to exclude carcinoma.

Adenomas attain certain size and remain in that because the expansile pressure restricts blood supply. It may suddenly enlarge and may be painful because of haemorrhage within the nodule. Adenomas occasionally have some dependence on TSH, so it regresses after administration of thyroid hormones.

Adenomatous goitre

Adenomatous goitre is usually multinodular but a few may present as solitary nodule. Most patients are euthyroid. Whether single or numerous, adenomatous nodules have similar appearances.

Typical features include

1. Nodularity created by islands of colloid filled or hyperplastic follicles.

2. Random irregular scarring.

3. Focal haemorrhages and haemosiderin deposition.

4. Focal calcification in areas of scarring

5. Microcyst formation.

Microscopically adenomatous nodules are composed of follicles of vaiying size. Some follicles are distended with colloid and lined by flattened epithelium, where as others are small and are more active appearing.

CARCINOMA

Papillary Carcinoma: (70%)

Common in adults and children. Responsible for 30% of the thyroid carcinoma occurring below 40 yrs. More common in women. It grows slowly. Metastasis to cervical lymphnodes are common. About 10-20% may present as only cervical lymphnode metastates.

The primary is occult (lateral aberrant thyroid). All the lesions below 1.0 cm are called as occult or micro carcinoma. Blood spread is unusual. Prognosis is good. 10 year survival rate is about 70-80%.

Histology

Complicated branching tree like pattern of cells outlined by papilliferous axial fibrovascular stroma. Pale, empty nuclei (Orphan Annie eyed nuclei) and Psammoma bodies are present. Papillary carcinoma is subjected to the influence of pituitary T.S.H.

Follicular carcinoma (25%)

It is a well differentiated carcinoma of the thyroid but more aggressive than papillary carcinoma. More common in women. Peak incidence occurs in 5th and 6th decade.

Two types:

i) Encapsulated - less common

ii) Invasive mass

Haemorrhages, cystic degeneration and necrosis are common. Microscopically picture is that of adeno carcinoma with considerable range in size and differentiation of glands. Blood spread occurs in 70% cases. Commonest sites are lungs, bones, brain etc. Regional lymphnodes are involved in only 5% of cases.

Medullary carcinoma

Derived from parafollicular cells (C cells). It is an APUDOMA. 80% occur sporadically usually in adults. 10-20% occur in children and teenagers with associated syndromes.

MEN Ila : MTC, Phaechromocytomas, parathyroid tumours

MEN lIb: MTC, Phaechromocytomas + Mucosal neuroma, Marfanoid features, ganglioneuromatosis.

90% of the patients secrete calcitonin. Less frequently histamine, prostaglandins, ACTH and serotonin are secreted. It may present as a single nodule or multiple nodules.

Sporadic forms occur in 5th - 6th decades. Often present in advanced forms. Familial type presents in second decade. Associated endocrine abnormalities bring the patient early. Diarrhoea is present in upto 30% of patients. Metastasis is usually to regional nodes (50%), lung, liver and bone. Medullaiy carcinoma is not TSH dependent. It does not take up radio iodine. Diagnosis of medullary carcinoma can be made by stimulating calcitonin secretion by Pentagastrin and calcium infusions.

Anaplastic carcinoma

Usually occurs in 7th and 8th decades of life, it is a rapidly growing, locally infiltrative tumour with very poor prognosis.

It spreads by lymphatics and by blood stream. Two histological types are small cell carcinoma and giant cell carcinoma. 1 year survival is about 20%. Other tumours like lymphoma, sarcoma and secondaries also occur in thyroid. Secondary tumours usually arise from kidney, breast, colon, melanomas.

Thyroiditis

(i) Hashimoto's Thyroditis

It is a an autoimmune thyroiditis. It is the commonest cause for goitrous hypothyroidism in places where iodine intake is adequate. It is a major cause for nonendemic goitre in children. The goitre is due to thyroid growth immunglobulins like auto antibodies to thyrotrophin receptors, follicular microsomes, thyroglobulin. Thyroid parenchyma is replaced by fibrous tissue because of the infiltration by lymphoid cells. So eventually hypothyroidism develops. Sometimes in the midcourse patient may develop thyrotoxicosis called 'Hasitoxicosis'. More common in women at menopausal age. Usually both the lobes are involved. Nevertheless one lobe is larger than the other. It is lobulate and rubbery in consistency. It may be associated with pernicious anaemia, vitiligo, Rheumatoid arthritis etc.

Histology

Excessive replacement of parenchyma by lymphocytes, plasma cells, macrophages, lymphoid germinal centers. Follicular cells are transformed into eosinophilic granular cystoplasmic cells called Hurthle cells (or oncocytes or Askanazy cells). Diagnosis rests on measurement of serum auto antibodies by Radio Immuno Assay. It is positive in over 85% of cases. Lymphoma may develop in Hashimoto's thyroiditis.

(ii) **Subacute Thyroiditis (De Quervain's Thyroiditis)**

Causative agent is a virus, probably mumps virus. Patient has flu like illness followed by pain and rapid onset of swelling of thyroid. Swelling may be diffuse or asymimetrical, and tender on palpation. During active phase patient may develop hyperthyroidism, then due to extensive destruction hypothyroidism develops.

Histology: Aggregation of macrophages admixed with multi nucleated giant cells; It is a self limiting condition

Acute bacterial thyroiditis is rare. Commonest organisms are staphylococcus.

(iii**) Riedel's Thyroiditis (Lignious Thyroiditis).**

Aetiology is unknown. There is extensive fibrosing reaction that destroys more or less all the thyroid gland. The fibrous tissue may extend beyond the capsule and involve other structures in the neck. More common in females. It is characterised by painless enlargement of thyroid, woody hard in consistency, asymmetrical, pressure symptoms may be present especially tracheal compression. It may be associated with retropentoneal fibrosis. Occasionally it may be associated with sclerosing cholangitis. About 25-50% of the patients are hypothyroid.

Toxic Adenoma:

This type produces hormones in sufficient quantity to give rise to hyperthyroidism. Thyroxine output is not controlled by TSH or LATS. It is an autonomous tumour. Patient has increased metabolic rate, loss of weight, intolerance to heat, tremors, fibrillations. Usually there is no exophthalmos. Radioiodine scan shows it to be a hot nodule.

Thyroid Cyst:

30% of Clinically palpable swellings are cystic

.Causes:

I)Colloid degeneration (50%)

II)Degeneration of follicular adenoma

III)10-15% are malignant.

CLINICAL PRESENTATION

Patients with nodule in thyroid may present for:

- Toxic symptoms (autonomous, hyper functioning nodule).
- Pressure symptoms - dyspnoea, dysphagia, hoarseness of voice and rarely superior venacaval obstruction.
- Metastatic disease in the neck lymph nodes
- Distant metastasis.
- Cosmetic reasons.

CLINICAL RISK FACTORS

Age

The risk of cancer in a solitary thyroid nodule is more than 10% in adults. This risk is more in teenagers and after 60 years of age (30% - 40%).

Sex

Nodules in men are more likely to harbour malignancy than in women.

Growth patterns

A nodule that has appeared recently or one that has undergone progressive enlargement over months is suspicious of malignancy. However sudden painful enlargement of a nodule is usually due to haemorrhage with in the nodule.

IRRADIATION

The finding of solitary thyroid nodule in an individual with a history of external irradiation31 therapy over face, neck and chest should be regarded with a high degree of suspicion for the presence of malignancy.

FAMILY HISTORY

The presence of a solitory nodule in a patient with a family history of thyroid malignancy increases the risk for malignancy in the nodule.

PHYSICAL CHARACTERISTICS OF THYROID NODULE

1. **Single Versus multiple**:

   Malignancy occurs in 10-20% of single thyroid nodules but in only 3 - 5% multi nodular goitre.

2. **Consistency and fixation**:

   Hard consistency and the clinical impression of fixation implying invasion of adjacent structures also suggest malignancy. Indeed, the majority of cancers occurring in single nodules are mobile and indistinguisable from benign lesions.

3. **Recurrent nerve paralysis.**

In the absence of previous neck surgery, it is virtually pathognomonic of malignancy.

4. **Obstructive signs:**

Clinical evidence of obstruction of the airway or of the great veins of neck and mediastinum by a solitary thyroid nodule is rare, but when present, should raise the suspicion of malignancy.

4. Lymphnodes

Associated palpable cervical lymph adenopathy points strongly to cancer 6. Distant metastasis.

CLINICO PATHOLOGICAL STAGING OF THYROID CARCINOMA; (DEGROOT)

I A Unilateral confined to thyroid

B.Bilateral or multifocal

II. A. Unilateral Significant cervical nodes

B. Bilateral cervical or mediastinal lymphnodes

III. Local invasion with or without positive nodes

IV. Distant metastasis TNM classification is separate for each type of thyroid carcinoma.

Definitions of low risk and high risk for differentiated carcinoma as per lahey clinic.

