

THYROID PATHOLOGY

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P&S '77

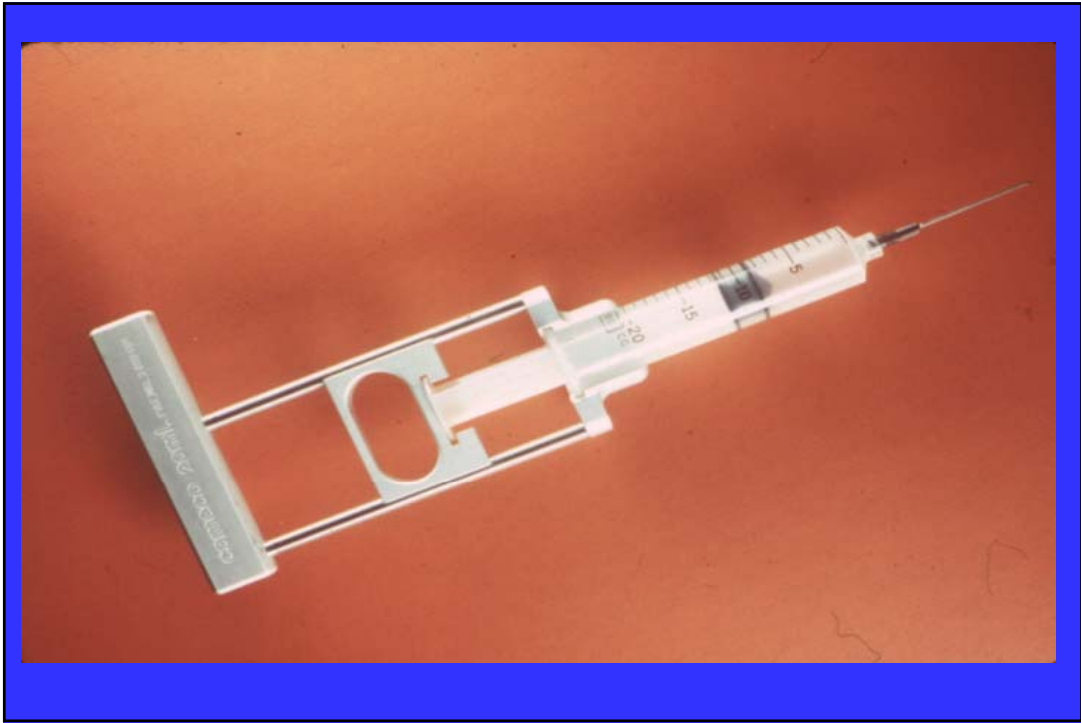
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CHORNOBYL
PROJECT

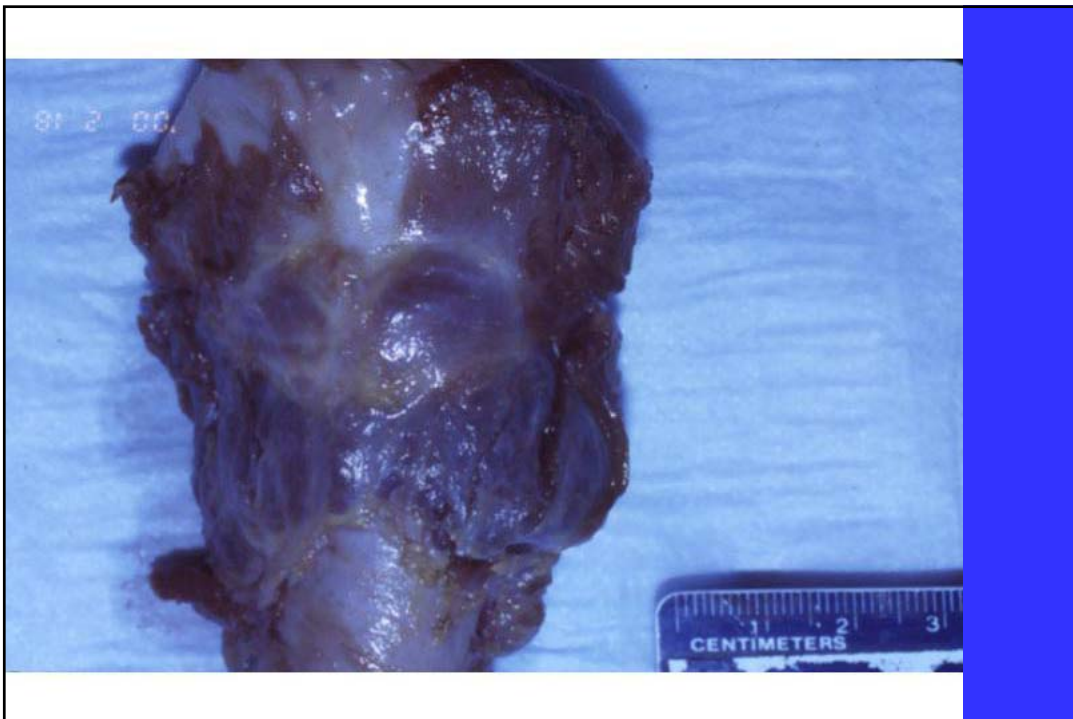
COLUMBIA
CLINICAL TEAM

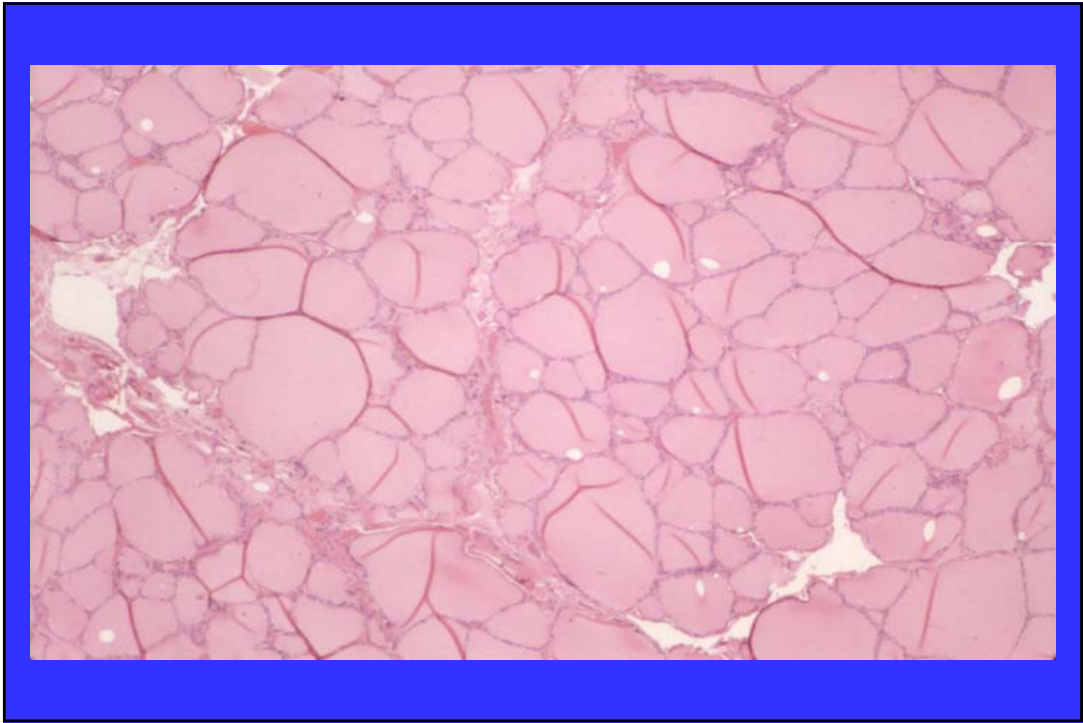




CHORNOBYL

**UKRANIAN-
AMERICAN
MOBILE
ULTRASOUND**





DEFINITIONS

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

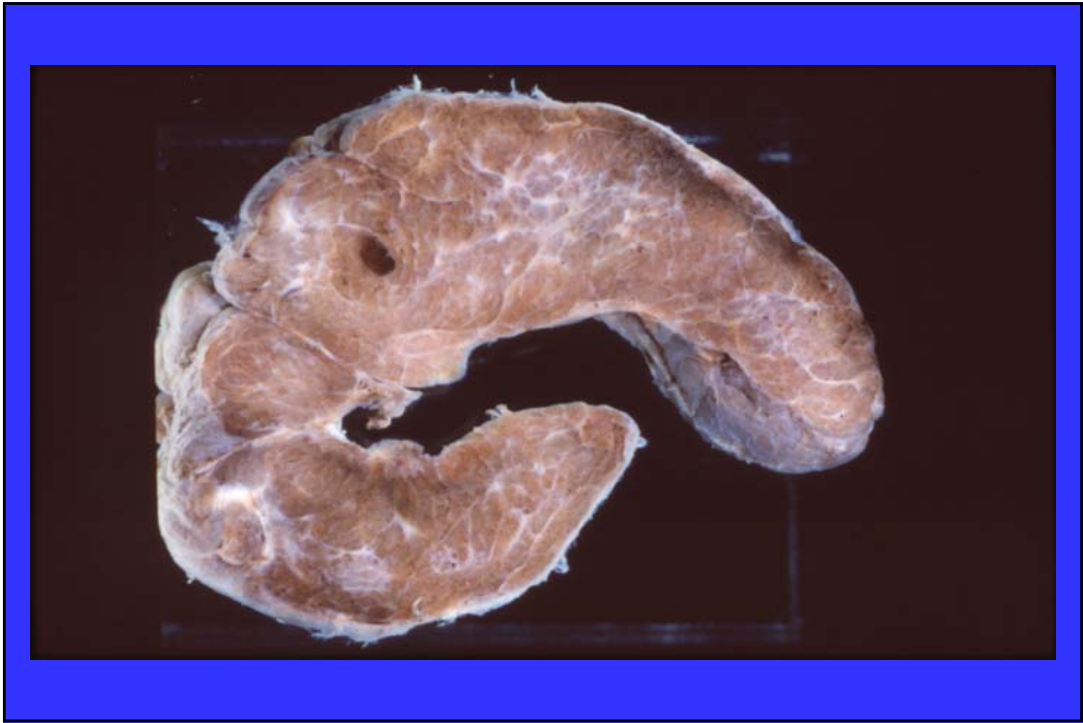
GRAVES' DISEASE DIFFUSE TOXIC GOITER

MOST COMMON CAUSE OF

HYPERTHYROIDISM

GROSS:

