

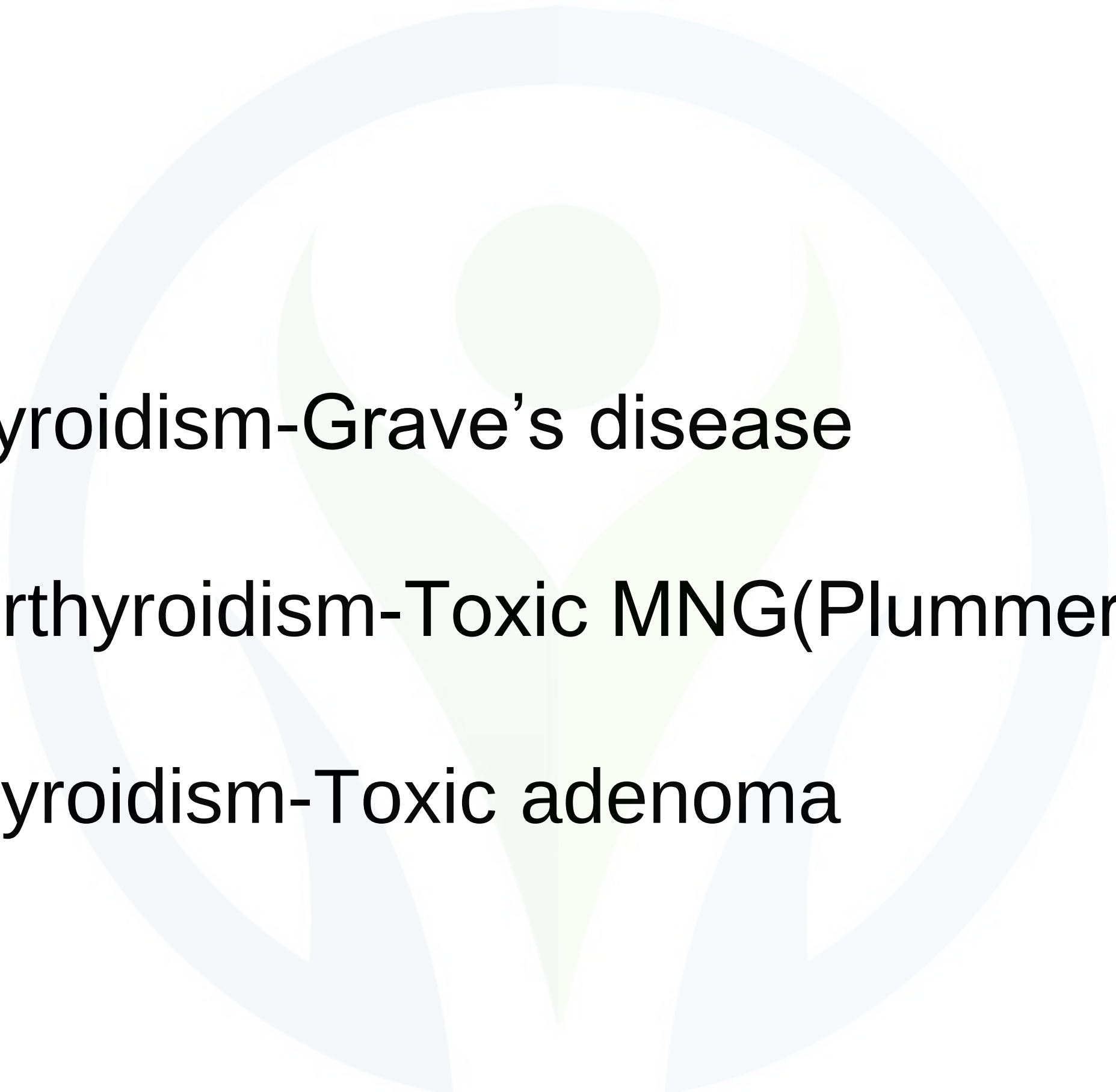
The logo for GP GUIDES is a circular emblem. It features a light blue outer ring. Inside this ring, there are two stylized, leaf-like shapes pointing upwards and outwards, one in light green and one in light blue. In the center of the emblem is a small, solid light green circle.

THYROID AND PARATHYROID

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Q A 30 year old female presented with complaints of swelling in front of neck since 3 months with protrusion of eyes and loss of 5 kgs of weight in spite of good appetite. She also complained of reduced sleep. Examination showed a staring look with diffuse swelling in front of neck which moved with deglutition. Her pulse rate was 106/mt

- a. What is the probable diagnosis?
- b. How do you investigate.
- c . Thyroid storm
- d. Dosage of Carbimazole

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- Primary hyperthyroidism-Grave's disease
 - Secondary hyperthyroidism-Toxic MNG(Plummer's disease)
 - Teritiary hyperthyroidism-Toxic adenoma

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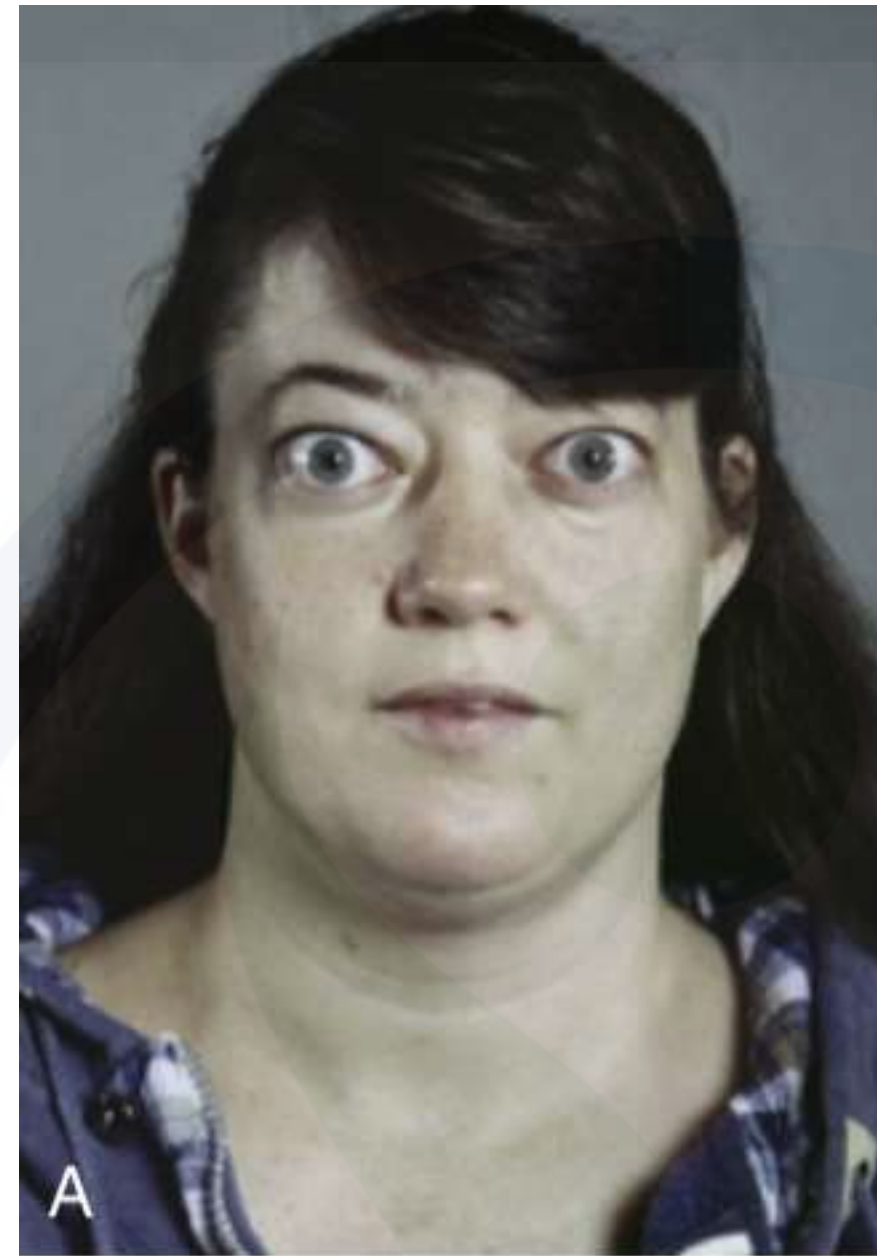
Grave's disease

- Autoimmune disease
- Strong familial predisposition
- F>M
- Diffuse thyroid enlargement +extra thyroidal manifestations

Ophthalmopathy

Dermopathy

Acropachy



INVESTIGATIONS

- **TFT**

Low TSH $\pm$ elevated T3/T4

- **Anti TSH R antibodies**

- **Anti Thyroglobulin**

- **Anti TPO antibodies**

Radio active iodine scan or Tc 99 scintigraphy

- Graves' disease-Diffuse enlargement
- Toxic MNG-increased uptake in nodules and suppression of surrounding gland
- Toxic adenoma-hot nodule with suppression of surrounding gland

Thyroid storm

Life threatening condition characterised by severe clinical manifestations of thyrotoxicosis.

Precipitating factors

- Trauma
- Infection
- Parturition
- Surgery on untreated or poorly managed hyperthyroidism

- Hyperpyrexia
- CVS/GI dysfunction
- Altered mental status

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- General measures-antipyretic,oxygen supplementation,correction of dehydration,intensive monitoring
- B blockers-propranolol,oral or IV can be given to control manifestations of increased adrenergic activities
- Anti thyroid drugs-PTU/Methimazole can be used to block de novo synthesis.
- Steroids-decrease peripheral conversion of T4 to T3

Carbimazole

- Dose is 1mg/kg
- 30-40mg/day once daily
- TFT done every month
- Control by 3months

