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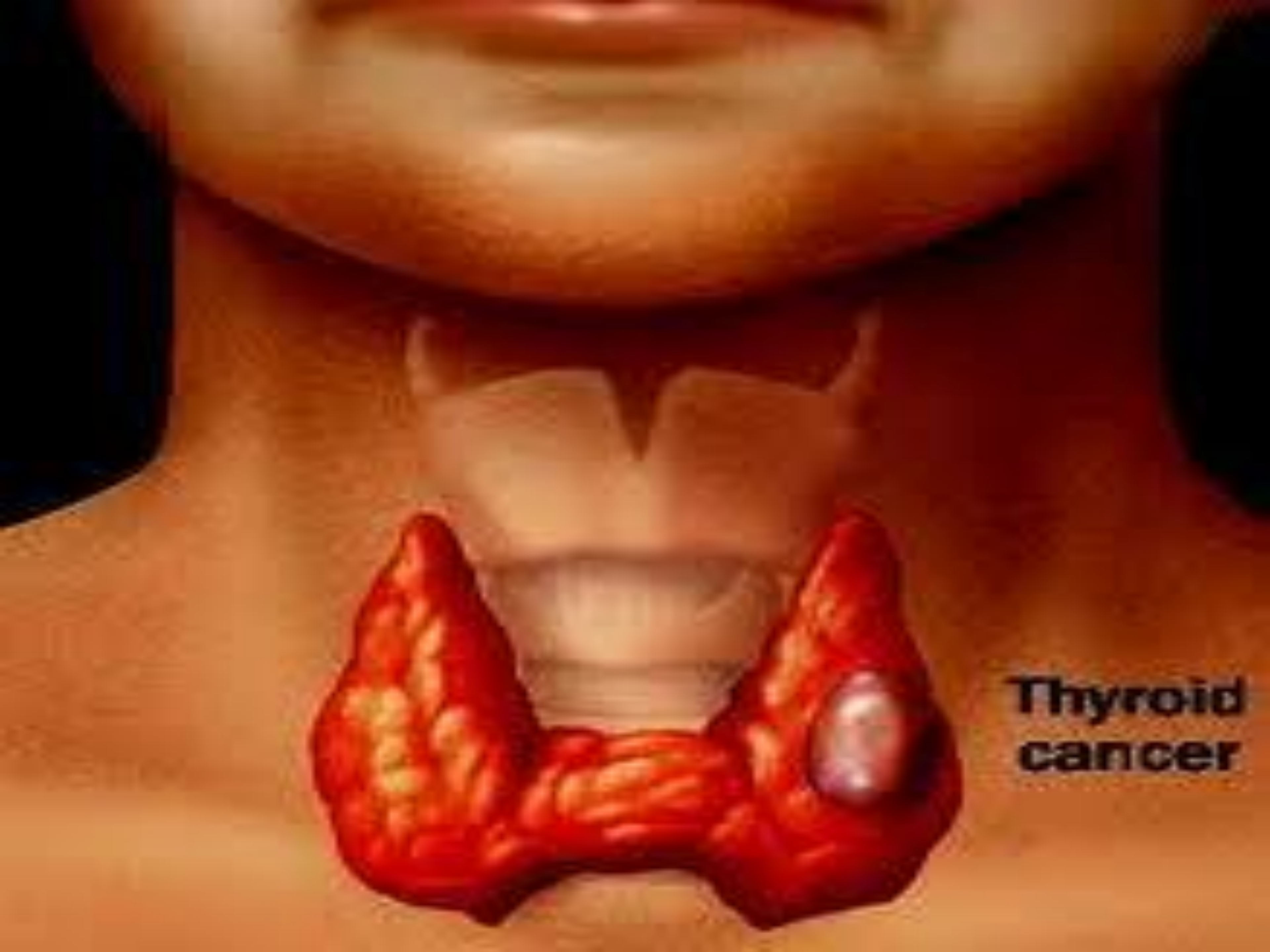
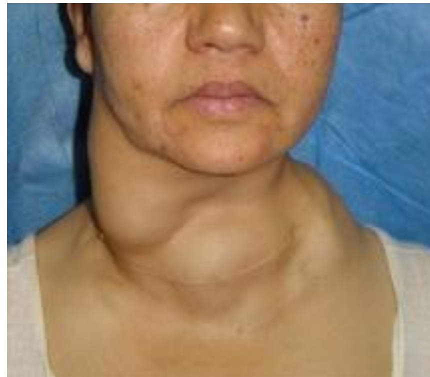