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

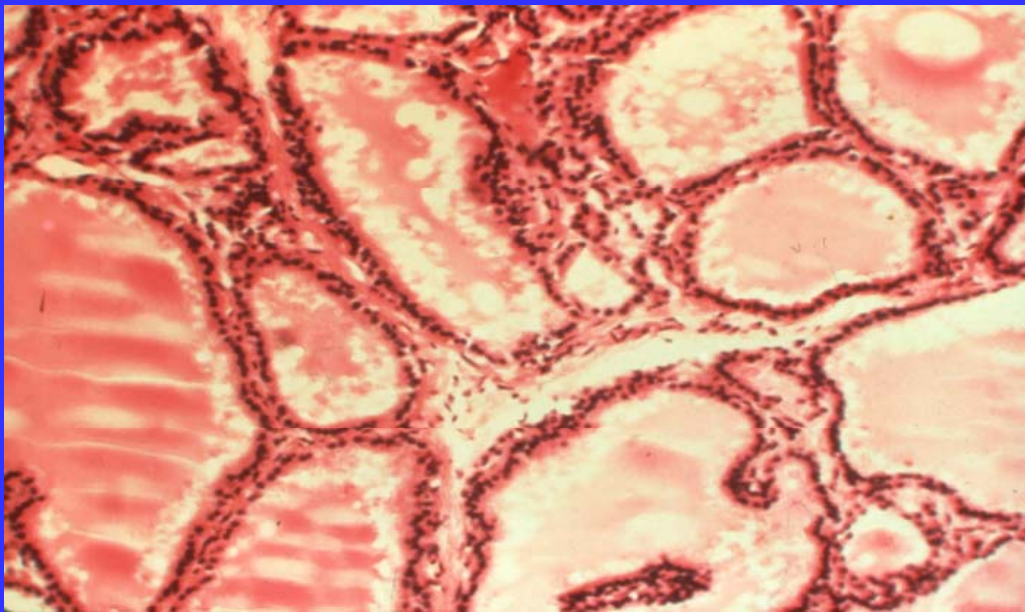


GRAVES' DISEASE

MICROSCOPIC:

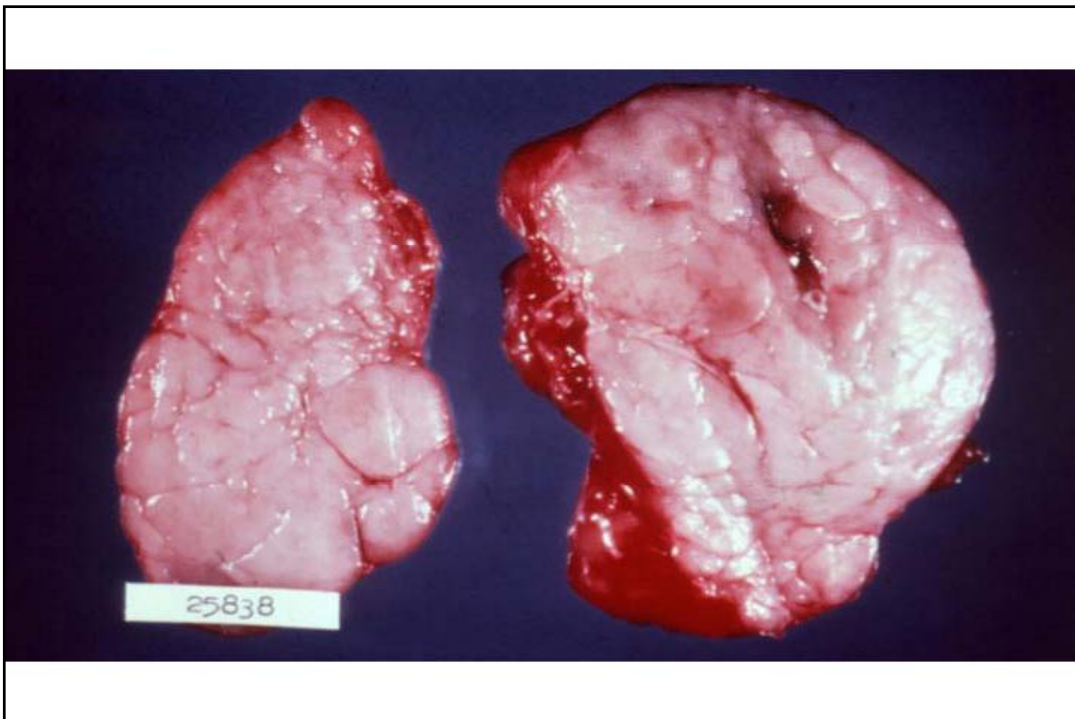
Hyperplasia of follicular lining cells

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



HASHIMOTO'S THYROIDITIS

- 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

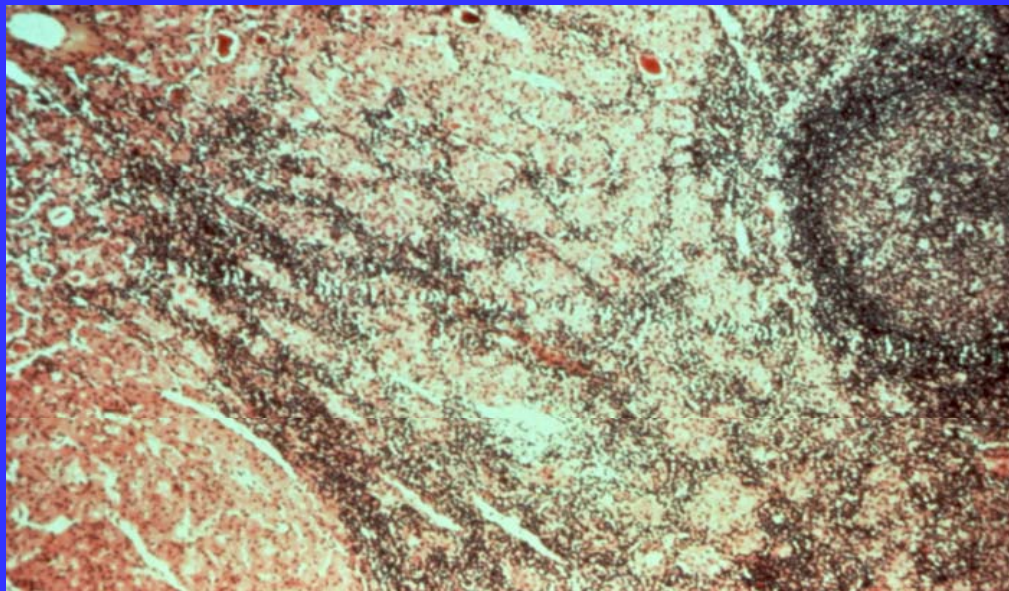


HASHIMOTO'S THYROIDITIS

Lymphocytic thyroiditis with oxyphilia

MICROSCOPIC:

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

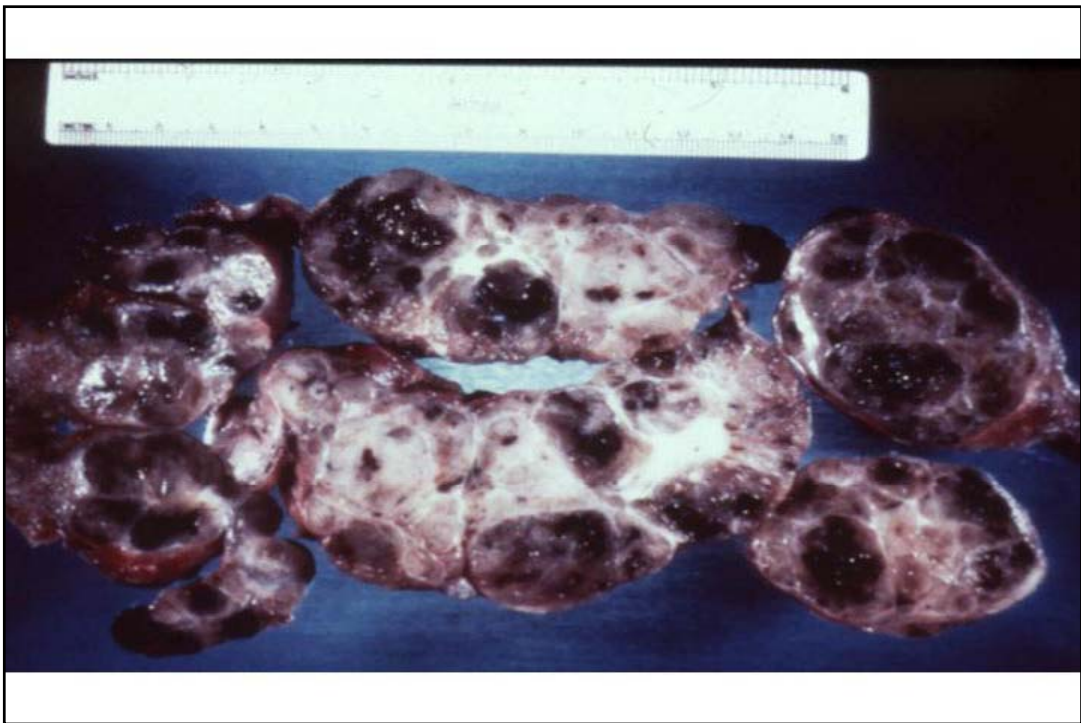
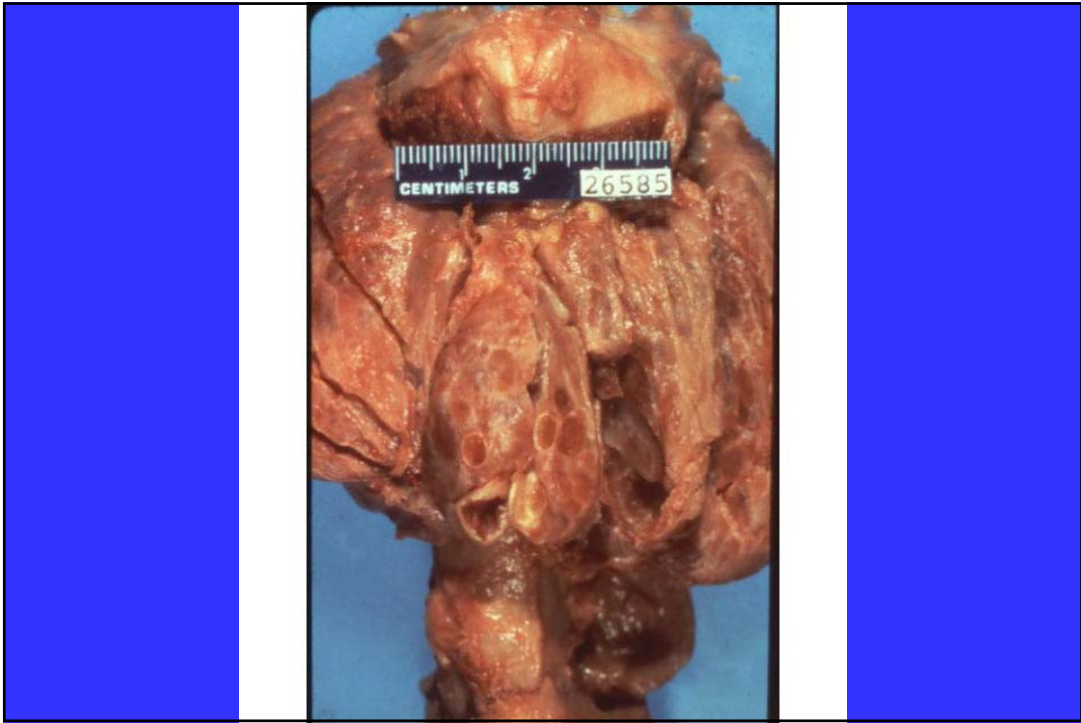


NONTOXIC NODULAR GOITER “NTNG”

- 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.**



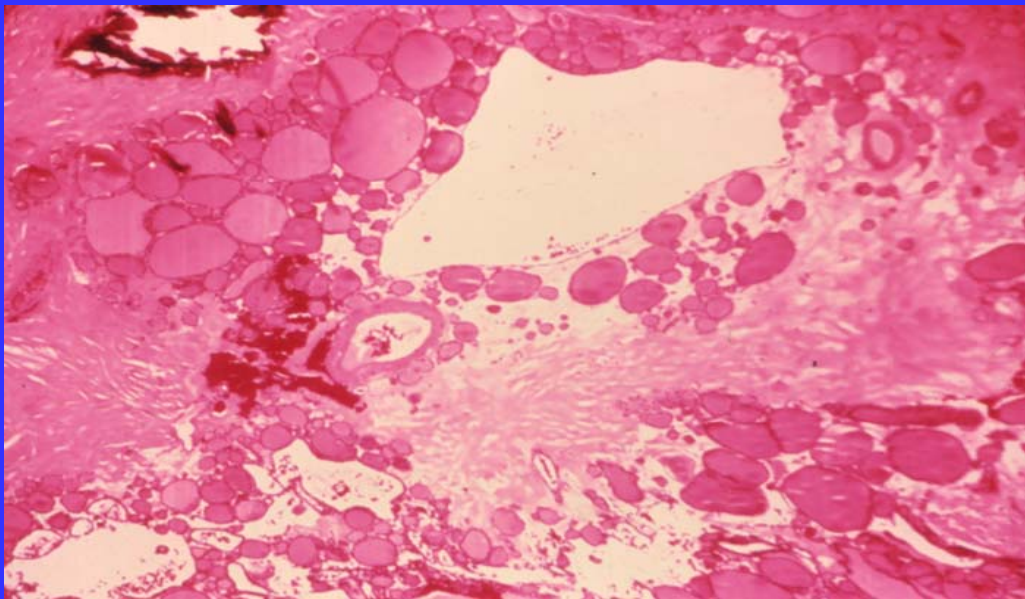
NONTOXIC NODULAR GOITER “NTNG”

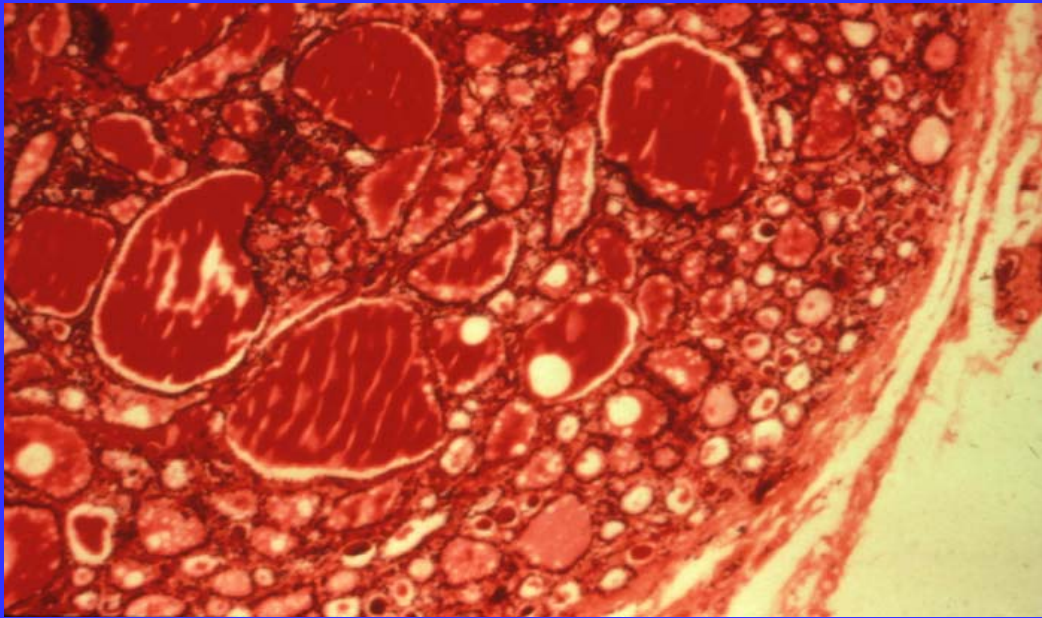
- **MICROSCOPIC:**

- Follicles

- **VARYING SIZES**, usually large
- filled with **COLLOID**
- lined by cuboidal cells