- ✓ AGES scale : Age, Grade of Tumour, Extent of disease, Size of Tumor
- ✓ MACIS Scale: Metastases : Age, extent of Clearance, Invasion, Size of tumour
- ✓ AMES scale : Age, Metastases, Extent of invasion, Size of tumour.

Low risk group

• Men of 40 years and younger, women of 50 years and younger without distant metastases.

• All older patients with intra thyroid papillary carcinoma or follicular carcinoma with minor capsular involvement, in association with tumors less than 5 cm in diameter and no distant metastases.

High risk group

• All patients with distant metastases

• All older patients with extra thyroid papillary carcinoma or follicular carcinoma with major capsular involvement and tumors 5 cm in diameter or larger regardless of extent of disease.

INVESTIGATION

Following investigation are required for evaluating a case of solitary thyroid nodule

. I. BIOCHEMICAL ASSESSMENT

Serum T3 T4 and TSH

In a hyper functioning nodule T3 and T4 will be high where as TSH will be low; but most patients with thyroid nodules are euthyroid. Risk of malignancy in a toxic nodule is negligible. Post - opTSH after thyroxine treatment should be about 0.1 micro u/ml in low risk group and < 0.1 micro u/ml in high risk group.

Plasma Calcitonin

A raised level of plasma calcitonin strongly suggests medullary carcinoma. Serum Calcitonin can be measured after a challenge with calcium or pentagastrin; can also be used for post-operative follow-up in MTC.

Thyrologlobulin assay

Mainly useful after total thyroidectomy for malignancy. A raised level is a marker of early recurrence. After total thyroidectomy, the levels should be <2 ng/ml when patient is on thyroxine and when not, it should be <3 ng/ml.

Serum levels of CEA, histaminase, CGRP and serotonin are elevated in cases of MTC. CEA can also be used for post op follow - up. Serum calcium levels should be observed to rule out, co-existent parathyroid disorders.

24-h urinary values of VMA (Vanillyl mandelic acid), catecholamine and metanephrine should be done to rule out co-existent phaeochromocytoma.

These biochemical investigations were done only for few cases in this series

. II. **STANDARD RADIOGRAPH**

Routine chest radiogram was done for all patients planned for surgery to assess the respiratory system. Radiogram of neck also was taken, they showed the position of trachea, any compression over it and rarely calcification in the nodule

III. **ISOTOPE SCANNING**

With appropriate apparatus, isotopically labelled materials that are differentially accumulated by thyroid tissue can be detected and quantified. Radio Isotopes used are 99mTc Pertechnetate, 131I, 125I and 123 I

99MTC PERTECHNETATE4

Actively concentrated by the thyroid but unlike iodide undergoes negligible organic binding. Half life is six hours, so requires only single patient visit. Also it delivers very low irradiation to the thyroid tissue so it provides information about iodide-transport function of thyroid and not about organic binding and retention. The stay in the thyroid gland is brief and hence imaging done early. It is inappropriate for metastasis and substernal goitre.

Route - Single IV bolus and imaging performed 4-6 hour later. Apparatus used is scintillation camera.

125Iodine:

Half life 60 days. Its low energy emission precludes scanning from deep sources such assternal goitre or distant metastasis.

123Iodine:

Half life 13 hours . Radiation to the thyroid tissue is about 1% of that is delivered by 131I since there is absence of beta radiation. So it is the ideal isotope.

131 Iodine:

Half life 8 days . Useful to find out functioning metastatic lesions of thyroid carcinoma

Tc-Pentavalent - dimercaptosuccinate Scanning (DMSA)

DMSA Scintigraphy scanning has been shown to be more accurate in localising medullary carcinoma than the more standard techniques such as USG, CT and MRI scanning. Tc-Pentavalent DMSA shows high concentration in lesions in about 80% of patients with medullary carcinoma thyroid

Tc99m - Sestamibi Scan, MIBG (Meta- Iodo Benzyl - Guanidine) Scan and pet scan can be used in case of recurrent /metastatic MTC.

USE OF THYROID SCAN

To define areas of increased or decreased function from the reminder of the gland provided these areas are 1 cm or more in diameter. Scan and PET scan can also be used in cases of recurrent / metastatic MTC. Tc99m -sestamibi scan also be used for recurrent Hurthle cell cancer.

To define areas of increased or decreased function from the reminder of the gland provided these areas are 1 cm or more in diameter. Better visualisation of small nodules can be achieved by oblique or lateral view along with antero --posterior view. About 85% of nodules are “cold” of which 10-25% are malignant. About 5% of nodules are hot, of which < 1% are malignant.

Though majority of cold nodules are not malignant, lack of function increases the chance of developing malignancy particularly if only one nodule is present. Conversely hot nodules are unlikely to be malignant.

Scans performed after exogenous thyroid hormone administration (suppression scans) can reveal autonomous nodules.

Thyroid scans are also useful in detecting retrosternal goitres and ectopic thyroid tissue in the neck or ovary.

The most important use is to trace metastasis from thyroid carcinoma. (differentiated type), which can be detected and treated by radioactive iodine in 75% of cases. Screening can be facilitated by removal of all thyroid tissue which is the most compelling of all arguments in favour of total thyroidectomy in differentiated thyroid malignancies, except Hurthle cell carcinomas. Scanning is more sensitive to detect pulmonary micro metastases than chest x-ray or CT scan.

Histologically radioisotope imaging has played a major role in the work up of thyroid nodules, however with the advent of fine needle aspiration cytology, this role has become less clear. Because thyroid scans add little in determining which nodules require surgical excision, they should no longer be a routine part of the evaluation of a solitary thyroid nodule.

IV. **Ultrasonogram of thyroid**

It is useful to know whether a nodule is cystic or solid and will often detect other impalpable nodules ; can be utilised for guided aspiration of cysts. USG can be used for followup of nodules after thyroxine suppression.

V. **CT scan**

Useful in assessing the extent of primary tumor and neck node metastases.. Also useful to detect pulmonary or brains metastasis. MRI can be used to differentiate suspicious recurrent tumours from scar tissue

. VI. Tissue Diagnosis

• Fine needle aspiration cytology

• Core needle biopsy

a. **Fine Needle Aspiration Cytology** (FNAC)

FNAC is the gold standard investigation for evaluation of solitary nodule and should be done for all cases. Its use in the recent years has resulted in a significant decrease in the number of thyroid surgeries being performed, while increasing the yield of malignant lesions of patients who have undergone operation.

ADVANTAGES

1. Most valuable in diagnosis
2. Safe, doesn't require experience, and can be repeated several times.
3. Has given better selection of patients for surgical removal of nodules

   Diagnostic accuracy - 96%
4. No complications.
5. Is therapeutic in cases of simple thyroid cysts.

MATERIALS

1. Disposable hypodermic needle 2 1-23 size and length of 1-1.5 inches.
2. Disposable 20 cc syringe, pistol syringe holder (cameco) preferred
3. Swabs and spirit to clean.
4. 76 x 26 mm microscopic slides which are suitably numbered and labelled.
5. Koplin jar for keeping smeared slides in the fixative i.e., isopropyl alcohol.
6. Transport box
7. Laboratory requisition form with full clinical details.
8. Stain - Haematoxylin & Eosin stain or May - Grounwald Giemsa stain.

TECHNIQUE

The lesion should be fixed between two fingers and needle placed in the centre of nodule for small lesions (1-2 cms) and at periphery for larger lesions (2-4 cms). With suction maintained several passes (usually 4-6) of the needle are made through the tissue preferably with a slight change of angle during each pass.

The plunger is released to equalise the pressure, the needle is withdrawn and the contents is expelled on a series of glass slides, smeared, air dried and stained.

DISADVANTAGES

1. More likelihood of insufficient material.

2. To differentiate follicular adenoma from follicular carcinoma.

b. **Core Needle Biopsy**:

It produces a small cylinder of tissue which is submitted to histopathological examination. Also useful in diagnosing follicular carcinoma, lymphoma and anaplastic carcinoma. This procedure has a high risk of haemorrhage and injury to adjacent structures, hence not routinely done.

VII. **Indirect laryngyoscopy**

To find out functional status of vocal cords. This was done in all patients submitted forsurgery.

Selective venous Catheterisation

This is done for cases of suspicious recurrent / metastatic MTC. Hepatic and jugular veins are catheterised and a rise in calcitonin levels of sample, after pentagastrin stimulation is diagnostic.

GENETIC STUDIES

This is done in cases of MTC to look for RET protoncogene (Cur. 10) Point mutation and if positive family members

MANAGEMENT

Management opted for solitary thyroid nodule are

1. Surgical

2. Non-Surgical

SURGICAL

Advised after cytological impression

Indications:

1. All proven malignant nodules
2. All cytologically diagnosed follicular neoplasm
3. All lesions exhibiting an atypical pattern but non-diagnostic cellular pattern on cytology.
4. All papillary adenomas
5. Cystic lesion which recurred following aspiration; > 4 cm in size; complex in nature
6. High suspicion of malignancy on clinical grounds even if cytology suggests benign disease and presence of high - risk factors.
7. Hyperfunctioning nodule resulting in hyperthyroidism.
8. Obstructive symptoms, actual or potential
9. Patient anxiety
10. Cosmesis.

