THYROID PATHOLOGY

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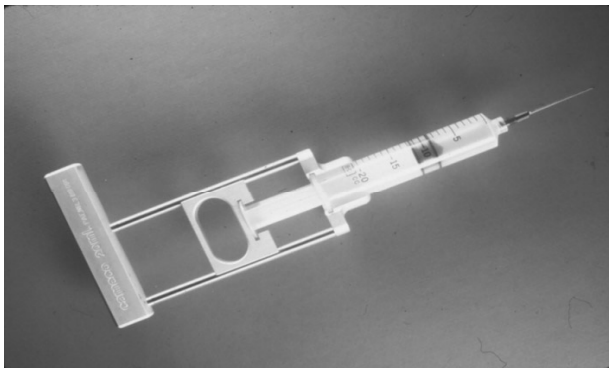
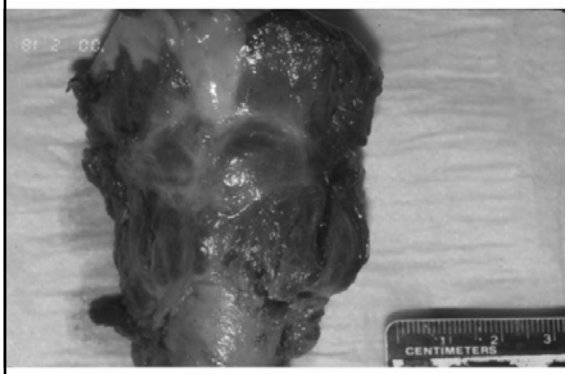
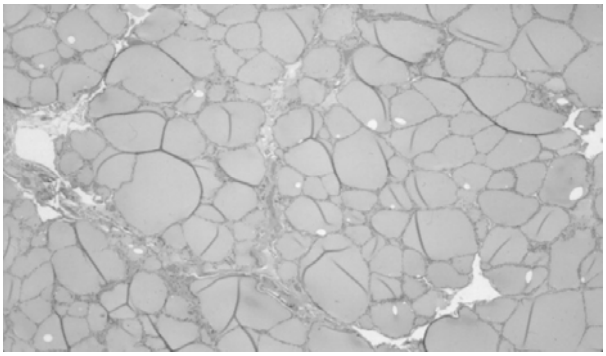






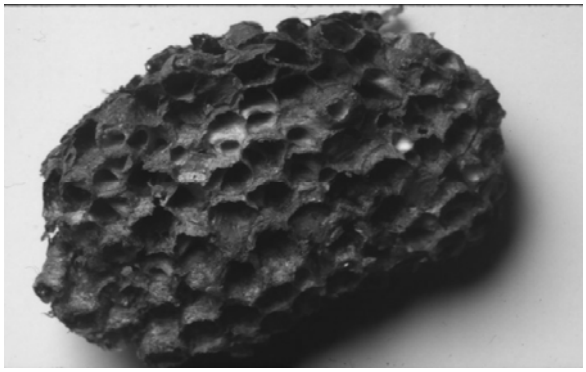
GRAVES' DISEASE
DIFFUSE TOXIC GOITER

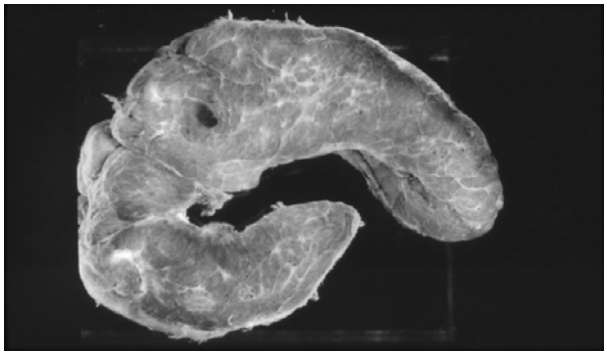
MOST COMMON CAUSE OF

HYPERTHYROIDISM

GROSS:

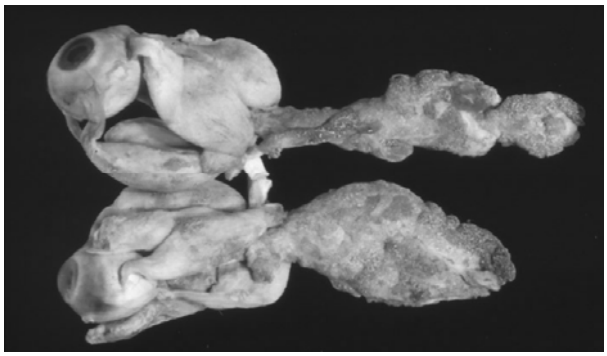
- **DIFFUSELY ENLARGED**
- **UP TO 3-4X NORMAL (normal 10-35gm)**
- **SURGERY RARE**





