Messages in Surgical Approach to Endocrine glands

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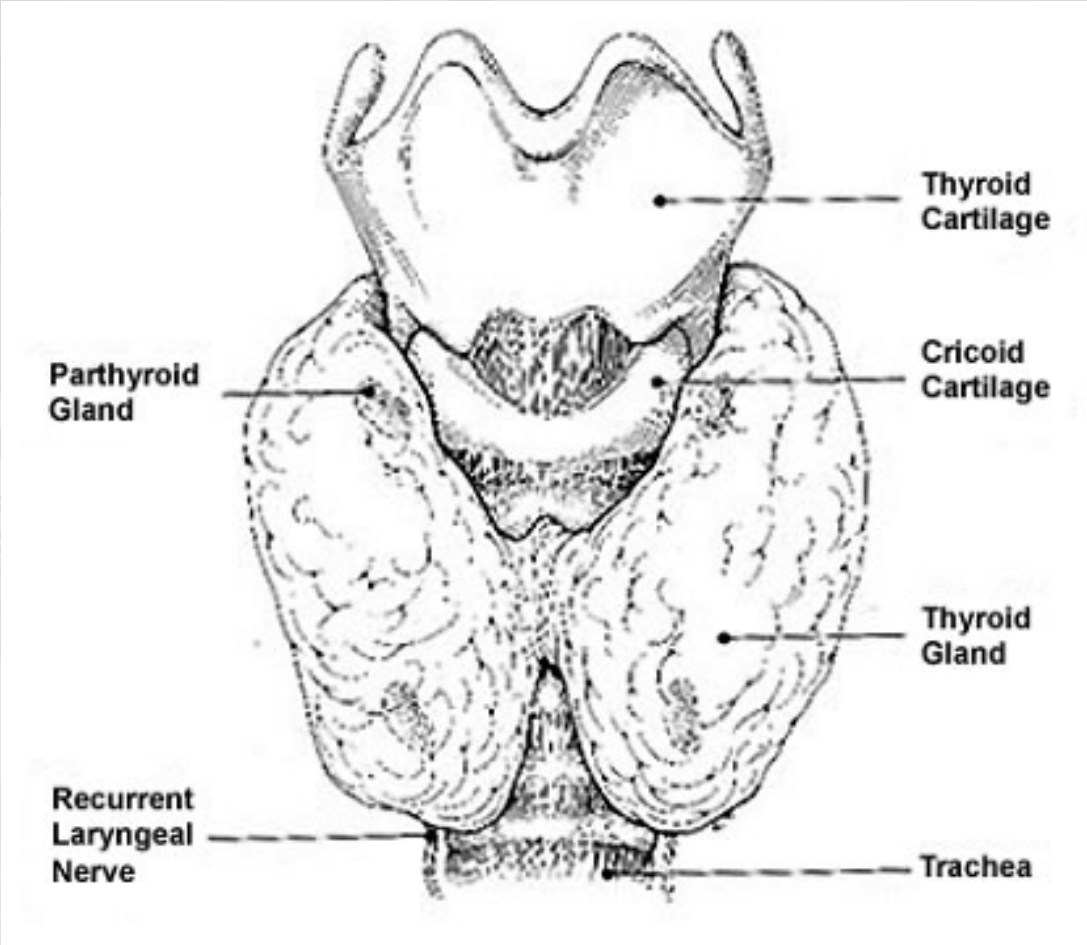
Thyroid

Anatomy of the Thyroid Gland



Message (1)

- Age is the most important factor.

Message (2)

- Do T3, t4 and TSH.

Message (3)

- The only indication for diagnostic thyroid scan is suppressed TSH.

Message (4)

- FNA should be reported with Bethesda score.

Message (5)

- Nodule < 1cm

No FNA.

Message (6)

- Follicular Neoplasm can be diagnosed by FNA most of the time.

Message (7)

- Always Do Ultrasound.

Ultrasound

- One nodule or more
- Cystic or solid
- Presence or abecence of features of malignancy
- Cervical LN enlargement

Features of malignancy in U/S

- Microcalcification.
- Hypoechoeic nodules.
- Increased vascularity.
- Interupted hallo sign

Message (8)

- Less is more sometimes.

Treatment

- Goals:

  1-to remove the primary tumour and its local extension.

  2-to minimize treatment related morbidity.

  3-to permit accurate staging.