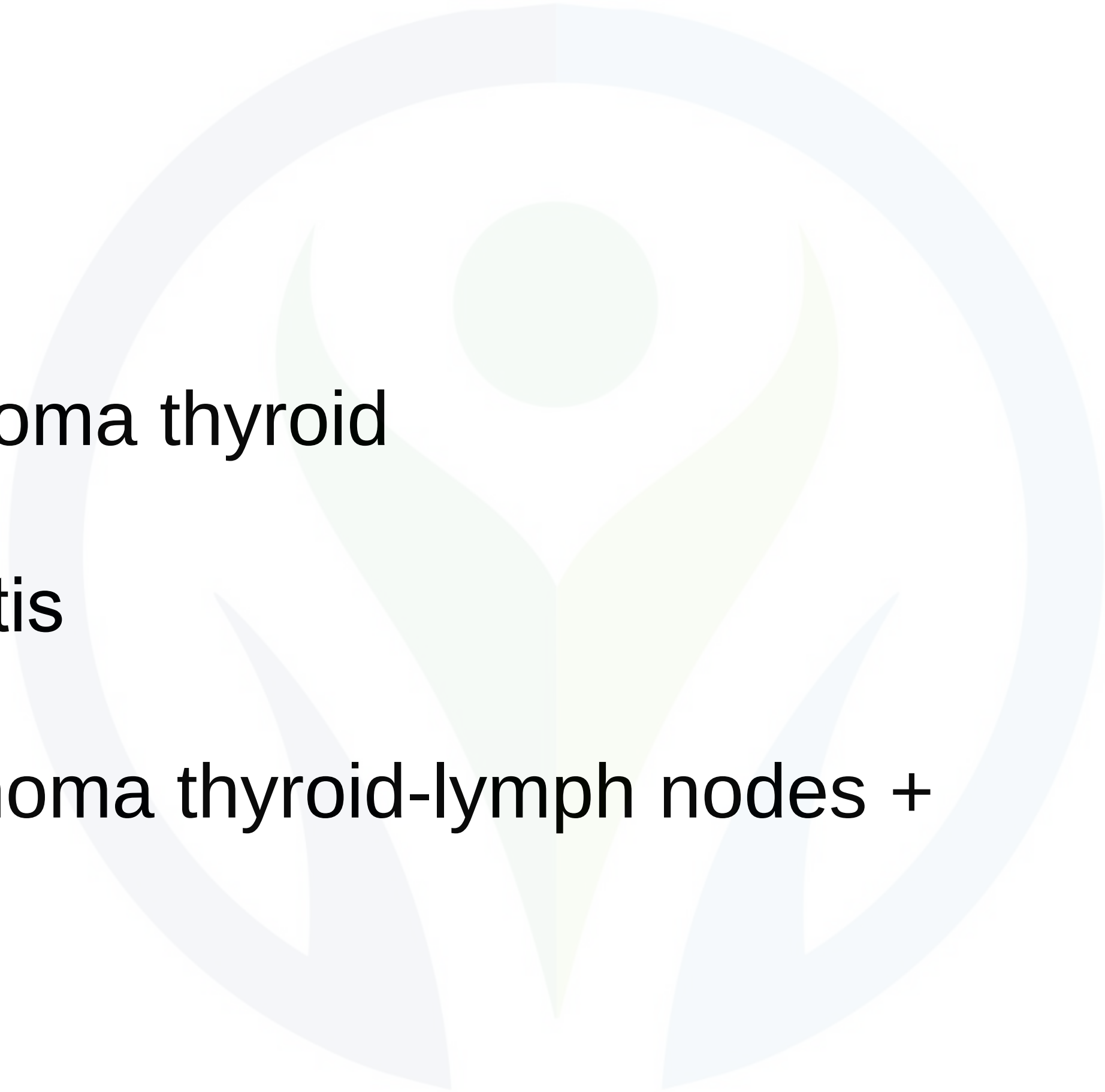
A 25 yr old gentleman presented to the surgical o.p. with a swelling front of neck at its right side of 4x3 cms size moving well with deglutition having well defined borders and uniformly hard consistency. Ipsilateral side level II and III hard lymphadenopathy of size 1,5 cm x 1cm noted with restricted intrinsic mobility.

- a) What is the most probable clinical diagnosis? Enumerate two points in favour of this diagnosis.
- b) Mention one most probable differential diagnosis of the scenario with only little difference in presentation, mentioning points in favour of this differential diagnosis. Enumerate 2 more differential diagnosis of this scenario, contrasting in its presentation by the absence of lymphadenopathy
- c) Discuss the investigations and management
- d) Briefly describe the complications of surgery and the protocol of follow up of this patient

- Papillary carcinoma thyroid
- Hard thyroid swelling
- Lymph nodes
- Age

Follicular carcinoma thyroid

- Hard thyroid swelling
- Lymph node involvement is less common
- Pulsatile bony mets mainly in skull and flat bones like ribs, sternum, scapula

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- Anaplastic carcinoma thyroid
 - Reidel's thyroiditis
 - Medullary carcinoma thyroid-lymph nodes +

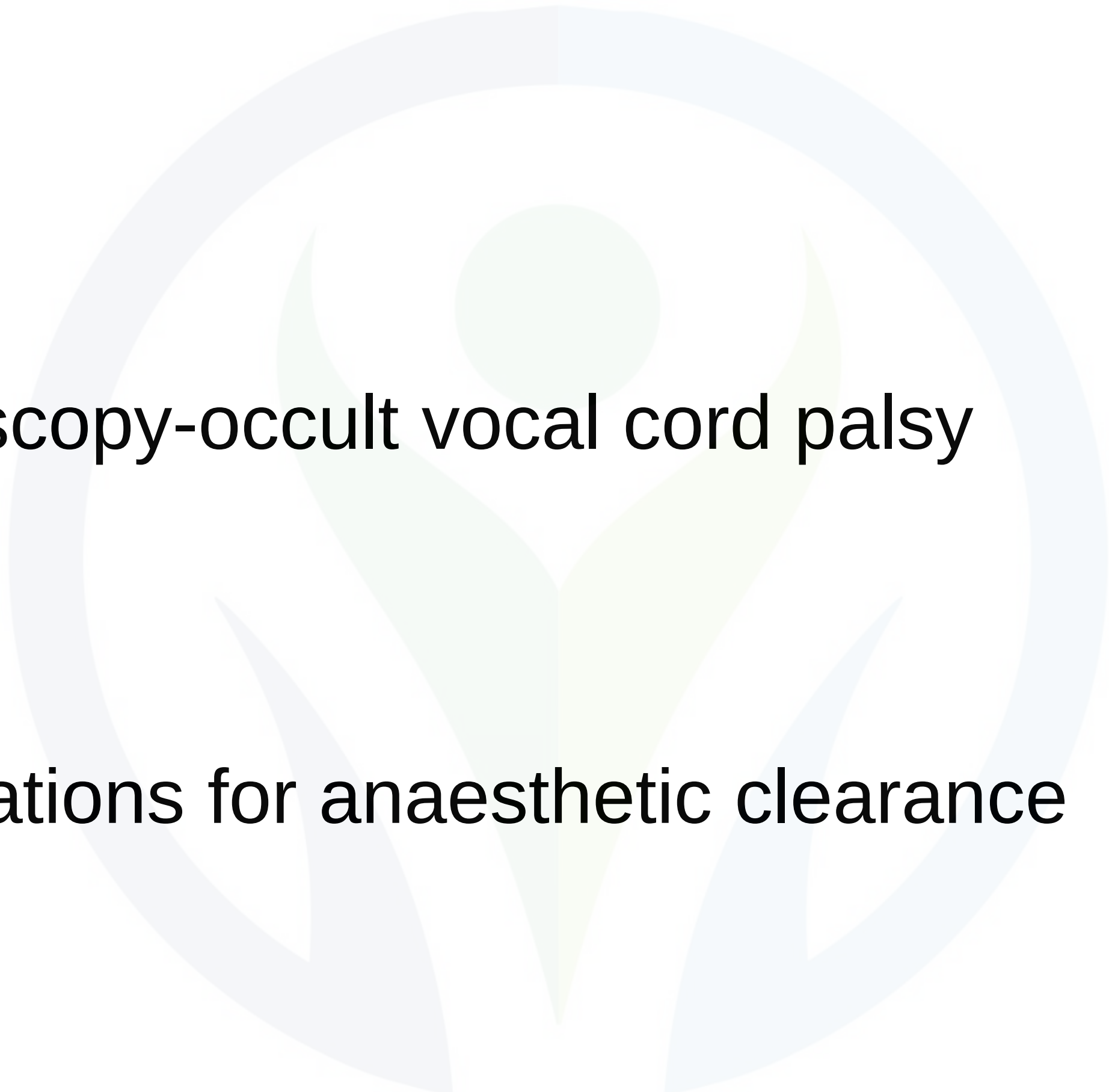
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Imaging

- The most important imaging modality for surgical planning is comprehensive thyroid ultrasound with lymph node mapping of the bilateral central and lateral neck lymph nodes.
- Preoperative ultrasound is the most sensitive test for the characterization of thyroid nodules as well as identification of pathologic lymphadenopathy.
- CECT NECK-Done for staging.
- Symptoms like voice changes, dysphagia, respiratory symptoms such as cough or hemoptysis, as well as palpable evidence of rapidly enlarging, bulky, and/or fixed disease on physical exam.

FNAC

DIAGNOSTIC CATEGORY (BETHESDA NUMBER)	RISK OF MALIGNANCY IF NIFTP $\neq$ CANCER
Nondiagnostic or unsatisfactory (I)	5%–10%
Benign (II)	0%–3%
AUS/FLUS (III)	6%–18%
FN/SFN (IV)	10%–40%
Suspicious for malignancy (V)	45%–60%
Malignant (VI)	94%–96%

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- Indirect laryngoscopy-occult vocal cord palsy
 - TFT
 - Routine examinations for anaesthetic clearance

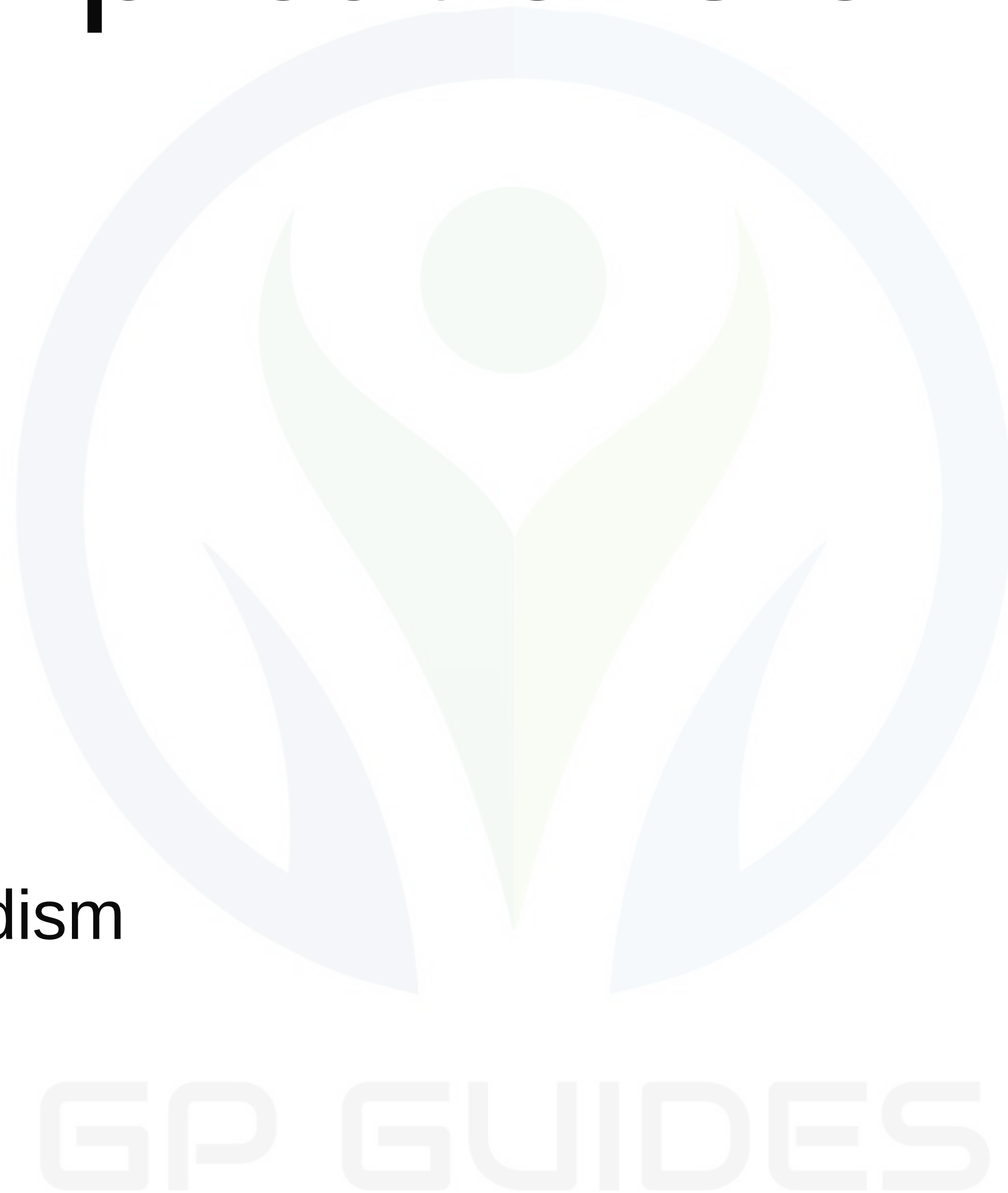
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Management