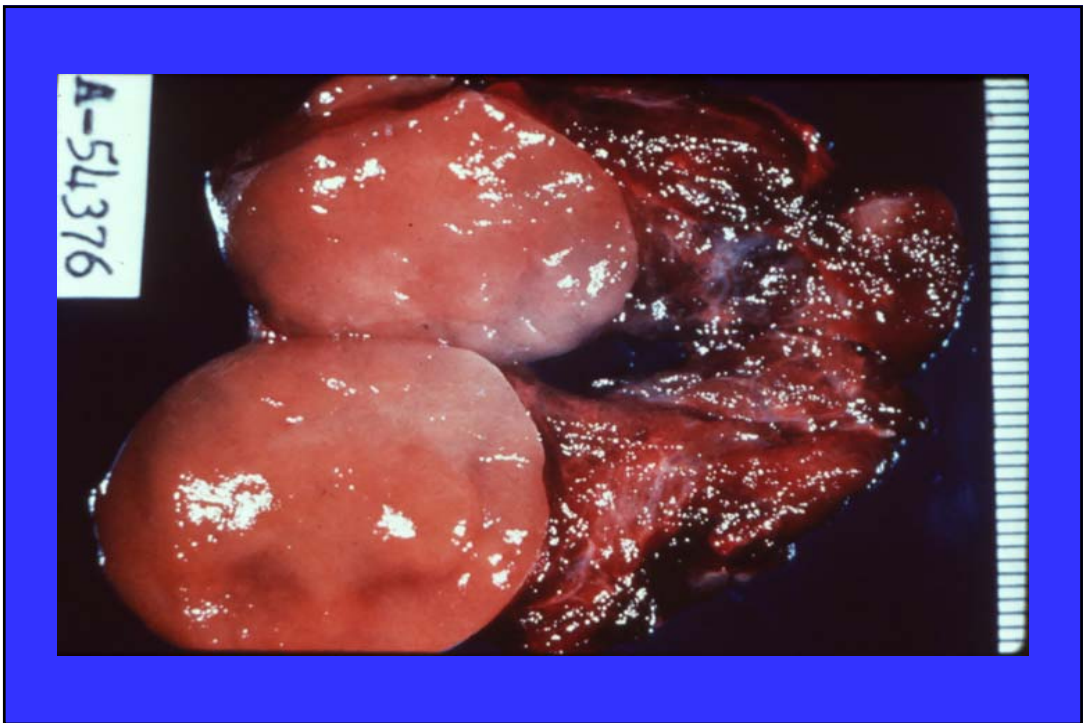
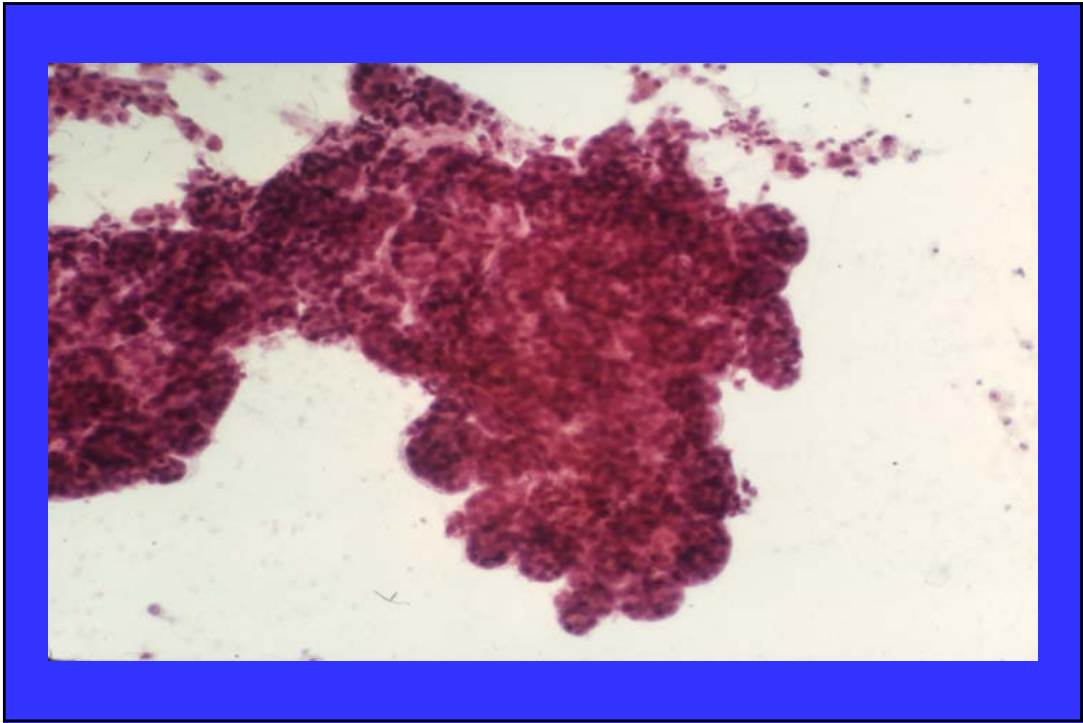
- Zones of **FIBROSIS & HEMORRHAGE**

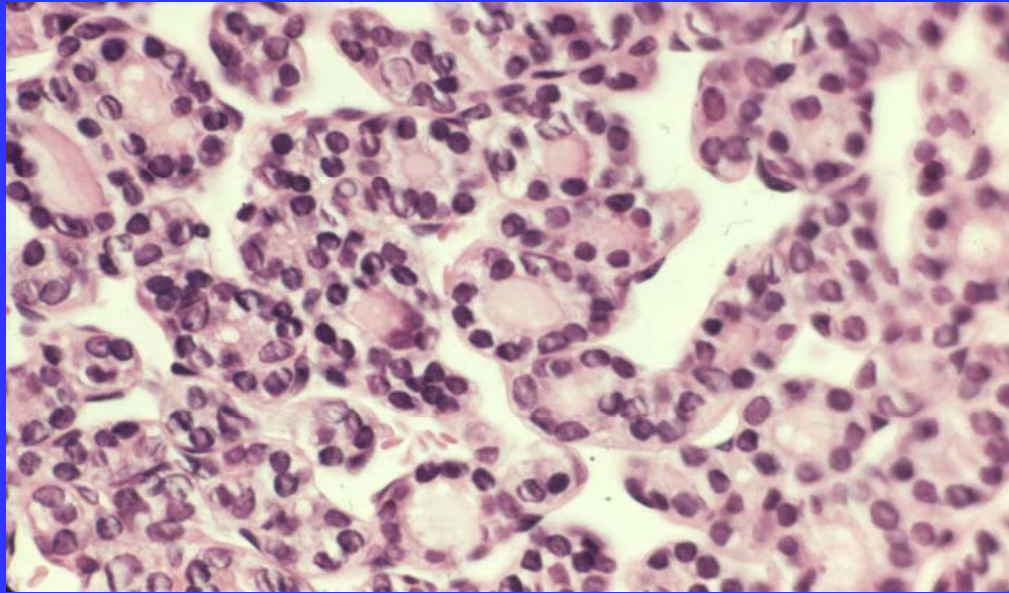




THYROID NEOPLASMS

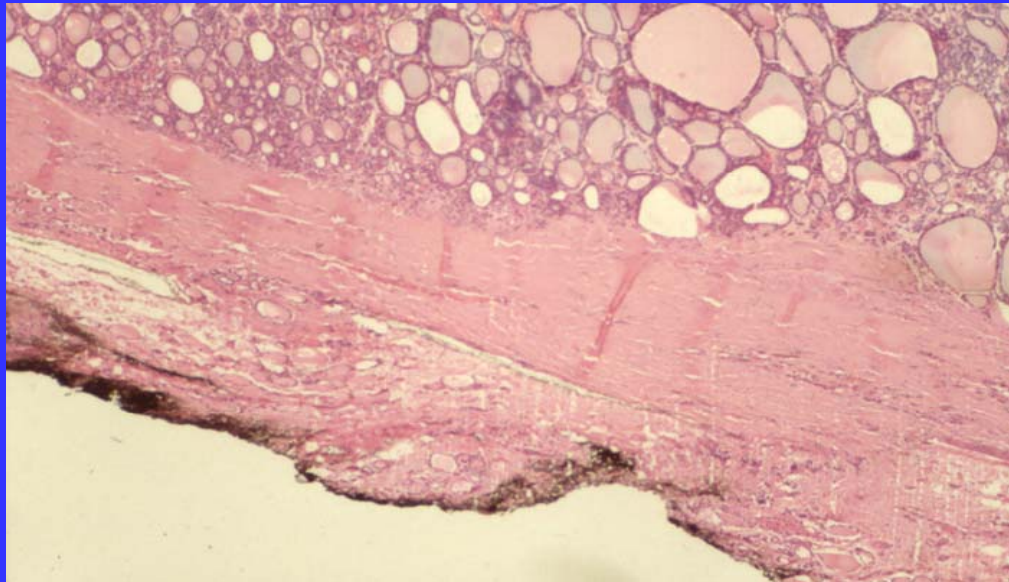
- **BENIGN: ADENOMA**
- **GROSS:**
 - Nodule
 - well encapsulated
 - solid
 - deep-tan





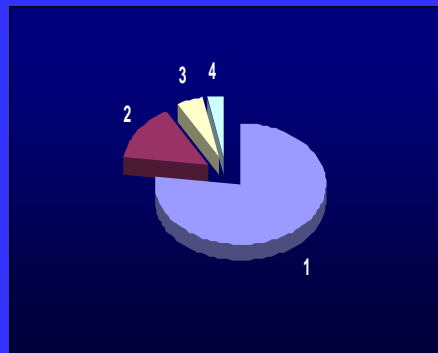
THYROID NEOPLASMS

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



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 CARCINOMA

GROSS:

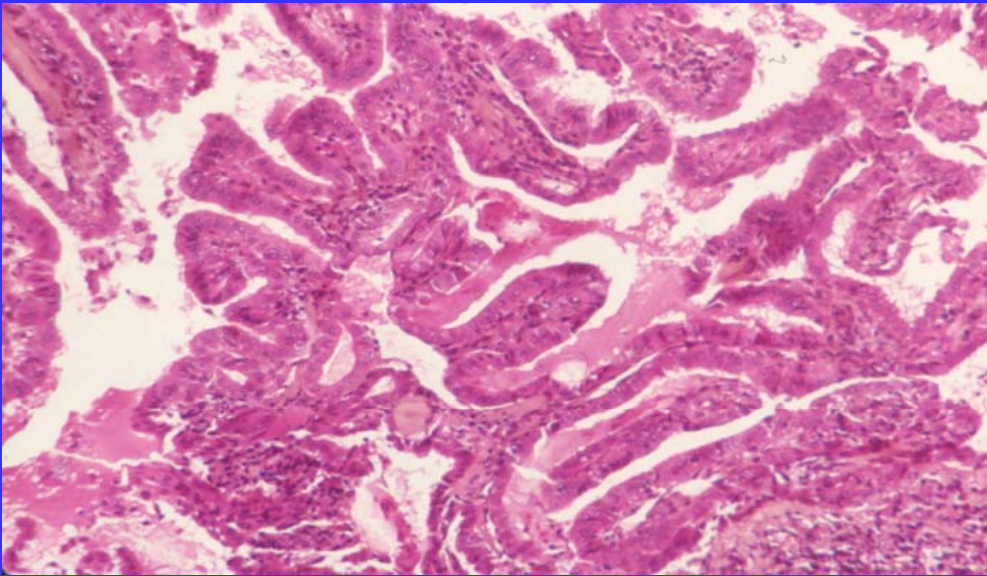
- GRANULAR or FIRM WHITE LESION
- IRREGULAR BORDERS

