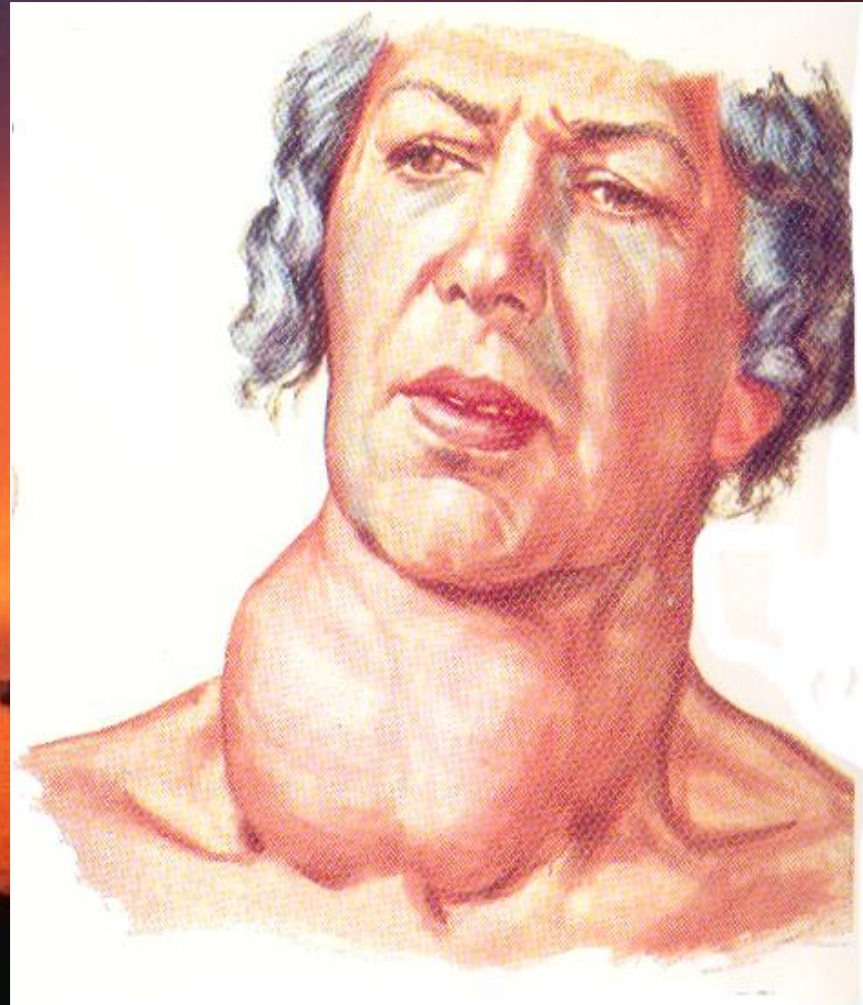


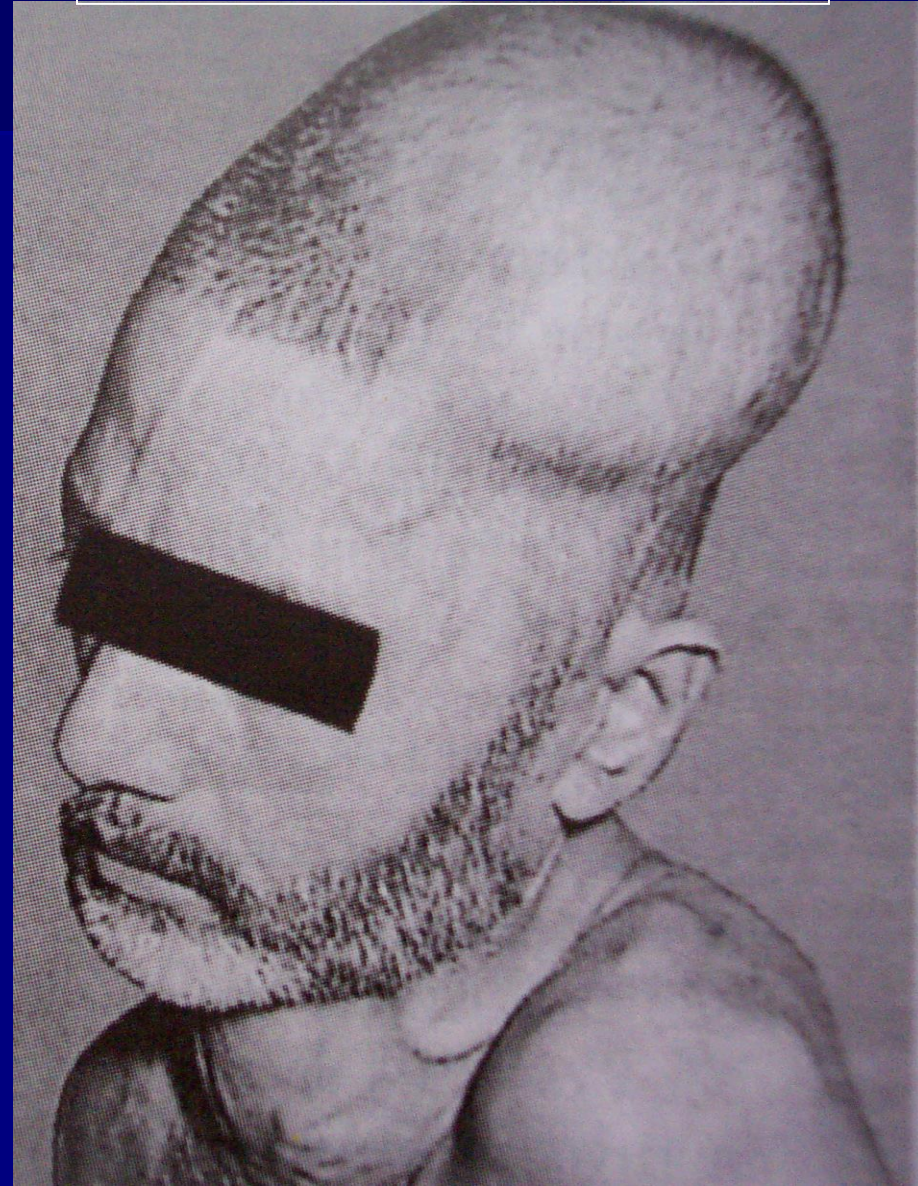
PRESENTING FEATURES

- PRIMARY
 - **Asymptomatic Solitary nodule**
 - **Goiter.**
- LOCAL SPREAD:
 - Hoarseness of voice
 - Dysphasia
 - Dyspnoea
 - Pain ref. to ear :
Anaplastic



Pulsatile Scalp Secondaries

- METASTASIS:
- Enlarged Cervical L.N.
- Pulsating Scalp Tumour
- Pulsating Bone Tumour
- Pathological Fracture.



SOLITARY THYROID NODULE:

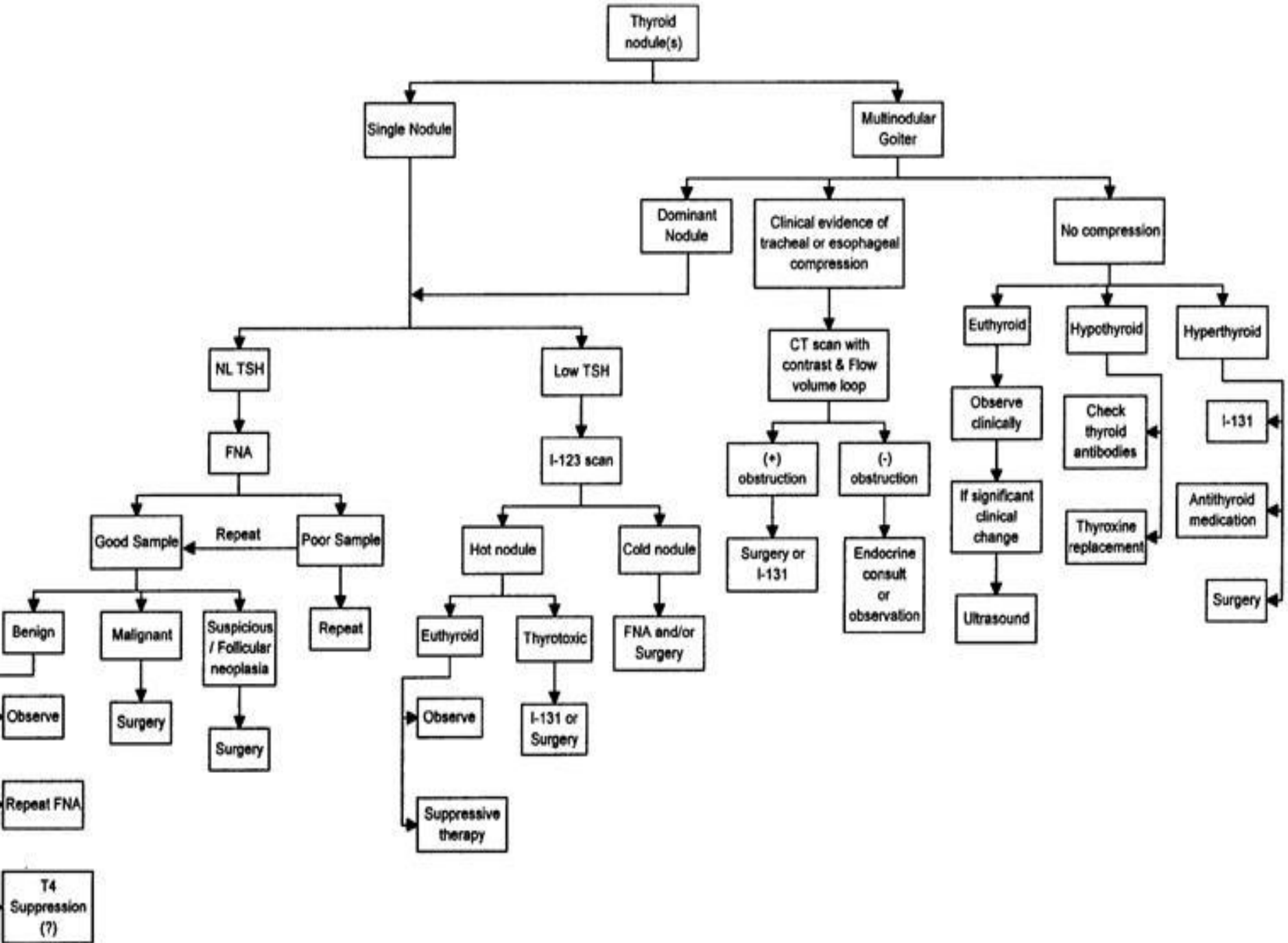
A Goitre, on clinical examination appears to be Single Nodule in Otherwise normal gland