- Total thyroidectomy
- The most relevant nodal stations for thyroid cancer include the central compartment (level VI and VII), and the lateral compartments containing the jugular groups (levels II, III, and IV) and the inferior posterior triangle (level Vb).
- Therapeutic lymph node dissection should be performed in patients with radiographic or clinical evidence of metastatic disease as determined either preoperatively or intraoperatively.
- The presence of ipsilateral central compartment nodal involvement warrants a level VI and VII dissection.
- The presence of lateral neck nodal metastases warrants both a central and lateral compartment-based neck dissection,

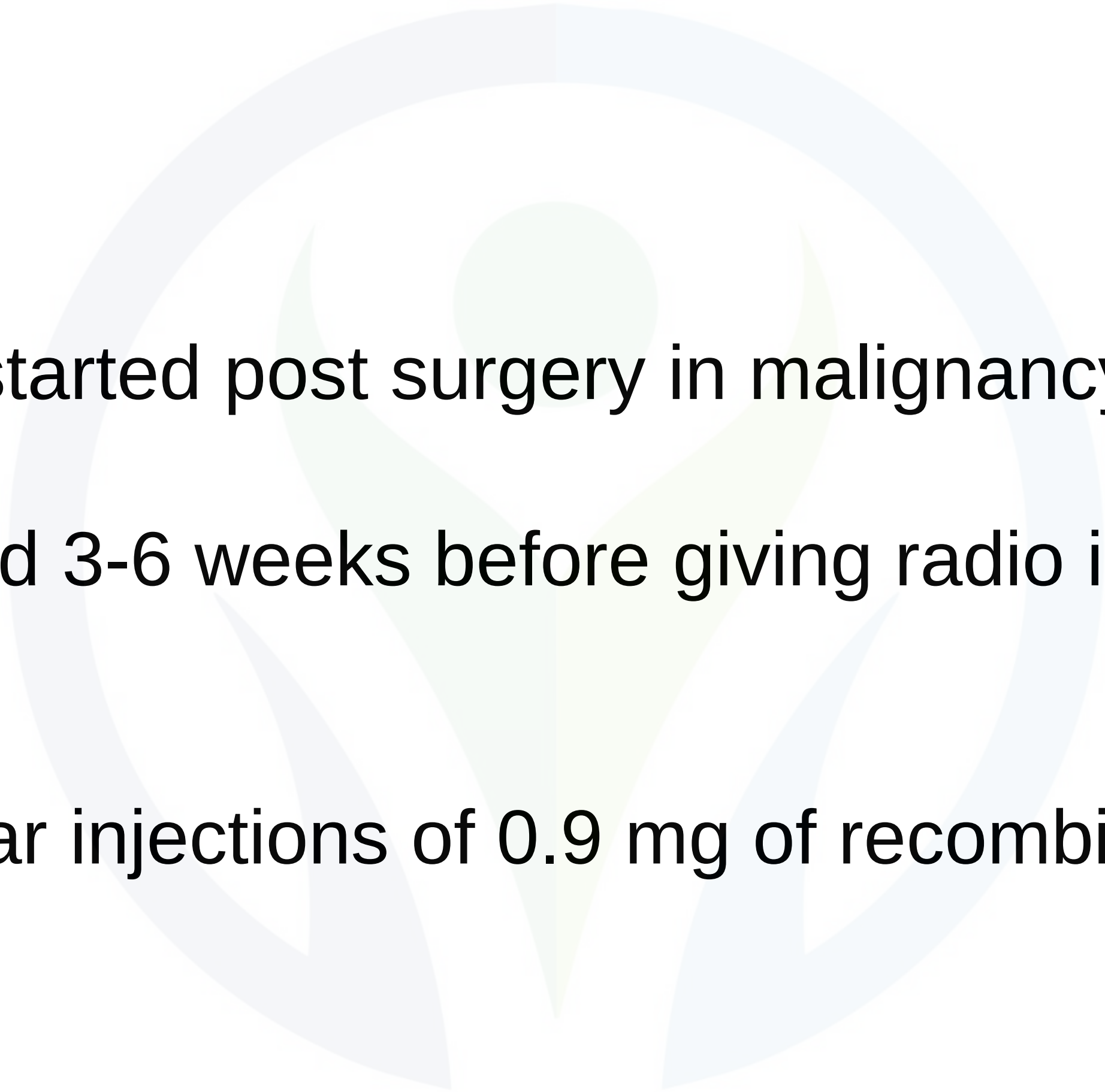
Complications of surgery

- Haemorrhage
- RLN Palsy
- Thyroid storm
- Hypoparathyroidism

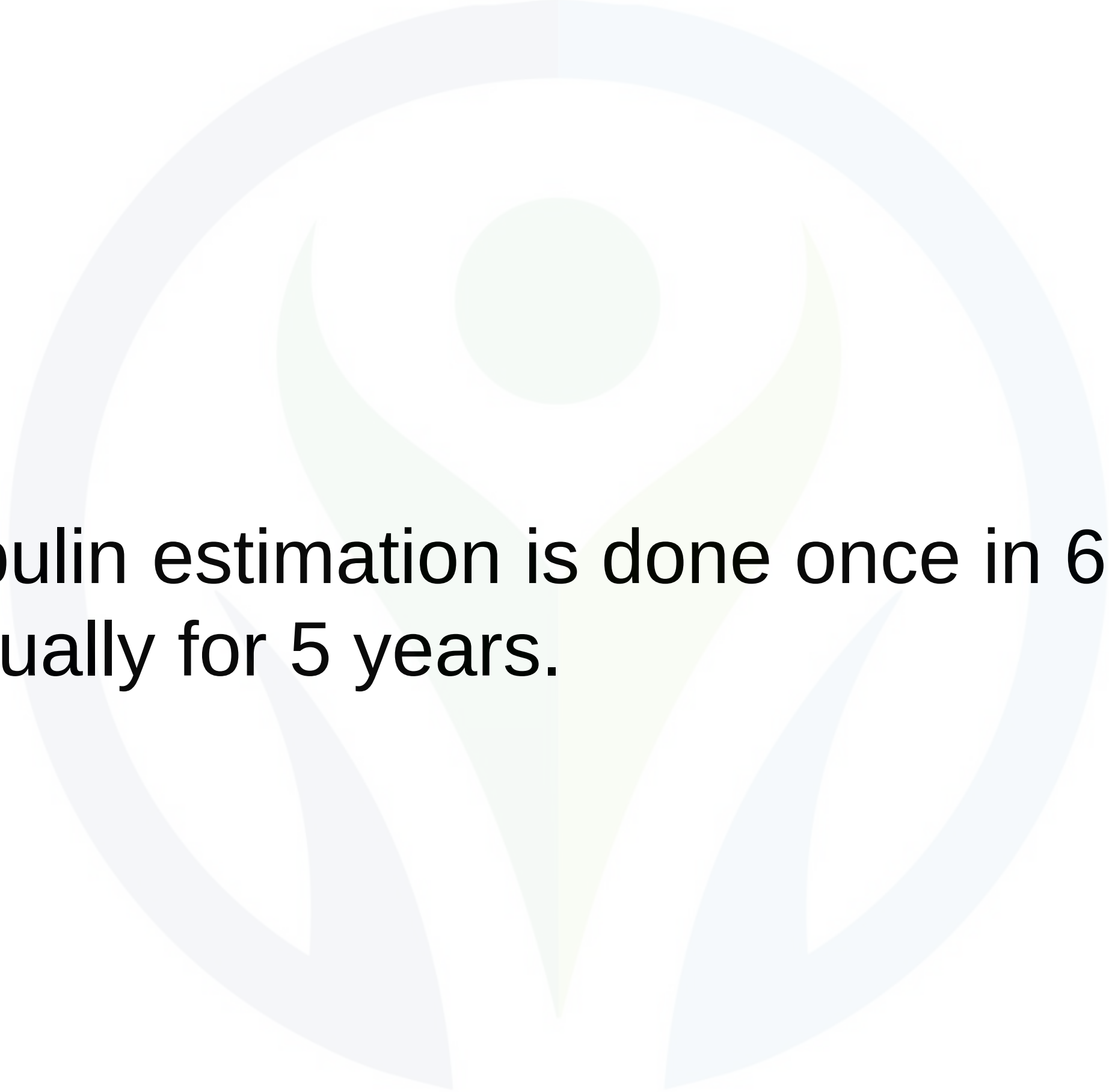


Follow up

- Radio iodine scan
- I123 -Diagnosis
- I 131-Both diagnostic and therapeutic

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- Thyroxin is not started post surgery in malignancy/suspected malignancy
 - If started stopped 3-6 weeks before giving radio iodine to make TSH more than 30M IU/L.
 - two intramuscular injections of 0.9 mg of recombinant human TSH

- If iodine isotope scan detects remnant disease, then 30-100 mCi of radio-ablation dose of 131 is given orally.
- RT will destroy occult microscopic disease.
- Post-ablation isotope scanning is done in 8 days.
- Later in intermediate and high risk patients, follow up body scan is done once in 6 months

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- Serum thyroglobulin estimation is done once in 6 months; neck US at 6, 12 months and annually for 5 years.

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Medullary carcinoma of thyroid - aetiology and surgical management

- 5% type of thyroid malignancy.
- It arises from the parafollicular 'C' cells which is derived from the ultimobranchial body.
- C cells are more in upper pole of the thyroid gland or at junction of upper 1/3rd and lower 2/3rd.
- In these patients blood levels of calcitonin is high, a very useful tumour marker.
- Tumour also secretes 5-HT (serotonin), prostaglandin, ACTH and vasoactive intestinal polypeptide (VIP).
- It spreads mainly to lymph nodes (60%)
- MCT is not TSH dependent and does not take up radioactive iodine.