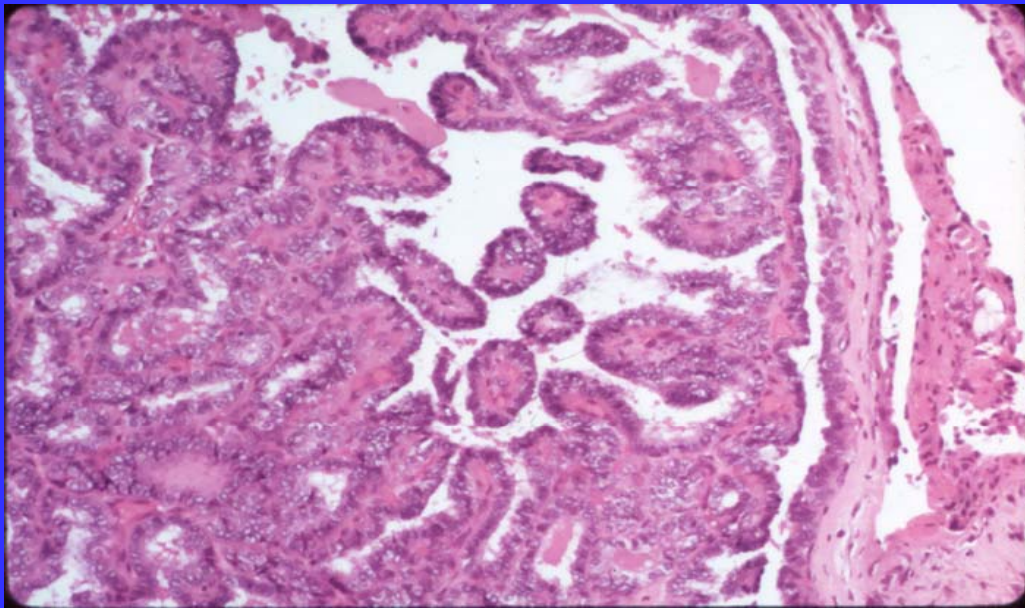


PAPILLARY CA

MICRO:

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





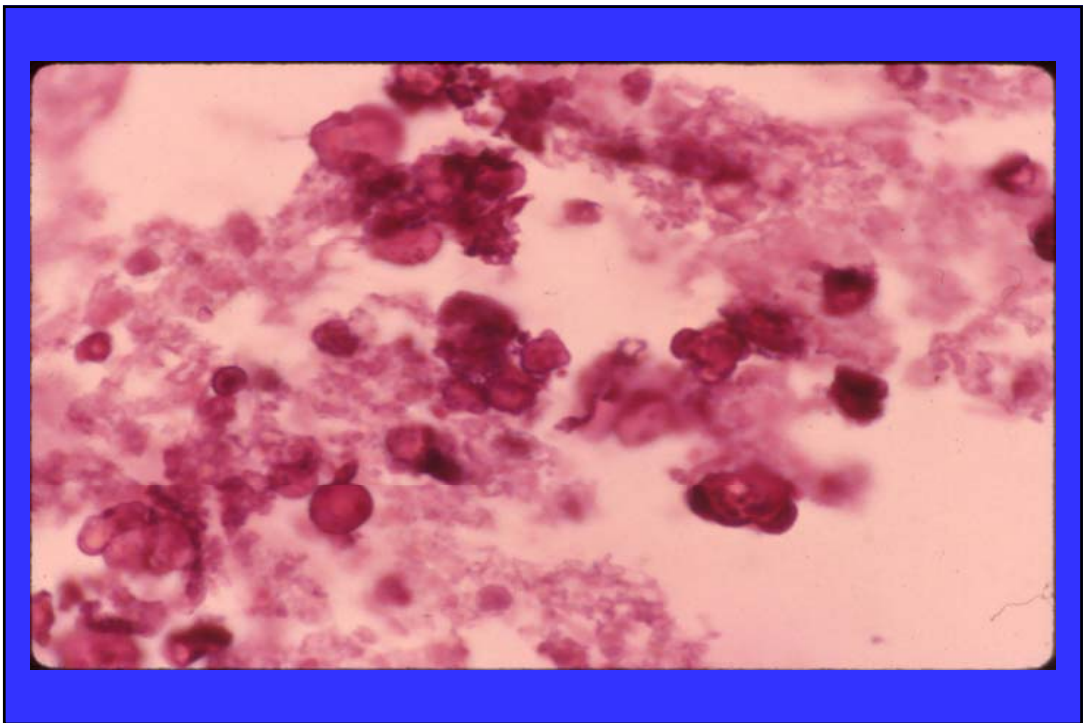
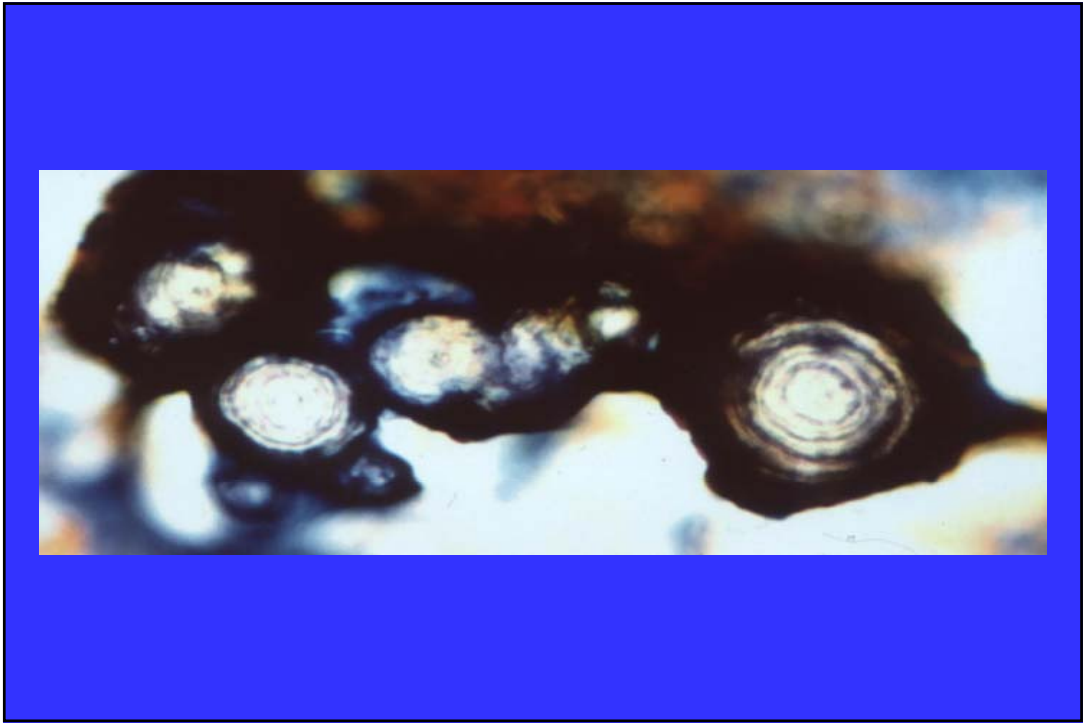
PAPILLARY CA

NUCLEAR FEATURES:

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

PSAMMOMA BODIES=

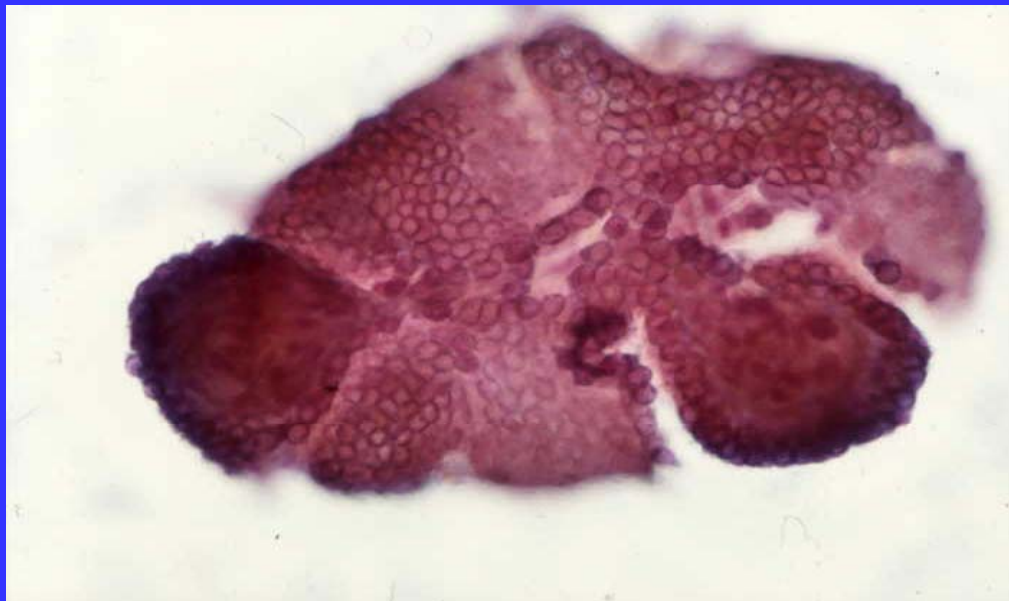
– SMALL CONCENTRIC CONCRETIONS



PAPILLARY CA

RELIABLY DIAGNOSED BY:

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



PAPILLARY CA

METASTATIC SPREAD:

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

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

FOLLICULAR CA

GROSS:

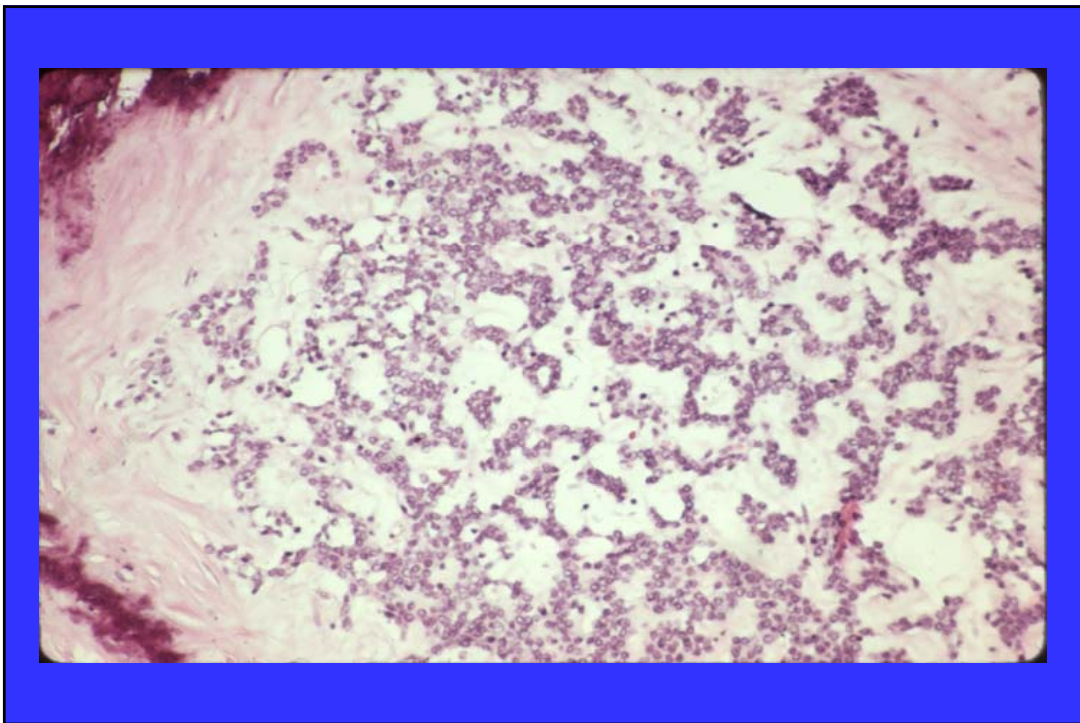
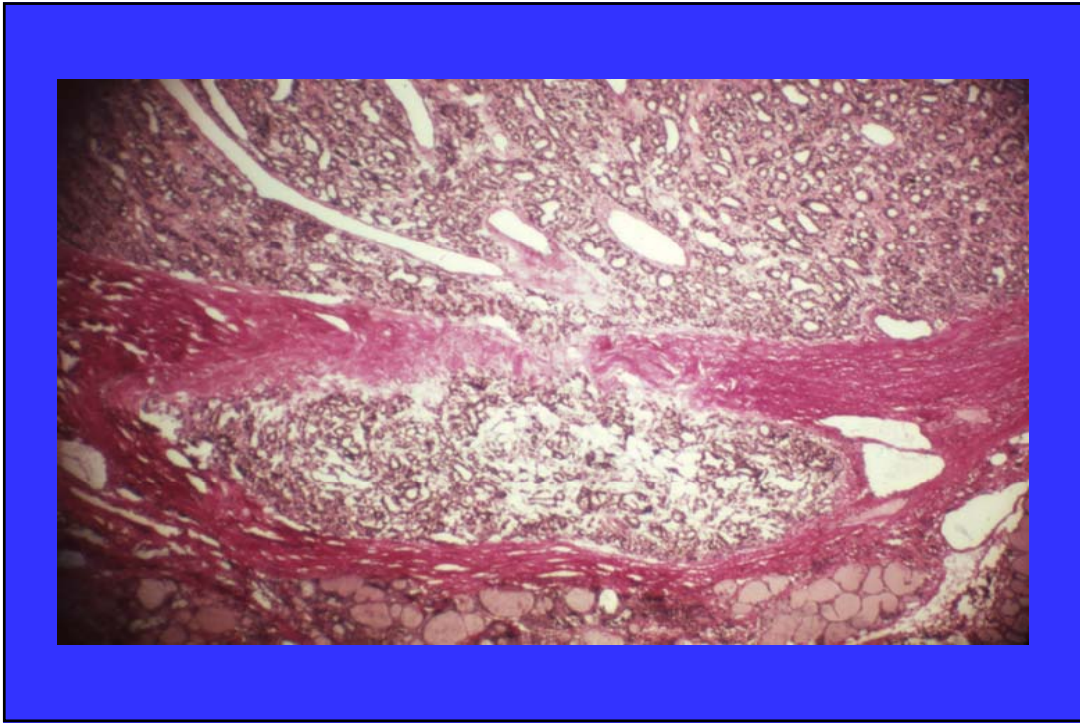
- SOLITARY
- MAY HAVE CAPSULE
 - INVASION DISTINGUISHES CA FROM ADENOMA
- MAY INVADE
 - ADJACENT THYROID
 - OUTSIDE THYROID & CAUSE ADHESIONS TO ADJACENT STRUCTURES



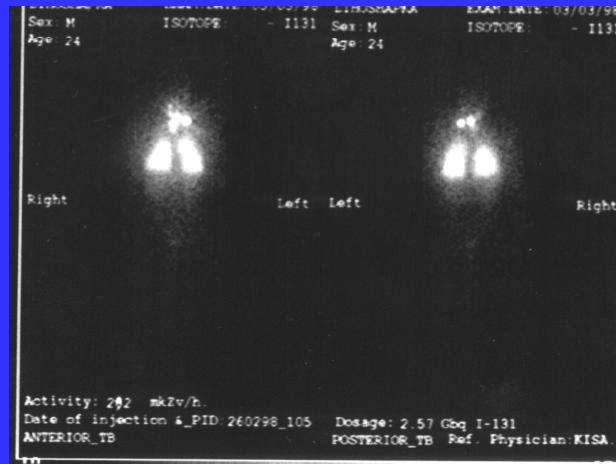
FOLLICULAR CA

MICRO:

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



CHORNOBYL PROJECT
**I¹³¹ Radioisotope scan of 24 year old man with
thyroid cancer and lung metastases**



FOLLICULAR CA

Treatment:

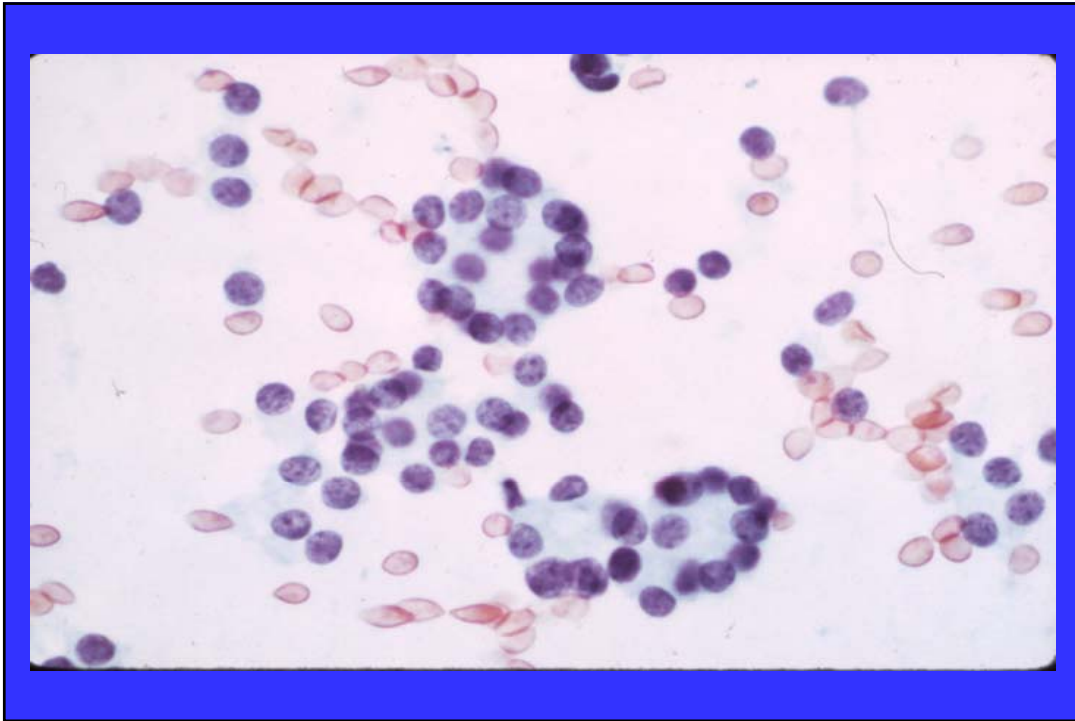
- **Total thyroidectomy (1 or 2 stages)**
- **If metastatic to lung or bone,
treat with hi dose ¹³¹I to ablate**
- **10 year survival: 50-70%**