The standard surgical procedure in a benign single nodule should be Hemithyroidectomy. The line of resection should be extended to the junction of the isthmus & the contralateral lobe

Patients with toxic nodule may be treated by surgery. Ideal procedure is Hemithyroidectomy. Prior to surgery patient should be brought to euthyroid state with propranolol and carbimazole. Surgical treatment is safe, certain and without morbidity. Patients with toxic nodule over the age of 45 years can be treated with radioiodine.

In patients with differentiated thyroid carcinoma, there are two schools of thought,

1. HEMI THYROIDECTOMY
2. TOTAL THYROIDECTOMY

The Treatment Objectives in differentiated thyroid cancer are

1. Eradicate primary disease
2. Reduce the incidence of local / distant recurrence
3. Facilitate the treatment of metastasis.
4. Cure the maximum number of patients
5. Achieve all of the above with minimal morbidity

In case of minimal papillary carinoma, and minimally invasive follicular carcinoma and the rare encapsulated papillary carcinoma, hemi thyroidectomy is the treatment. In all other cases of differentiated thyroid cancers total thyroidectomy is the procedure of choice

There are several arguments for treatment of differentiated thyroid cancer by total / near total thyroidectomy.

i) Multifocal disease

ii) decreased incidence of local recurrence

iii) reduced risk of anaplasia in any residual tissue.

iv) facilitation of diagnosing unsuspected metastatic disease by radioactive iodine scanning or treatment with I131.

v) Greater sensitivity of blood thyroglobulin levels to predict persistent / recurrent disease.

If total thyroidectomy is contemplated, it is not better than near total thyroidectomy in which 1 - 2 gms of normal thyroid tissue is preserved on the contralateral side to protect blood supply to one or more parathyroid glands

If conservative surgery has been done TSH is suppressed by levothyroixine 0.2- 0.3 mg/ day. But TSH suppression is of doubtful value in Low risk patients

In preparing patients for isotope scanning, T4 is stopped 8 weeks before and T3 is used for the first 6 weeks and stopped only 2 weeks before so that the patient will not develop thyroid insufficiency. A low iodine diet is also recommended during those 2 weeks.

If lymphnodes are affected by secondary deposits in cases of papillary carcinoma or MTC and if a nodule of MTC is > 2 cm in size, modified neck dissection is performed on the ipsilateral side. Routine central neck node dissection is done for Hurthle cell carcinoma and MTC and in cases of involved central nodes bilateral neck dissection should be done.

If distant metastasis are found, they are treated with large doses of '~'I. The alternative is TSH suppression with T3.

In patients with medullary carcinoma the treatment of choice is total thyroidectomy with central neck node dissection and T3 replacement therapy. Close relatives are screened by estimating serum calcitonin in both basal and after pentagastrmn or calcium. If rise in serum calcitonin is observed, prophylactic thyroidectomy is done. Phaeochromocytoma should be excluded before surgeiy, Screening of family members with RET protooncogene point mutation has replaced the provocation tests.

In case of anaplastic carcinoma, total thyroidectomy with modified neck dissection is treatment of choice but in almost all patients it is not resectable. Isthmusectomy is done to decompress trachea and to obtain tissue for histology. External irradiation should be given in all cases for palliation of pain and dyspnea. Chemotherapy with adriamycin or adriamycin, chlorambucil and vincristine combination are advised

In case of lymphoma, radical surgery is unnecessary. Once the diagnosis is established by biopsy, isthmusectomy is done for tracheal decompression. Lymphoma responds well to radio therapy

THYROIDECTOMY PROCEDURE

For Hemi Thyroidectomy

1. Patient in supine position, neck extended with the help of a sandbag placed between the shoulders and rotation of the head is avoided by keeping the head on a ring.
2. A transverse collar incision is made about two finger breadth above the clavicle.
3. Elevation of upper & lower flaps in the plane between platsyma and deep cervical fascia.
4. Vertically incise the deep cervical fascia in the midline
5. Vertically split infrahyoid muscles.
6. Ligate and divide middle thyroid vein.

7. Ligate and divide superior thyroid pedicle
8. Inferior thyroid artery to be ligated incontinuity away from the gland.
9. The thyroid isthmus is clamped at the junction with contralateral lobe and divided.

For total Thyroidectomy:

The same technique to be followed on contralateral side also. The parathyroids are carefully separated and left insitu.

NON SURGICAL MANAGEMENT

Thyroid surgery, even in experienced hands, is associated with definite morbidity and should not be undertaken lightly.

When the question of malignancy within a solitary thyroid nodule has been eliminated by FNAC and in the absence of obstructive symptom, it is reasonable to offer the patient a conservative line of management.

Review the patient after 6 months, carry out a full cervical examination and repeat the FNAC. Provided there is no clinical suspicion of cancer and the cytology again is unequivocally benign, the individual is seen on an annual basis for re examination and further FNAC.

Suppressive dose of exogenous T4 to inhibit further growth of solitary thyroid nodule is a controversial question.

ASTWOOD6 et al, Celani et al 1990, reported successful reduction in size of nodules but other workers, in equally well documented reports, draw the contrary conclusion (Reverter et al 1992)

CLASSIFICATION OF FNAC REPORTS

THY1	NON-DIAGNOSTIC
THY1C	NON DIAGNOSTIC CYSTIC
THY2	NON NEOPLASTIC
THY3	FOLLICULAR
THY4	SUSPICIOUS OF MALIGNANCY
THY5	MALIGNANCY

MULTINODULAR GOITRE

There are multiple nodules in thyroid

Progression from diffuse hyperplastic goiter

Can weigh upto 2kg

Mostly euthyroid

More common in FEMALES

They can be : NonToxic & Toxic

Toxic MNG : a hyperfuntioning nodule may develop within a long standing goiter resulting in hyperthyroidism . The condition called **PLUMMER SYNDROME**

AETIOLOGY OF MULTINODULAR GOITRE

Marrine, a trained pathologist did brilliant studies on goitre. One of the most classical experiments in public health shows iodine as a prophylactic supplement. The recent introduction of tracer methods, urinary radioactive iodine and of technique of chromatography has provided fresh opportunities for an understanding of the aetiology and pathogenesis of nodular goitre. Marrine demonstrated an inverse relationship between iodine contents of the given gland and the degree of epithelial hyperplasia. Vanfallen berg and Mac

lendon demonstrated an inverse relationship between the level of iodine in food and drinking water on one hand and the incidence of goitres on the other.

The next phase of work on the iodine deficiency hypothesis relates to experimental production of thyroid lesion in animals. Identical with that of endemic goitre under conditions in which deficiency of iodine is the only etiological factor. Several diets consisting of natural food stuffs deficient in iodine have been shown to lead to hyperplasia of thyroid acini. The most recent phase in the study is with the use of radioactive iodine.

The pioneering study of Stanburg in Argentina and followed by similar studies in India, Holland, Finland in Congo have yielded results, which are consistent with iodine deficiency hypothesis. 22

GOITROGENS

- Environmental
  - Cassava root (contains thiocyanate)
  - Vegetables cruciferae family (cabbage, cauliflower, brussel sprouts)
  - Milk from regions where goitrogens are present in grass
- Drugs
  - Iodides
  - Amiodarone,
  - aminoglutethemide,

- Lithium –
- Cobalt
- Diiodoquinone
- Ethionamide
- PAS

There is evidence that, two classes of goitrogenic compounds, Thiocynates and Thiouracil like substances exist in food habitually consumed by man and domestic animals. Thiocynates inhibit the concentration of iodine and synthesis of thyroid hormones. Clement was of the opinion that plant goitrogens are unlikely to be significant etiological factors.

FACTORS OTHER THAN IODINE DEFICIENCY

There are two outstanding well-documented epidemics on which the observed features do not fit in with the iodine deficiency hypothesis. Clement has shown that school children in Southern Tasmania develop seasonal goitre even though they have preceding large iodine supplement. This seasonal increase appears to coincide with the spring flush of postures and weeds. Strong evidence was presented to suggest that a goitrogen in milk from cow fed on such postures was the cause of thyroid enlargement.

Boys and girls are equally affected unlike in epidemics where girls predominate. Italy's Coster showed another exception to iodine deficiency hypothesis when he observed in several epidemics that iodine may be normal or elevated, PBI level within the normal range and 23 water and urinary iodine values, no different from non-endemic region. There is yet no explanation for this, but Coster stated that some strong ties were observed between endemic and epidemic goitres in this region.