Thyroid
cancer

Thyroid Cancer
or
Thyroid Carcinomas
or
Thyroid Nodules



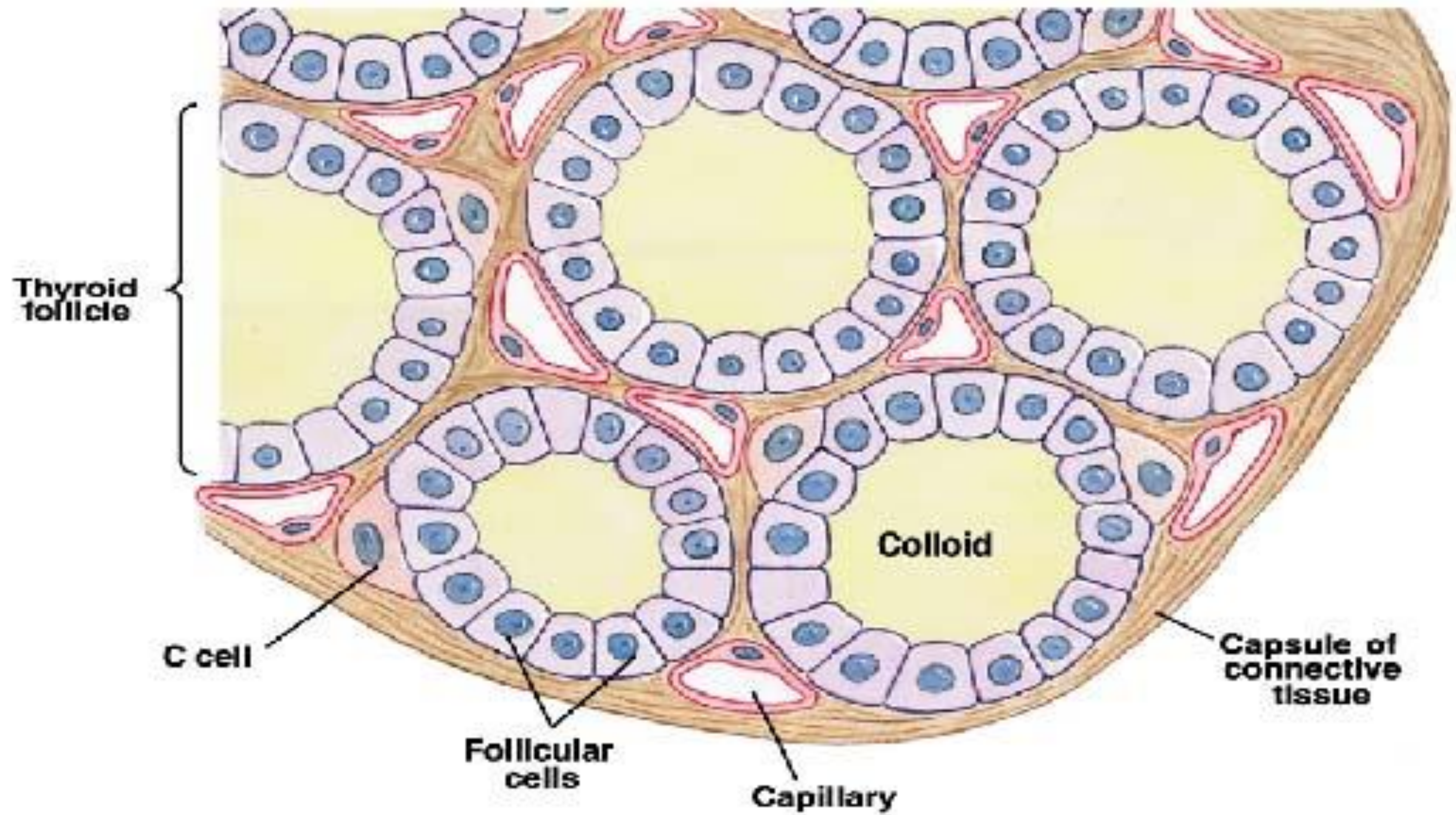
Introduction

- Accounts for 1.5% of all cancers
- Most common endocrine malignancy
- Around 22000 cases per year and around 1200 patients may die annually
- 90% having favorable prognosis
- Females are commonly affected