■ Non neoplastic

- Dominant nodule of mng
- Localized Hashimoto's disease
- Thyroid cyst.
- Cystic degeneration of MNG

■ Neo Plastic

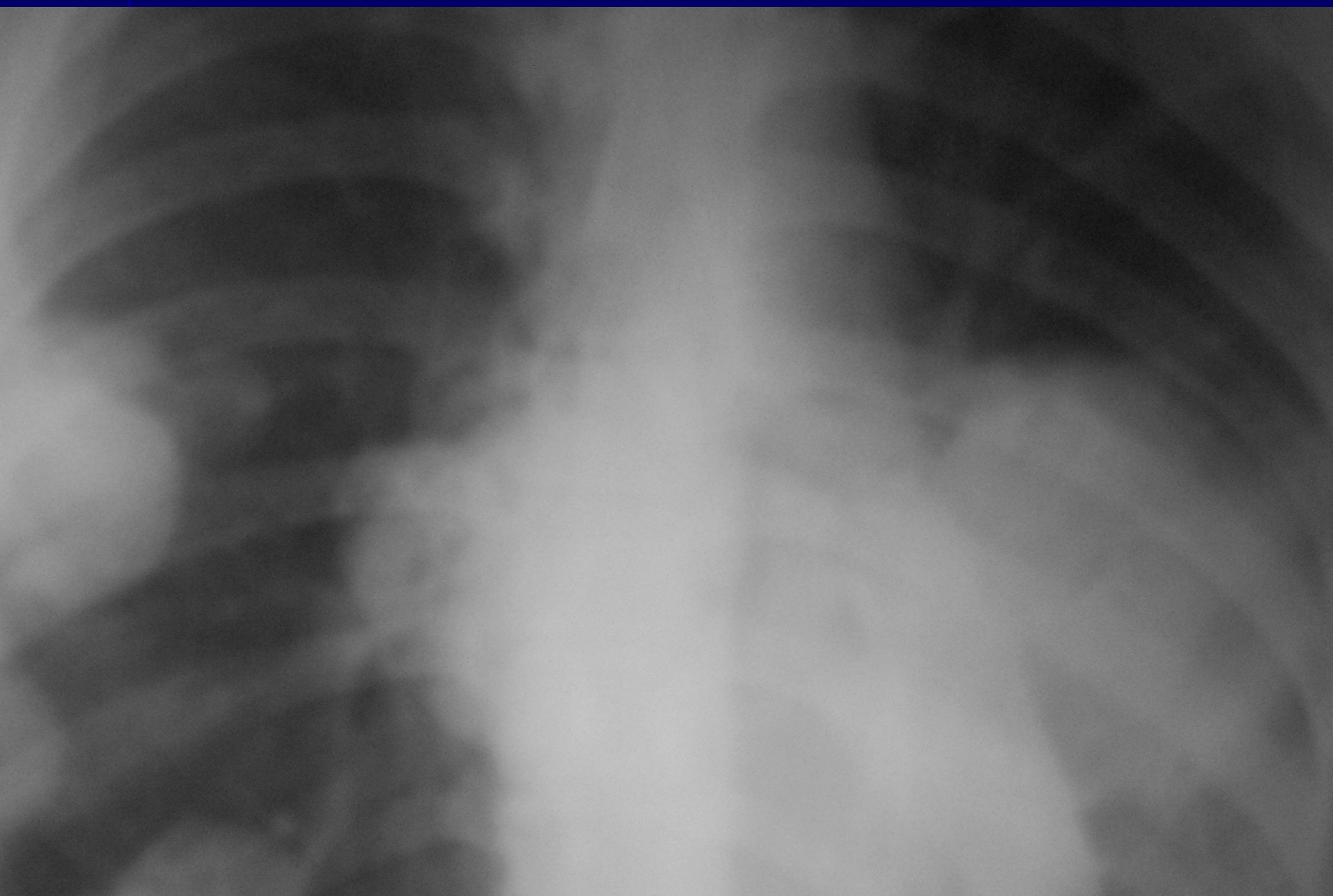
- Follicular Adenoma
- Papillary Adenoma
- Papillary Carcinoma
- Follicular Carcinoma
- Medullary Carcinoma
- Metastatic Carcinoma
- Intra cystic papillary Carcinoma
- Cystic degeneration of Adenoma or Carcinoma



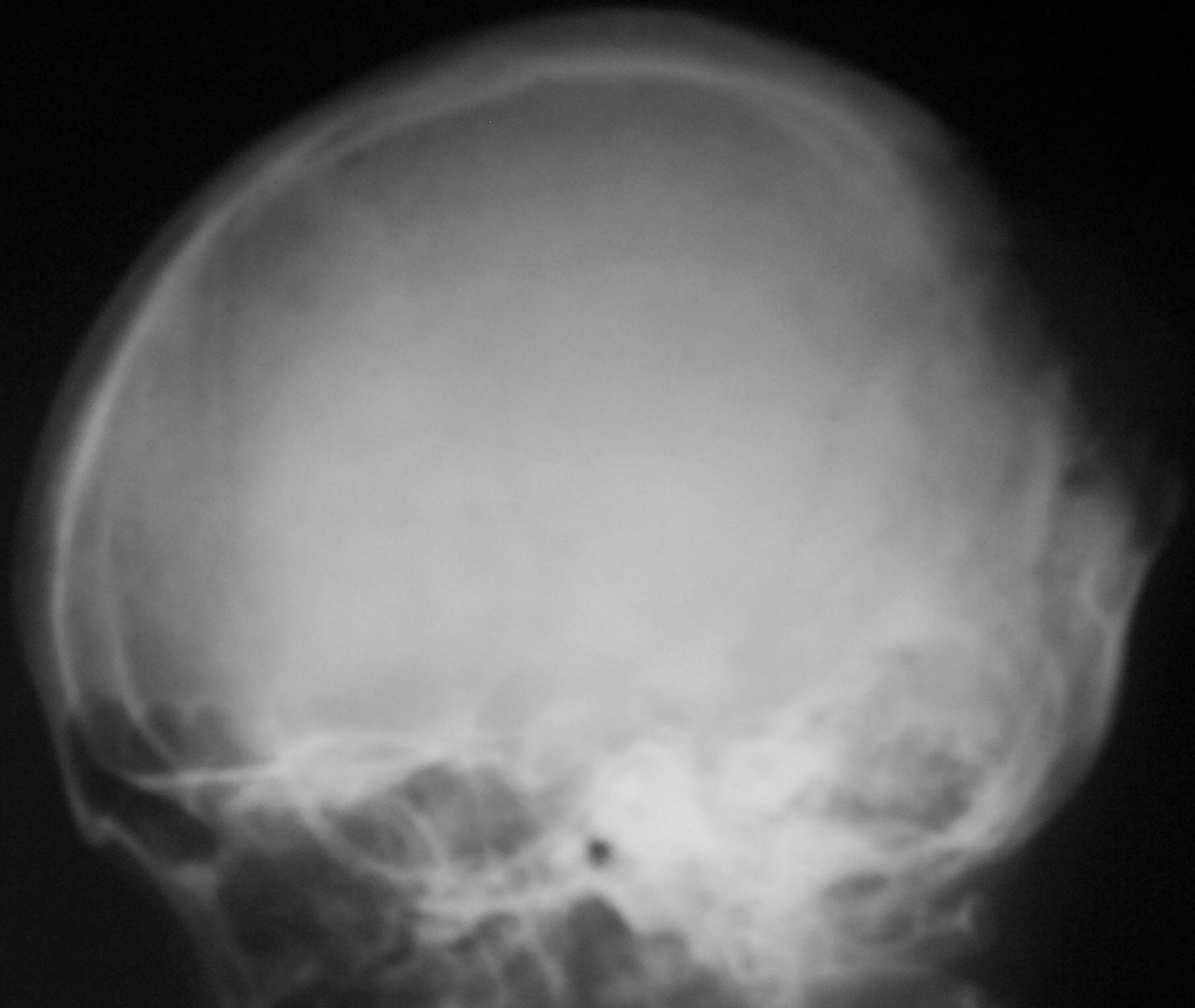
INVESTIGATIONS:

1. T.F.T. Euthyroid /Hyperthyroid
2. Anti Thyroid ab. Co existing Thyroiditis
3. X'ray Neck
 - Small grain of sand, Thin strand
Psamoma bodies: Pap. Ca.
 - Circumscribed amorphous calc Benign:.
4. Ba. Swallow:
5. X Ray Chest Mediastinal L N
Secondaries in Lungs
6. Bone X Ray : xray skull
 - OSTEOLYTIC – FOLLICULAR carcinoma
 - OSTEOLYTIC – MEDULLARY carcinoma

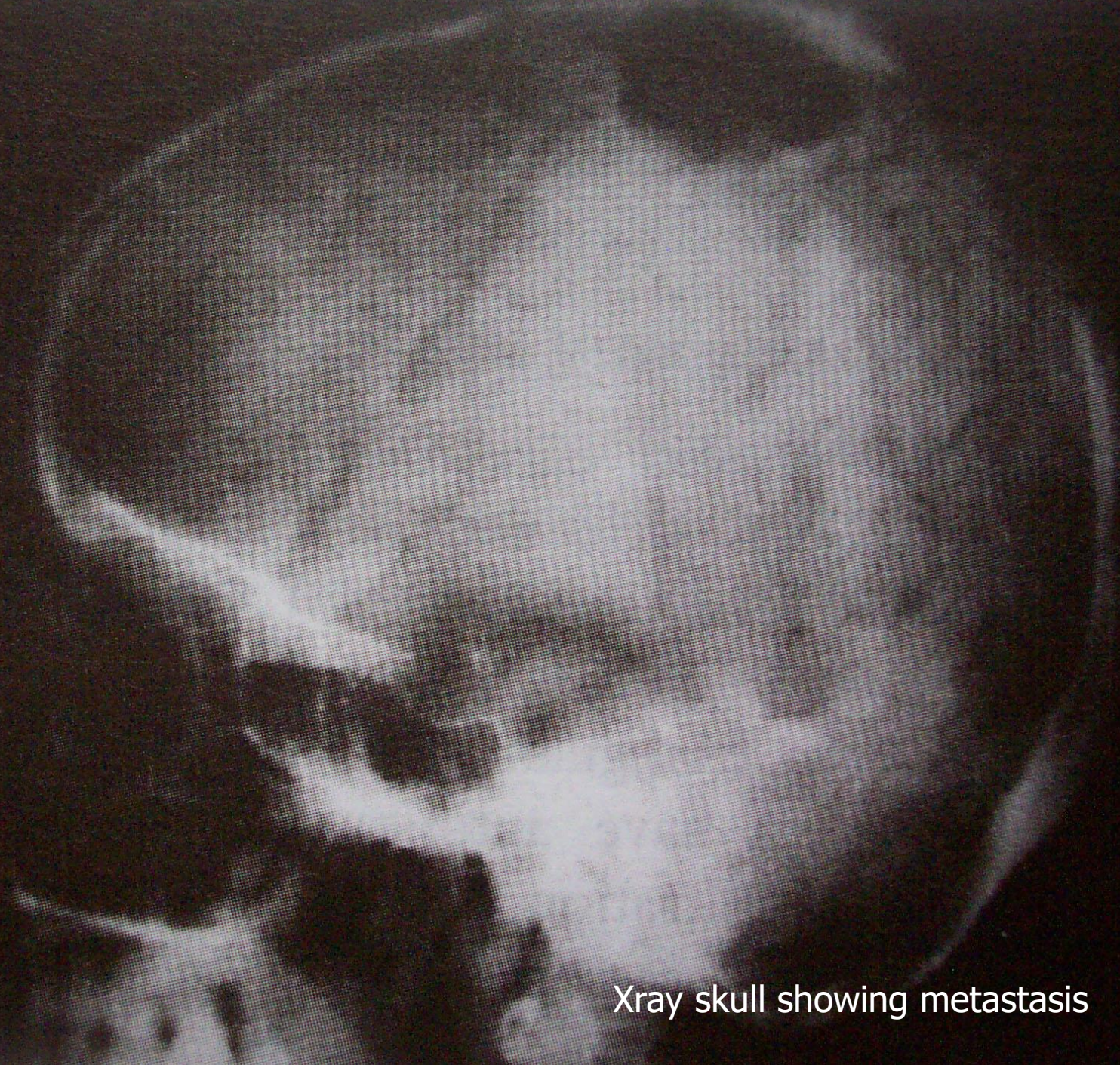
X'ray Chest showing Secondaries in lung



X'ray skull showing Erosion



(a)



Xray skull showing metastasis

Tumour Markers:

- THYROGLOBULIN ASSAY:
 - Normal :0 to 20.7 ng/ml
 - Raised I Follicular carcinoma
 - Normal levels after Surgery.
 - Diagnostic For residual Tumour and Recurrence
- Calcitonin : Medullary Ca (MCT)
 - Calcitonin: Basal levels: 1000 pg/ml
 - Extensive MCT: >100,000 pg/ml
 - Helpful to find out recurrence, residual tumour
- C.E.A.(Carcino-embryonic antigen)

ULTRASOUND:

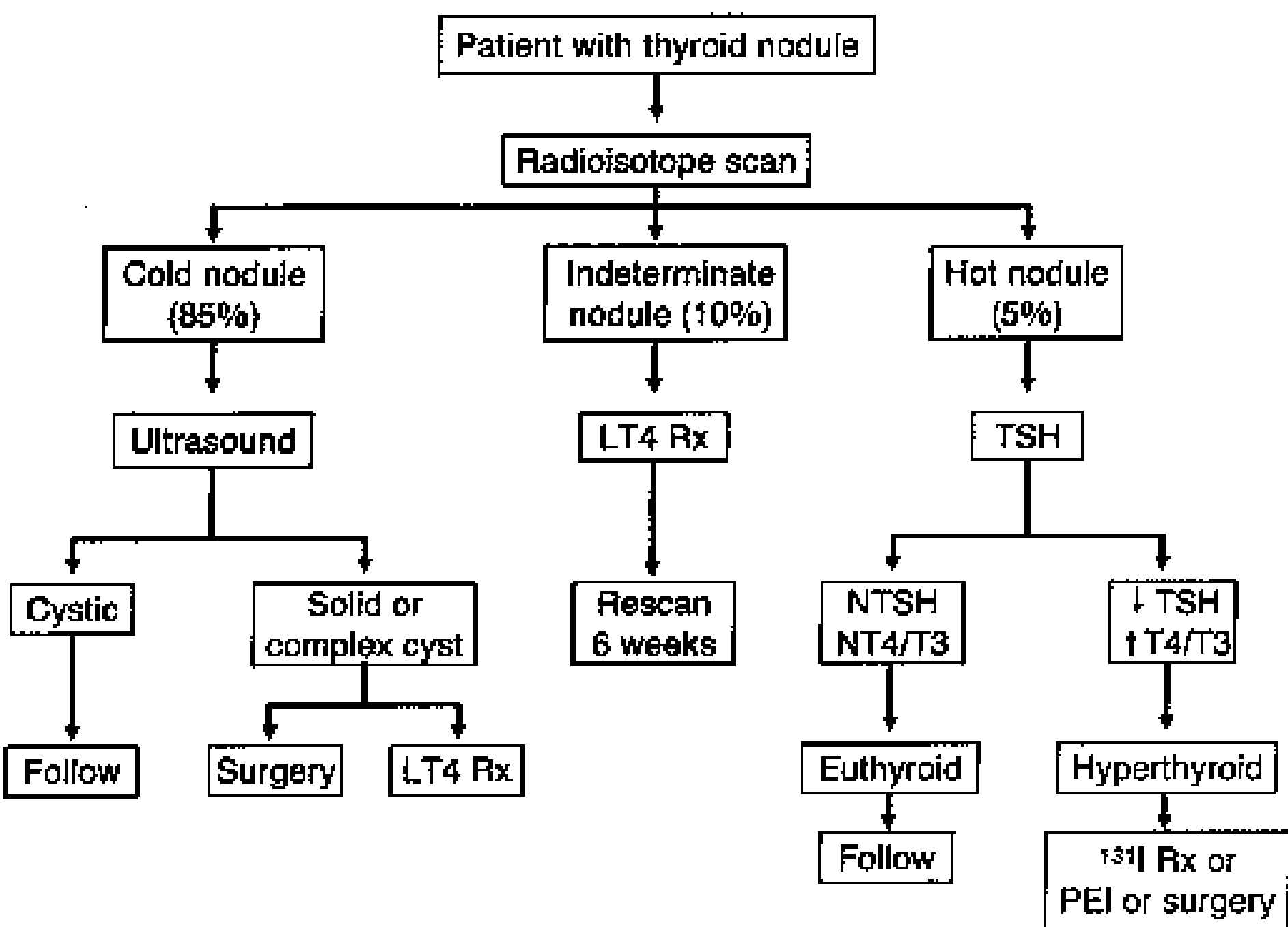
- Is helpful to differentiate Cystic and Solid lesions
- Dominant Nodule with Clinically not palpable multiple nodules
- USG guided FNAC
- In Japan- widely used to diagnose papillary carcinoma.