Thyroid nodule in children following therapy with I131 The development of thyroid nodule several years after treatment with I131 for hyperthyroidism has been described in 256 patients treated between 1943-53 in California Hospital. Thyroid nodules were discovered in 8 patients from 5 to 30 years, 6 patients were less than 18 years at the time of radio iodine administration and 2 were 25 and 30 years. Thus younger the patients, greater the chance of thyroid nodules developing from radioiodine therapy for thyrotoxicosis.

At the time of development of nodules none had hypothyroidism, none received thyroxine. Nodules are originated in the focal hyperplastic and regenerated portions of lobules apparently due to prolonged TSH stimulation on the tissues still able to react. Pathogenic changes in the thyroid gland were found in number of marshalled people of Rongelap Island who were accidentally exposed to radioactive fallouts in 1954.

Definite thyroid nodules were noted in all people, minor changes in 5 others and hyperthyroidism in 2. All but one case occurred in most heavily exposed population who received 175 rads of whole body 24 radioactive burns of the skin of the fallout products and internal absorption fission products. In 200 individuals of control group, not exposed, no such abnormalities were found. In 55 children less than 10 years of age, thyroid nodules developed. Radiation etiology of these cases appears to be certain, in view of the following facts.

Thyroid gland received a substantial dose of radiation from radioiodine and external gamma radiation. The incidence of nodule was high in exposed group and absent in unexposed group and the control population living in the same island. Increased sensitivity of children's thyroid gland in the development of nodules from radiation exposure has been amply demonstrated.

FAMILIAL GOITRES

1. Defect in iodine transport
2. Defect in organification failure to form organic iodine
3. Deficiency of enzymes • Lack of iodine peroxidase – complete block • Lack of iodine transferase – incomplete block, relatively common 25 More than 150 cases reported with consistent association of goitre with

deaf mutism. Pendred's syndrome is generally limited to single generation.

4. Coupling defect – Failure to couple iodotyrosines uncommon – 6 cases reported, more common in females.
5. Iodotyrosine deiodinase defect - uncommon.
6. Abnormal serum iodinated polypeptides – rare.

CHILDHOOD GOITRE

The presence of nodule or nodules in the thyroid gland in a child raises the strong possibility of malignancy, more likely to be malignant in a child than in an adult. Likelihood of malignancy increases when the nodule is single, hard and does not concentrate radioiodine (cold nodule). The nature of the diseases that produce the nodular enlargement in a child cannot be determined in most instances, except by histology. Thyroid hormones are required for female reproductive 26 functions. Physiological variations in hormones during menstruation, pregnancy and lactation contribute to the development of goitre, more common in females than males.

CLASSIFICATION OF THYROID NODULES

There is no universally accepted classification, as the aetiology of the nodular goitre is presumptuous and pathological appearances are often difficult to correlate with clinical features (Alan Newton, 1950). Any classification must be workable and usable to clinician and pathologist and simple to avoid confusion, so admittable to change and revisions made by the newer concepts. (Warren and Meissner 1953).

WHO CLASSIFICATION

0-A No goitre

0-B Goitre detectable only by palpation and not visible even when the neck infull extended

1 Goitre palpable, but visible only when the neck is fully extended

2 Goitre visible with the neck in normal position

3 Very large goitre which can be recognized at a considerable distance

THYROID ANTIBODIES

TPO-Thyroid peroxidise antibody

TRAB-Thyroid stimulating harmone receptor antibody

TgAb-thyroglobulin antibody

TPO

- ✓ **A**ntibody to glycoprotein(thyroperoxidase) responsible for catalysing iodine and performing iodination of tyrosine to produce thyroid hormone via colloid
- ✓ Measured with a luminometre(0-60u/ml)
- ✓ Positive in Hashimotos thyroiditis -90%
- ✓ GRAVES 60-80%
- ✓ 10 % of the healthy population may have detectable anti-tpo antibodies
- ✓ Mainly used to help diagnose autoimmune thyroditis

TRAB

- ✓ Antibody to TSH receptor in the thyroid
- ✓ >1.5IU/L=POSITIVE
- ✓ These antibody cause autoimmune thyrotoxicosis
- ✓ Very sensitive and specific for Graves disease

- ✓ PRESENT IN 70- 100% of patients with Graves .
- ✓ Present in 1-2% of healthy population

TGAB

- ✓ Antibody targets thyroglobulin
- ✓ Can interfere with thyroglobulin quantification
- ✓ Sandwich assay
- ✓ <4IU/ML
- ✓ High levels in the blood may indicate Graves or Hashimoto

RETROSTERNAL GOITRE

- o A goitre with a portion of its mass located in the mediastinum

- ✓ Primary

  not connected to cervical thyroid –Less than 1 %

- ✓ Secondary

  connected to cervical thyroid

- ✓ PLUNGING-

  Rise with Deglutition and decent again through the thoracic inlet

- ✓ MEDIASTINAL-

lie wholly in the chest and connected to thyroid and supplied by thyroid vessels

- ✓ INTRATHORACIC-

lie wholly in the chest but completely seperated from the gland supplied by mediastinal vessels

Symptoms

- ✓ Dyspnoea
- ✓ Dysphagia
- ✓ Superior vena caval obstruction
- ✓ Horners syndrome
- ✓ Percussion of the sternum may reveal retrosternal dullness

