PEMBESARAN KELENJAR TIROID

Bambang Sugeng

Embriologi

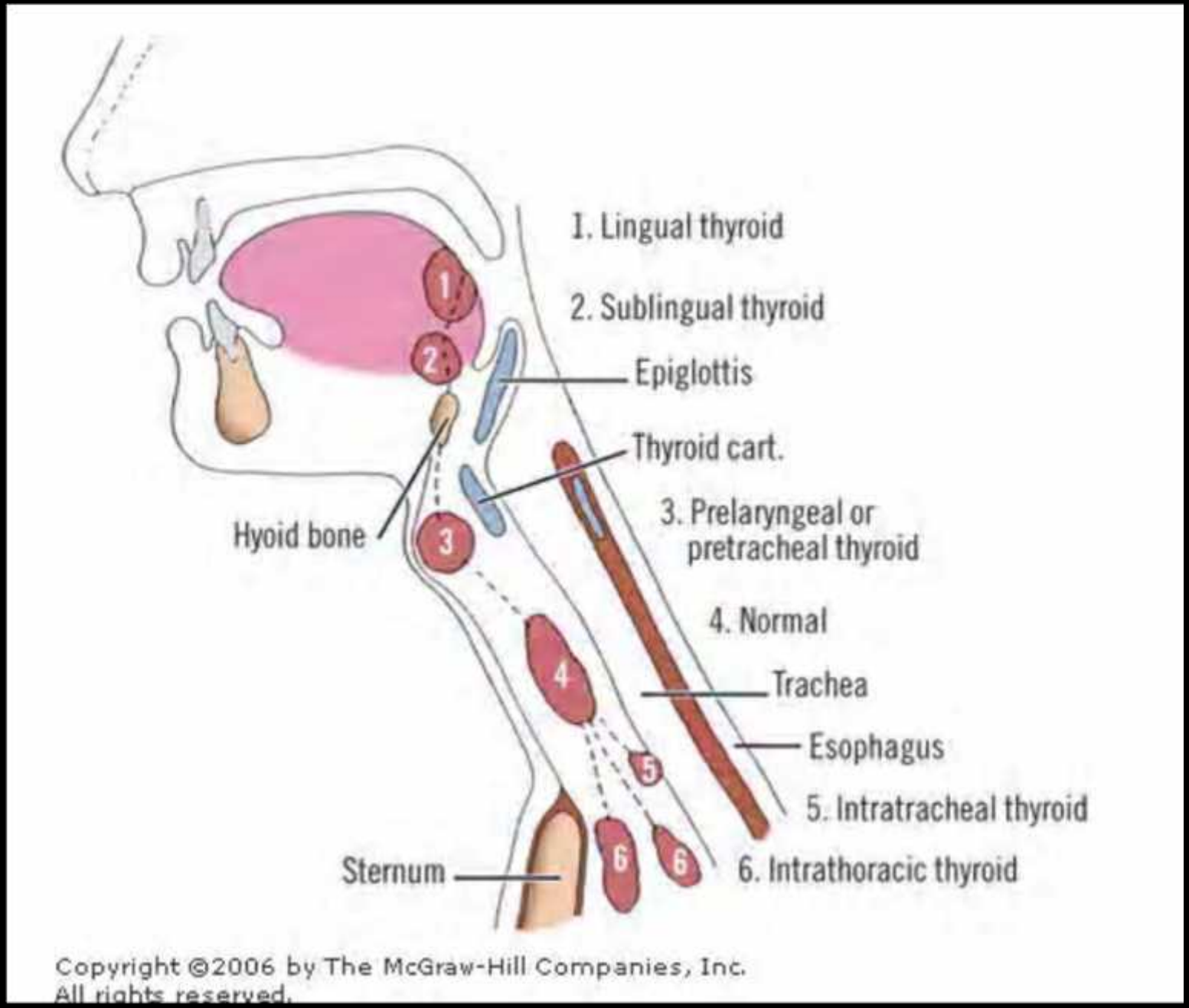
- Thyroidea → thyros = perisai
- Endoderm, tonjolan bakal pharynx dari foramen sekum (pangkal lidah) turun ke caudal (ke leher) pd garis tengah