  4-fascilitate postop. Radioactive Iodine ttt.

  5-fascilitate long term postop. Surveilance

  6-minimize disease reccurence and mets.

Message (9)

- Subtotal thyroidectomy is part of history.

Thyroidectomy – Types

- **Hemi-thyroidectomy:** Removal of half of thyroid gland (Lobe + Isthmus+ Pyramidal)
- **Lobectomy:** Removal of either right of left lobe of thyroid gland

Both these are done in solitary goitre

- **Total thyroidectomy:** Removal of whole thyroid gland

This is done in cases of malignancy

Thyroidectomy types

- **Subtotal thyroidectomy:** Removal of a little less than total; done in multi-nodular goitre
- **Near-total thyroidectomy:** Almost same as total, but a little thyroid tissue around one parathyroid gland is preserved
- **Isthmusectomy:** Dividing the isthmus

Total Thyroidectomy

- 1- FNA → papillary,medullary.
  2- nodule > 4cm and atypia.
  3- hx. Of irradiation or positive family hx.
  4- bilateral nodules.
  5- regional LN or distant metastases.
  6- patient preferance for one stage.
  7- relative indication→age >45

Lobectomy

- Soitary nodule+indetermined pathology FNA+ patient preferance.

Central LN Dissection

- CLN are most common site of recurrence.

- Routine CLN dissection is indicated in medullary Ca., no consensus in papillary Ca.

Message (10)

- Cricothyroid muscle is a landmark of safety.

Message (11)

- Never ligate the inferior thyroid artery at stem.

Message (12)

- Parathyroid change in color is a sign of venous congestion.

Message (13)

- Occult papillary and NIFTP do not need completion.

Completion Thyroidectomy

- To allow resection of multicentric disease.
- Allow radioactive Iodine diagnostic scan and treatment.
- Studies:same surgical risk as one stage surgery.
- (small tumours<1cm,intrathyroid,node neg.,low risk group) can be managed without completion.

Message (14)

- Follow up can be done with thyroglobulin and ultrasound.

Message (15)

- Medullary: once clinical it is very difficult to reach a biochemical cure.

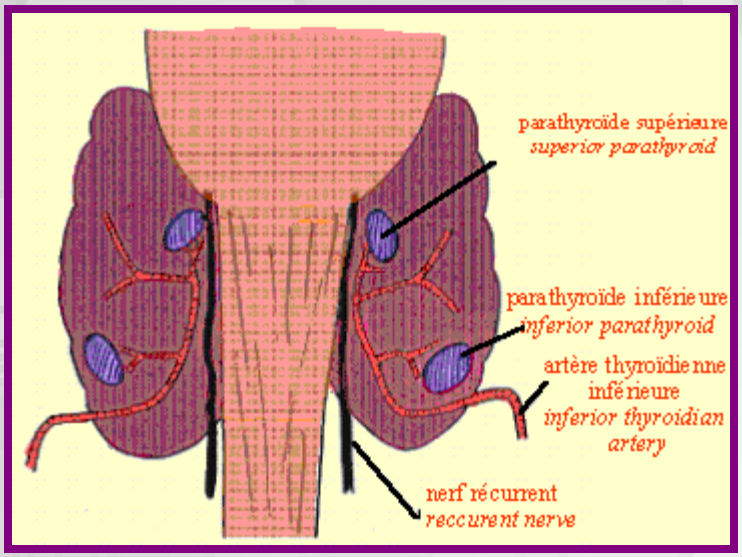
Complications of thyroidectomy

- Intraoperative
  - Bleeding
    - Damage to arteries/veins of neck
- Postoperative presentation
  - Injury to recurrent laryngeal nerve
    - Unilateral: hoarseness
    - Bilateral: respiratory distress
  - Bleeding
    - Expanding hematoma – causes compression, shortness of breath
  - Hypocalcemia
    - Removal or injury to parathyroid glands or their blood supply
  - Scar

If patient develops expanding neck hematoma postoperatively, treatment involves immediate opening of sutures to evacuate clot and return to OR to explore and stop bleed

Parathyroid glands

Parathyroid



- Four glands located behind the thyroid
- Length 6 millimeters
- Width 3 millimeters
- Thickness 2 millimeters
- Often accidentally removed
- Normal function with at least 2 glands

Message (1)

- Secondary hyperparathyroidism is common, always check vitamin D.