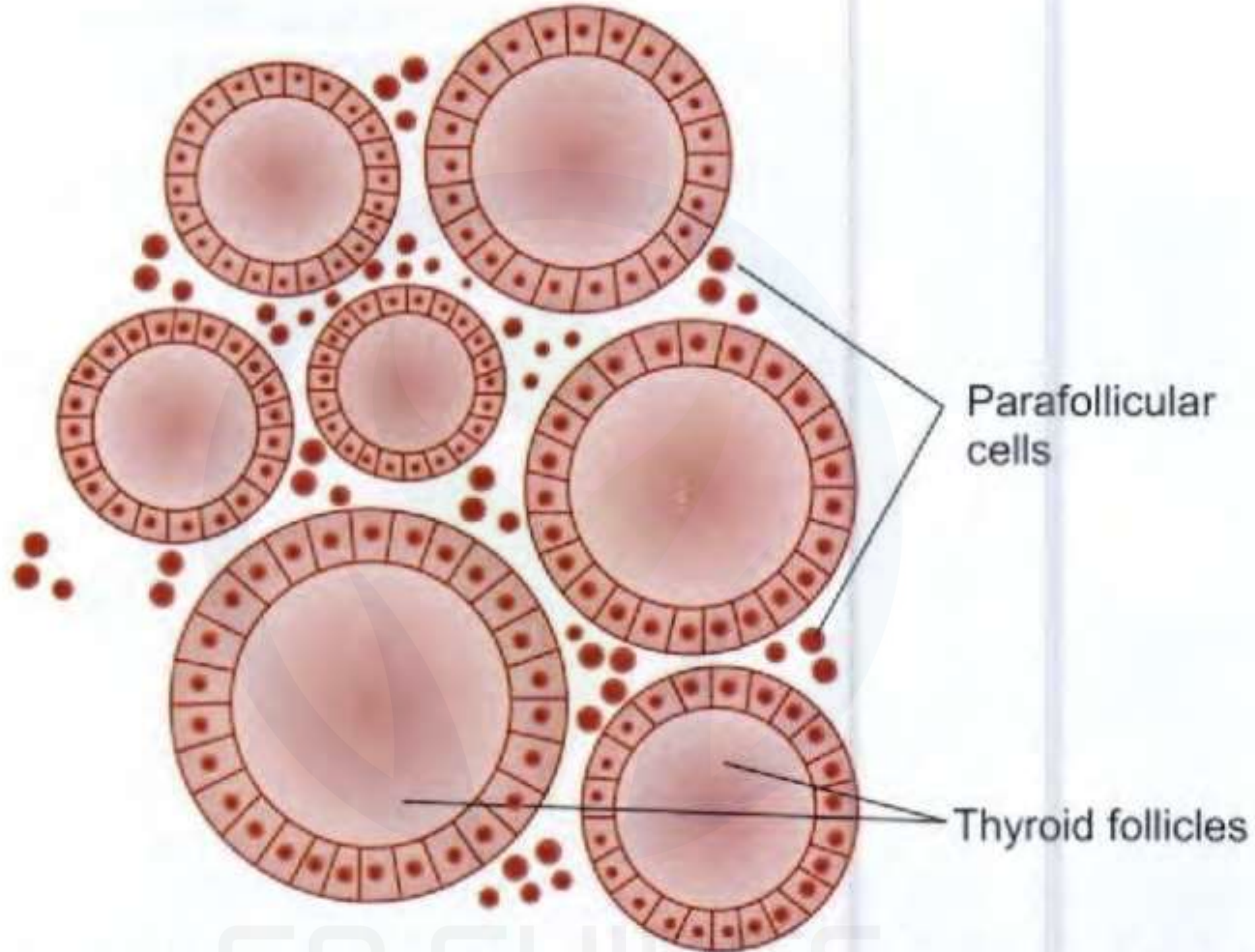
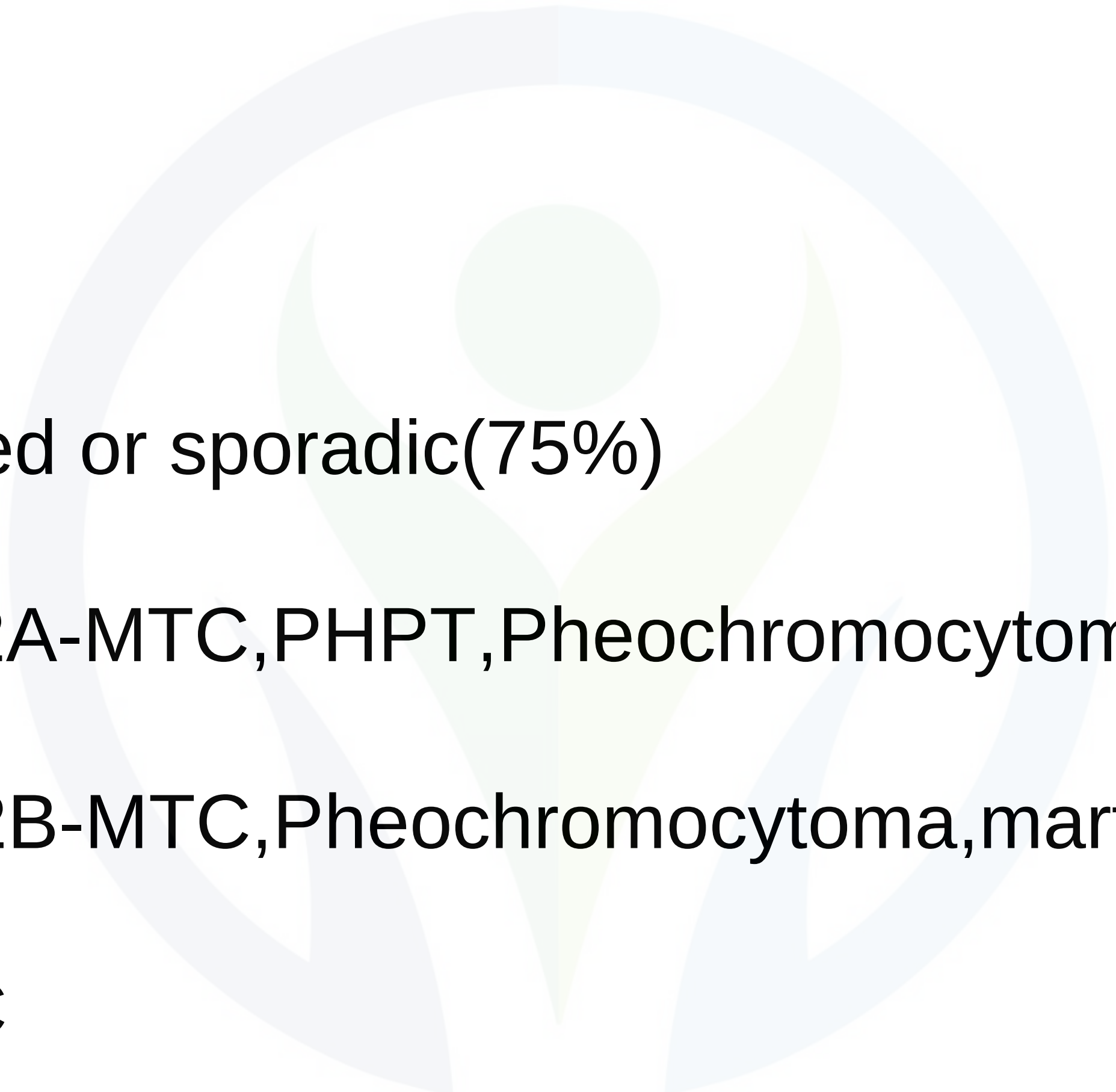


Fig. 6.52: Note the parafollicular cells. Cell of origin of medullary carcinoma thyroid.

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- It can be inherited or sporadic(75%)
 - Inherited-MEN 2A-MTC,PHPT,Pheochromocytoma

MEN 2B-MTC,Pheochromocytoma,marfanoid habitus

FMTC

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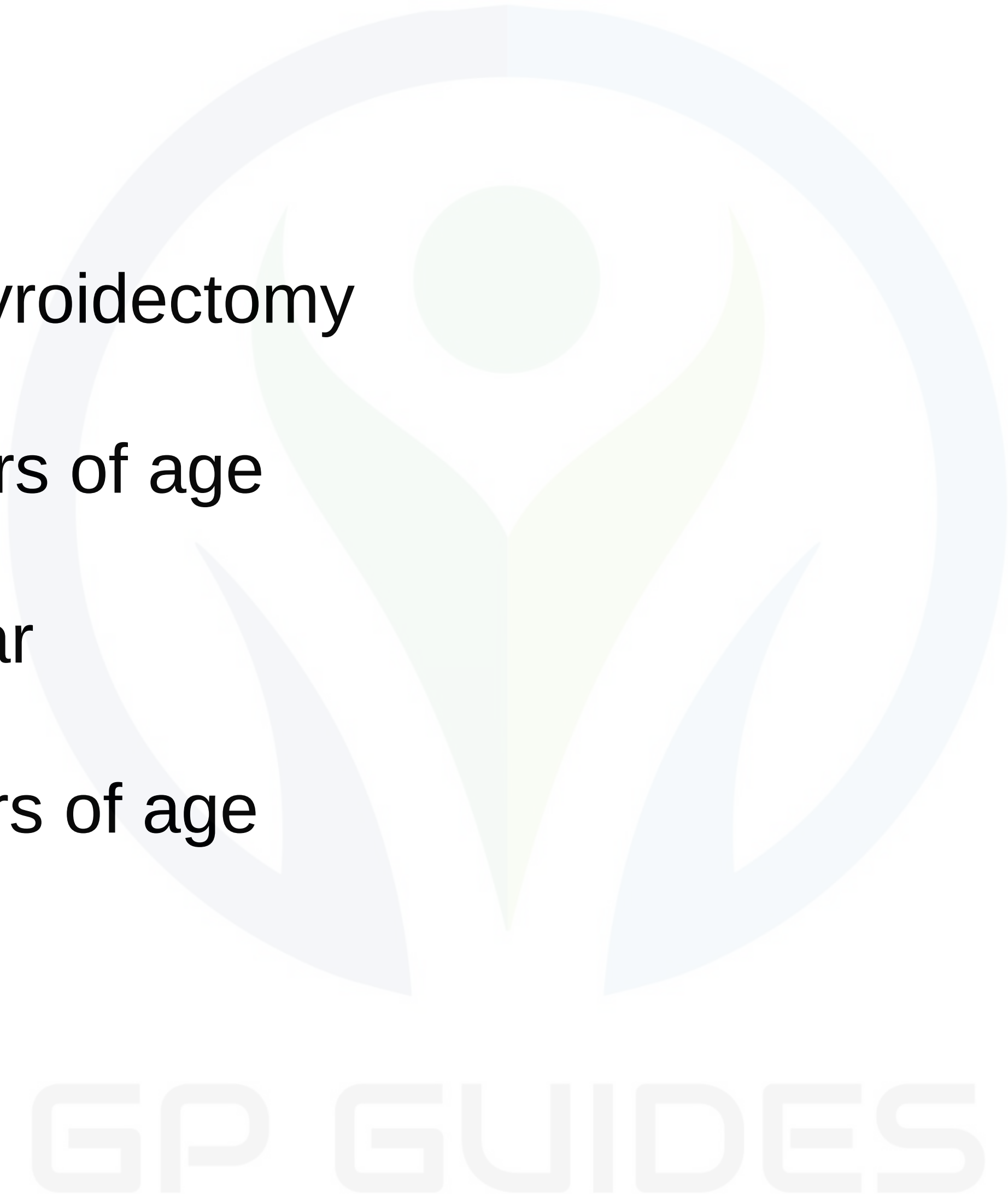
- F>M
- Neck mass with cervical lymphadenopathy; mass usually unilateral in sporadic and multicentric in familial.
- Pain
- Diarrhoea, flushing (30%)., HTN seen in asso with Pheochromocytoma
- Paraneoplastic syndrome like Cushing's and carcinoids.
- 50% of MCT spread to neck nodes, 15% have distant spread to liver, lung and bone.