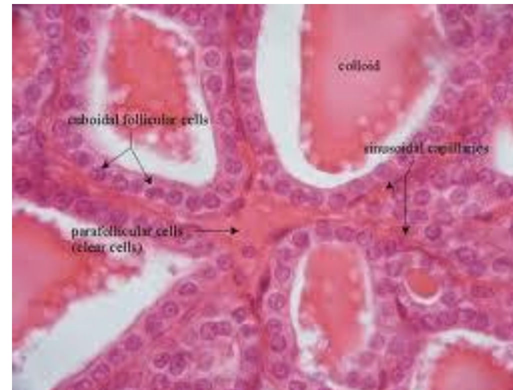
Introduction

- **Primary** are more common than secondary
- Most common malignancy of thyroid is **Papillary** carcinoma
- 10-20% of cold nodules are malignant
- Autoimmune thyroiditis may predispose malignant lymphoma
- Increased TSH stimulation in endemic goiter may predispose to follicular carcinoma
- Family history positive in medullary thyroid carcinoma

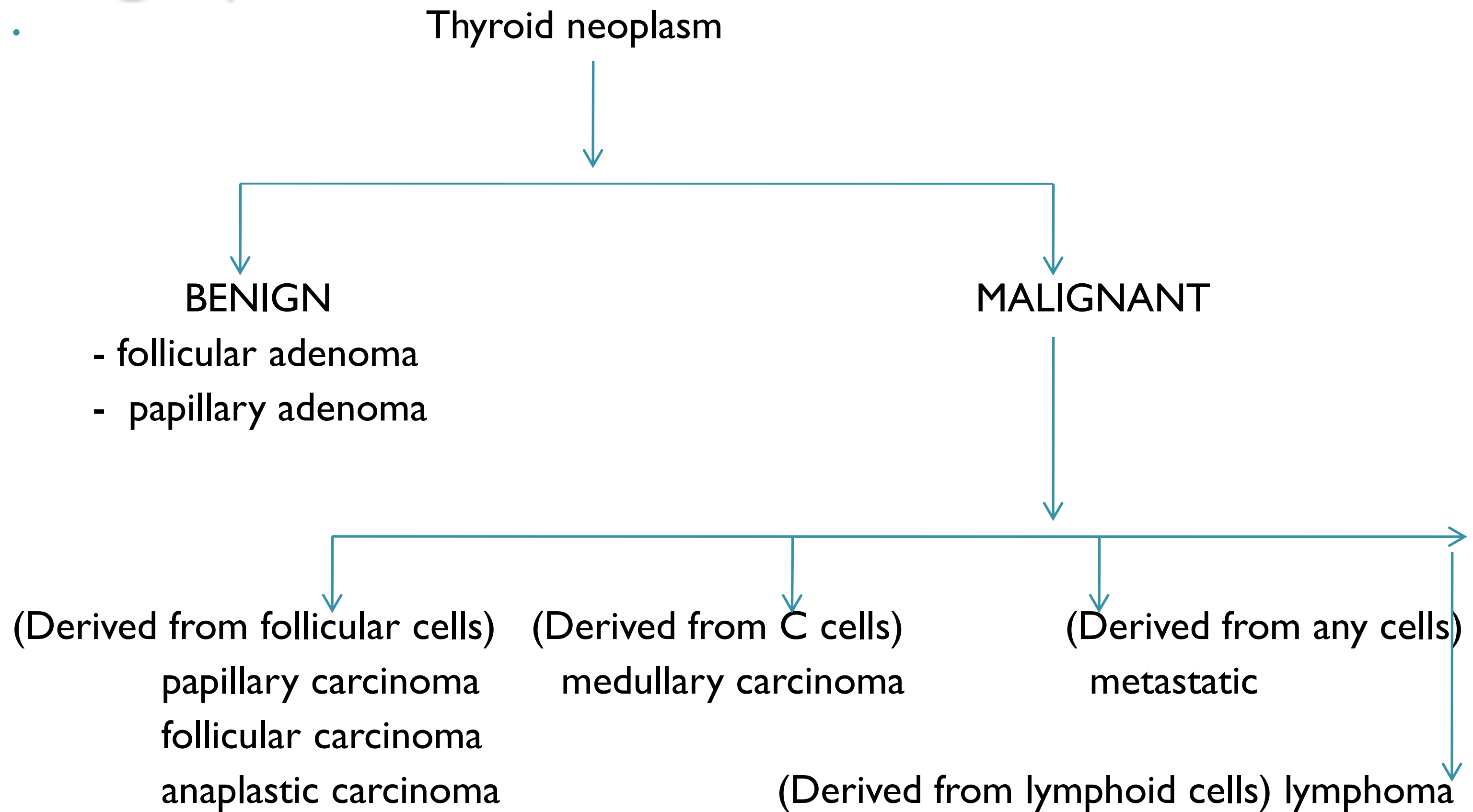
Thyroid gland



Normal histology of thyroid gland



Classification (depends on cells of origin)



Classification(depends on histology)

- **Differentiated thyroid cancer**
- -papillary
- -follicular
- **Undifferentiated thyroid cancer**
- -anaplastic

Classification(acc. to prevalence)

- Papillary thyroid cancer (75% to 85% of cases)
- Follicular thyroid cancer (10% to 20% of cases)
- Medullary thyroid cancer (5% to 8% of cases)
- Anaplastic thyroid cancer (Less than 5%)

TNM Classification

- **Primary tumor (T)**
- **TX**- Primary tumor cannot be assessed
- **T0**- No evidence of primary tumor is found
- **T1**-Tumor size ≤ 2 cm in greatest dimension and is limited to the thyroid
- **T1a**-Tumor ≤ 1 cm, limited to the thyroid
- **T1b**-Tumor > 1 cm but ≤ 2 cm in greatest dimension, limited to the thyroid
- **T2**-Tumor size > 2 cm but ≤ 4 cm, limited to the thyroid.
- **T3**-Tumor size >4 cm, limited to the thyroid or any tumor with minimal extrathyroidal extension (eg, extension to sternothyroid muscle or perithyroid soft tissues)
- **T4a-**Moderately advanced disease; tumor of any size extending beyond the thyroid capsule to invade subcutaneous soft tissues, larynx, trachea, esophagus, or recurrent laryngeal nerve