Investigation

CT NECK

CT CHEST

X RAY CERVICAL SPINE

Management

THYROIDECTOMY is the only line of management

Mostly via cervical approach

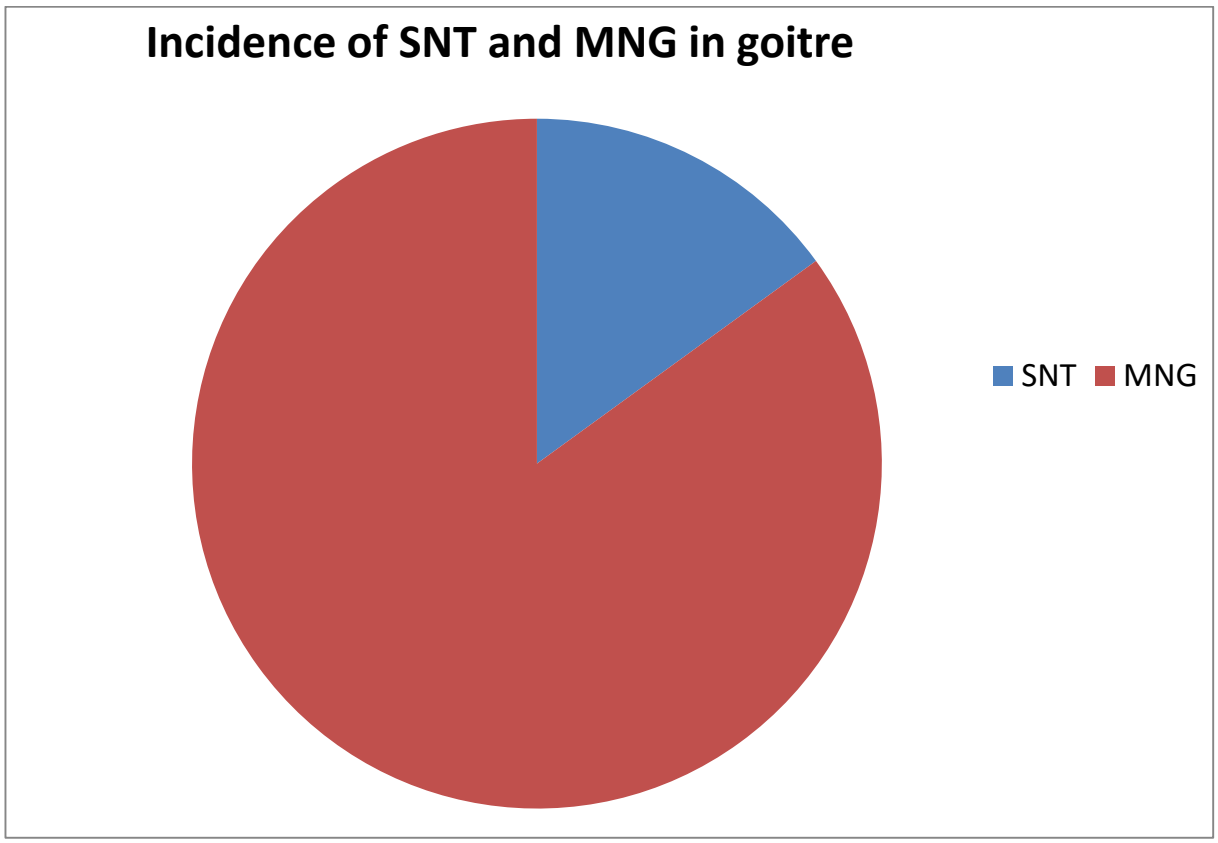
Rarely median sternotomy is needed

OBSERVATION& DISCUSSION

INCIDENCE OF SNT AND MNG IN GOITRE

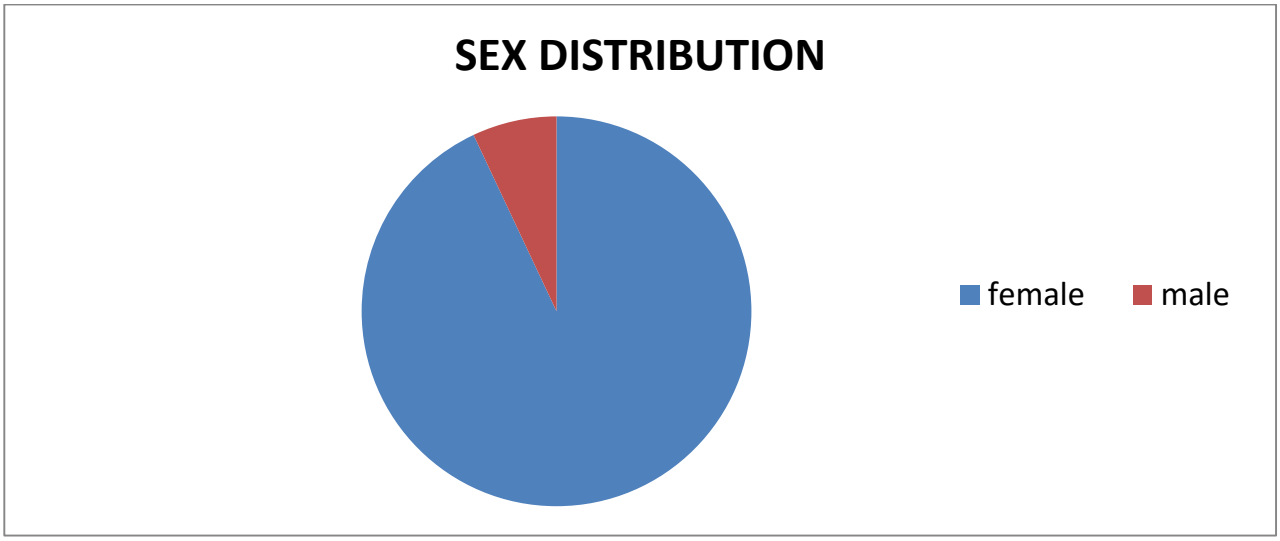
TABLE 1

TOTAL NO OF GOITRE	SNT	MNG
160	25	135
PERCENTAGE	15.62	84.37



SEX DISTRIBUTION

SEX		PERCENTAGE
FEMALE	149	93.12
MALE	11	6.8

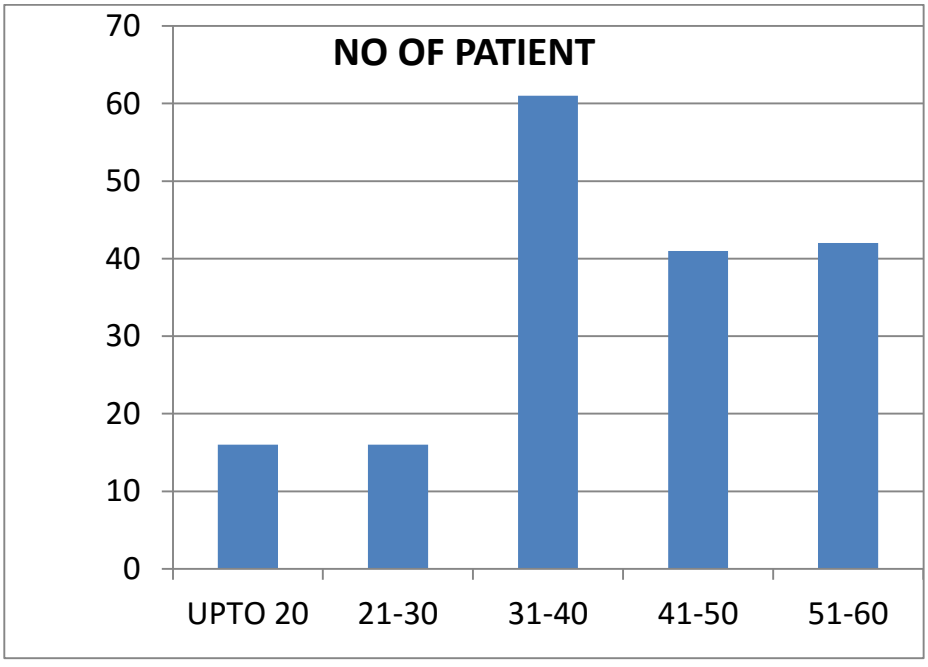


This distribution is in accordance with most of the reported series in our country and else where.

Female incidence is more partly because of increased prevalence and partly because of increased cosmetic awareness among female.

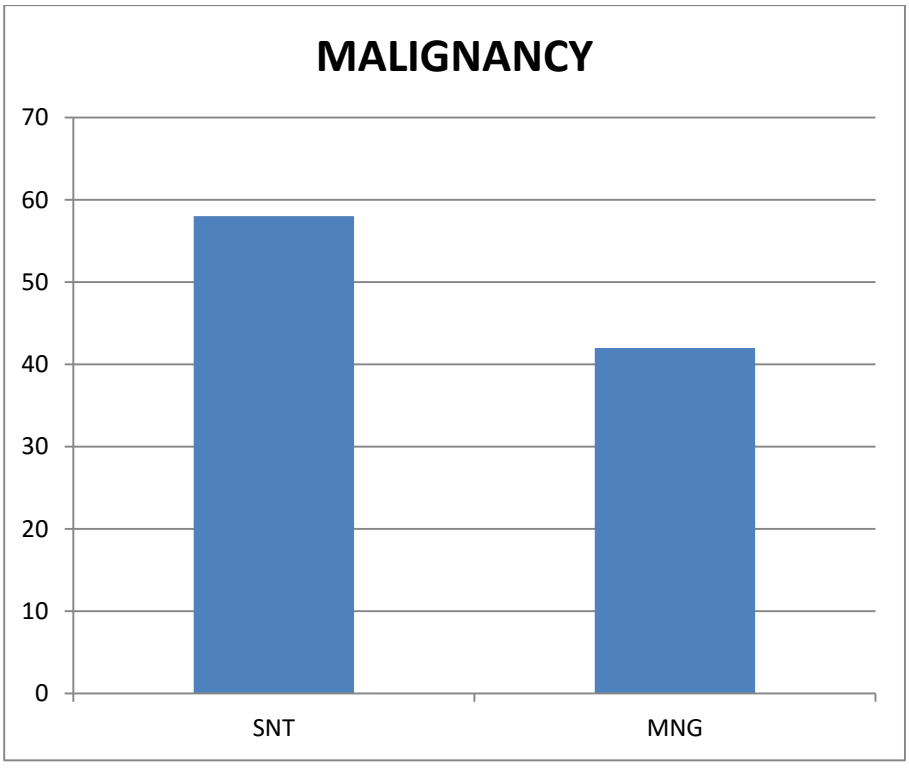
AGE DISTRIBUTION

AGE IN YEARS	NO OF PATIENTS	PERCENTAGE
UPTO 20		
21- 30	16	10
31-40	61	38
41-50	41	25.6
51-60	42	26.2
61 AND ABOVE	O	0



INCIDENCE OF MALIGNANCY IN SNT

	SNT	MNG
NO OF CASES	7	5
PERCENTAGE	58	42

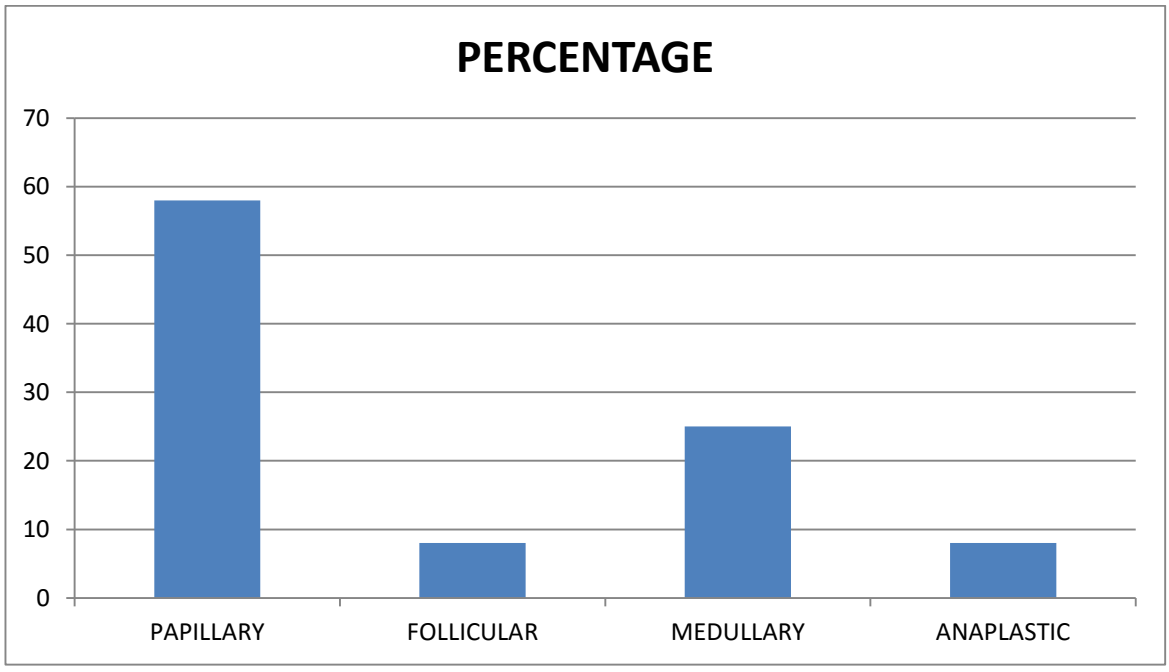


- ✓ Among 12 cases of thyroid malignancy, 7 cases clinically presented as solitary nodular thyroid.
- ✓ **58** percentage of solitary nodular Thyroid were malignant