Message (2)

- Around 70% primary hyperparathyroidism diagnosed incidentally have symptoms.

Messages (3)

- Locaization is indicated only when surgery in indicated.

Hyperparathyroidism
Surgical Management

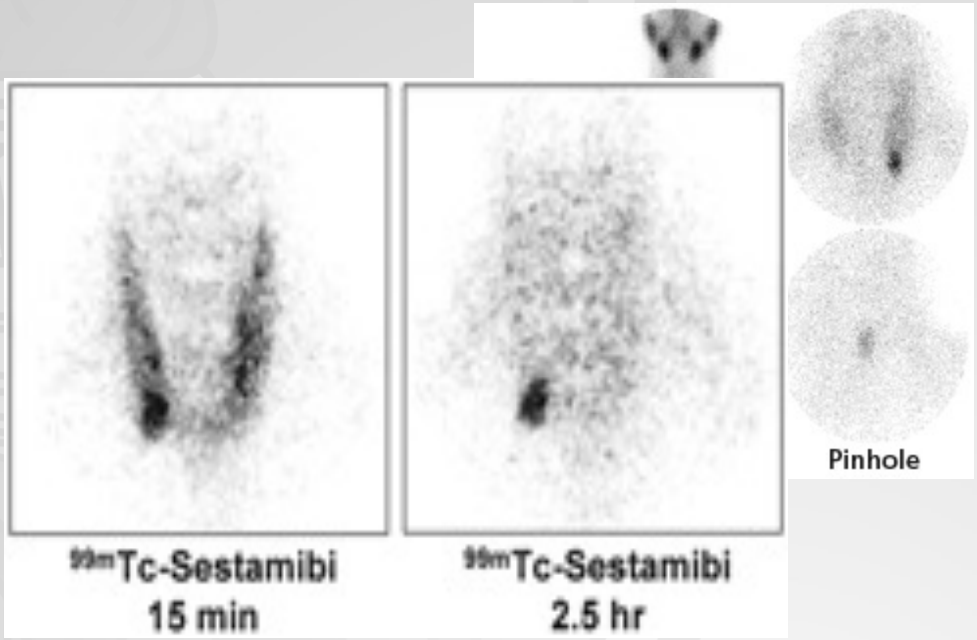
- Serum calcium > 11.5 mg/dl
- Hypercalciuria > 400mg/day
  - Normal <200 mg/day
- Presence of signs and symptoms
  - Nephrolithiasis
  - Osteitis fibrosa Cystica
  - Neuromuscular symptoms
- Markedly reduced cortical bone density
- Decreased creatinine clearance
- Patient age < 50 years
- Markedly reduced cancellous bone density
  - Spine

Message (4)

- Sistamibi scan is the best localization test.

Pre-Operative Imaging-Localization

- High-resolution ultrasound
  - Sensitivity 65-85% for adenoma
  - Results suboptimal in pts with multinodular thyroid disease, pts with short thick neck, ectopic glands (15-20%)
  - May be useful in detecting sestamibi scan negative adenomas
- CT with contrast/thin section
  - Sensitivity of 46-87%
  - Good for ectopic glands in the chest
- MRI
  - Sensitivity of 65-80%
  - Good for ectopic glands
- Sestamibi
  - 85-95% accurate in localizing adenoma in primary HPT
- Sestamibi-SPECT(single photone emission CT)
  - Sensitivity 60% for enlarged gland and 98% for solitary adenomas


Pinhole
99mTc-Sestamibi
15 min
99mTc-Sestamibi
2.5 hr

Message (5)

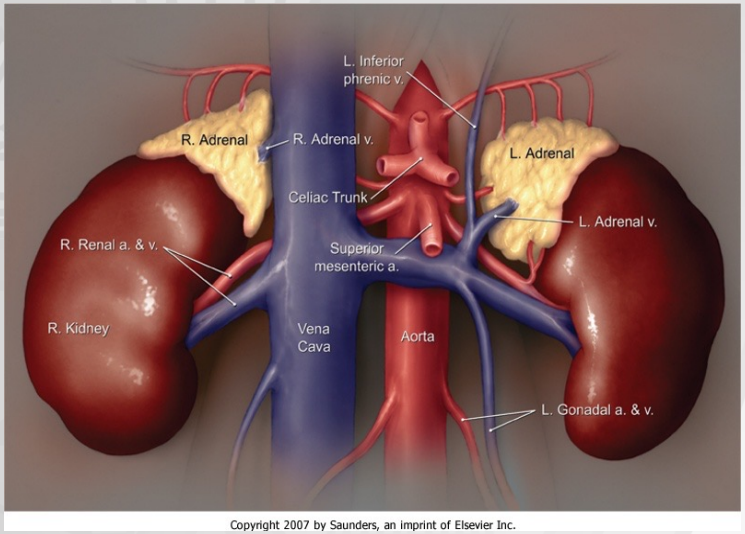
- Quick PTH is crucial for minimally invasive surgery.