- **T4b**-Very advanced disease; tumor invades prevertebral fascia or encases carotid artery or mediastinal vessel
- *All anaplastic carcinomas are considered stage IV:*
- T4a-Intrathyroidal anaplastic carcinoma
- T4b-Anaplastic carcinoma with gross extrathyroid extension

Regional lymph nodes (N)

- *Regional lymph nodes are the central compartment, lateral cervical, and upper mediastinal lymph nodes:*
- NX-Regional nodes cannot be assessed
- N0-No regional lymph node metastasis
- N1-Regional lymph node metastasis
- N1a-Metastases to level VI (pretracheal, paratracheal, and prelaryngeal/Delphian lymph nodes)
- N1b-Metastases to unilateral, bilateral, or contralateral cervical (levels I, II, III, IV, or V) or retropharyngeal or superior mediastinal lymph nodes (level VII)

Distant metastasis (M)

- M0-No distant metastasis is found
- M1-Distant metastasis is present

Risk factors

- **Radiation** –high dose x-rays or radioactive fallout during childhood
- **Family history**
- -goiters
- -mutation
- **Gender** –females
- **Iodine level-** low level favors malignancy
- **Seafood/shellfish consumption**

Genetic Causes :

- **MUTATION:**
- 1)**Chromosomal translocation**
- -RET proto-oncogene
- - NTRK1
- 2) **Point mutation**.
- - BRAF oncogene

Diagnosis

- History , physical examination
- And evaluation is must

Clinical features:general

- Goiter –painless , palpable , nodules
- Euthyroid
- Pressure symptoms like dysphagia,dyspnoea,RLN palsy, dilated veins in the neck
- Hard , fixed cervical LN
- Pathological fractures due to metastasis
- Paraplegia