Investigation

- Usg neck
- FNAC
- S.calcitonin- $>100\text{pg/ml}$
- S.CEA raised in 50% patients.
- Urine metanephrine
- S.Ca and PTH
- CECT NECK, THORAX, ABDOMEN

Treatment

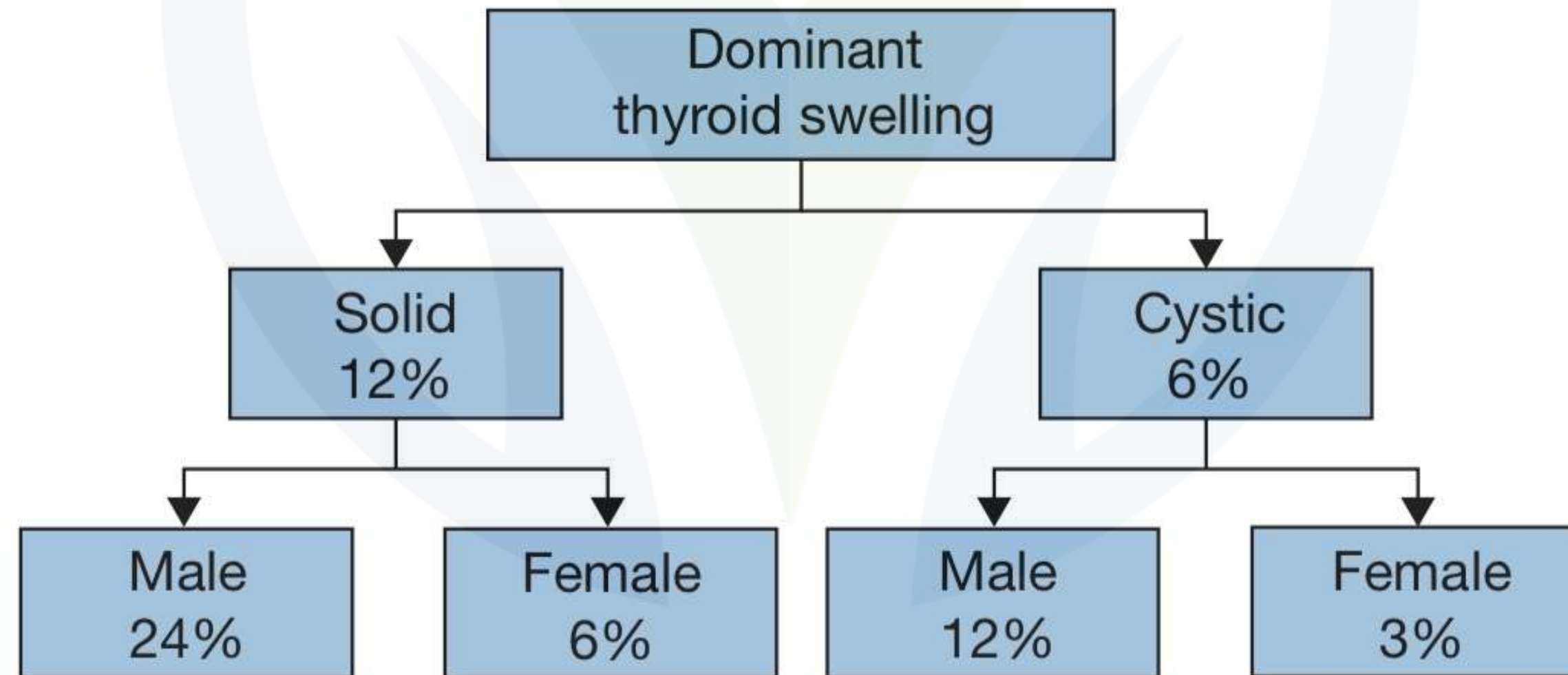
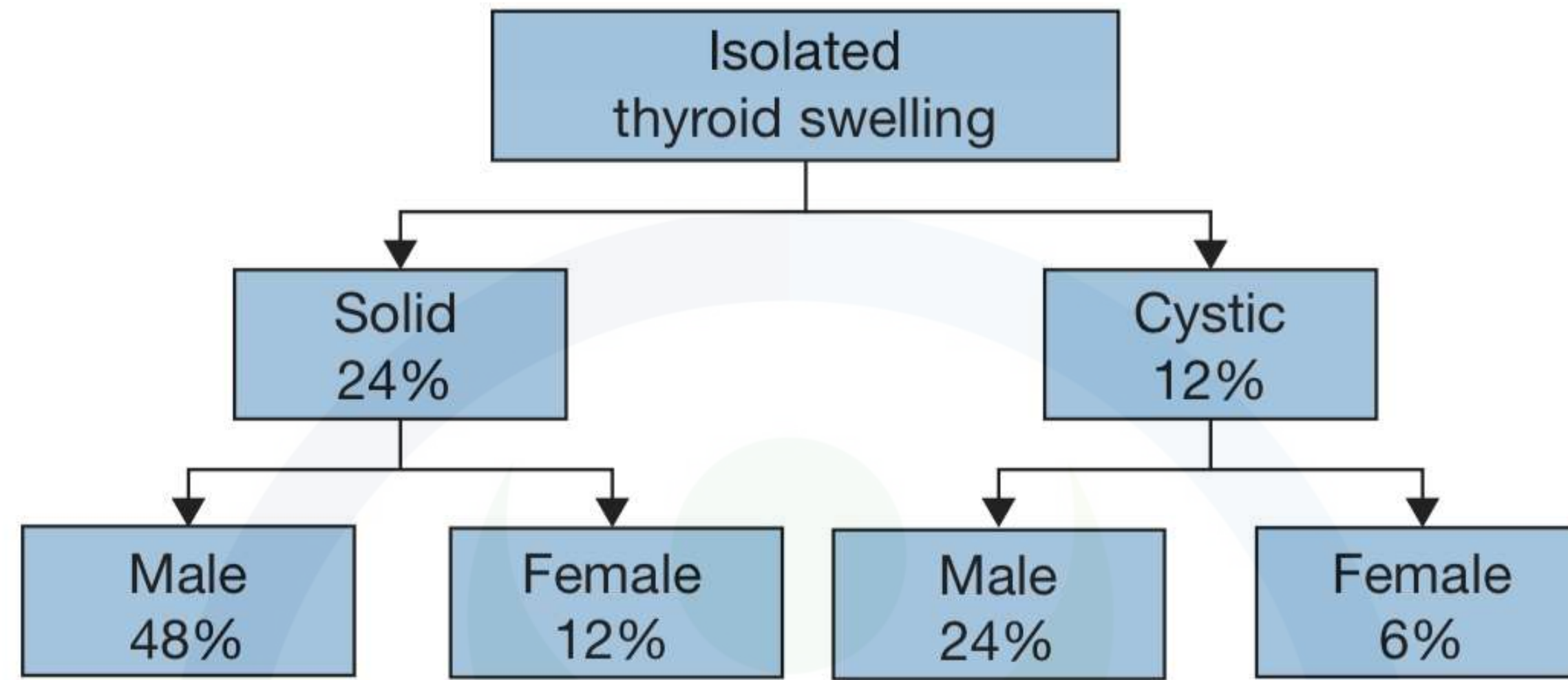
- Surgery is the main therapeutic modality.
- Total thyroidectomy with bilateral central node dissection and ipsilateral lateral neck dissection if primary tumour is > 1 cm or central nodes are positive.
- No role for RAI
- RT for unresectable/residual tumours.

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- Prophylactic Thyroidectomy
 - MEN 2A- <5 years of age
 - MEN 2B- <1 year
 - FMTC-5-10 years of age

Q. Rule of 12 in thyroid swelling



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Generalised thyroid swelling

Cl

Simple goitre (euthyroid)	Diffuse hyperplastic	• Physiological • Pubertal • Pregnancy
	Multinodular goitre	
Toxic	Diffuse (Graves' disease)	
	Multinodular	
	Toxic adenoma	
Neoplastic	Benign	
	Malignant	
Inflammatory	Autoimmune	Chronic lymphocytic thyroiditis Hashimoto's disease
	Granulomatous	de Quervain's thyroiditis
	Fibrosing	Riedel's thyroiditis
	Infective	Acute (bacterial thyroiditis, viral thyroiditis, 'subacute thyroiditis')
	Other	Chronic (tuberculous, syphilitic)
		Amyloid

rg

Radioisotope thyroid scan

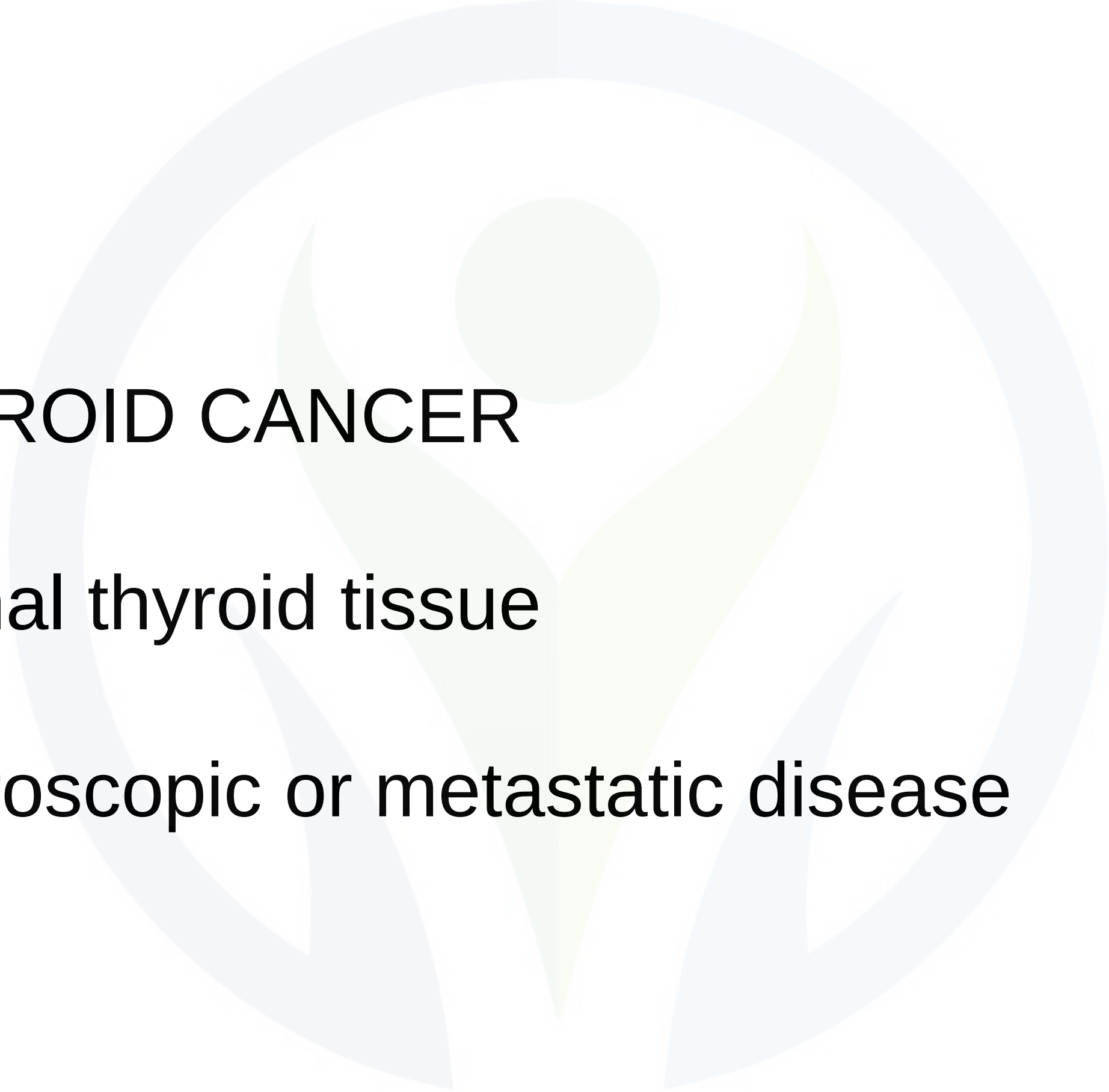
- I 123 and I 131

I 123	I 131
T half-13 hours	T half - 7-8 days
Emits gamma rays	Emits both gamma and beta rays
Used for imaging	Used for both imaging and ablation