DEFINITIONS

- GOITER: enlarged thyroid
- EUTHYROID: normal thyroid function
- NONTOXIC: thyroid not hyperfunctional
- TOXIC: hyperfunctional thyroid

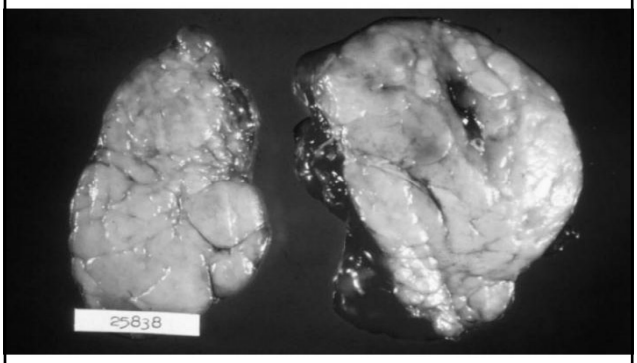


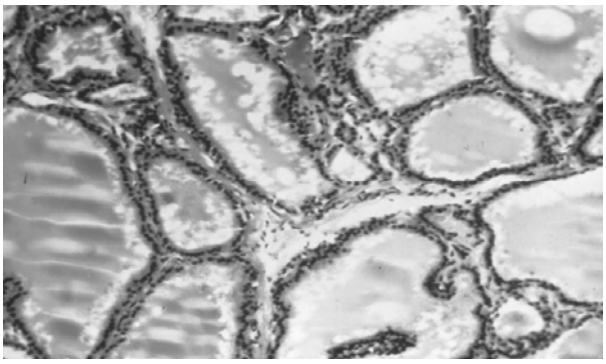
GRAVES' DISEASE

MICROSCOPIC:

Hyperplasia of follicular lining cells

- **New follicles formed;** tall, columnar cells
- **Scalloping** of colloid
- **Lymphoid cell infiltrates**
  - **?source of abnormal autoantibodies**





HASHIMOTO'S THYROIDITIS

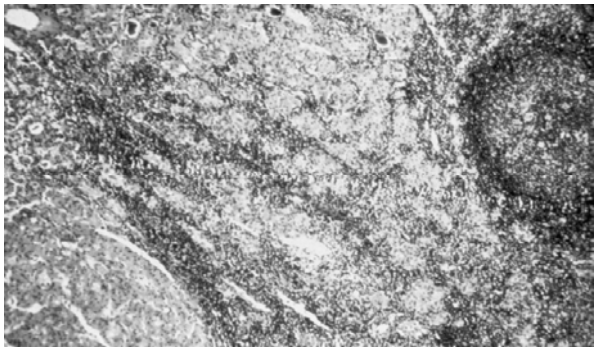
Lymphocytic thyroiditis with oxyphilia

MICROSCOPIC:

- LYMPHOCYTES & plasma cells
- HURTHLE CELLS = Oxyphilic cells
  - Abundant pink cytoplasm
  - pink = acidophilic = eosinophilic
  - Electron Microscopy
    - numerous mitochondria

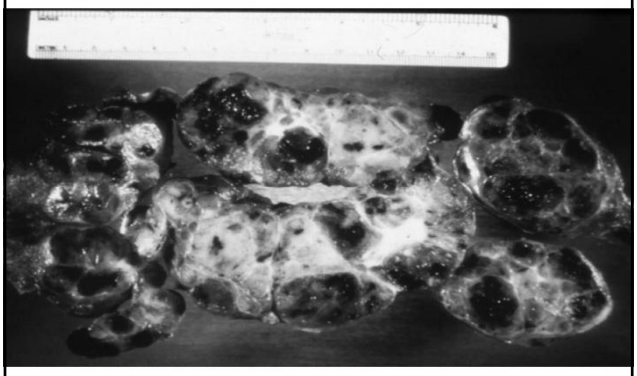
HASHIMOTO'S THYROIDITIS

- May be found
  - incidentally
  - visible neck mass
  - compressing trachea or esophagus
- **GROSS**:
- Usually enlarged up to 2-3X
- Usually symmetrical, diffuse & firm
  - if nodular, suspect neoplasm
- Light tan or gray
- L-thyroxine therapy may shrink gland