Thyroid Scan with Radioactive I 131 or Tc 99

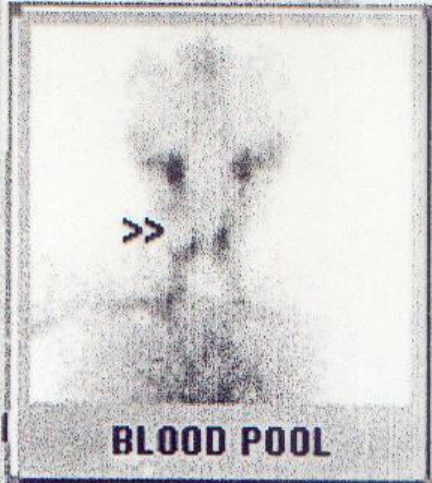
- Hyperthyroid with with hot overactive nodule:
 - Toxic nodule
 - Toxic adenoma.
- Euthyroid Or warm active nodule
 - Functioning adenoma or Toxic adenoma
 - Simple nodule with functioning thyroid tissue
 - Well differentiated Carcinoma.
- Euthyroid with cold inactive nodule.
 - adenoma (non functioning)
 - carcinoma.

10: 20 to 30% of cold nodules are malignant.
40% thyroid malignancies take up I 131

99 MTC (D) : dimercaptosuccinic acid
:Localized in medullary Ca
Primary, Secondary



COLD NODULE



LEFT

BLOOD POOL

	TOTAL	RIGHT	LEFT
UPTAKE (%):	0.4	0.2	0.2
CTS. (kcts):	17.8	8.2	9.6
SIZE (cm ²):	16.7	10.1	6.6

FUNCTIONING ADENOMA

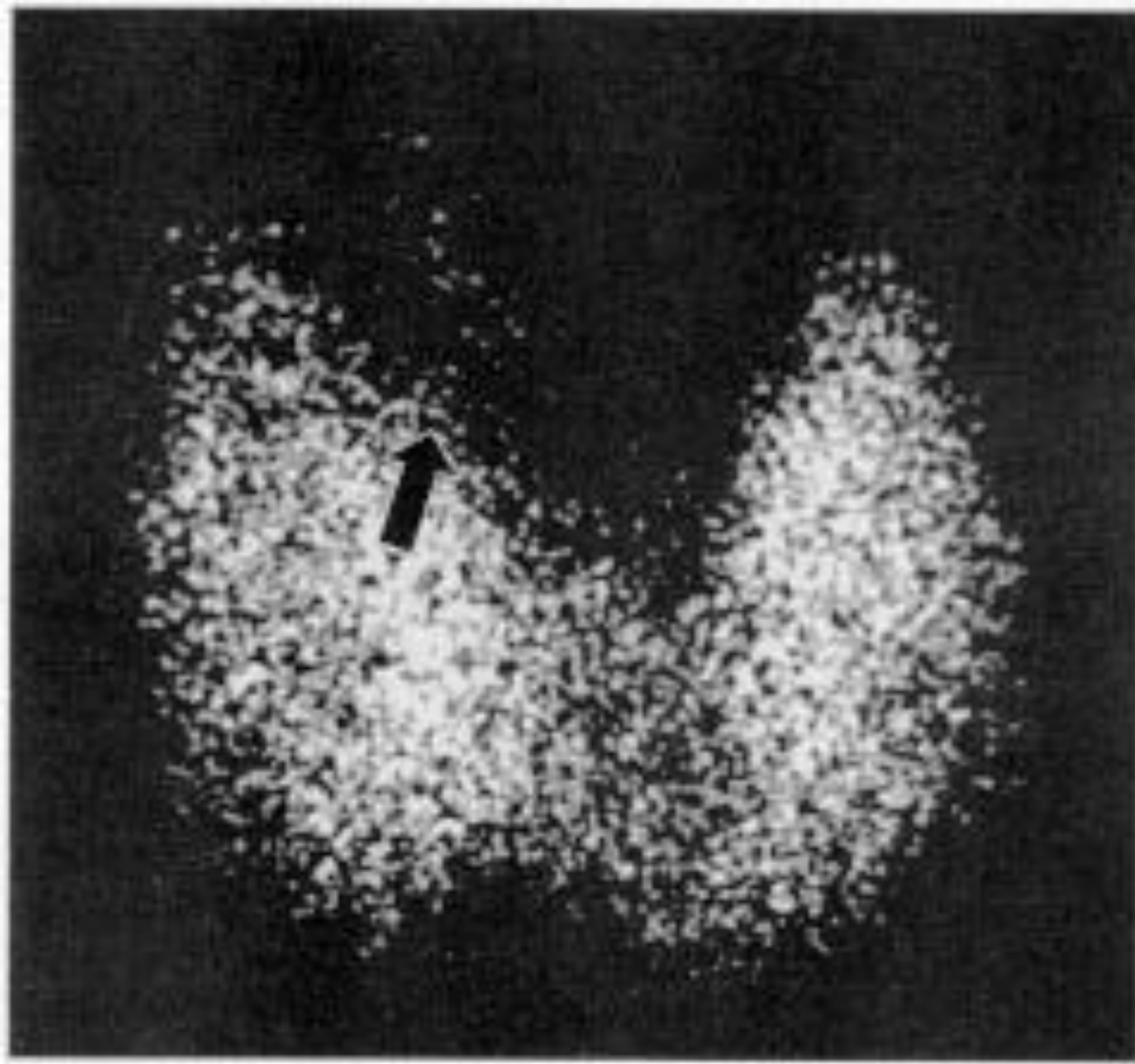


RIGHT

LEFT

ISOTOPE : Tc-99m
 REFER. ACT. : 224.3 MBq

	TOTAL	RIGHT	LEFT
UPTAKE (%):	0.9	0.9	0.0
CTS. (kcts):	28.1	27.7	0.4
SIZE (cm ²):	14.3	10.1	4.2



Patient with thyroid nodule

FNA biopsy

Diagnostic (85%)

Nondiagnostic (15%)

Suspicious (20%)

Malignant (5%)

Benign (75%)