INCIDENCE OF TYPES OF MALIGNANCY

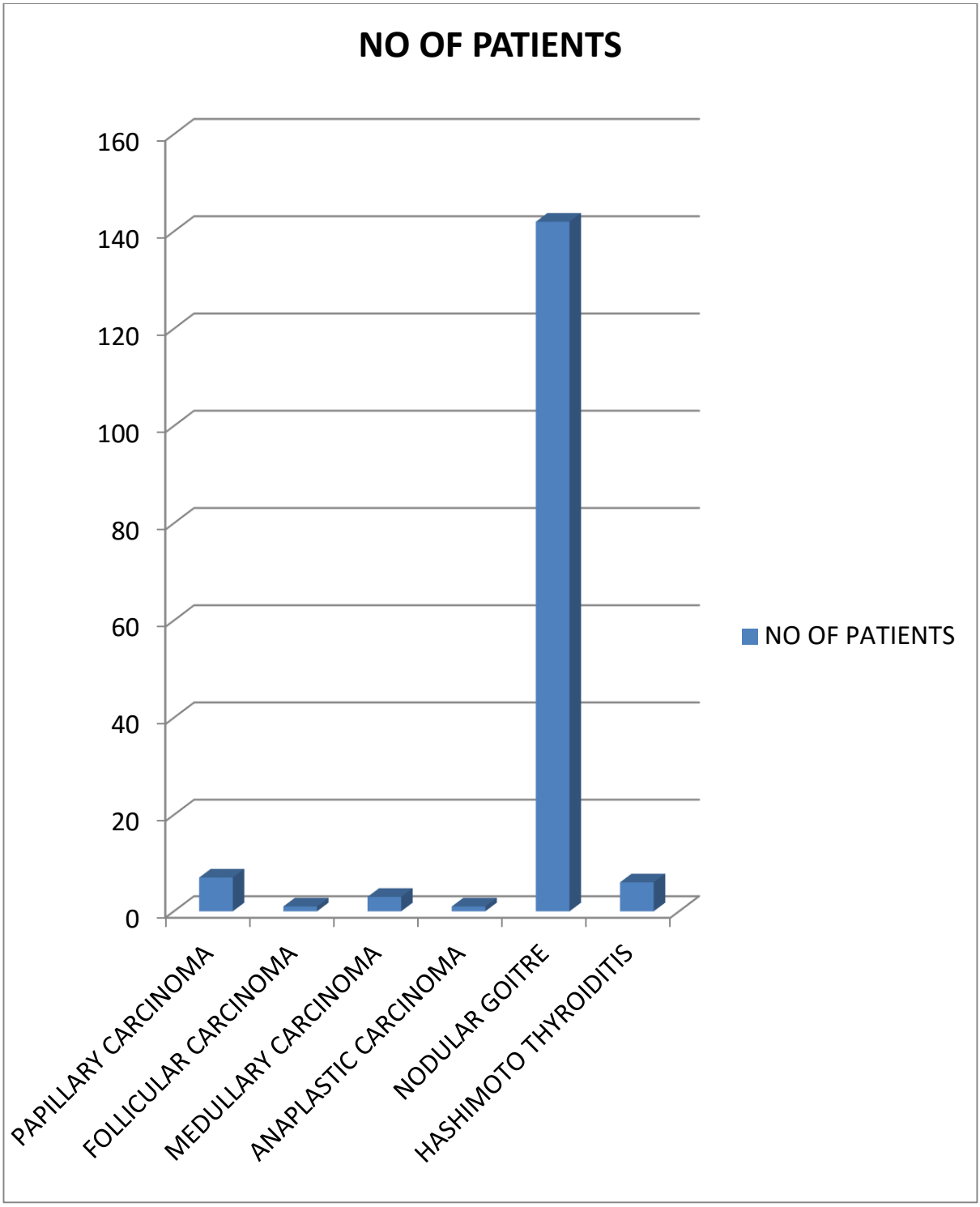
TOTAL NO OF MALIGNANCY- 12

TYPES OF MALIGNANCY	NO	PERCENTAGE
PAPILLARY	7	58.33
FOLLICULAR	1	8.3
MEDULLARY	3	25
ANAPLASTIC	1	8.3



- ✓ 58 percentage of Thyroid malignancy were found to be of papillary carcinomatous variety.

S NO	CASES	NO OF PATIENTS	PERCENTAGE
1	PAPILLARY CARCINOMA	7	4.3
2	FOLLICULAR CARCINOMA	1	O.625
3	MEDULLARY CARCINOMA	3	1.875
4	ANAPLASTIC CARCINOMA	1	0.625
5	NODULAR GOITRE	142	88.75
6	HASHIMOTO THYROIDITIS	6	3.75


NO OF PATIENTS
160
140
120
100
80
60
40
20
0
PAPILLARY CARCINOMA
FOLLICULAR CARCINOMA
MEDULLARY CARCINOMA
ANAPLASTIC CARCINOMA
NODULAR GOITRE
HASHIMOTO THYROIDITIS
NO OF PATIENTS

CONCLUSIONS

1. 58% of Solitary thyroid nodule were found to be malignant.
2. 60% of thyroid cancer occurred in patients between 30- 40 years of age.
3. 58% of malignancy were Papillary carcinoma.
4. Female preponderance was seen with 93 percentage.
5. Among 160 cases of goiter 88 % was found to be nodular goiter.
1. 6.Suspect Malignancy at extremes of age.
6. 42% of MNG were found to be malignant.
7. 3.75% of thyroid swellings were found to be HASHMOTO's thyroiditis.

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PROFORMA

Name:

Age:

Sex:

Duration of symptoms:

Any co-morbidities:

Diabetes mellitus - yes / no

Ischemic heart disease - yes / no

Radiation history

Familial history

Personal history:

Alcoholism - yes / no smoking - yes / no

General examination:

Local examination:

Investigation:

Urine sugar- urine ketones

TFT

Blood sugar

Urea

Serum creatinine:

HISTOPATHOLOGICAL REPORT

USG NECK:

CT NECK/CT CHEST

INFORMED CONSENT FORM

Title of the Study INCIDENCE AND TYPES OF MALIGNANCY AMONG GOITRE IN CHENGALPATTU MEDICAL COLLEGE

Name of the Participant :

_____.

Name of the Principal (Co-Investigator) :

_____.

Name of the Institution : Government Chengalpattu Medical college and Hospital

Name and address of the sponsor / agency(ies) (If any) :

_____

_____

_____

Documentation of the informed consent :

I _____have read the information in this form (or it has been read to me). I was free to ask any questions and they have been answered. I am over 18 years of age and, exercising my free power of choice, hereby give my consent to be included as a participant in **"INCIDENCE AND TYPES OF MALIGNANCY AMONG GOITRE IN CHENGALPATTU MEDICAL COLLEGE**

.

1. I have read and understood this consent form and the information provided to me.
2. I have had the consent document explained to me.
3. I have been explained about the nature of the study.
4. I have been explained about my rights and responsibilities by the investigator.
5. I have been informed the investigator of all the treatments I am taking or have taken in the past _____ months including any native (alternative) treatment.
6. I have been advised about the risks associated with my participation in this study.*
7. I agree to cooperate with the investigator and I will inform him/her immediately if I suffer unusual symptoms.*
8. I have not participated in any research study within the past _____month(s).*
9. I have not donated blood within the past _____months----add if the study involves extensive blood sampling.*
10. I am aware of the fact that I can opt out of the study at any time without having to give any reason and this will not affect my future treatment in this hospital.*
11. I am also aware that the investigator may terminate my participation in the study at any time, for any reason, without my consent.
12. I hereby give permission to the investigators to release the information obtained from me as result of participation in this study to the sponsors, regulatory authorities, Govt. agencies, and IEC. I understand that they are publicly presented.
13. I have understand that my identity will be kept confidential if my data are publicly presented .
14. I have had my questions answered to my satisfaction.
15. I have decided to be in the research study.