NONTOXIC NODULAR GOITER "NTNG"

- Common:
  - 4-7% adults in US have palpable nodular goiter
  - usually asymptomatic but may cause compression
  - most are MULTINODULAR
  - may have only one palpable nodule
    - **clinical concern to rule out neoplasm**
    - **do ultrasound to detect other nodules**
    - **do needle aspirate or core bx to diagnose NTNG**



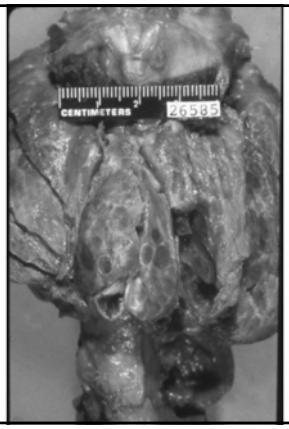
NONTOXIC NODULAR GOITER "NTNG"

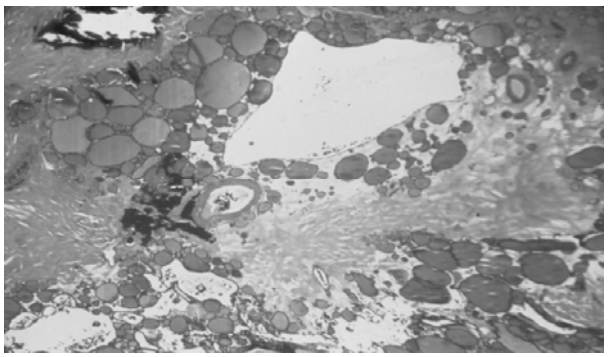
- **GROSS:**

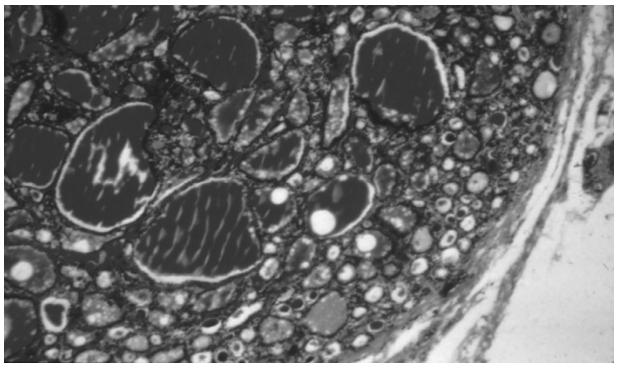
  ≥1 round, well demarcated, tan glistening nodules of variable sizes within normal red-brown thyroid tissue.

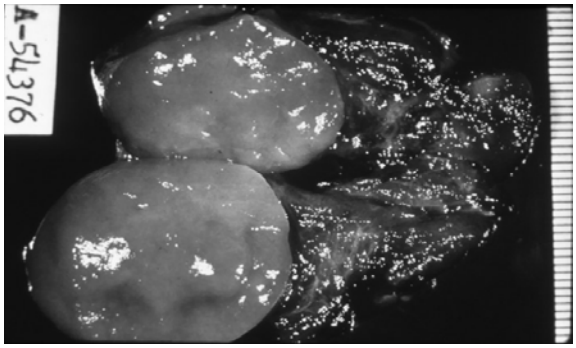
NONTOXIC NODULAR GOITER "NTNG"

- **MICROSCOPIC:**
  - **Follicles**
    - **VARYING SIZES, usually large**
    - **filled with COLLOID**
    - **lined by cuboidal cells**
  - **Zones of FIBROSIS & HEMORRHAGE**