Rebiopsy

Nondiagnostic

US-FNA

Nondiagnostic

Other

Follicular neoplasm

Surgery

Follow or T4 Rx

TSH + scan

↓ TSH
Hot nodule

NTSH
Cold nodule

Cyst < 4 cm

Solid

Cyst > 4 cm

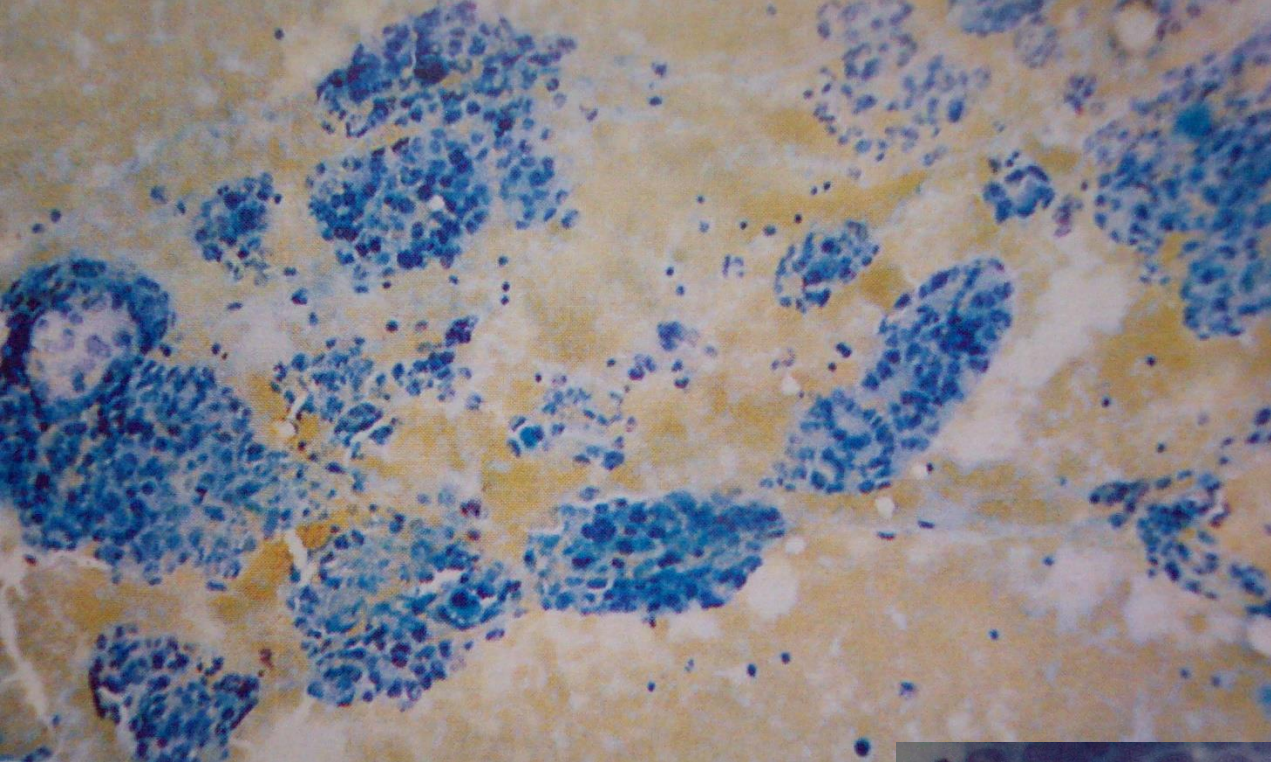
Follow or Rx

Surgery

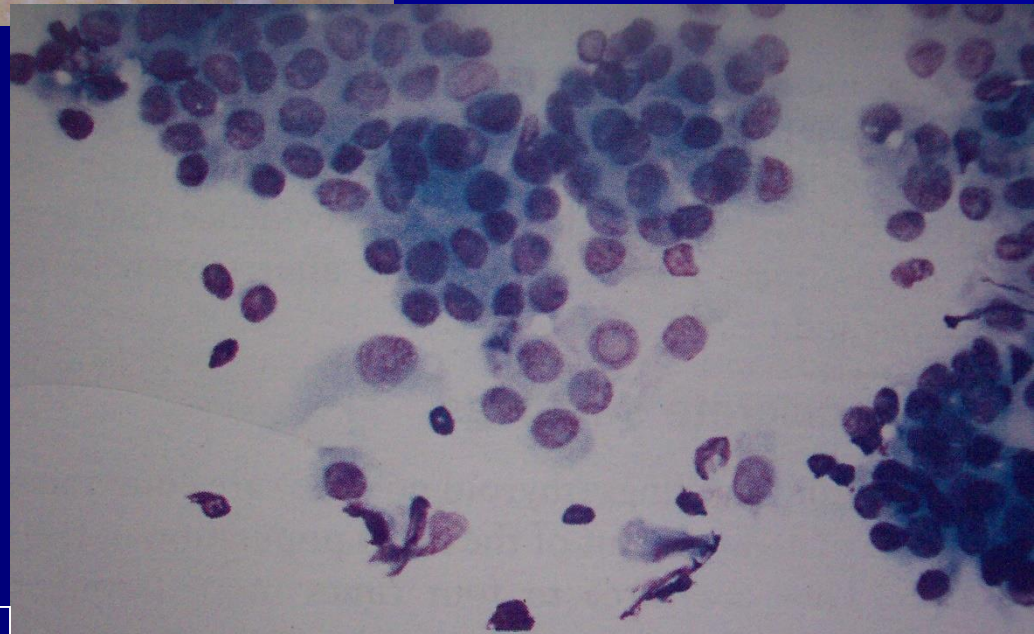
Follow

Surgery

Fine needle aspiration cytology



Follicular carcinoma



Papillary carcinoma

Aspiration cytology. Papillary carcinoma with typical cellu

Thyroid lymphangiography

- Fine needle aspiration cytology:

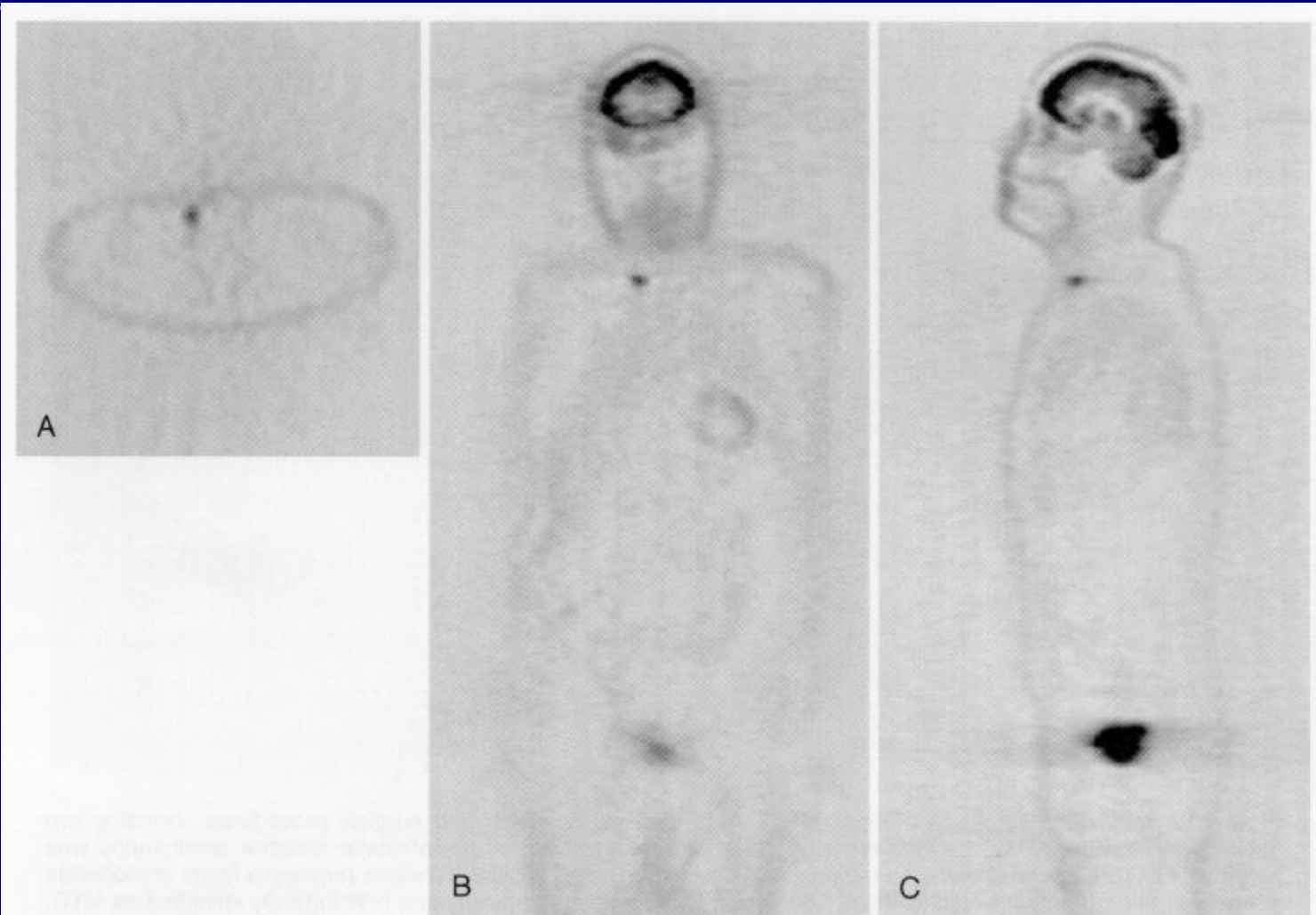
Positron Emission Tomography

- Positron emission tomography (PET) is an imaging technology used to assess tissue metabolism.
- The increased metabolic demands of tumors can be visualized through increased uptake of the positron-emitting tracer [18] F-fluorodeoxyglucose (FDG).
- The distribution of FDG helps distinguish benign from malignant tissue.
- Tool for the diagnosis of recurrence in previously treated patients
- Might be of help to differentiate Follicular adenoma from carcinoma

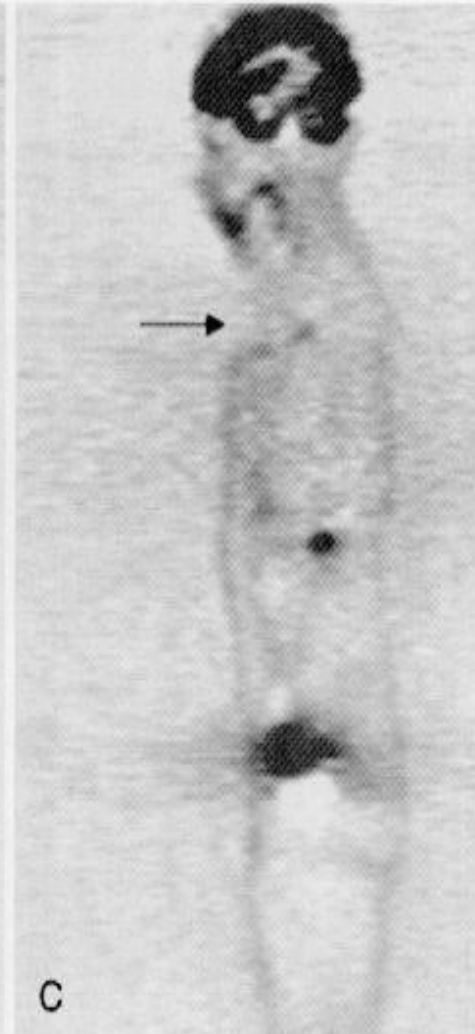
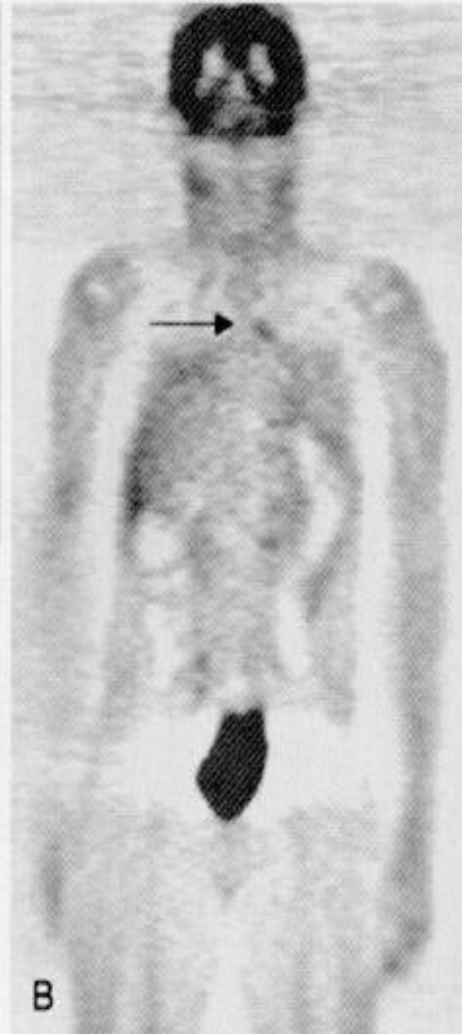
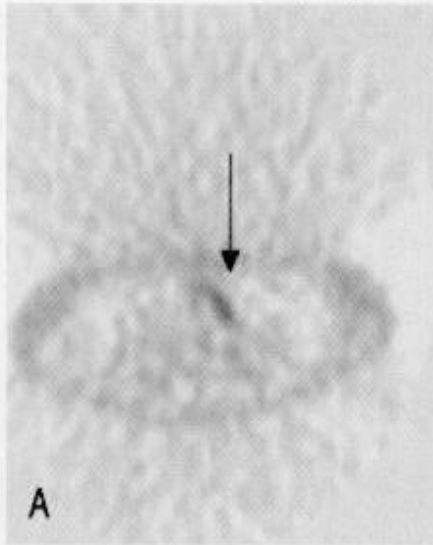
Medullary thyroid carcinoma (MTC).