Papillary carcinoma

- Most common type
- Age –less than 35 years
- Sex – more in females
- Causes –post-irradiation and following thyroglossal cyst
- Lymphatic spread is more common than hematogeneous spread
- The so-called Lateral aberrant thyroid is actually a lymph node metastasis from papillary thyroid carcinoma

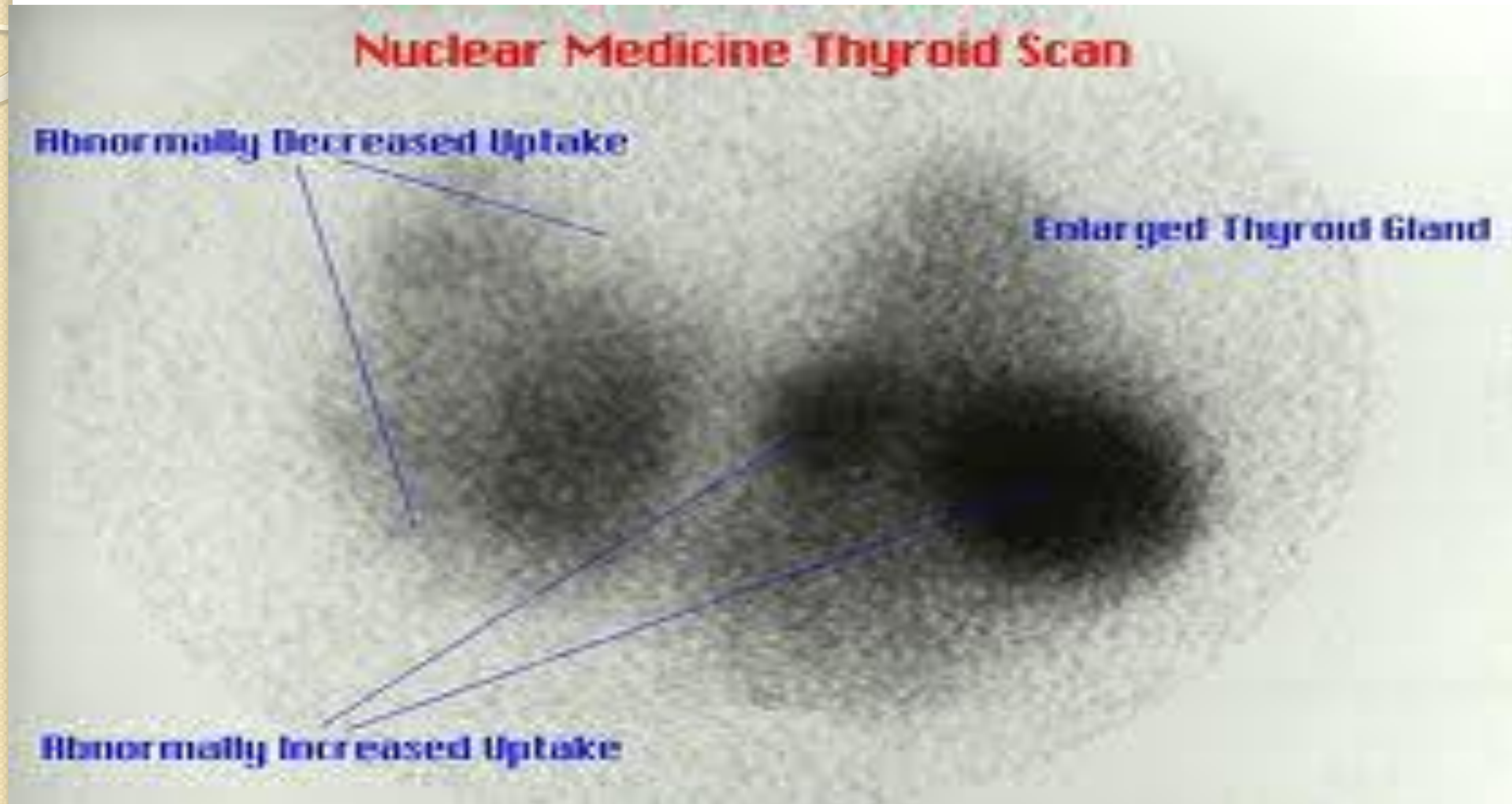
DIAGNOSIS

- FNAC
- Most important Diagnostic tool.