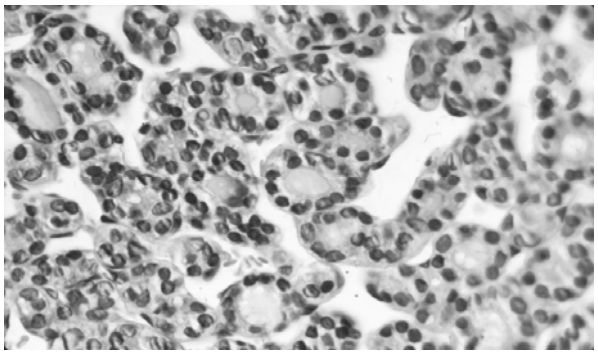


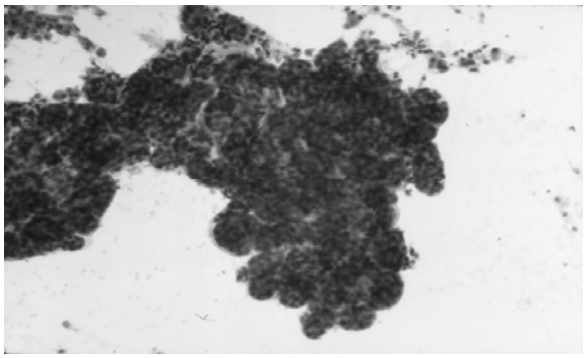




THYROID NEOPLASMS

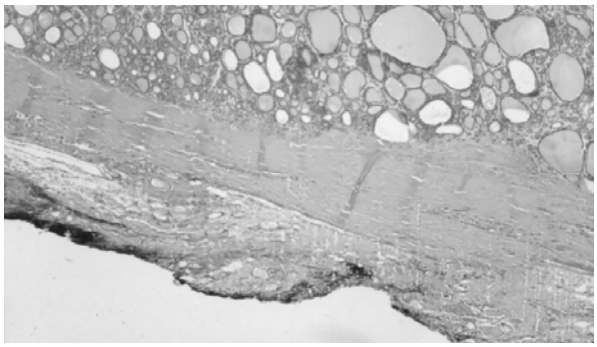
- **BENIGN: ADENOMA**
- **GROSS:**
  - **Nodule**
    - **well encapsulated**
    - **solid**
    - **deep-tan**





THYROID NEOPLASMS

- **How to distinguish Follicular ADENOMA from CARCINOMA?**
  - **Search for invasion of capsule or blood vessels**
  - **Examine entire nodule, especially capsule**



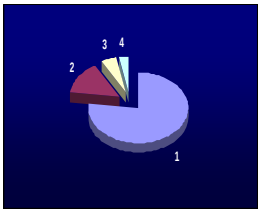
PAPILLARY CARCINOMA

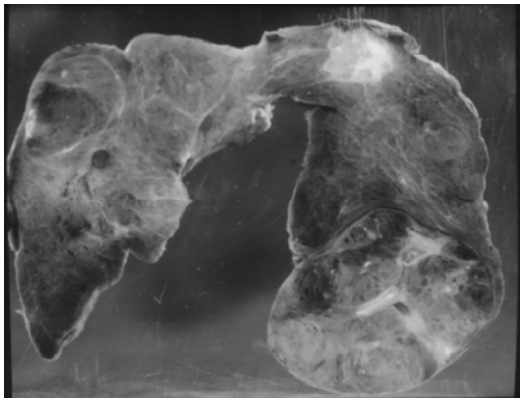
GROSS:

- GRANULAR or FIRM WHITE LESION
- IRREGULAR BORDERS

THYROID CARCINOMA

1. PAPILLARY:	70-80%
2. FOLLICULAR:	10-20%
3. MEDULLARY:	5%
4. ANAPLASTIC:	1-3%





PAPILLARY CARCINOMA

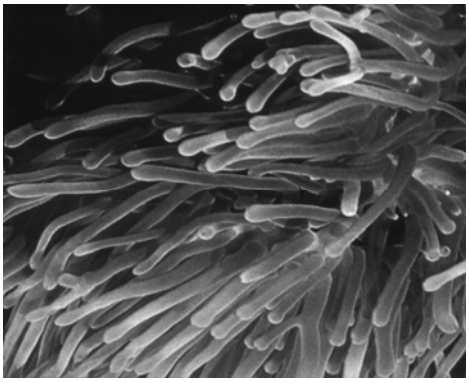
- 70-80% of thyroid carcinomas
- GROSS: most often solitary

  BUT……..
- MICRO: most often multifocal
  - if opposite lobe is serially sectioned, another focus will be found in 50-75% of cases

PAPILLARY CA

MICRO:

- PAPILLARY FRONDS
- CUBOIDAL LINING CELLS
- MOST LESIONS ALSO HAVE FOLLICULAR AREAS
- SAME BIOLOGIC BEHAVIOR REGARDLESS OF % PAP VS. FOLL