I am aware that if I have any question during this study, I should contact the investigator. By signing this consent form I attest that the information given in this document has been clearly explained to me and understood by me, I will be given a copy of this consent document.

SIGNATURE

PATIENT CONSENT FORM

STUDY DETAIL: INCIDENCE AND TYPES OF MALIGNANCY AMONG GOITRE IN CHENGALPATTU MEDICAL COLLEGE

STUDY CENTER:

CHENGALPATTU MEDICAL COLLEGE & HOSPITAL, CHENGALPATTU

PATIENT NAME: PATIENT AGE:
IDENTIFICATION NUMBER:

I confirm that I have understood the purpose of procedure for the above study.
I have the opportunity to ask the question and all my questions and doubts have been answered to my satisfaction.
I understand that my participation in the study is voluntary and that I am free to withdraw at anytime without giving any reasons, without my legal rights being affected.
I understand that investigator, regulatory authorities and the ethics committee will not need my permission to look at my health records both in respect to the current study and any further research that may be conducted in relation to it, even if withdraw from the study, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from the study.
I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperative with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or wellbeing or any unexpected or unusual symptoms.
I hereby give consent to participate in this study.
I hereby give permission to undergo complete clinical examination and diagnostic test.

Signature/Thumb impression: Place: Date:
Patient name and address:

Signature of the investigator: Place: Date:

Study investigator's name:

<u>சுயஒப்புதல்படிவம்</u>

ஆய்வுசெய்யப்படும் தலைப்பு INCIDENCE AND TYPES OF MALIGNANCY AMONG GOITRE IN CHENGALPATTU MEDICAL COLLEGE

ஆய்வுசெய்யப்படும் இடம்:

பங்குபெறுபவரின் பெயர்:

பங்குபெறுபவரின் வயது: பங்குபெறுபவரின் எண் :

மேலேகுறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கபட்டுள்ளது. நான் இவ்வாய்வில் தன்னிச்சையாக பங்கேற்கின்றேன். எந்தகாரணத்தினாலோ, எந்த சட்டசிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகிக்கொள்ளலாம் என்றும் அறிந்துகொண்டேன்.

இந்த ஆய்வுசம்பந்தமாகவோ, இதைசார்ந்து மேலும் ஆய்வுமேற்கொள்ளும்போதும் இந்த ஆய்வில்பங்கு பெறும் மருத்துவர், என்னுடைய மருத்துவஅறிக்கைகளைபார்ப்பதற்கு என் அனுமதிதேவைஇல்லை என அறிந்துகொள்கிறேன். இந்த ஆய்வின் மூலம்கிடைக்கும் தகவலையோ, முடிவையோ பயன்படுத்திக்கொள்ள மறுக்க மாட்டேன்.இந்த ஆய்வில் பங்குகொள்ள ஒப்புக்கொள்கிறேன். இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிக்கிறேன்.

பங்கேற்பவரின்கையொப்பம்: சாட்சியாளரின்கையொப்பம்:

இடம்: இடம்: தேதி:

தேதி :

பங்கேற்பவரின் பெயர் மற்றும் விலாசம்:

ஆய்வாளரின் கையொப்பம்: இடம்: தேதி:

MASTER CHART

S.no	NAME	IP NO	AGE	SEX	DIAGNOSIS	FNAC
1	KALA	36740	33	F	MNG	NODULAR COLLOID GOITRE
2	MYAWATHI	36261	43	F	MNG	NODULAR COLLOID GOITRE
3	VINUMARY	11612	56	F	RT SNT	PAPILLARY CARCINOMA
4	RANI	17592	43	F	MNG	NODULAR COLLOID GOITRE
5	KASTHURI	61048	34	F	RT SNT	NODULAR COLLOID GOITRE
6	UMA	11453	38	F	MNG	HASHIMOTO THYROIDITIS
7	GAYATHRI	11456	53	F	MNG	NODULAR COLLOID GOITRE
8	NEELAVATHY	57152	43	F	MNG	NODULAR COLLOID GOITRE
9	THRAMMAL	11672	41	F	MNG	NODULAR COLLOID GOITRE
10	GOMATHI	33475	39	F	LT SNT	NODULAR COLLOID GOITRE
11	KUMARI	33459	22	F	RT SNT	NODULAR COLLOID GOITRE
12	EZHUMALAI	32586	45	M	MNG	NODULAR COLLOID GOITRE
13	SUDHA	24570	43	F	RT SNT	NODULAR COLLOID GOITRE
14	DURAIRAJ	4414	49	M	MNG	NODULAR COLLOID GOITRE
15	THENMOZHI	61121	56	F	MNG	NODULAR COLLOID GOITRE
16	KAMATCHI	50298	33	F	MNG	NODULAR COLLOID GOITRE
17	NIRMALA	42275	28	F	MNG	NODULAR COLLOID GOITRE
18	VEERAMANI	37232	59	M	MNG	NODULAR COLLOID GOITRE
19	THENIMOZHI	37656	34	F	MNG	NODULAR COLLOID GOITRE
20	VANITHA	43036	38	F	MNG	NODULAR COLLOID GOITRE

21	KALI	114782	40	F	RT SNT	NODULAR COLLOID GOITRE
22	DAVID	24236	21	M	MNGG	NODULAR COLLOID GOITRE
23	KANAGA	6609	40	F	MNG	NODULAR COLLOID GOITRE
24	ANNAMMAL	63806	58	F	LT SNT	PAPILLARY CARCINOMA
25	SUBRAMANI	58727	45	M	MNG	MEDULLARY CARCINOMA
26	SUMATHII	51130	46	F	RT SNT	FOLLICULAR CARCINOMA
27	KRISHNAVENI	37080	52	F	RT SNT	NODULAR COLLOID GOITRE
28	DEVI	44633	35	F	RT SNT	NODULAR COLLOID GOITRE
29	KANNAGA	11302	35	F	MNG	NODULAR COLLOID GOITRE
30	ALAMELU	40122	49	F	MNG	HASHIMOTTO THROIDITIS
31	SUPRIYA	33737	40	F	LT SNT	PAPILLARY CARCINOMA
32	RANI	27517	40	F	LT SNT	NODULAR COLLOID GOITRE
33	ELLAMMMAL	12624	40	F	RT SNT	NODULAR COLLOID GOITRE
34	RAMADEVI	50634	30	F	LT SNT	NODULAR COLLOID GOITRE
35	RAVI	51933	37	M	LT SNT	NODULAR COLLOID GOITRE
36	PRIYA	27396	34	F	MNG	NODULAR COLLOID GOITRE
37	POONGODI	61407	32	F	RT SNT	NODULAR COLLOID GOITRE
38	LATHA	14151	37	F	MNG	NODULAR COLLOID GOITRE
39	NIRMALA	10309	34	F	MNG	NODULAR COLLOID GOITRE
40	KALYANI	59994	40	F	LT SNT	NODULAR HYPERPLASTIC GOITRE
41	POONGODI	16267	40	F	MNG	NODULAR COLLOID GOITRE
42	KUMUDA	46202	56	F	MNG	HASHIMOTO THROIDITIS
43	TAMILSELVAN	57472	30	M	LT SNT	MEDULLARY CARCINOMA
44	KRISNAMMALL	55771	58	F	MNG	NODULAR COLLOID GOITRE

45	CHINNAPONNUU	54580	54	F	MNG	NODULAR COLLOID GOITRE
46	RAZITHA	11308	35	F	MNG	NODULAR COLLOID GOITRE
47	KANNIYANNAL	33616	45	F	MNG	NODULAR COLLOID GOITRE
48	RAMAN	29302	46	M	MNG	PAPILLARY CARCINOMA
49	ELUMALAI	33616	55	M	MNG	MEDULLARY CARCINOMA
50	SUGANYAMARY	35938	47	F	MNG	NODULAR COLLOID GOITRE
51	DEVALKI	31467	52	F	RT SNT	NODULAR COLLOID GOITRE
52	USHADEVI	16459	34	F	MNG	NODULAR COLLOID GOITRE
53	GRACY	34210	38	F	MNG	NODULAR COLLOID GOITRE
54	ANJALI SEVI	88522	36	F	MNG	NODULAR COLLOID GOITRE
55	POURNMMAL	26670	52	F	MNG	NODULAR COLLOID GOITRE
56	MANJULA	42678	32	F	MNG	NODULAR COLLOID GOITRE
57	VANITHA	33055	35	F	MNG	NODULAR COLLOID GOITRE
58	LAXMI	15621	31	F	MNG	NODULAR COLLOID GOITRE
59	PRIYA	158267	37	F	MNG	NODULAR COLLOID GOITRE
60	AMIRTHA	156216	38	F	MNG	NODULAR COLLOID GOITRE
61	MUNIRATHINAM	35298	45	F	MNG	NODULAR COLLOID GOITRE
62	RENUGA	34389	40	F	MNG	NODULAR COLLOID GOITRE
63	KALA	24321	30	F	MNG	NODULAR COLLOID GOITRE
64	KAMATCHI	37157	48	F	MNG	NODULAR COLLOID GOITRE
65	SANGEETHA	158606	40	F	MNG	NODULAR COLLOID GOITRE
66	MUNIYAMMAL	37136	65	F	MNG	NODULAR COLLOID GOITRE
67	BAVANI	39206	39	F	MNG	NODULAR COLLOID GOITRE
68	JAYARANI	167210	47	F	MNG	NODULAR COLLOID GOITRE