A 12-year-old boy after four surgical procedures, including two neck dissections for MTC, still had elevated calcitonin serum levels. A somatostatin receptor scintigraphy was negative. FDG-PET scan showed on transaxial (A), coronal (B) and sagittal (C) slices a focus of moderate intensity in the left anterior mediastinum.

This lesion was removed surgically and histologically identified as MTC.



Thyroid carcinoma. A 70-year-old man, 4 years after total thyroidectomy and four I131 treatments (total dose of 650 mCi) presented with very high thyroglobulin serum levels and only faint uptake in the right lower neck on the last I131 post-treatment scan. The FDG-PET transaxial (A), coronal (B) and sagittal (C) views clearly demonstrate an intense focus of increased uptake near the medial aspect of the right clavicle.



Recurrent papillary carcinoma of the thyroid gland in a 50-year-old woman 4 years after treatment for differentiated thyroid cancer.

FDG-PET coronal slices (*upper row*) show three lesions in the left paratracheal and pericarotid regions (*arrows*), which were histologically proved to be lymph node recurrences after reoperation. The corresponding MR imaging slices (*lower row*) shown for reference give precise localization of these lesions.



de-Groot's staging

CLINICO PATHOLOGICAL STAGING:

- IA: Unilateral – confined to gland – lobe.
- IB: Bilateral – multifocal “ ”
- IIA Unilateral significant cervical LN
- II B: Bilateral cervical or mediastinal LN
- III Local invasion cervical (neck) with or without S Pos. LN (LN METS)
- IV: Distant metastases Outside Neck.

TNM Staging:

- TX:
 - T1: 1 cm, <1cm, limited to thyroid
 - T2: 1-4 cm, limited to thyroid.
 - T3: >4cm Limited to thyroid.
 - T4: Any size. extending beyond thyroid.
- No: no nodes
 - N1 a: ipsilateral cervical lymph nodes
 - N1b: bilateral, midline contra lateral, cervical mediastinal nodes

■ M0 no distant metastasis M1 Distant Metastasis

* Stage Grouping Papillary or Follicular

<45 years

■ > 45 years

- Stage I : Any T Any NMO
- Stage II: Any T Any N1M1
- Stage III:
- Stage IV

- Stage I : T1 NoMo
- Stage II: T2 NoMo
- Stage III: T3 NoMo,
T4 NoMo
- Stage IV Any T withM!

Stage Grouping Medullary

- Stage I T1 NoMo
- Stage 2: T2NoMo, T3NoMo,
T4NoMo
- Stage 3: any T N1Mo
- Stage 4: any T any N
and M1

Stage Grouping Undifferentiated

All cases are Stage IV

SURGICAL PROCEDURES

■ Enucleation to be condemned

Resection Enucleation

Partial Lobectomy

Subtotal lobectomy

Solitary Nodule
which is benign
on FNAC

Lobectomy

Hemithyroidectomy

Follicular Carcinoma RAI not available

Minimal Papillary Carcinoma.

Low Risk Papillary carcinoma

■ Near Total Thyroidectomy

■ Hartley Dunhill procedure

- Papillary Carcinoma
- High Risk Papillary and Follicular carcinoma
- Advanced Papillary carcinoma (ET + MET)
- Follicular Carcinoma (Beir-Walt Re)
- Medullary Carcinoma
- Early Resectable Ana plastic.

Radical Near Total
(Extra Cap)
Thyroidectomy

SURGICAL PROCEDURES for LN metastasis

- Berry Picking
- Mod. Radical Neck Dissection. Type 3
- Inter jugular LN Dis.
- Mediastanal Dissection

Level	Lymph Node Group
Ia	Submental nodes
Ib	Submandibular nodes
IIa	Upper jugular, anterior to IX
IIb	Upper jugular, posterior to IX (submuscular recess)
III	Middle jugular nodes
IVa	Lower jugular nodes (behind clavicular head of sternocleidomastoid muscle)
IVb	Lower jugular nodes (behind sternal head of sternocleidomastoid muscle)
Va	Posterior triangle nodes (spinal accessory group)
Vb	Posterior triangle nodes (transverse cervical artery group, supraclavicular group)
VI	Anterior (central) compartment lymph nodes (paratracheal, perithyroidal, Delphian)



Modified radical neck dissection

Type I (XI preserved)

Type II (XI, IJV preserved)

Type III (XI, IJV, sternocleidomastoid muscle preserved)

TSH SUPPRESSION THERAPY

Useful in T.S.H. dependant Tumour
Prevents recurrence.
Supplemental to other Therapy

Indications:

- ❖ Well-differentiated Ca
- ❖ Well-differentiated Ca and Advanced in Young patients
- ❖ Well-differentiated Ca + Excessive pulmonary Mets
- ❖ (1 131: Pulmonary Fibrosis)
- ❖ Insufficient 1 131 uptake

- Jesse & Clark : MD And Hosp. No effect
- Block No effect
- Cadey: Lahey Clinic 5% improved Survival
in Papillary and Follicular: No effect

RADIOACTIVE IODINE THERAPY

- Autonomous hyper functioning
- Functioning aggressive: Elderly
- Well functioning) Inoperable Ca
- Well differentiated carcinomas
- Rapidly Progressing Familial Ca.

BEIRWALT REGIME: deGroot's Regime

- - Near total Thyroidectomy
- - No (Thyroid + Iodine cont. drug)
for one week.
- - Post operative I¹³¹ scan
- I¹³¹ 3 to 12 months
- Dose < 30 yr: 500 mc
- Dose > 30 yr: 800 mc

EXTERNAL IRRADIATION:

Teletherapy or Linear accelerator

Anaplastic Carcinoma

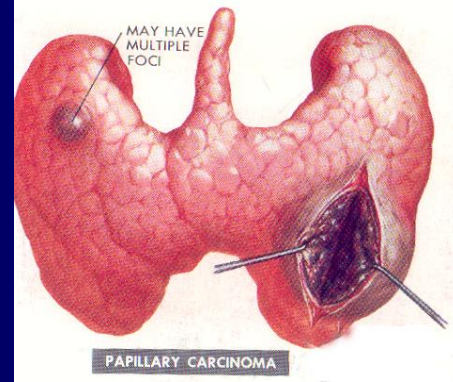
Medullary Carcinoma: Advanced.

Solitary bony Secondaries: pain

Focal type of Lymphoma

- **CHEMOTHERAPY:**
- Doxyrubicin,
- Methotrexate.
- Actinomycin D,
- CIS-Platinum
- Etoposide.

Papillary Carcinoma



Slow course. Multicentric, TSH Dependant, Lymphatic spread, Low I uptake

- **LOW RISK GROUP**
- Age M < 40 F < 50
- TUMOUR SIZE < 5 CMS
- NO DISTANT METS
- NO CAPSULAR – INVASION
- ADHESIONS – INVASION



HEMITHYROIDECTOMY
LOWER HALF OF LOBE
LOWER 1/3 OF OPPOSITE. LOBE

- HIGH RISK GROUP**
AGE M >40 f >50
TUMOUR > 5 CMS
EXTRATHYROIDAL SPREAD
METASTASIS



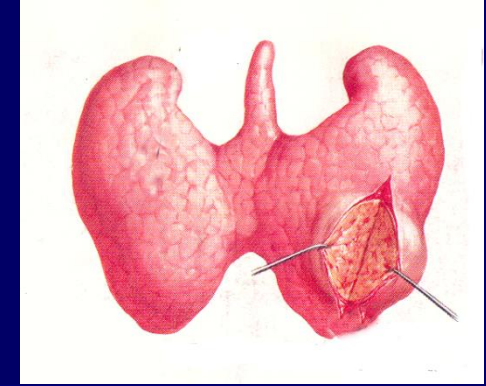
Near Total Thyroidectomy
Modified Radical Neck Dissection
(Inter Jugular Node Dissection)

II ry of Papillary ca – Takes up I 131
THYROGLOBULIN – TUMOUR MARKER

RAI Therapy
TSH suppression

FOLLICULAR CARCINOMA

- UNICENTRIC, BLOOD SPREAD,
- HIGH IODINE UPTAKE,
- TSH NonDependant



LOCAL TUMOUR : Hemithyroidectomy

METASTATIC Ca : Near Total Thyroidectomy without I 131 Therapy
IF FACILITY IS AVAILABLE BEIRWALT REGIME FOR BOTH

HIGH RISK Group

OLD Pts

Gross capsular invasion
vascular invasion

Metastatic disease

Solid cluster of Tumour
cells (INSULAR CA)



BEIRWALT Regime

Thyroglobulin monitoring

Low risk group

Young patients

Minimal vascular invasion

Localised disease



Hemithyroidectomy

SERUM THYROGLOBULIN : PROGNOSTIC INDEX

- Initial high levels : >500 ng/ml
Metastasis
- Initial low levels < 100 mg/ml :
LOCALISED
- Level becoming < 5 ng/ml after
operation/I 131 If no residual tumour
- Recurrence is followed by raised levels.