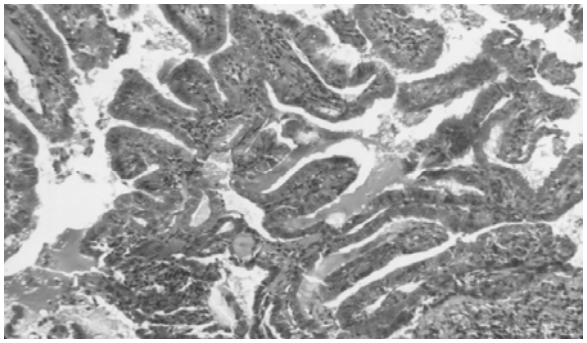
PAPILLARY CA

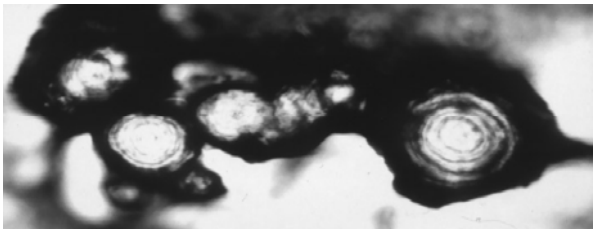
NUCLEAR FEATURES:

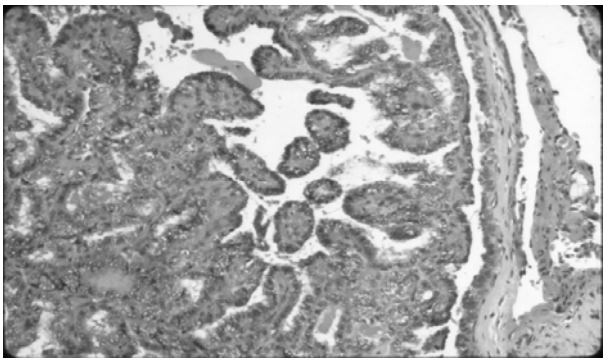
- **GROUND GLASS**
- **OPTICALLY CLEAR**
- **ORPHAN ANNIE-EYE**

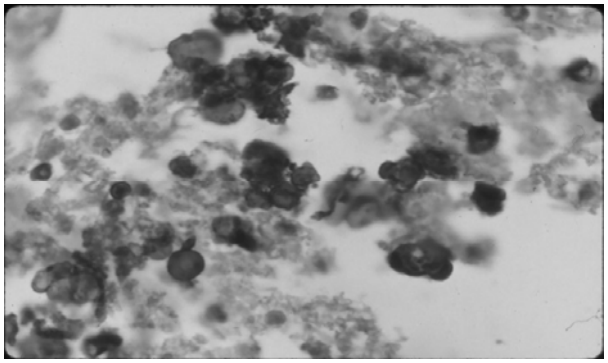
PSAMMOMA BODIES=

- **SMALL CONCENTRIC CONCRETIONS**









PAPILLARY CA

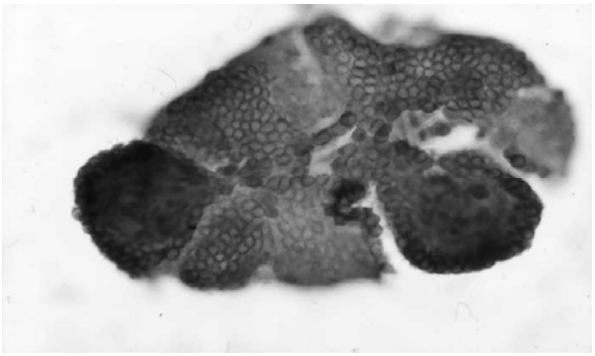
RELIABLY DIAGNOSED BY:

1. FINE NEEDLE ASPIRATION (FNA)
2. CORE NEEDLE BIOPSY
3. FROZEN SECTION DIAGNOSIS

PAPILLARY CA

SPREAD:

- RARELY DIE OF PAPILLARY CA
- IF DIE, USUALLY
  - PULMONARY OR CEREBRAL METS
  - INVASION OF JUGULAR, CAROTID OR AIRWAY
  - ANAPLASTIC DIFFERENTIATION