Message (6)

- With a multiple gland disease keep what is equal to a normal parathyroid.

Adrenal Glands

Adrenal Gland

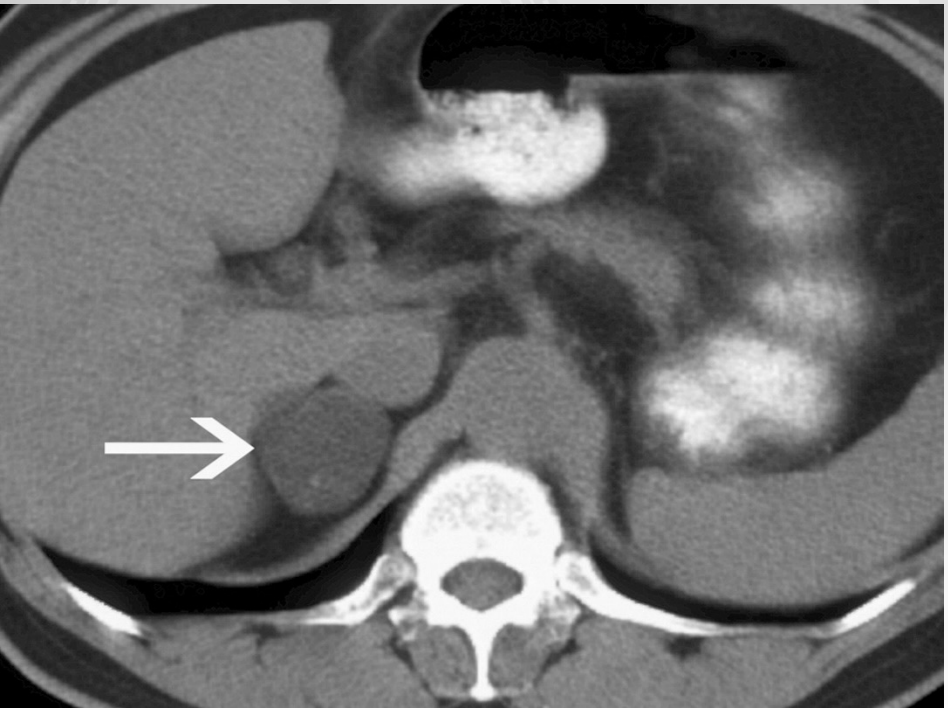


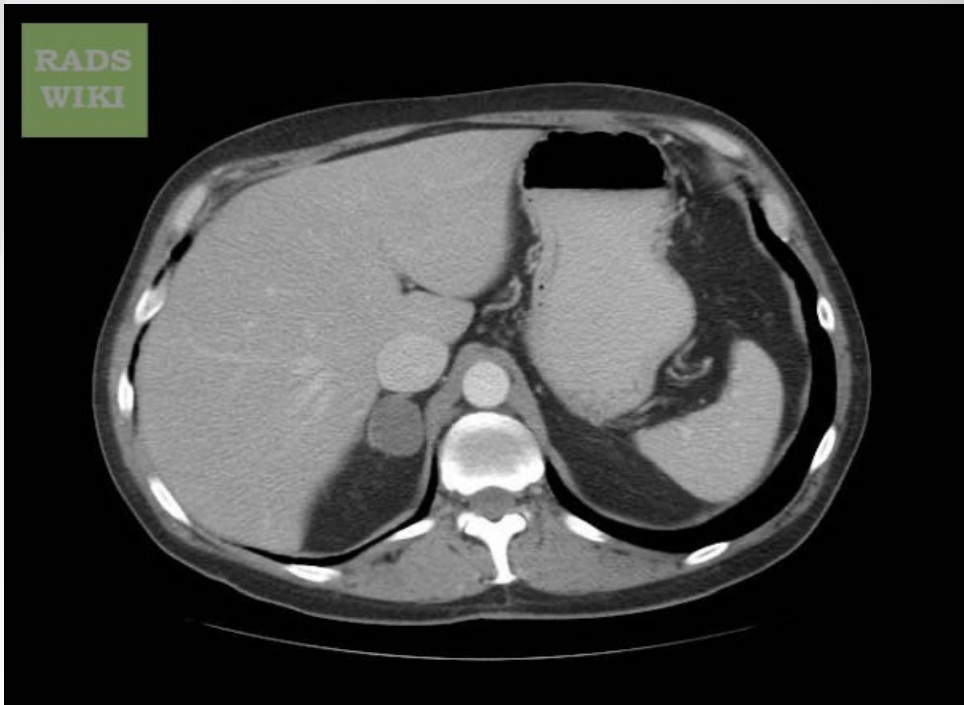
- Blood supply
  Arterial - receives 7cc/gram minute
- arterial sources of flow:
- 1. Inferior phrenic artery
- 2. Aorta
- 3. Renal artery