THYROID NEOPLASMS

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

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

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

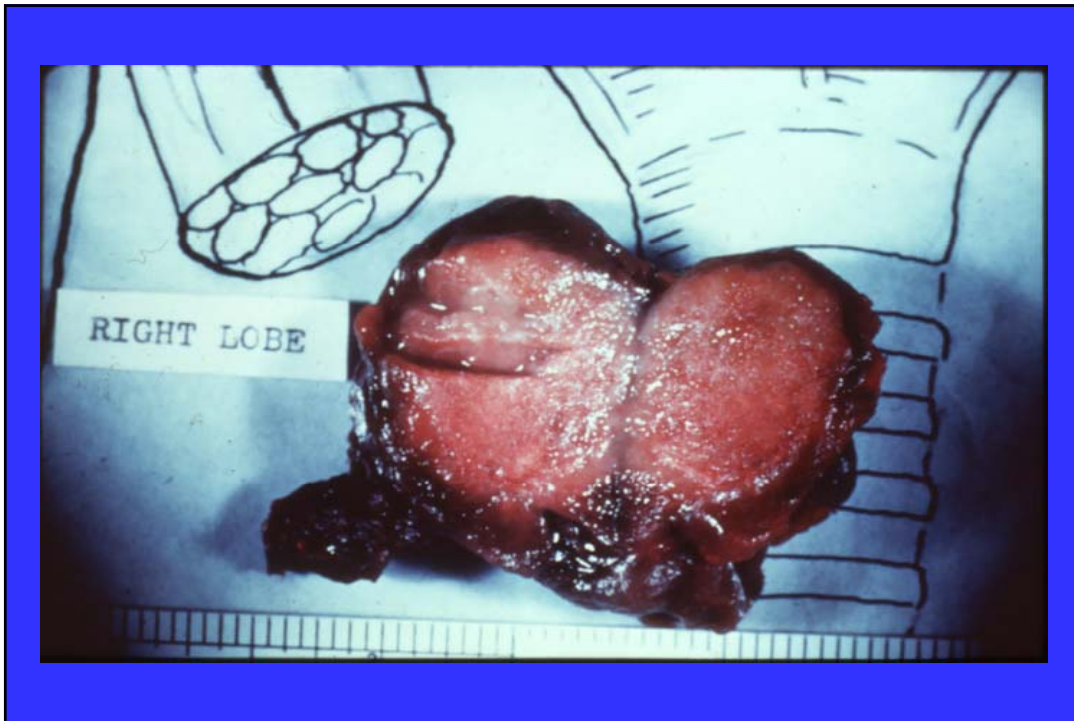
MEDULLARY CA

- “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:

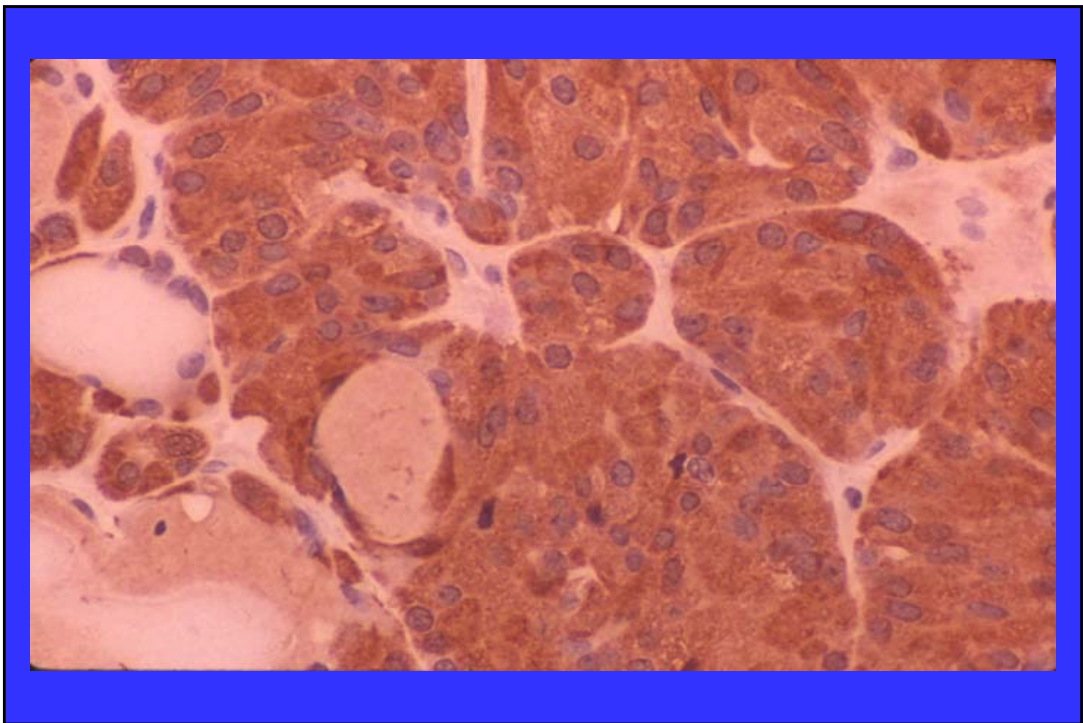
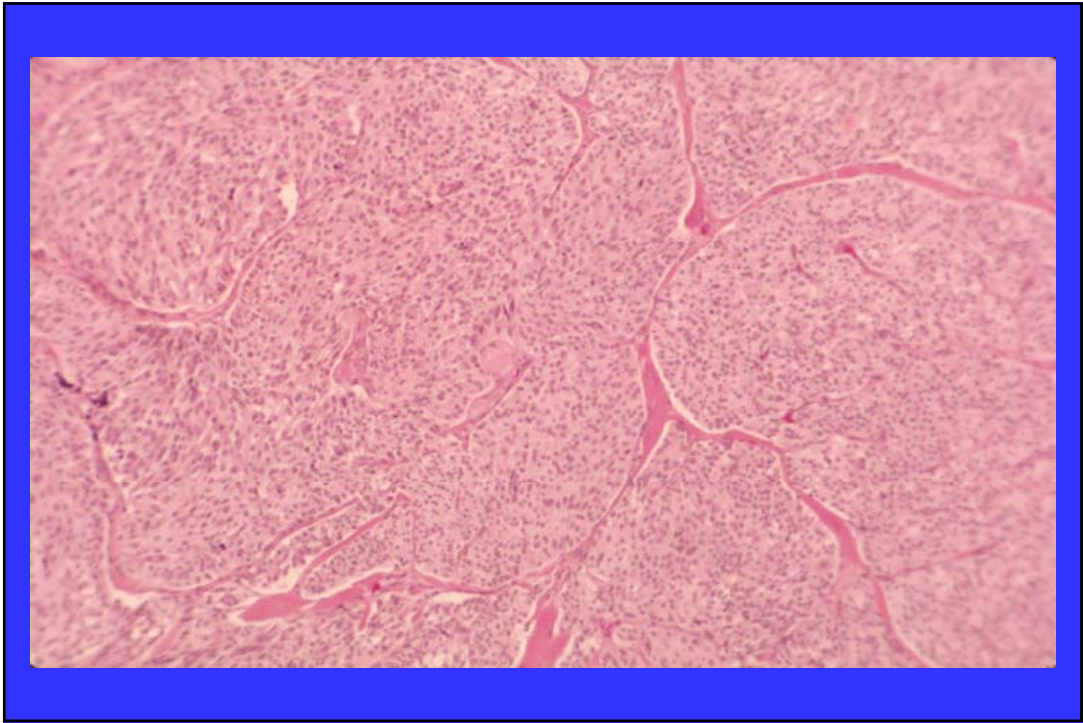
- YELLOW-TAN
- ILL-DEFINED BORDERS
- INFILTRATES ADJACENT TISSUES