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- INDICATIONS
 - Grave's disease
 - Toxic MNG
 - Toxic adenoma
 - Differentiated Thyroid cancers

CONTRA INDICATIONS

- Pregnancy
- Breast feeding

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- GOALS IN THYROID CANCER
 - Ablation of normal thyroid tissue
 - Ablation of macroscopic or metastatic disease

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Preparation of patient

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COMPLICATIONS

	Acute	Long term
	Neck pain	Bone marrow suppression
	Thyroiditis	Leukemia
	Sialadenitis	Anaplastic thyroid cancer
	Vocal cord paralysis	Lung cancer,breast cancer

Draw & illustrate the Triangles of neck.

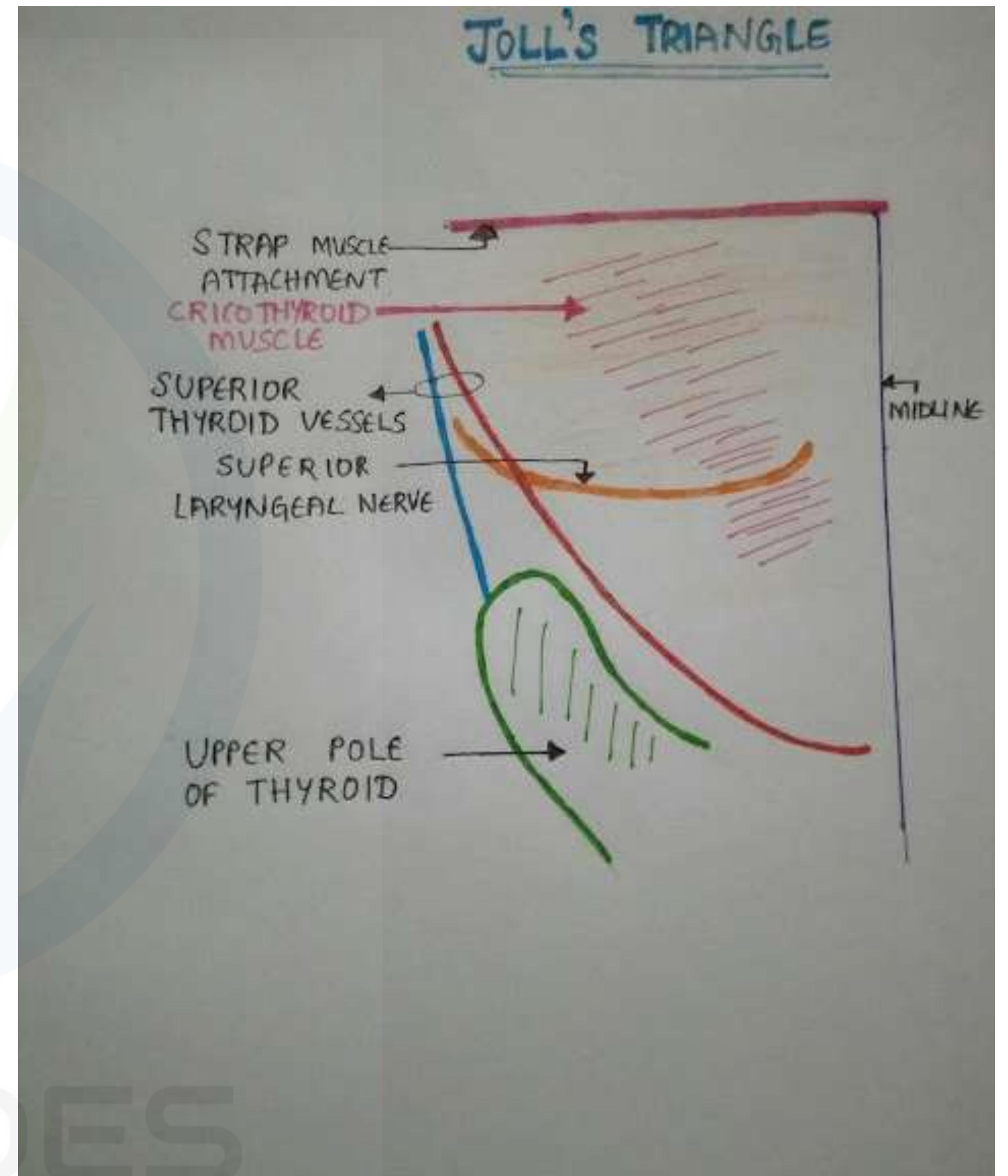
- Joll's triangle
- Lore's triangle
- Riddles triangle



Joll's triangle

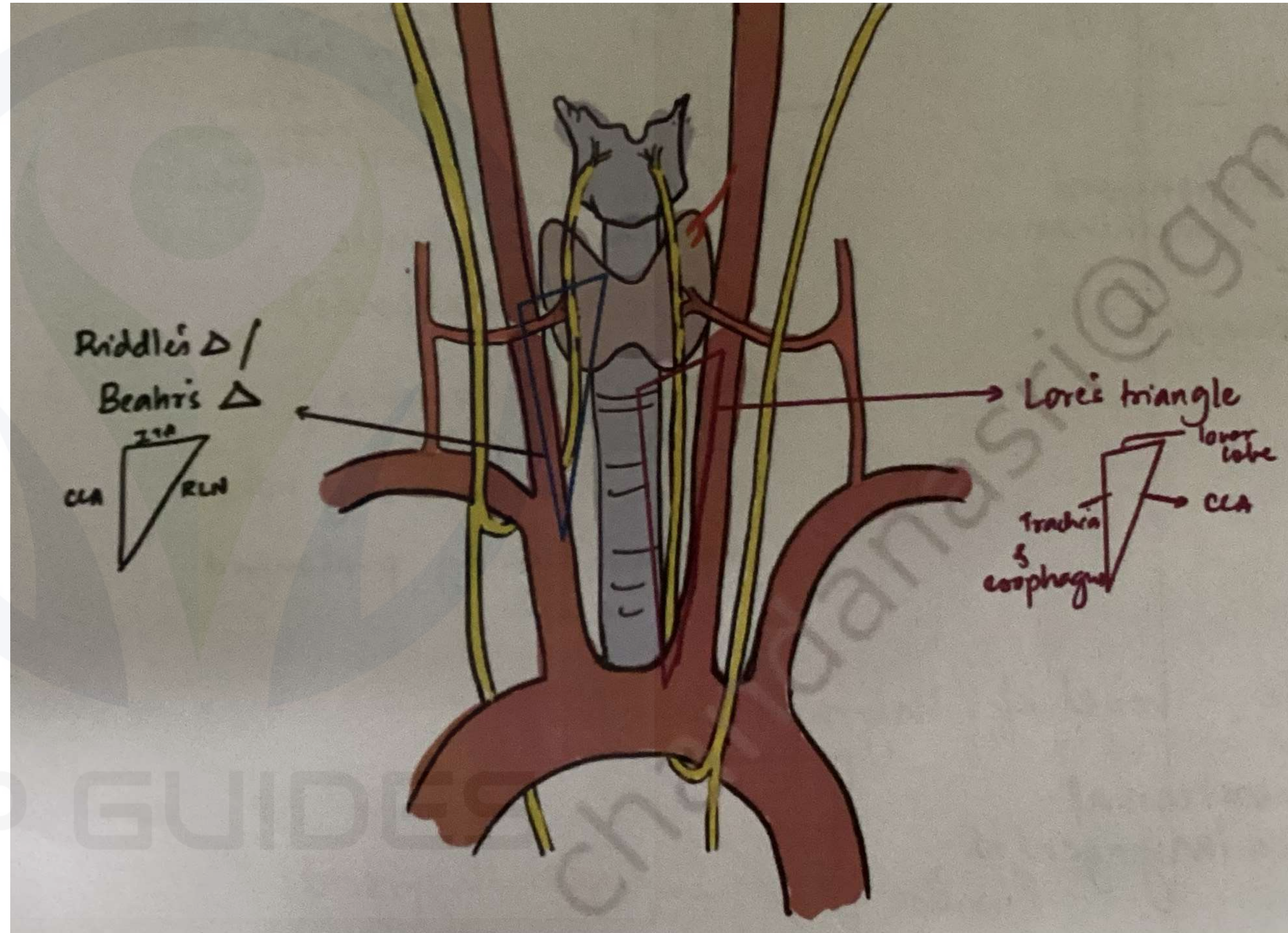
Used to identify external laryngeal nerve

- Medially by midline
- Superiorly by attachment of strap muscles
- Laterally by superior thyroid vessels



Riddle's triangle and Lore's triangle

Used to identify recurrent
laryngeal nerve



Types of Modified radical neck dissections

- level 1 to 5 lymph nodes and submandibular glands removed in all MRND
- MRND 1-Spinal accessory nerve is spared
- MRND 2-SAN and SCM spared
- MRND 3-SAN,SCM,IJV spared

Classify hyperparathyroidism. Discuss the causes, clinical features, investigations, and management of primary hyperparathyroidism.

- Primary HPT-intrinsic abnormality of parathyroid gland. Gland enlarges and secretes more PTH and there is increase in serum calcium
- Secondary HPT-Deranged calcium homeostasis. Compensatory increase in secretion of PTH along with hyperplasia of all 4 glands
- Tertiary HPT—Long standing sec HPT will cause loss of response to serum calcium levels and lead to persistent autonomous secretion of PTH along with 4 gland hyperplasia.