- Venous – single main vein most important surgical structure
  - right → post IVC
  - left → renal vein

CT Adenoma Characteristics

- Sharp margins
- Smooth, homogenous, lipid rich
- Most <10 Hu on noncontrast images
- Washout >50% @ 15 min





- Secreting tumors:

- 1- Hyperaldosteronism (Conn`s syndrome)
- 2- Hypercortisolism (Cushing syndrome)
- 3- Hyperandrogenism (Precocious puberty)
- 4- Pheochromocytoma

Nature of Incidentally Found Adrenal Masses

- Review of 2,005 incidentally-discovered adrenal masses:

- Nonfunctioning adenoma 82%
- Functioning: Cushing's 5%
- Pheo 5%
- Aldosteronoma 1%
- Malignancy: Metastasis 3%
- ACC 4%

- Young WF, et al. Endocrinol Clin N Am. 2000

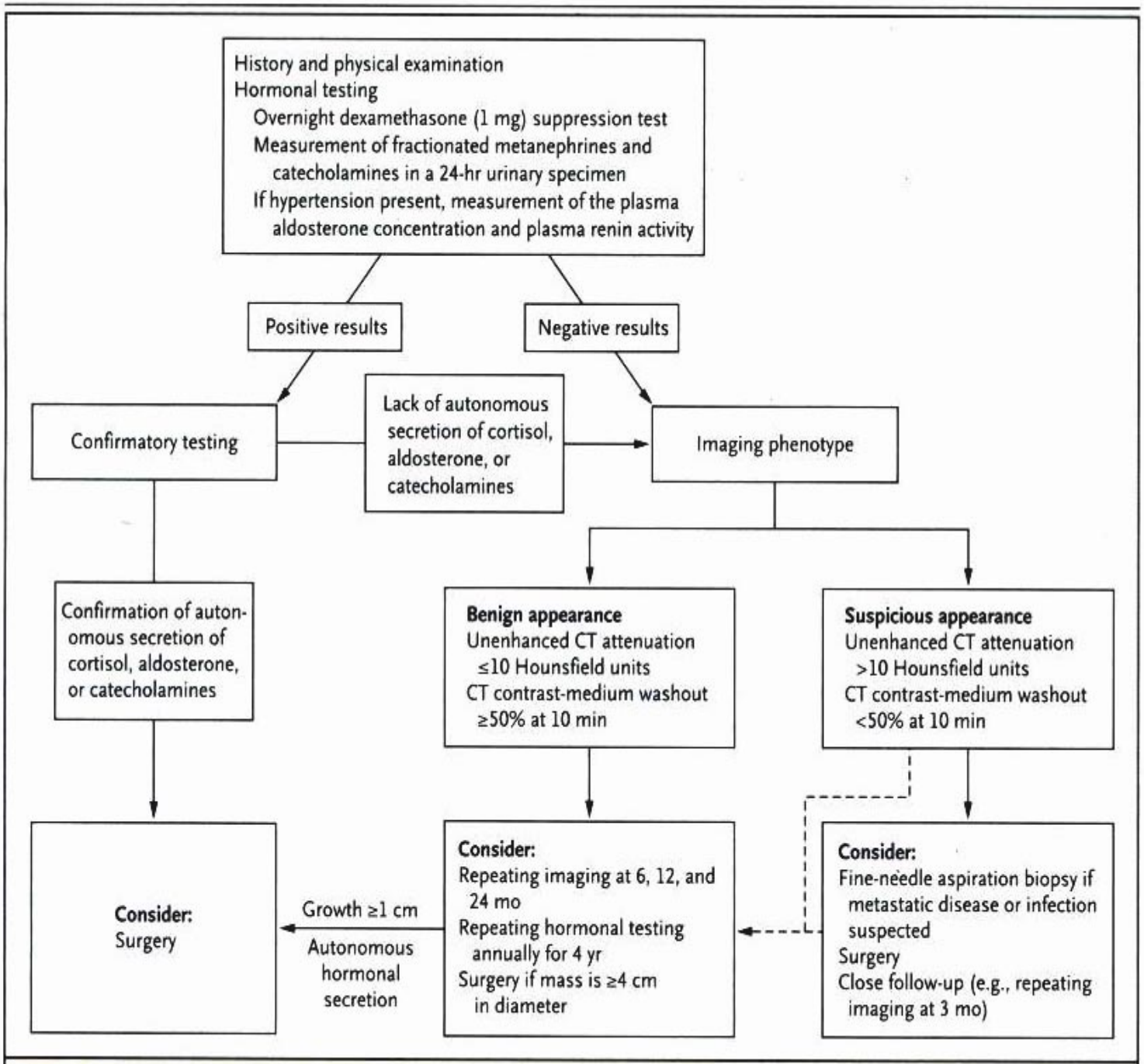
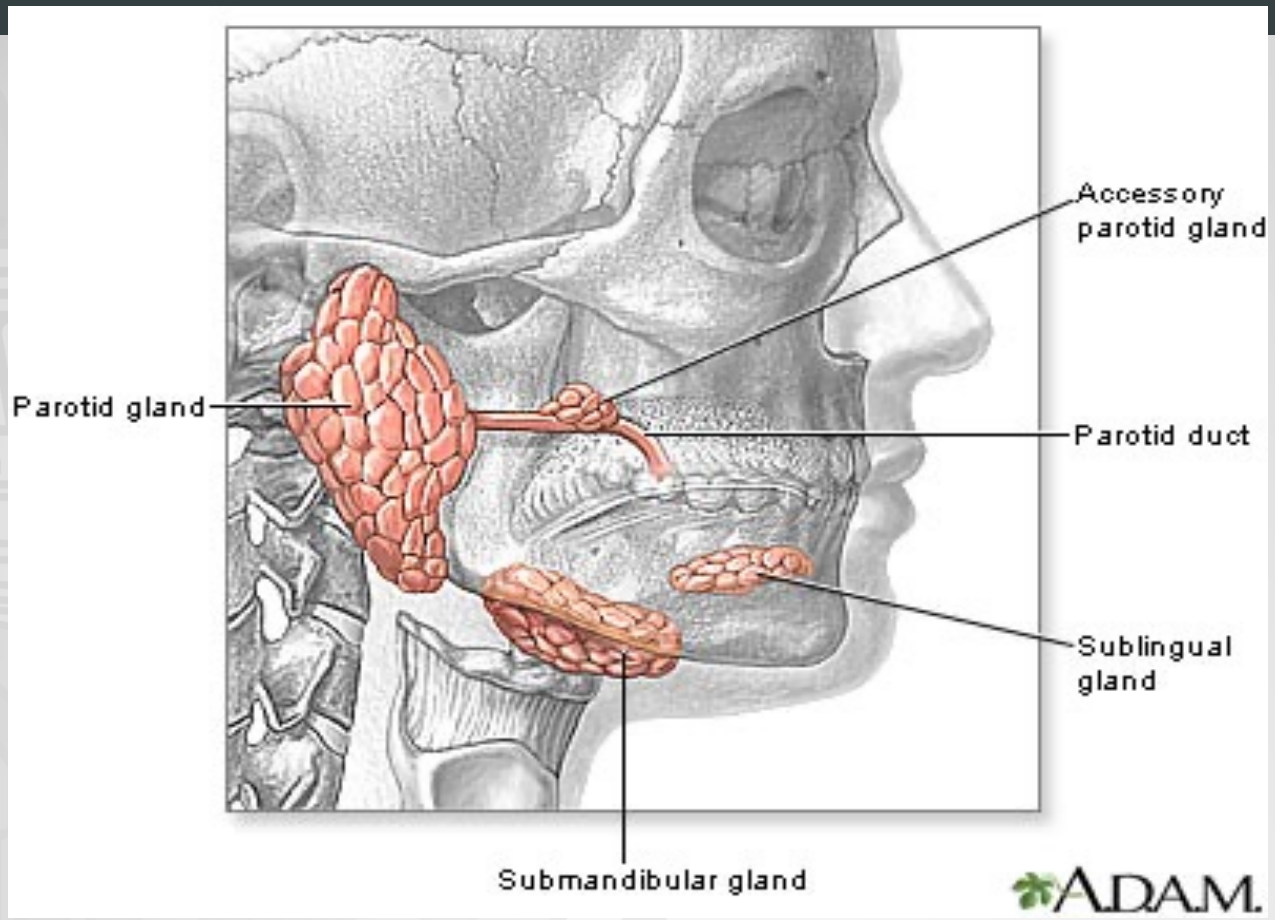