FOLLICULAR CA

- 10-20% OF THYROID CARCINOMAS
- USUALLY
  - SOLITARY
  - COLD
  - LOW RAI UPTAKE

PAPILLARY CA

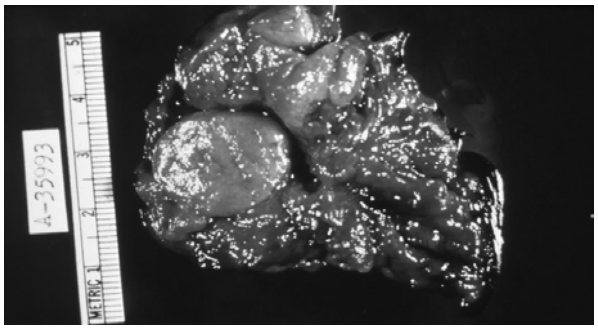
METASTATIC SPREAD:

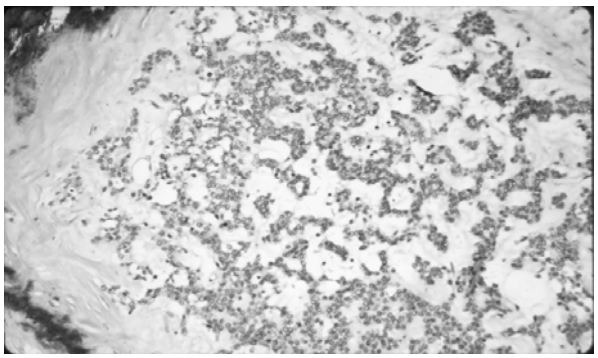
- LYMPHATIC TO PARATHYROIDAL LNs
- MULTICENTRIC FOCI IN THYROID
  - ? MULTIPLE PRIMARIES
  - ? MET FOCI VIA LYMPHATIC SPREAD
- CLINICAL OR SUBCLINICAL

FOLLICULAR CA

GROSS:

- SOLITARY
- MAY HAVE CAPSULE
  - INVASION DISTINGUISHES CA FROM ADENOMA
- MAY INVADE
  - ADJACENT THYROID
  - OUTSIDE THYROID & CAUSE ADHESIONS TO ADJACENT STRUCTURES



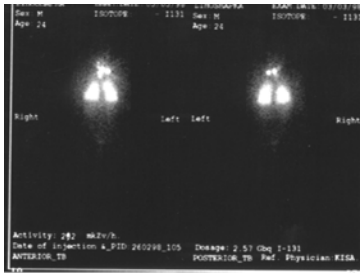


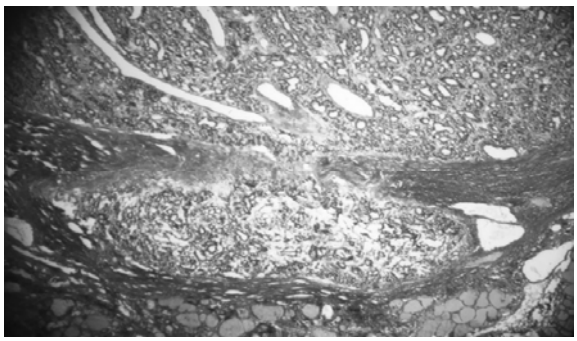
FOLLICULAR CA

MICRO:

- **SOLITARY IN ONE LOBE**
- **METASTATIC SPREAD:**
  - **INVADES AND METS VIA VEINS**
  - **COMMON SITES OF METS:**
    - **LUNGS AND BONES**

CHORNOBYL PROJECT
I ^{131} Radioisotope scan of 24 year old man with thyroid cancer and lung metastases





FOLLICULAR CA

Treatment:

- **Total thyroidectomy (1 or 2 stages)**
- **If metastatic to lung or bone, treat with hi dose ^{131}I to ablate**
- **10 year survival: 50-70%**

THYROID NEOPLASMS

- How to distinguish Follicular ADENOMA from CARCINOMA?
  - Search for invasion of capsule or blood vessels
  - Examine entire nodule, especially capsule