MEDULLARY CARCINOMA

TSH non-respondent Do not conc. iodine
Relatively insensitive to External Radiation.
Frequently multi centric Surgery only choice

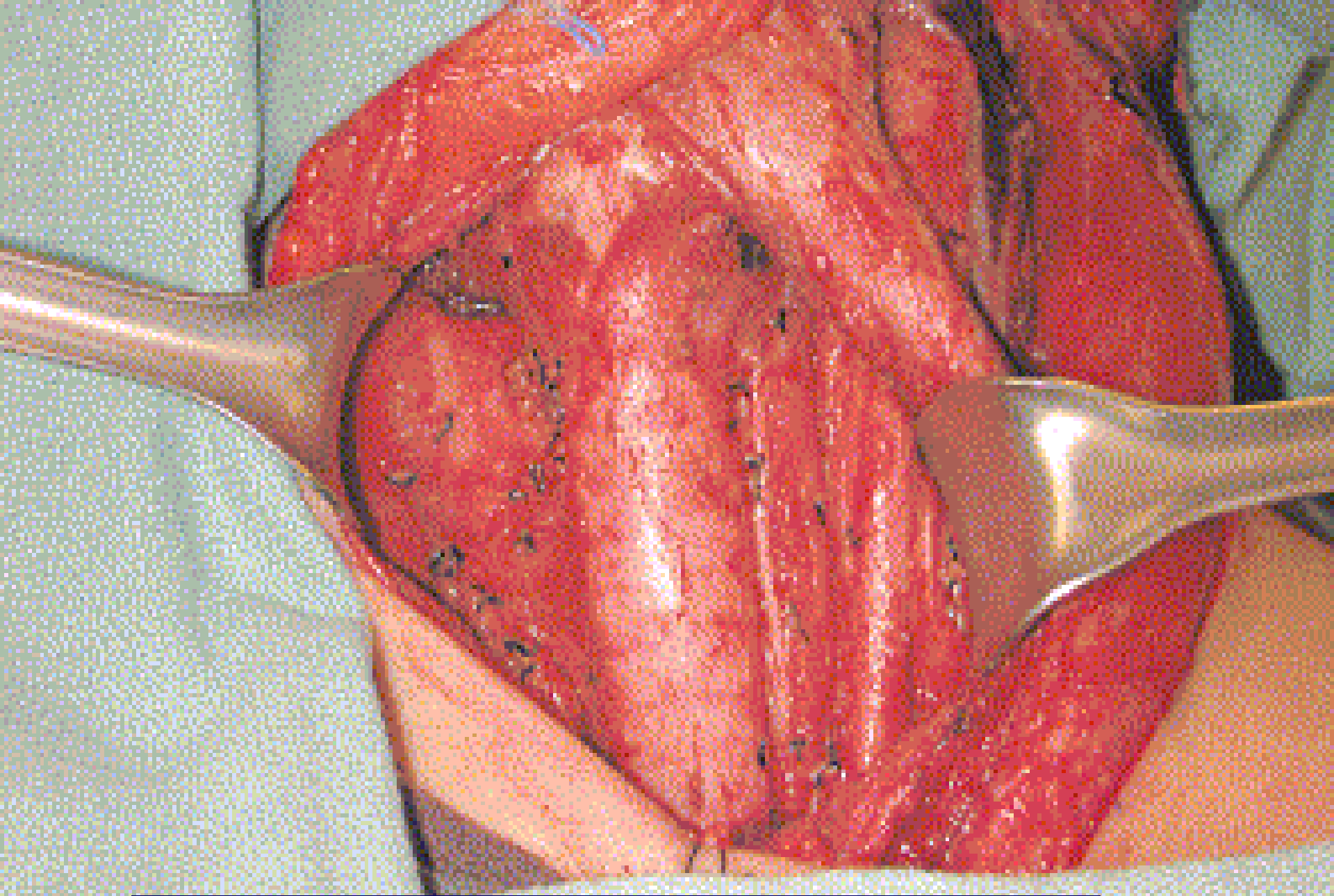
Localized Disease: Near Total Thyroid
LN enlarged: Inter jugular RND

Monitoring with
Serum Calcitonin

Advanced Disease: 1) Debulking (Hormone source removed)
2) Combination Chemo Therapy
Doxyrubicin with Streptozotocin

Investigations: For Men Type II/A and B

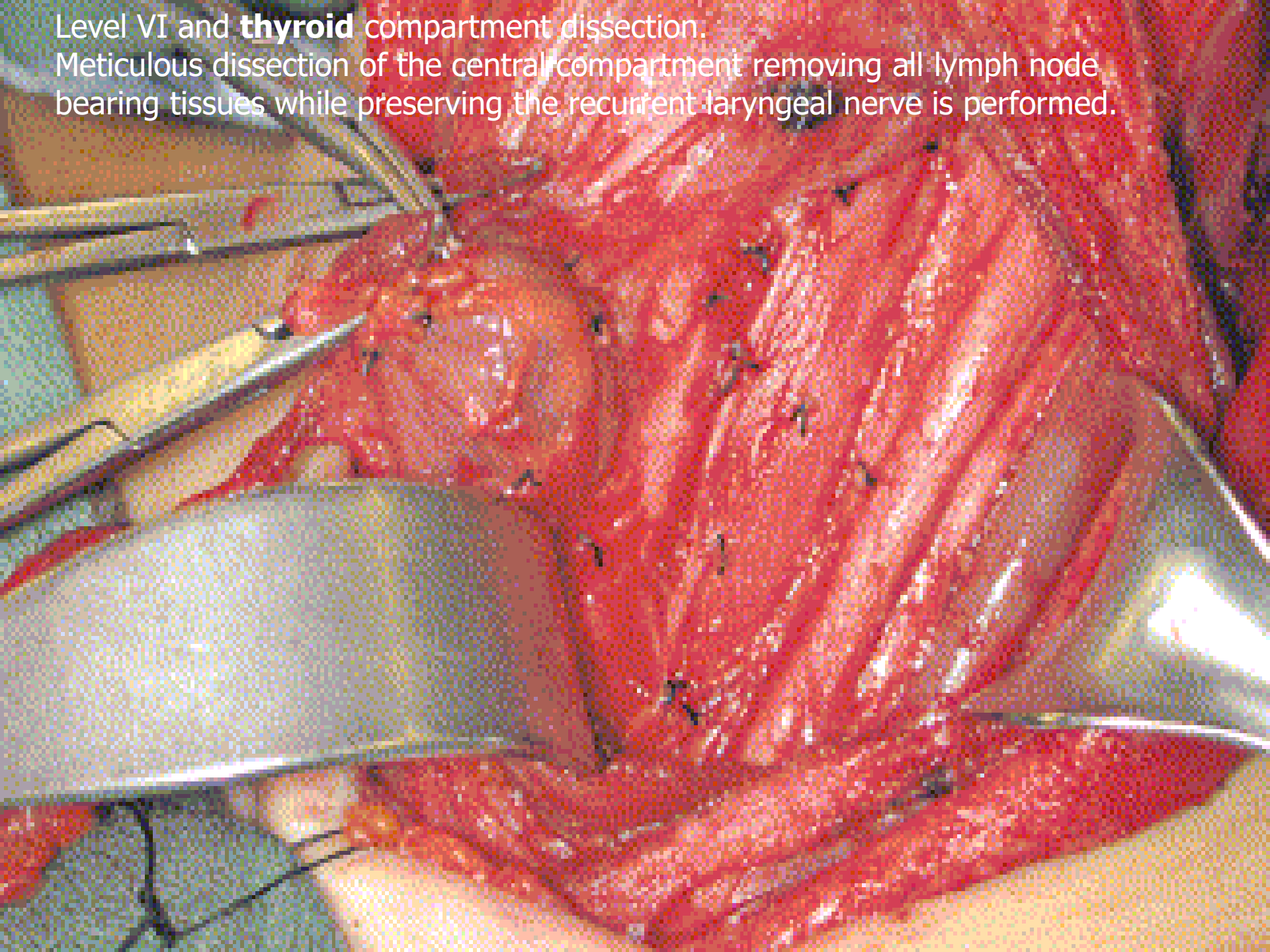
- Appropriate management
 - Pheochromocytoma : First
 - Thyroid Next
 - Parathyroid Last