- USG
- Either cystic or solid

Scan

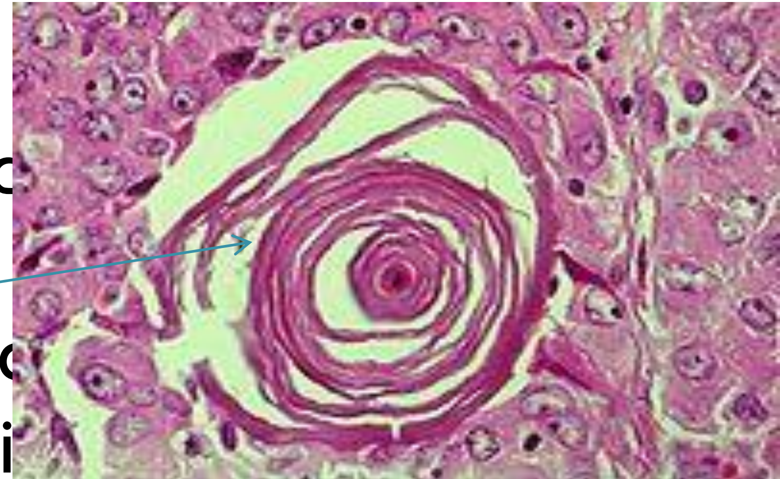
- THYROID SCAN-cold or hot nodules

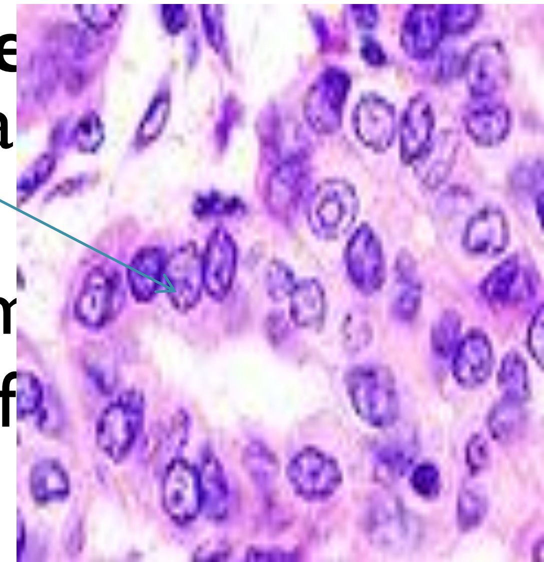


- CHEST XRAY FOR METASTASIS

Continue….