Figure 1. Algorithm for the Evaluation of Patients with an Adrenal Incidentaloma.

Young, WF; New England Journal of Medicine, 356:601-610, 2007, fig. 1

Parotid

- Any mass in the parotid triangle should be managed as a parotid mass.


Accessory parotid gland
Parotid gland
Parotid duct
Sublingual gland
Submandibular gland
A.D.A.M.

- Fine needle aspiration is helpful to determine the extent of surgery.

- Incision: Lazy S.
- Flap: determined by Greater auricular nerve.
- Land marks of safety: Tragus & Post. Belly of digastric muscle.

- 70-80% of Salivary tumors →Parotids.
- 70-80% of Parotid tumors → benign.
- 80% of benign tumors → pleomorphic adenoma.

- Account 1% to 3% of all head and neck tumors.
- 75%–85% are benign.
- Pleomorphic adenoma and Warthin tumors accounting for up to 94% of all tumors

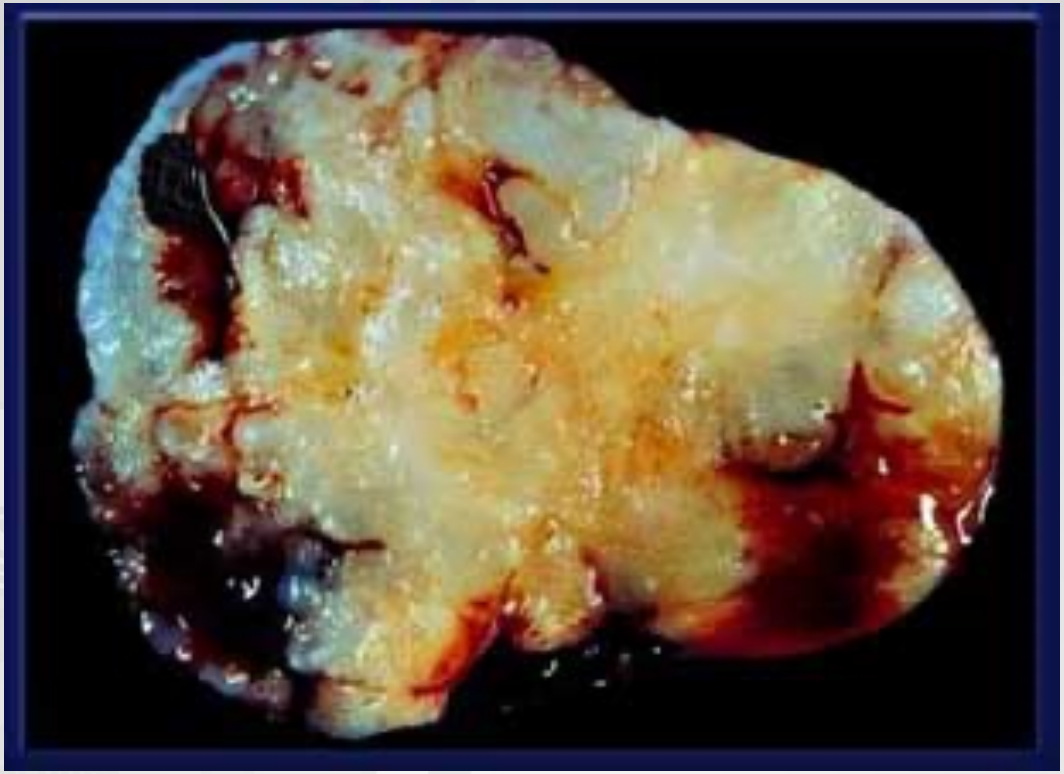
Pleomorphic adenoma

- Most common.
- Peak age: 5° decade.