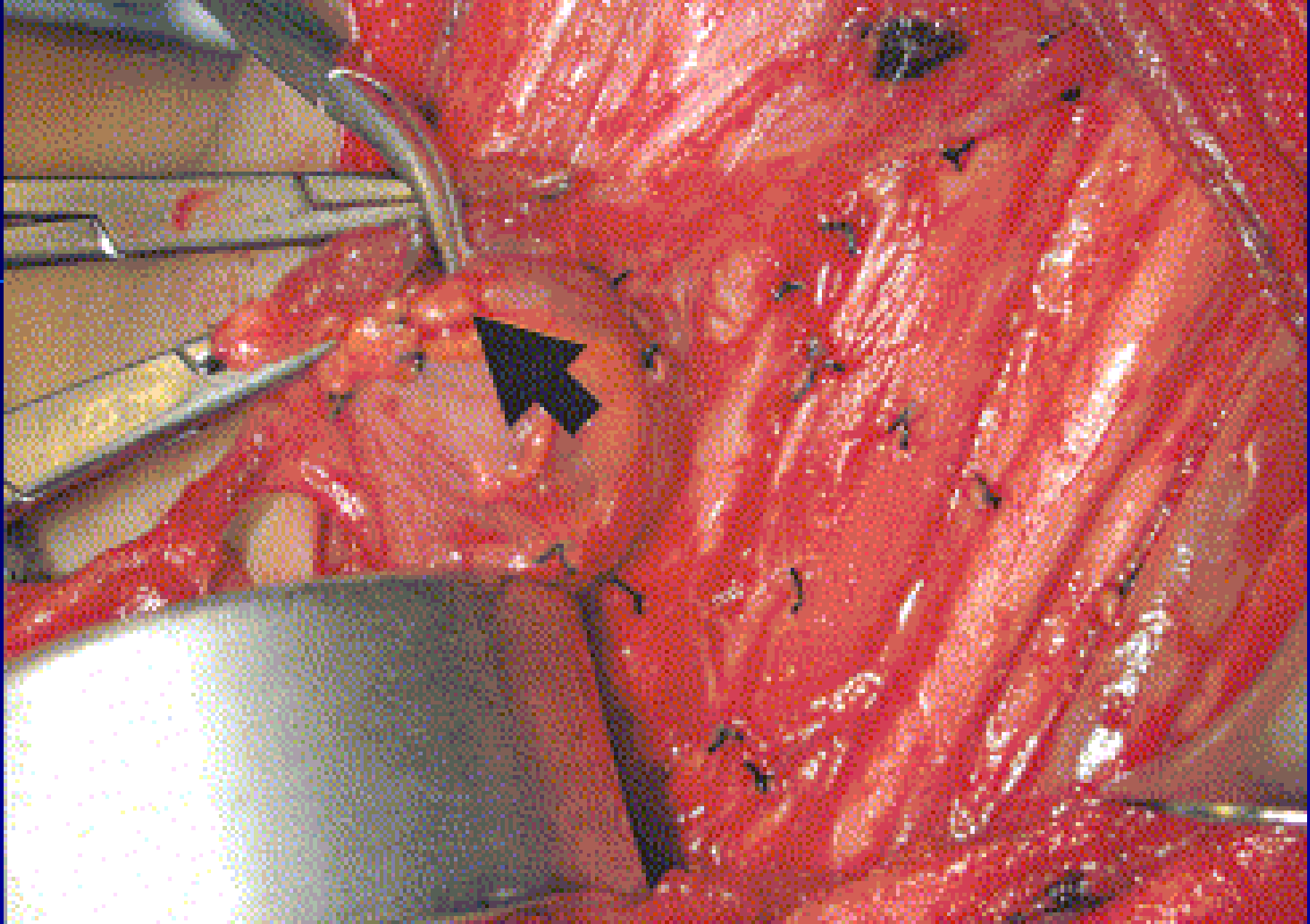


Total thyroidectomy and central compartment dissection is the current standard treatment for medullary **thyroid** cancer.

Level VI and **thyroid** compartment dissection.

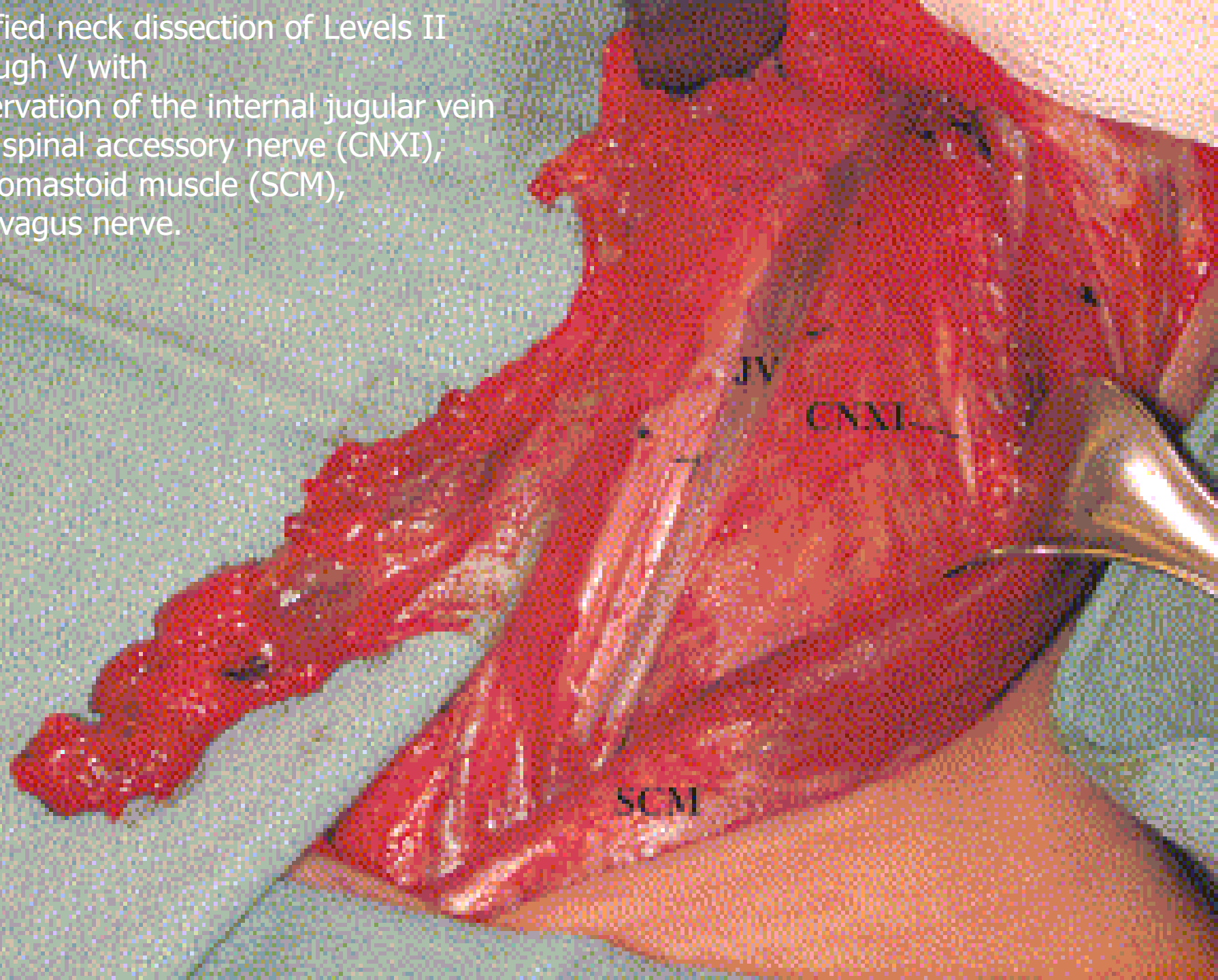
Meticulous dissection of the central compartment removing all lymph node bearing tissues while preserving the recurrent laryngeal nerve is performed.



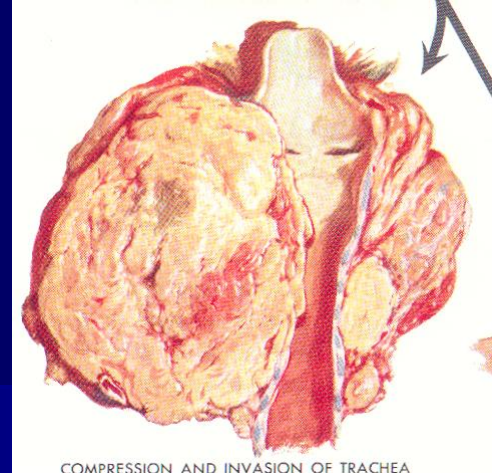


Intraoperative identification of the left superior parathyroid gland (*arrow*). It is possible to identify the parathyroid glands visually by anticipating their anatomical location, shape, and color. Every attempt is made to identify the parathyroid glands. In instances of devascularization, pathologic confirmation and autotransplantation is performed.

Modified neck dissection of Levels II through V with preservation of the internal jugular vein (JV), spinal accessory nerve (CNXI); sternomastoid muscle (SCM), and vagus nerve.



Anaplastic Carcinoma



CONTROL OF LOCAL DISEASE:

Preservation of airways

Surgical Resection

External Irradiation

Combination chemotherapy Doxyrubicin, Methotrexate, Actinomycin D,
Cis-Platinum, Etoposide.

Above Combination chemotherapy

- Mean Survival 175 days
 - Survival Rate 6 months: 50%
 - 1 year 35%
 - 5 years 17%
- Other Series 30 to 40% Remission
- If yes Survival benefit

PROGNOSTIC INDEX

DNA ploidy : Aneuploidy aggressive
25% Lethal

AGES Scale : MAYO CLINIC

AGE

Grade path.

Extent of disease

Size of Tumour

High Risk

Undifferentiated

Extrathyroidal + Metastasis

Large

Low risk : 86%

2 % MORTALITY

High risk : 14%

46 % MORTALITY

AMES SCALE : LAHEY CLINIC

Age

Metastasis

Extent of local disease

Size of Tumour

MACIS

Metastases,

Age,

Completeness of surgery,

Invasion of extrathyroidal tissue,

Size)

University of Chicago criteria

Operative findings

Total Body I 131 scan within six months.

Histology of Thyroid tumours and Survival

		20 yrs	Survival
Anaplastic	Localised/Generalised		in months
Papillary	Capsulated		90%
	Poor Capsulation Extra Thyroidal		50%
Follicular	Minimum Capsular Invasion/vascular Invasion		80%
	Gross Invasion		20%
Medullary	Confined to Gland		50%
	Stage II and stage III		10%



Shortcut to Thyroid for oncologist.Ink