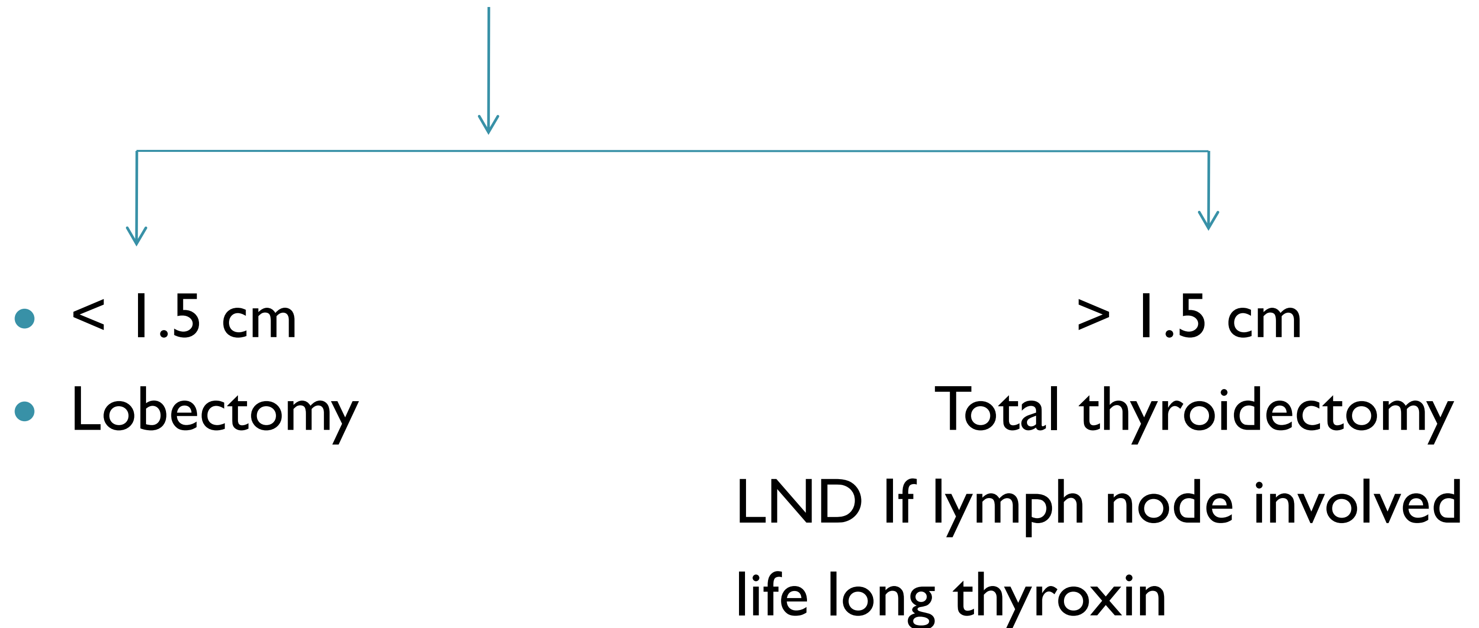
- Diagnosis –FNAC
- Mixture of papillary anc
- filled follicles
- **Psammoma bodies**(c
- layer of calcium deposi
- **Orphan Annie –eyed nucle** with uniform staining, which a
- **Occult carcinoma**
- **(micro adenoma)**- is a term
- for all papillary carcinoma of
- than 1.5 cm size





Treatment

- Depending on size



- < 1.5 cm
- Lobectomy

> 1.5 cm

Total thyroidectomy

LND If lymph node involved

life long thyroxin

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- No role for prophylactic LND
- ^{131} I may be used
- Prognosis is good
- Prognosis depends on several index like
- **MACIS**
- Follow up –thyroglobulin is tumor marker
- Post op complications
- -respiratory stridor
- -tracheomalacia(scabbard's trachea)
- -laryngeal edema
- -hypocalcaemia

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Different thyroid surgeries

- **1)Hemi-thyroidectomy :**
- -lobectomy with isthumectomy
- 2)**Subtotal thyroidectomy**
- -it leaves a rim of thyroid tissue bilaterally,ensuraning parathyroid viability
- 3)**Near total thyroidectomy:**
- Complete dissection on one side while leaving a remnant of thyroid tissue laterally on the contralateral side which incorporate the parathyroids
- 4)**Total thyroidectomy:**
- Complete removal of virtually all visible thyroid tissue bilaterally
- NOTE-in 3) and 4), pt is given l-thyroxin 0.1 to 0.2 mg /day for replacement.
- -

THYROID SURGERY POST-OP Cx

- THYROTOXIC CRISIS/ THYROID STORM→
- Cause- poor pre-op prep
- S/S- exacerbation of hyperthyroidism- warmness, fibrillation etc
- Rx-
  - Cool pt with ice packs
  - O2
  - IV Fluids
  - Sedation
  - IV Hydrocortisone
  - Digoxin/ DC shock for fibrillation
  - Diuretics for CCF
  - Carbimazole 10-20 mg 6 hrly
  - Propranolol 40 mg 6 hrly/ inj 1-2 mg
  - Iodine- Lugole's 10 drops 8 hrly / Na iodide tabs 1gm

FOLLICULAR CARCINOMA

- Age -40-60 years
- 3 times more common in female
- More common in long lasting endemic goiter
- Spread is hematogeneous-to distant sites such as bone(osteolytic),lung and liver.
- Regional lymph nodes are not involved.
- Capsule invasion-most reliable criteria for malignancy
- Can not be differentiated adenoma from carcinoma with FNAC

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Treatment

- Near Total thyroidectomy
- If LN are affected then these should be dissected. otherwise not.
- Good response to radioiodine.
- ^{131}I may be used in case of metastasis
- External radiation in case of trachea or esophagus involved
- Suppressive thyroid hormone therapy is advocated for rest of life.