		PHPT	SHPT	THPT
S CA		HIGH	LOW	HIGH
S PHOSPHATE		LOW	HIGH	LOW
PTH		HIGH	HIGH	HIGH

PHPT

CAUSES

- SPORADIC-adenoma
- MEN 1
- MEN 2 a
- Parathyroid carcinoma

Clinical features

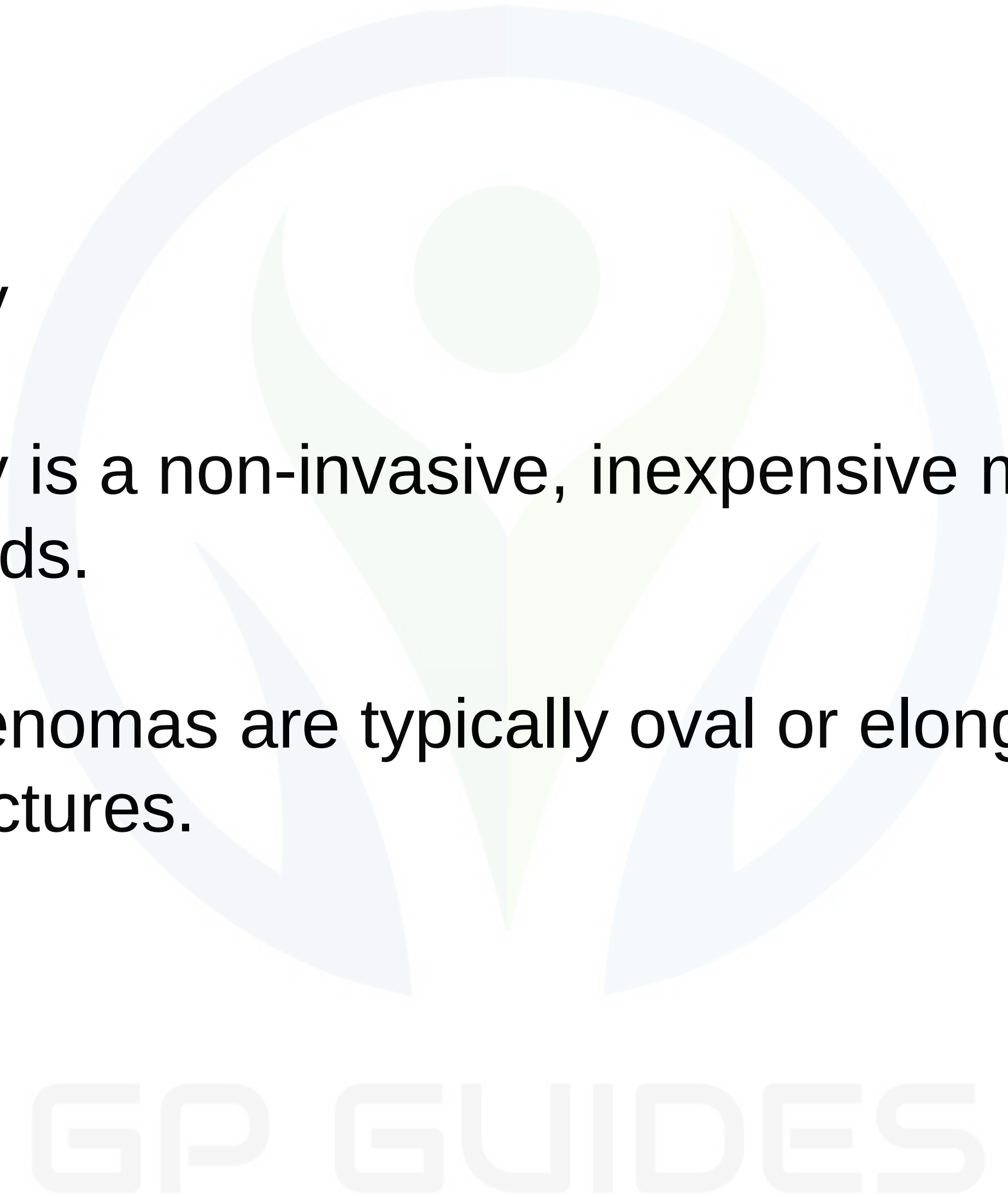
- **BONES,GROANS,STONES,OVERTONES**
- BONES-osteoporosis,osteopenia,pain
- Groans- vomiting,constipation
- Stones-nephrolithiasis,nephrocalcinosis
- Overtones-fatigue,insomnia,mood swings
- Pancreatitis

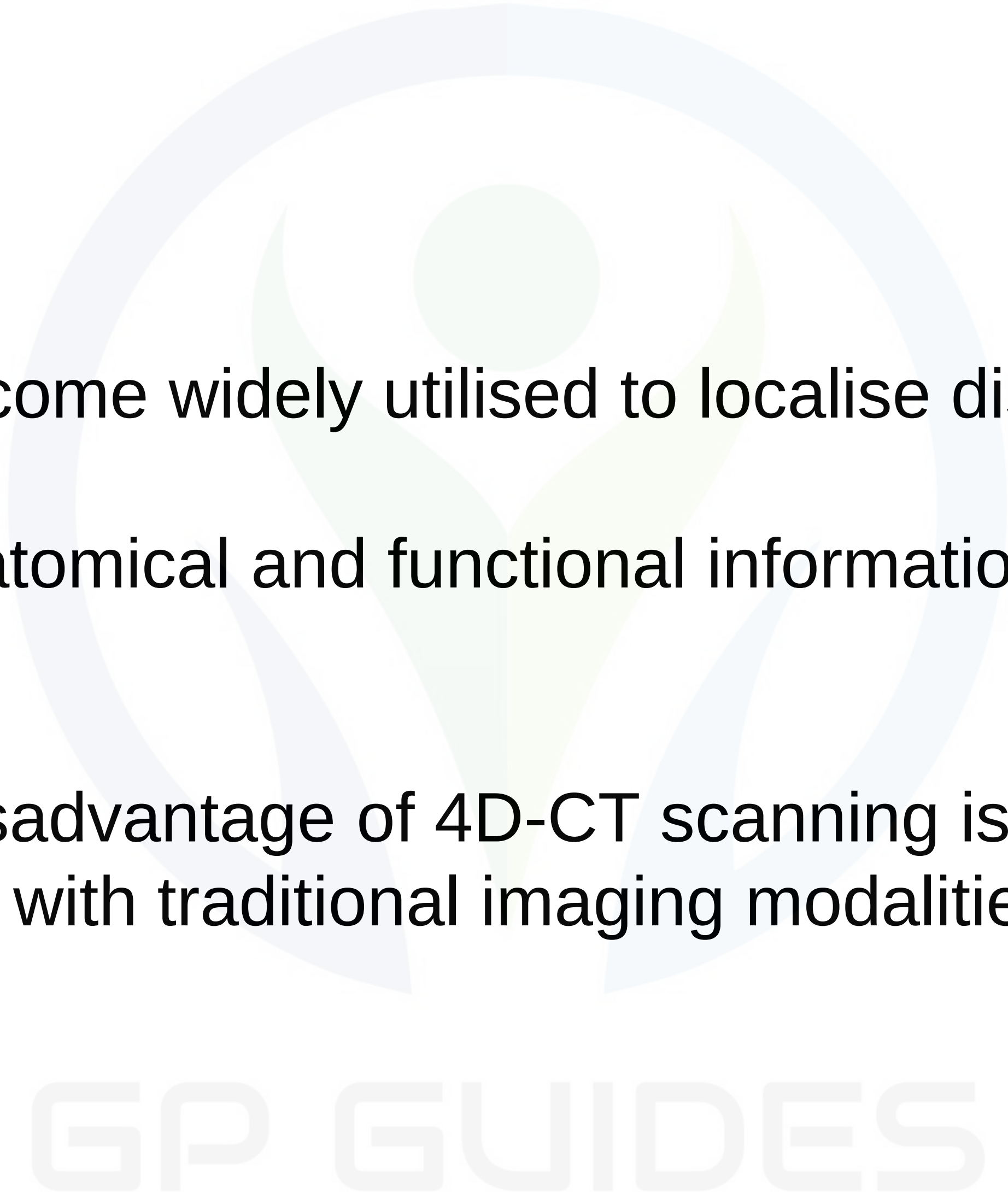
Investigations

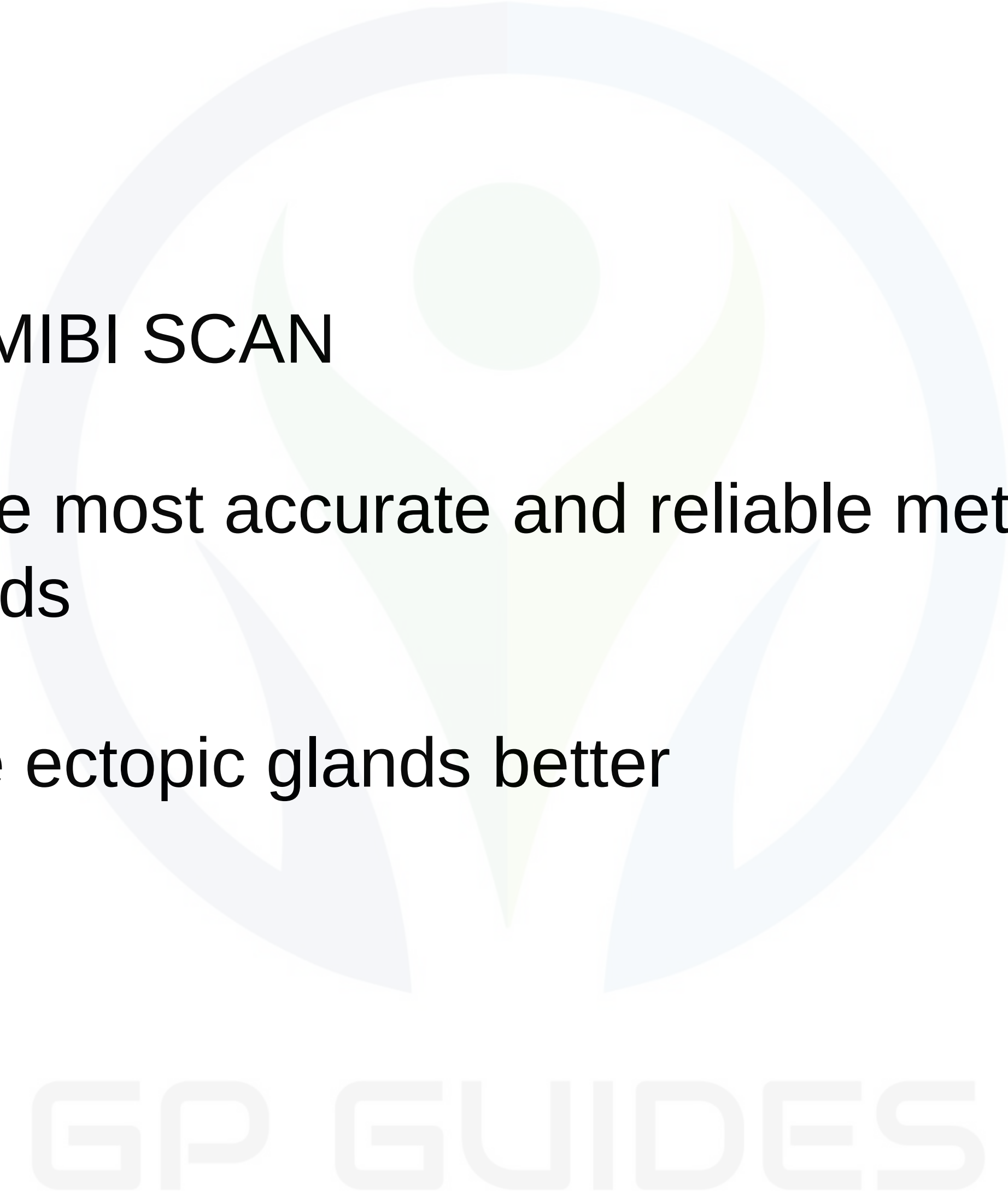
- S PTH
- S CA
- S PHOSPHATE



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- Ultrasonography
 - Ultrasonography is a non-invasive, inexpensive method of imaging the parathyroid glands.
 - Parathyroid adenomas are typically oval or elongated, bi- or multilobed hypoechoic structures.