69	REKA	40240	26	F	MNG	NODULAR COLLOID GOITRE
70	MANJULA	16344	33	F	MNG	NODULAR COLLOID GOITRE
71	GOWRI	16728	54	F	RT SNT	PAPILLARY CARCINOMA
72	KALIASELVI	34210	35	F	MNG	NODULAR COLLOID GOITRE
73	VENDA	44410	30	F	MNG	NODULAR COLLOID GOITRE
74	ROZY	43661	55	F	MNG	NODULAR COLLOID GOITRE
75	EZHIKASI	42671	30	F	MNG	NODULAR COLLOID GOITRE
76	KANNAGA	45062	40	F	MNG	NODULAR COLLOID GOITRE
77	JAYABHARATHI	45647	30	F	MNG	NODULAR COLLOID GOITRE
78	ALAMELU	45559	35	F	MNG	NODULAR COLLOID GOITRE
79	KUTTYAMMAL	46914	40	F	MNG	NODULAR COLLOID GOITRE
80	ESWARI	46525	59	F	MNG	NODULAR COLLOID GOITRE
81	PARIMALA	19895	36	F	MNG	NODULAR COLLOID GOITRE
82	NAGARATHINAM	46481	49	F	MNG	NODULAR COLLOID GOITRE
83	SASIKALA	47787	31	F	MNG	NODULAR COLLOID GOITRE
84	ATHILAKSHMI	43677	45	F	MNG	NODULAR COLLOID GOITRE
85	MAHESHWARI	436477	48	F	MNG	NODULAR COLLOID GOITRE
86	SUNIL KUMAR	492923	39	M	RT SNT	NODULAR COLLOID GOITRE
87	VANISRI	48361	20	F	MNG	NODULAR COLLOID GOITRE
88	GEETHA	206479	35	F	MNG	NODULAR COLLOID GOITRE
89	PREMA	47234	48	F	MNG	NODULAR COLLOID GOITRE
90	SUMATHY	50657	43	F	MNG	NODULAR COLLOID GOITRE
91	ARPUDAN	512114	48	F	MNG	HASIMOTO THYROIDITIS
92	DEVI	54480	31	F	MNG	NODULAR COLLOID GOITRE

93	LALITHA	54543	58	F	MNG	NODULAR COLLOID GOITRE
94	MEENA	47880	55	F	MNG	NODULAR COLLOID GOITRE
95	MARIAMMAL	56037	45	F	MNG	NODULAR COLLOID GOITRE
96	RADHIKA	25357	32	F	MNG	NODULAR COLLOID GOITRE
97	NEELAVATHY	57572	48	F	MNG	NODULAR COLLOID GOITRE
98	LAKSHMI	606236	34	F	MNG	NODULAR COLLOID GOITRE
1OO	PADMA	26125	54	F	MNG	NODULAR COLLOID GOITRE
101	KAMATCHI	57314	28	F	MNG	NODULAR COLLOID GOITRE
102	POORNIMA	57314	32	F	MNG	NODULAR COLLOID GOITRE
103	MUTHAL	57230	33	F	MNG	NODULAR COLLOID GOITRE
104	PADMAVATHY	60374	54	F	MNG	NODULAR COLLOID GOITRE
105	GONSA	60375	21	F	MNG	NODULAR COLLOID GOITRE
106	RAJESHWARI	52594	36	F	MNG	NODULAR COLLOID GOITRE
107	KANAGA	52601	45	F	MNG	NODULAR COLLOID GOITRE
108	PONNAL	52691	32	F	MNG	HASHIMOTO THYROIDITIS
109	LISSY	22411	41	F	MNG	NODULAR COLLOID GOITRE
110	LAKSHMI	40263	48	F	MNG	NODULAR COLLOID GOITRE
111	PONNI	19238	38	F	LT SNT	PAPILLARY CARCINOMA
112	PATTAMMAL	70284	55	F	MNG	NODULAR COLLOID GOITRE
113	KUMARAVALLI	40606	35	F	MNG	NODULAR COLLOID GOITRE
114	JAYALAKSHMI	40464	33	F	MNG	NODULAR COLLOID GOITRE
115	VASANTHA	38920	47	F	MNG	NODULAR COLLOID GOITRE
116	SUNDARI	37820	50	F	MNG	NODULAR COLLOID GOITRE
117	SELVI	37043	58	F	SNT	NODULAR COLLOID GOITRE

118	VASANTHA	35597	47	F	MNG	NODULAR COLLOID GOITRE
119	ABIRAMI	34560	39	F	MNG	NODULAR COLLOID GOITRE
120	MATHI	37606	47	F	MNG	NODULAR COLLOID GOITRE
121	PADMA	35063	57	F	MNG	NODULAR COLLOID GOITRE
122	VEDAVALLI	29766	48	F	MNG	NODULAR COLLOID GOITRE
123	NANDHINI	178285	32	F	MNG	NODULAR COLLOID GOITRE
124	REETA	178285	40	F	MNG	NODULAR COLLOID GOITRE
125	BANUMATHI	177946	56	F	MNG	NODULAR COLLOID GOITRE
126	LALITHA	29561	45	F	LT SNT	NODULAR COLLOID GOITRE
127	ELLAMMAL	14326	48	F	MNG	NODULAR COLLOID GOITRE
128	VEDHAVEL	28083	45	F	MNG	NODULAR COLLOID GOITRE
129	CHINNAPONNU	130357	48	F	MNG	NODULAR COLLOID GOITRE
130	KAMALA	24934	46	F	MNG	NODULAR COLLOID GOITRE
131	LAKSHMI	26387	38	F	MNG	NODULAR COLLOID GOITRE
132	SUDHA	26391	29	F	MNG	NODULAR COLLOID GOITRE
133	GEETHA	26370	36	F	MNG	NODULAR COLLOID GOITRE
134	KOTHISHWARI	149210	45	F	MNG	NODULAR COLLOID GOITRE
135	ANIFABEE	98431	58	F	MNG	ANAPLASTIC CARCINOMA
136	AMSA	98431	33	F	MNG	NODULAR COLLOID GOITRE
137	CHINAPONNU	143196	65	F	MNG	NODULAR COLLOID GOITRE
138	SEETHA	22076	57	F	MNG	HASHIMOTO THYROIDITIS
139	SHRADA	113954	55	F	MNG	NODULAR COLLOID GOITRE
140	THIRUPUSUNDARI	21717	37	F	MNG	NODULAR COLLOID GOITRE
141	SALSA	15378	36	F	MNG	NODULAR COLLOID GOITRE

142	PADAVATHAMMAL	68143	46	F	MNG	NODULAR COLLOID GOITRE
143	RAJESHWARI	6814	58	F	MNG	NODULAR COLLOID GOITRE
144	DEVAKI	68156	29	F	MNG	PAPILLARY CARCINOMA
145	JAYA	253717	33	F	MNG	NODULAR COLLOID GOITRE
146	DHANALAKSMI	64697	45	F	MNG	NODULAR COLLOID GOITRE
147	SUDHA	64722	37	F	MNG	NODULAR COLLOID GOITRE
148	AMUDHA	64768	37	F	MNG	NODULAR COLLOID GOITRE
149	LAKSHMI	62441	53	F	LT SNT	PAPILLARY CARCINOMA
150	MAYALVIZHI	45632	34	F	MNG	NODULAR COLLOID GOITRE
151	RAJALAKSNMI	61021	40	F	MNG	NODULAR COLLOID GOITRE
152	THILAGAVATHI	58834	41	F	MNG	NODULAR COLLOID GOITRE
153	SARASWATHI	57499	37	F	MNG	NODULAR COLLOID GOITRE
154	SELVARAJ	22129	51	M	MNG	NODULAR COLLOID GOITRE
155	BAKKAYALAKSHMI	256175	38	F	MNG	NODULAR COLLOID GOITRE
156	VELAMMAL	56127	56	F	MNG	NODULAR COLLOID GOITRE
157	ANJALA	23439	53	F	MNG	NODULAR COLLOID GOITRE
158	GOWRI	50061	51	F	MNG	NODULAR COLLOID GOITRE
159	VISALAKSHMI	51867	45	F	MNG	NODULAR COLLOID GOITRE
160	THENMOZHI	51478	34	F	MNG	NODULAR COLLOID GOITRE