Hurthle cell carcinoma

- A variant of follicular carcinoma
- Some are benign and some are malignant
- Malignant with invasion and nodal spread
- High rate of mortality and recurrence
- Treatment is total thyroidecomy if malignant
- Lobectomy if benign

Medullary carcinoma

- originates from the para follicular cells (C cells), which produce the hormone calcitonin.
- non follicular histological appearance but solid composed of solid mass of cells.
- familial and sporadic
- AGE-from children to old age.
- familial case if it is in early 20.
- Equal sex incidence
- C cell hyperplasia is precurser for MCT.

Clinical features

- Present with single or multiple nodule
- Produce local pressure symptoms like dysphagia,dyspnoea and hoarseness(only 10% cases)
- Cervical lymphadenopathy
- Major clinical symptom is diarrhoea due to increased level of 5HT and PGE2 which leads to increased motility and impaired absorption of water and electrolyte imbalance.
- Kidney stone sometimes due to HPT.

Diagnosis

- Serum calcitonin level measured by radioimmunoassay.
- Pentagastrin stimulation test
- CT Scan for other associated malignancy like pheochromocytoma
- 24 hour urinary total catecholamines,metanephrins or vanillyl mandelic acid(VMA)level for pheochromocytoma
- Serum calcium level

Familial medullary carcinoma

- Bilateral
- 28-30% show familial nature.
- Transmitted as autosomal dominant
- May be associated with MEN-II Syndrome
- **MEN-II A (Sipple syndrome)**
- -pheochromocytoma
- -hyperparathyroidism
- Familial medullary carcinoma
- **MEN-II B (Mucosal neuroma syndrome)**
- Same as A but associated with mucosal carcinoma of lip,tongue,conjuctivae .

Medullary carcinoma:

- Amyloid stroma present in histology
- High level of serum Calcitonin present and it is also used for follow up
- Spread is hematogeneous-to distant sites such as bone(osteoblastic),lung and liver.
- Regional lymph nodes are involved.

Treatment:

- is total thyroidectomy and lymph node dissection
- In case of incomplete resection recurrence is common
- No role of radioiodine or external radiation and thyroxin therapy.
- If ca+ level is high subtotal parathyroidectomy.(removing 3 ½ glands)
- Adriamycin (chemotherapy) lead to remission
- Vandetanib became the first drug to be approved by US FDA for treatment of late-stage (metastatic) medullary thyroid cancer in adult patients who are ineligible for surgery.

Continue…

- In case of familial MCT,bilateral total adrenalectomy may be necessary.
- Life long glucocorticoid and mineralocorticoid postoperatively.

Anaplastic carcinoma

- Common in old age over 50 year of age
- May develop from previous nodular goiter and/or from preexisting well differentiated thyroid carcinoma
- Not encapsulated
- Presence of mitosis is characteristic
- Presence of painless thyroid nodule,
- gland is fixed,
- consistency -hard and
- show poor movement on swallowing
- Spread by both lymphatic and blood
- Local infiltration is early feature.

Treatment

- Resection(surgery) is advised if no infiltration is there
- As the disease is in advance stage at diagnosis, usual treatment is radiotherapy(external radiation only) and chemotherapy(adriamycin or combination of chlorambusil,adriamycin and vincristine)
- **Worst prognosis** ,death usually occur within months or before 1 year.

Metastatic or secondary

- 2-4% have this type of metastasis
- Most common primary are
- -bronchogenic carcinoma
- -hypernephroma
- -breast and colon carcinoma
- -melanoma

Complication if untreated

- Hemorrhage or hematoma
- Respiratory obstruction
- -tracheal compression
- -Laryngeal edema
- -bil.vocal cord palsy
- RLN palsy
- Hypoparathyroidism
- Thyroid crisis
- Hypothyroidism
- Perforation of trachea

Any question?

Thank You