- Proliferation of: - epith.
  - myoepith.
  - stroma tissue→resemble cartilage and bone.

Pleomorphic adenoma

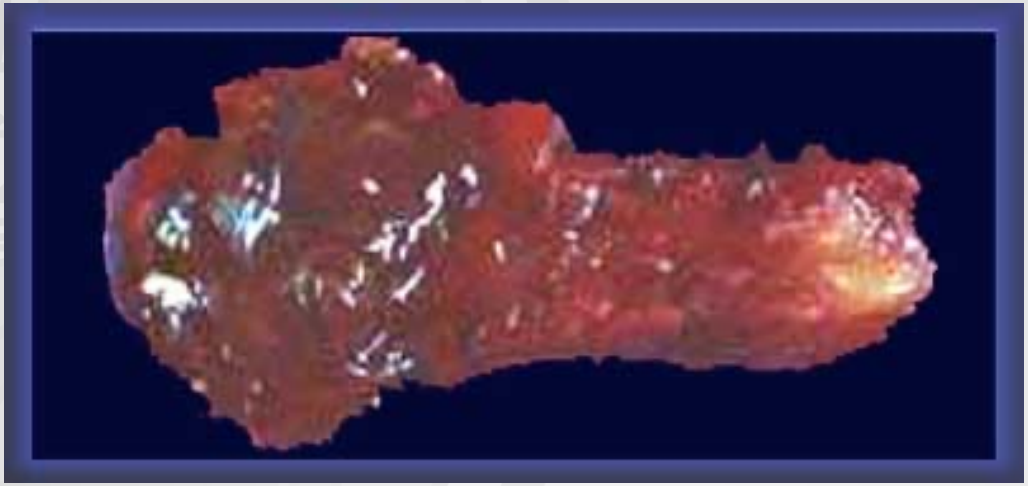
- Solitary Painless mass in Parotid area,firm,slowly growing,mobile.
- Its mixture of both epithelial and mesenchymal components
- The subtypes of myxoid, cellular, or classic refer to the ratio of the two tissue components within the tumor.
- 2-10% may turn into malignant (usually adenocarcinoma)



Papillary Cystadenoma Lymphomatosum (Warthin)

- Occurs only in Parotid.
- 10% bilat.
- More in males(90%)
- More in smokers.
- Cystic mass(may be fluctuant)
- Doesnot change into malignancy.

- **Gross** appearance: ovoid to spherical mass with variable no. Of cysts that excude a clear fluid.



Rare Benign Types

- Oxyphilic adenoma
- oncocytic adenoma
- basal cell adenoma
- sebaceous adenoma
- canalicular adenoma.

non epithelial Benign tumors

- **Haemangioma:** most common in children,comressible mass,ttt include steroids , angiogram & surgery,spontaneous regession may occure.
- **Lipoma**
- **Lymphangioma(cystic hygroma):** 50% manifest at birth, 80% by 2 years.

Malignant Tumors

- 96% → discrete mass.
- 4% → diffuse enlargement.
- 12-24% → painful.
- 17% → fixed to masseter.
- 8-26% → fascial nerve dysfunction.
- 9% → skin ulceration.
- Formication:parasthesia described as feeling of ants crawling on skin.

Malignant Tumors

- **Mucoepidermoid:**

  -most common.

  -usually in parotid, 2° site is palate.

  -peak age 5° decade.

  -high or low grade.

Malignant Tumors

- **Adenoid cystic Ca. :**

- 2° most common,but is the most common in other glands than parotid.
- Usually well defined but not encapsulated.
- Rarely involves lymphnodes,may have perineural invasion , may reach base of skull.

Malignant Tumors

- **Acinic cell Ca.**:2° most common parotid and paediatric ca. It Has a good prognosis

- Adenocarcinoma and Squamous Cell Carcinoma are rare and aggressive types.

Thank You