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- **4D CT**
 - (4D-CT) has become widely utilised to localise disease.
 - It gives both anatomical and functional information about the parathyroid glands.
 - The potential disadvantage of 4D-CT scanning is the higher radiation dose when compared with traditional imaging modalities.

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- Tc 99m SESTAMIBI SCAN
 - Regarded as the most accurate and reliable method for imaging the parathyroid glands
 - Helps to localise ectopic glands better

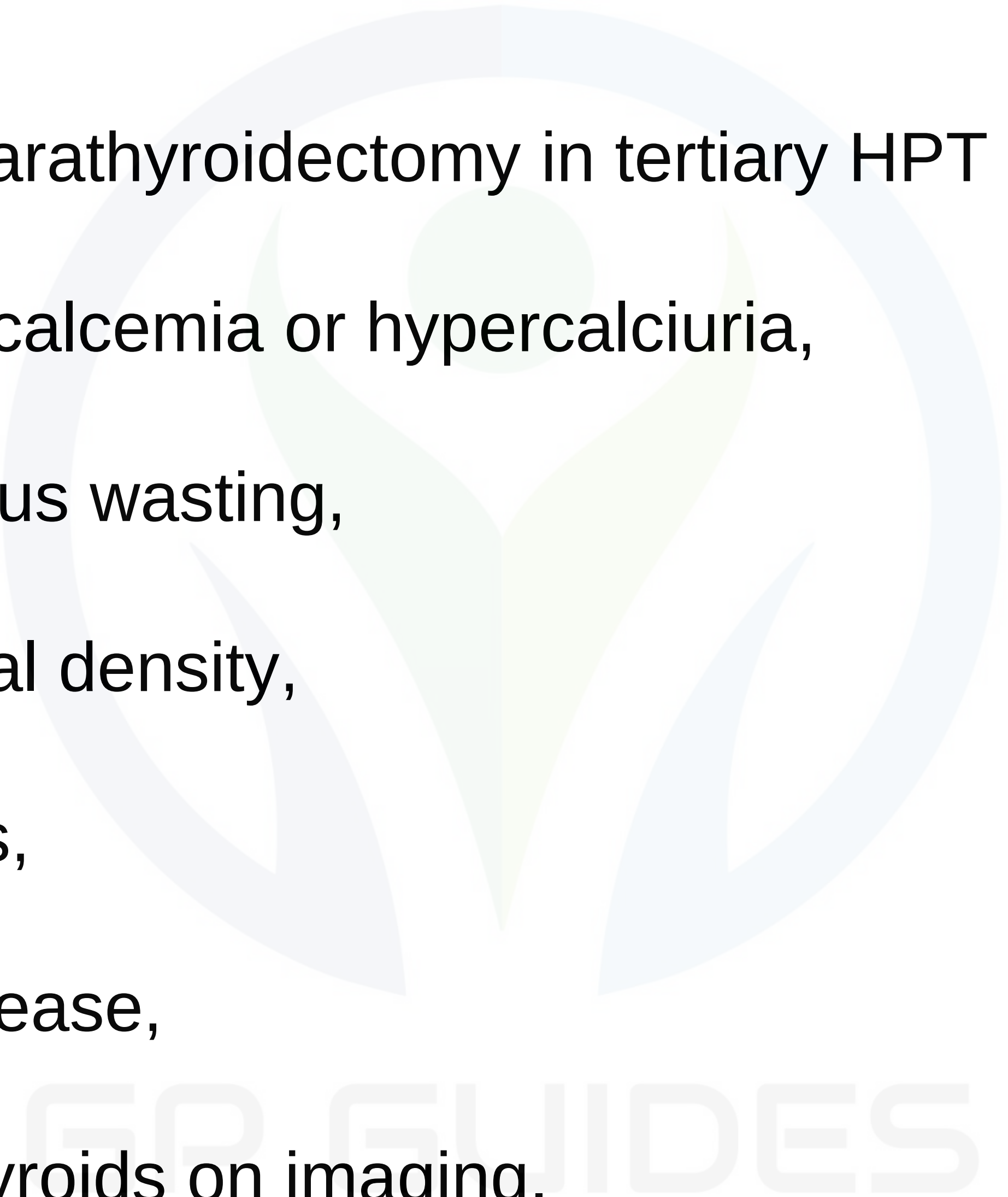
Treatment

- All symptomatic patients should be offered surgery.
- four glands can be resected and a forearm autotransplant created.
- Adenoma-only adenoma is removed
- Medical management-inoperable/unfit patients
- Bisphosphonates, calcimimetics: aim is to stabilise ca levels and decrease skeletal complications.

Tertiary Hyperparathyroidism

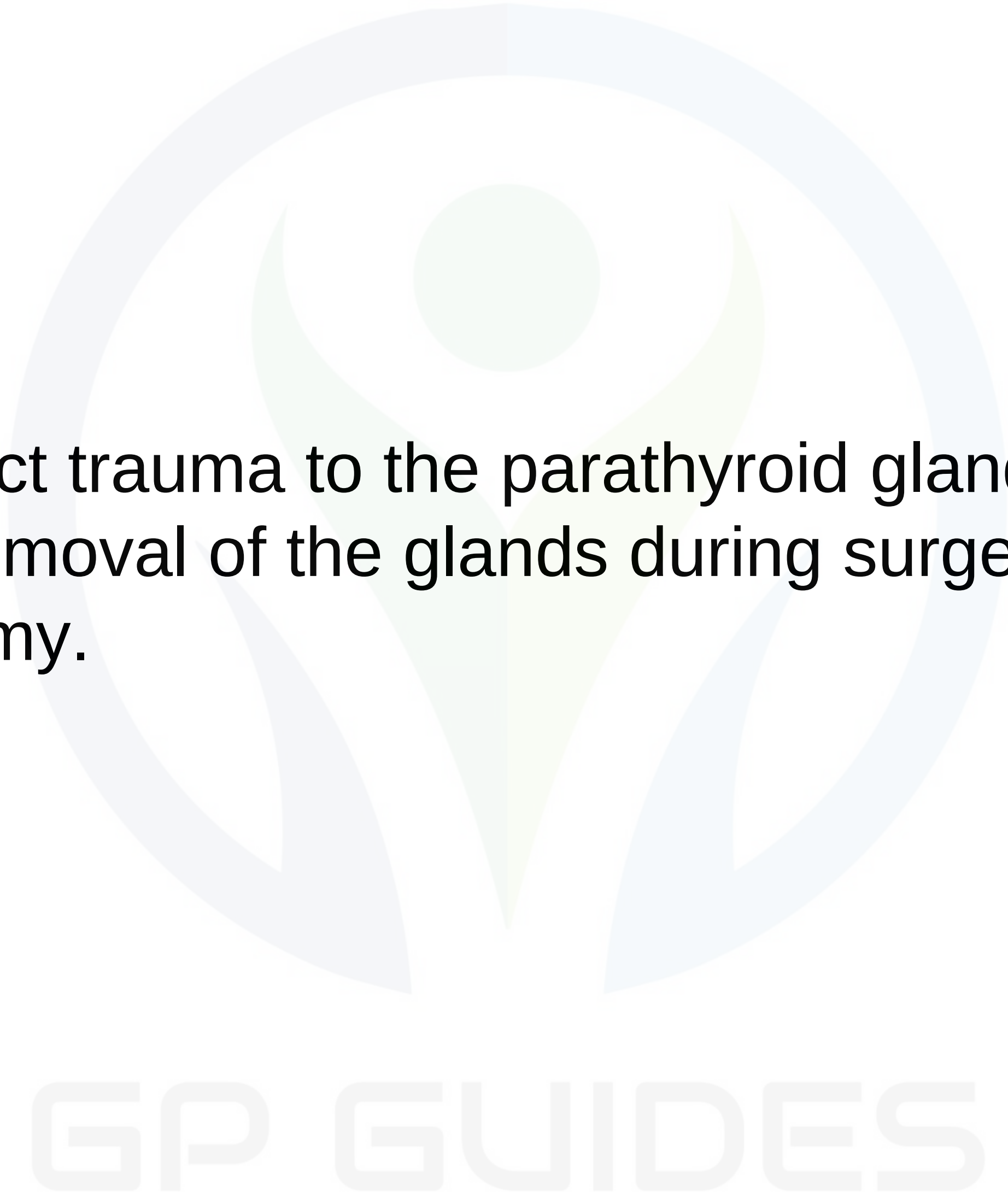
- Long standing sec HPT will cause loss of response to serum calcium levels and lead to persistent autonomous secretion of PTH along with 4 gland hyperplasia.
- Seen in patients with secondary HPT post renal transplant

Clinical features, investigations and management similar to PHPT

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- The logo for FPGUIDES is a large, faint watermark in the background. It features a circular emblem with a stylized human figure in the center, composed of green and blue shapes. Below the emblem, the text 'FPGUIDES' is written in a large, light blue, sans-serif font.
- Indications for parathyroidectomy in tertiary HPT include
 - persistent hypercalcemia or hypercalciuria,
 - renal phosphorous wasting,
 - low bone mineral density,
 - nephrocalcinosis,
 - symptomatic disease,
 - enlarged parathyroids on imaging.

HYPOPARATHYROIDISM

- Hypoparathyroidism is defined as a PTH level <10 pg/ml; normal values range between 10 and 65 pg/ml
- Inadequate production of PTH leads to hypocalcemia. Hypoparathyroidism and the resulting hypocalcemia may be permanent or transient.
- Permanent hypoparathyroidism would be defined as requirement of therapeutic vitamin D and/or calcium replacement at 6 months

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- Causes are-direct trauma to the parathyroid glands, devascularization of the glands, or removal of the glands during surgery like-thyroidectomy and parathyroidectomy.

Features

- Circumoral tingling, numbness, paraesthesia.
- Carpopedal spasm, laryngeal stridor.
- Respiratory muscle spasm, suffocation.
- Convulsions, blurred vision due to intraocular muscle spasm.
- Cataract formation as late feature

- In symptomatic patient intravenous calcium gluconate 10 ml 10% solution (1 g) is administered over 10 minutes
- One to two grams of elemental oral calcium should be given each day. Calcium carbonate 1250 mg provides 500 mg of elemental calcium; the patient should take 2500-5000 mg/day.
- The patient needs vitamin D supplementation with calcitriol 0.25- 1 ~1g/day. The calcium supplementation should be divided 4-5 times per day rather than in a single dose to maximize absorption by the GI tract.