MEDULLARY CA

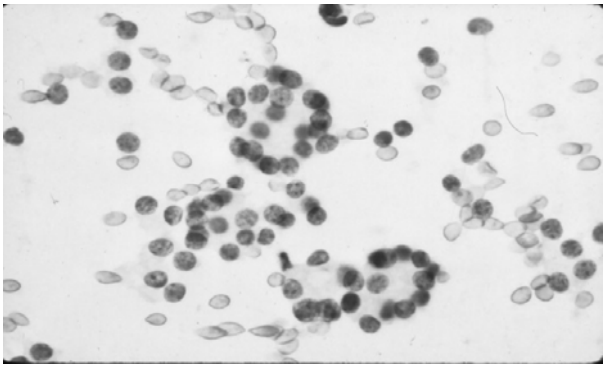
- 5% OF THYROID CARCINOMAS
- ARISE from PARAFOLLICULAR CELLS ("C" CELLS)
  - ARISE FROM NEURAL CREST
- FAMILIAL 25% (MEN)
- ASSOCIATED WITH RET PROTO-ONCOGENE

FOLLICULAR CA

- VERY DIFFICULT TO DIAGNOSE BY FROZEN SECTION
  - Bland tumor cells
  - Subtle invasion
- EASY TO DIAGNOSE ANY CA WITH GROSS INVASION &/OR ANAPLASIA AND MITOSES

MEDULLARY CA

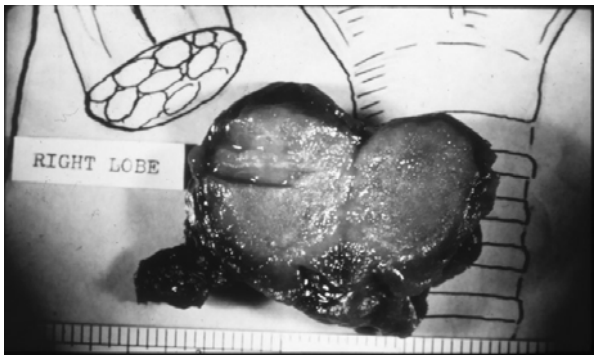
- "C" CELLS PRODUCE MAINLY CALCITONIN
  - & OTHER PP HORMONES ie SERATONIN, ACTH
- PRE-OP SERUM CALCITONIN FOR DIAGNOSIS
- POST-OP SERUM CALCITONIN TO DETECT RESIDUAL OR RECURRENT TUMOR
- TOTAL THYROIDECTOMY
- LN DISSECTION IF ENLARGED OR SUSPICIOUS NODES

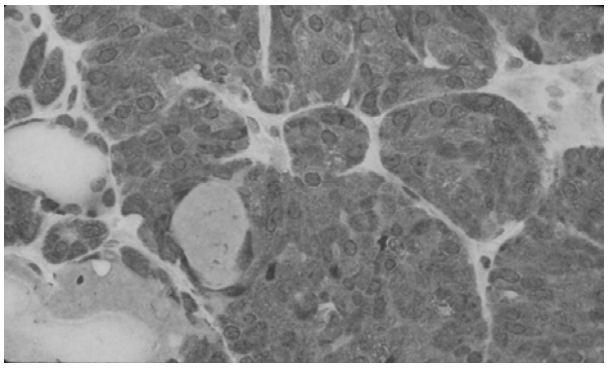


MEDULLARY CA

GROSS:

- YELLOW-TAN
- ILL-DEFINED BORDERS
- INFILTRATES ADJACENT TISSUES

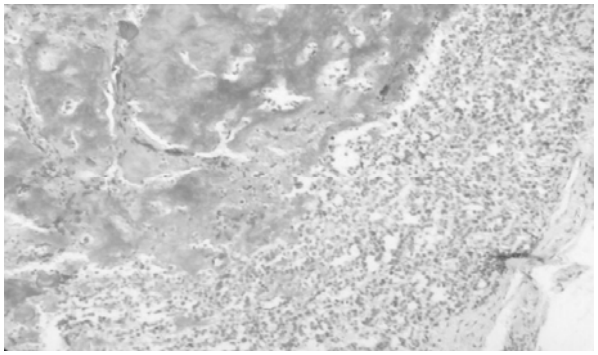


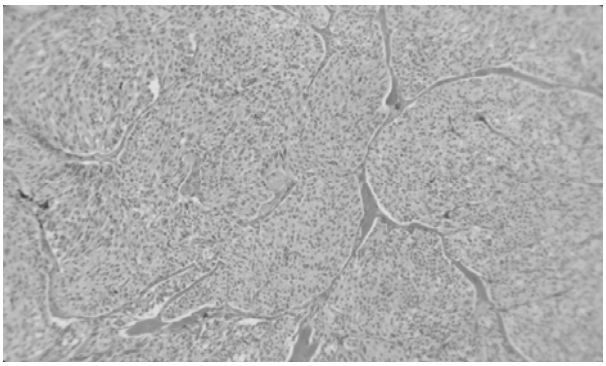


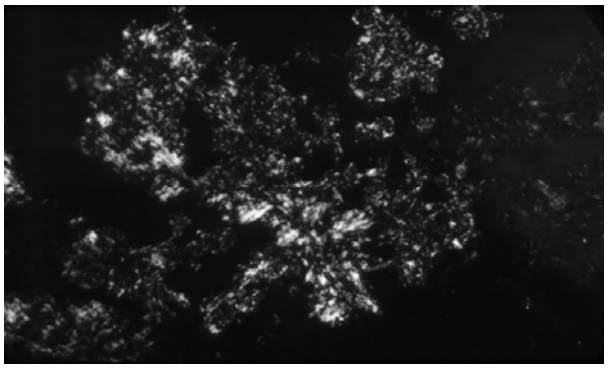
MEDULLARY CA

MICROSCOPIC:

- SOLID NESTS
- ROUND TO SPINDLY CELLS
- AMYLOID-LIKE STROMA
  - –CONGO RED, POLARIZED: APPLE GREEN BIREFRINGENCE







MEDULLARY CA

SPREAD:

- **LYMPHATIC**
- **VENOUS**
- **METS TO LUNG AND BONES**
- **MULTIFOCAL**

ANAPLASTIC CA

CLINICAL:

- **Rapid growth**
- **Invasion of adjacent structures**
- **Tracheostomy frequently necessary**
- **Usually unresectable**
- **Chemo / Radiation not useful in most**

ANAPLASTIC CA

- **1-3% OF THYROID CARCINOMAS**
- **VERY POOR PROGNOSIS**

  (<5% SURVIVE 5 YEARS)
- **LESS FREQUENT than 40 years ago**

ANAPLASTIC CA

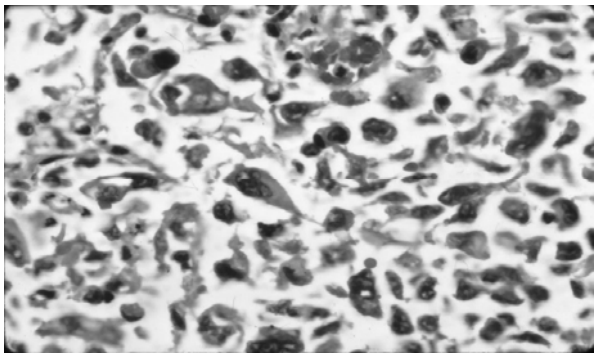
MICRO:

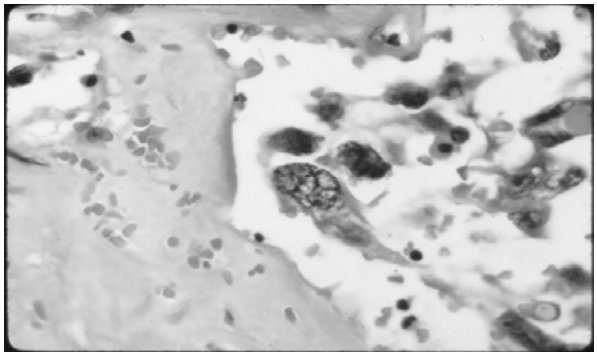
- **HIGHLY UNDIFFERENTIATED!!!!!**
  - **small cells**
  - **giant cells**
  - **spindle cells**
- **May need immunostains to distinguish from lymphoma & sarcoma**

ANAPLASTIC CA

CLINICAL:

- **Patients >50 years old**
- **Old nodule begins to grow rapidly**
  - **? arose in pre-existing nodule**
- **? Lower incidence due to more resected nodules**





THYROGLOSSAL DUCT CYST

- **PERSISTENT THYROID ALONG EMBRYONAL MIGRATION PATH IN MIDLINE NECK, ANTERIOR TO LARYNX & HYOID BONE**
- **RESECTED WHEN RESIDUAL TRACT / CYST PERSISTS OR RECURS**
- **MICRO:**
  - **LINED BY CILIATED RESPIRATORY EPITHELIUM, SQUAMOUS, OR BOTH**

MALIGNANT LYMPHOMA OF THYROID

- **USUALLY ARISES IN HASHIMOTO'S THYROIDITIS**
- **RARELY PRIMARY IN THYROID**