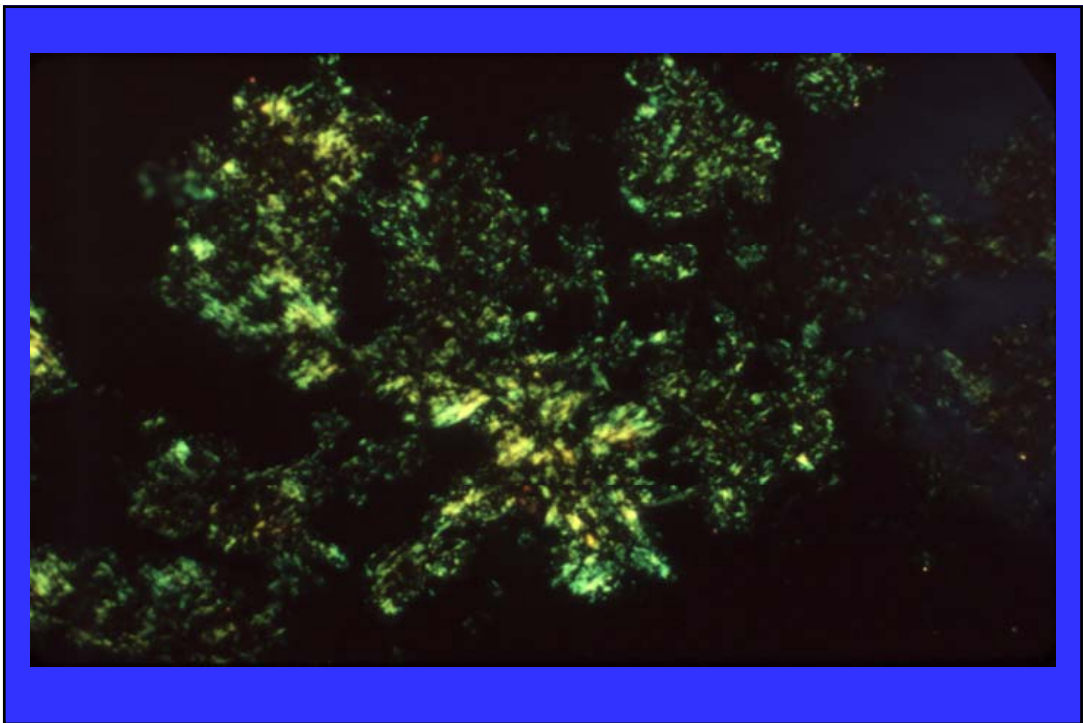
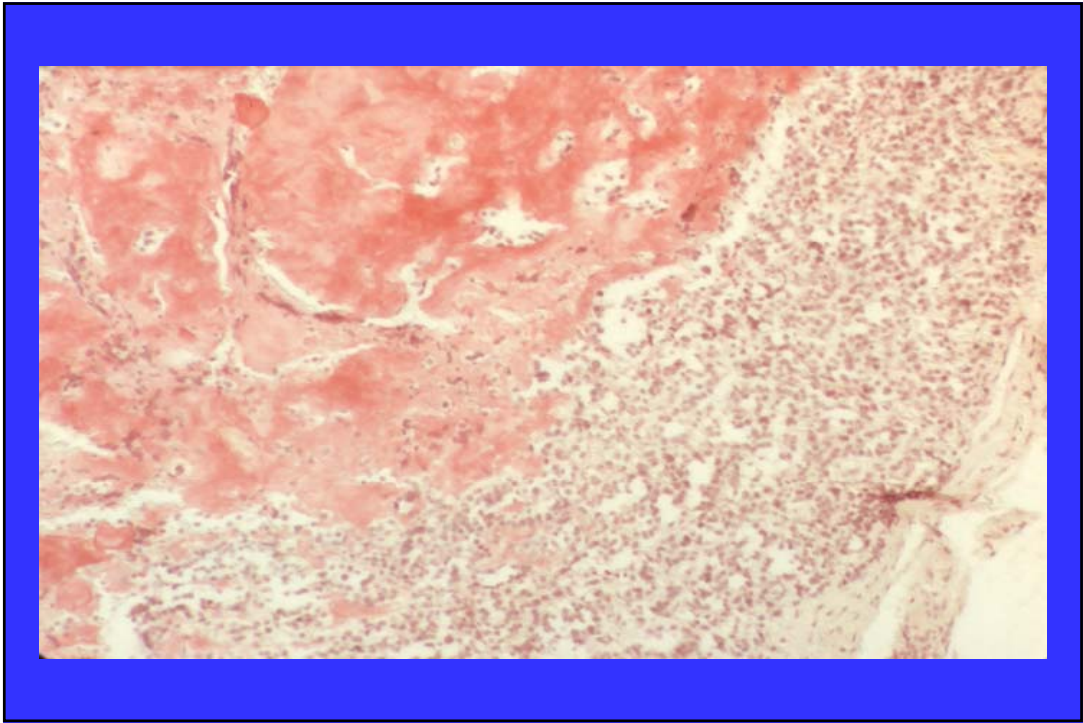


MEDULLARY CA

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

- **1-3% OF THYROID CARCINOMAS**
- **VERY POOR PROGNOSIS**
(**<5% SURVIVE 5 YEARS**)
- **LESS FREQUENT than 40 years ago**

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

ANAPLASTIC CA

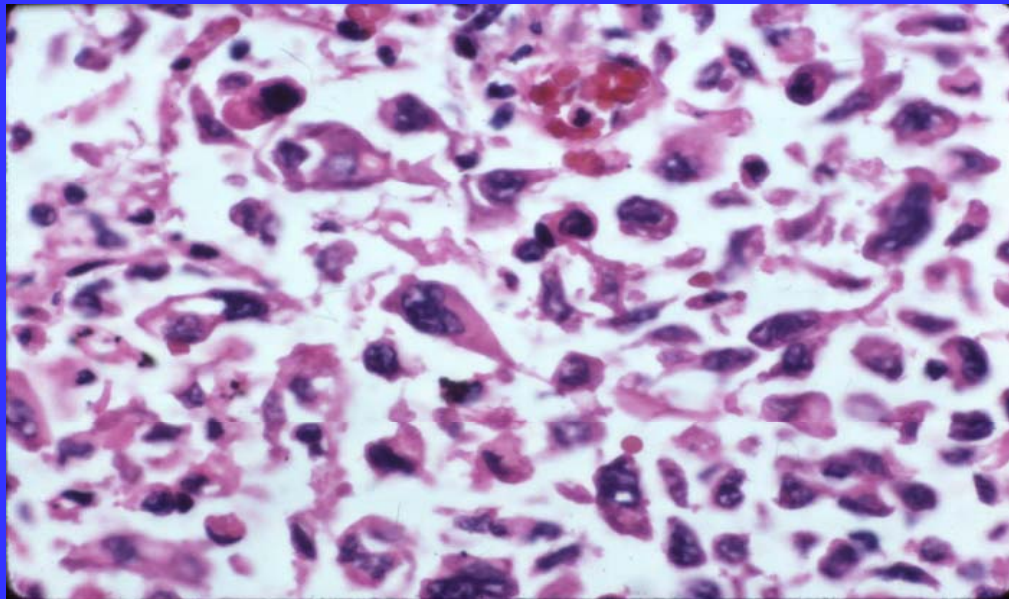
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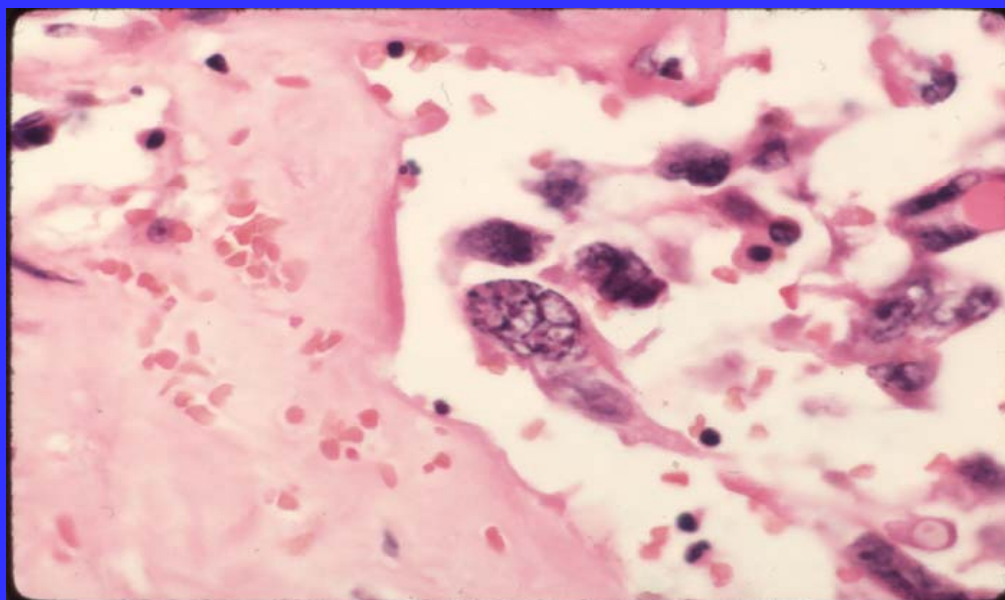
- Rapid growth
- Invasion of adjacent structures
- Tracheostomy frequently necessary
- Usually unresectable
- Chemo / Radiation not useful in most

ANAPLASTIC CA

MICRO:

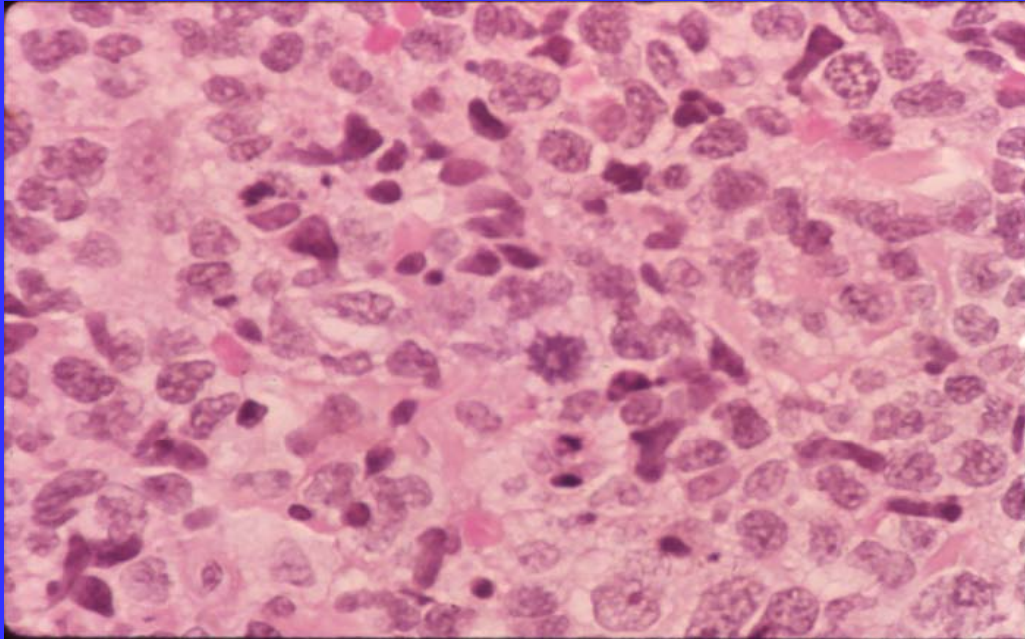
- **HIGHLY UNDIFFERENTIATED!!!!**
 - small cells
 - giant cells
 - spindle cells
- **May need immunostains to distinguish from lymphoma & sarcoma**





MALIGNANT LYMPHOMA OF THYROID

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



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