KELAINAN KONGENITAL

TIROID EKTOPIK

- Tiroid lingual
- Lateral aberrant thyroid
- Median ectopic thyroid

THYROGLOSSAL CYST = Kista duktus tiroglosus



Anatomi

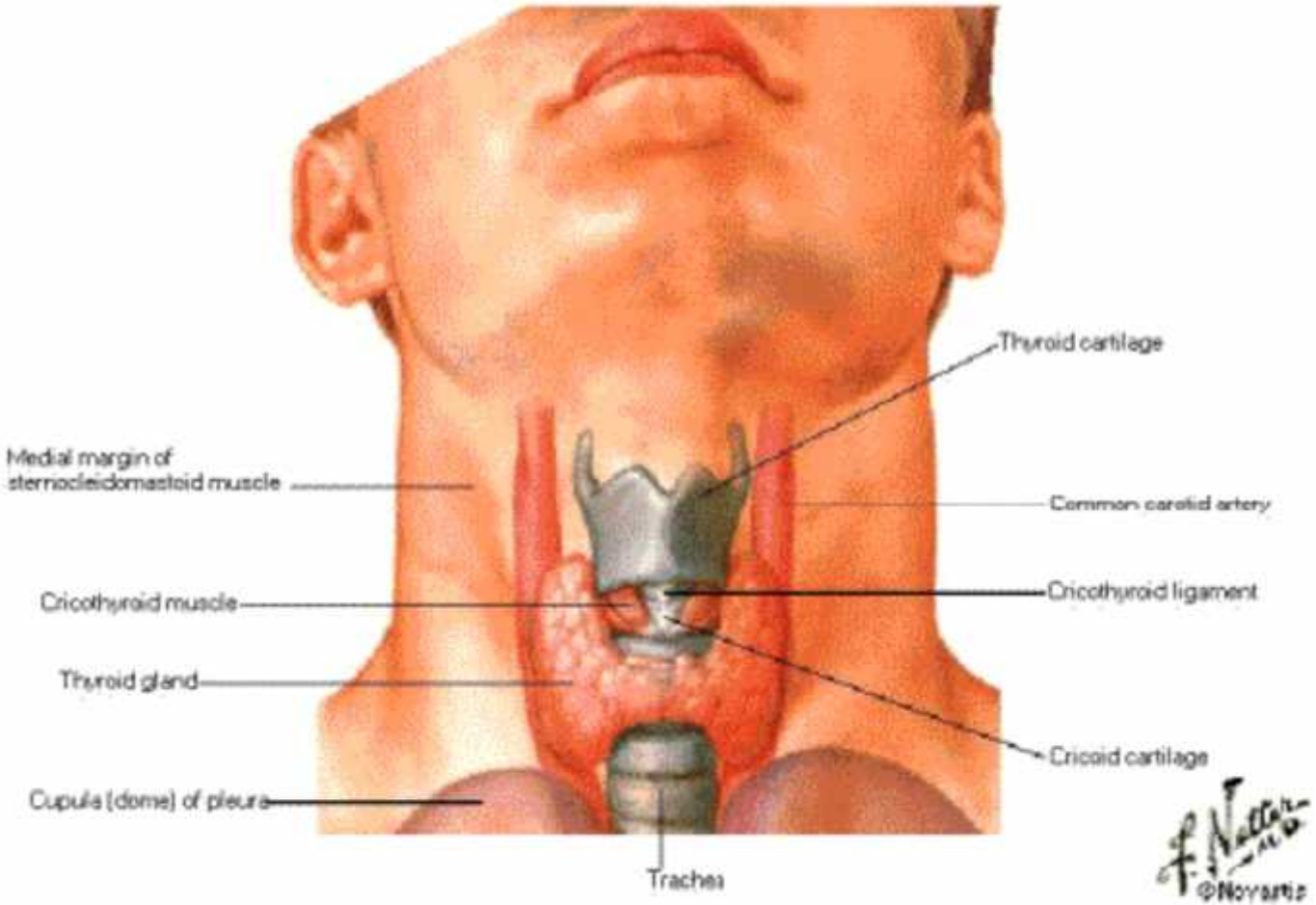
MAKROSKOPIS

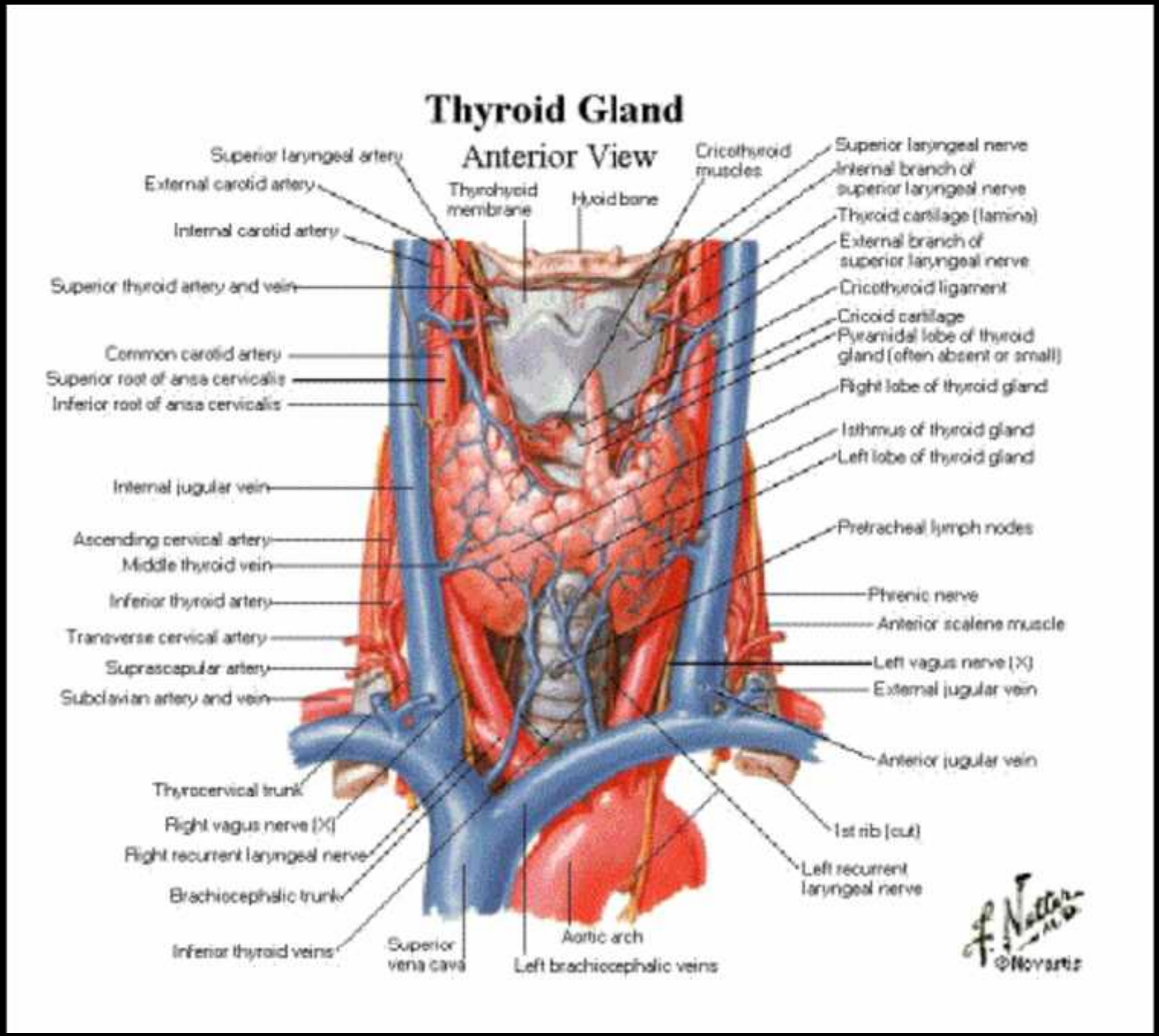
- Berat 20 – 25 gram
- Lobus kanan-kiri, lobus piramidalis
- Paratiroid
- Aa Vv thyrodea superior dan inferior yang ber-anastomosis dengan pembuluh darah trakhea dan oesophagus
- Limfe : juxtathyroid, pre-tracheal, para-tracheal
- N laringeus superior dan inferior / recurrens


Cricoid
cartilage

Thyroid Gland in Situ

Anterior View




Thyroid Gland
Anterior View
Superior laryngeal artery
External carotid artery
Internal carotid artery
Superior thyroid artery and vein
Common carotid artery
Superior root of ansa cervicalis
Inferior root of ansa cervicalis
Internal jugular vein
Ascending cervical artery
Middle thyroid vein
Inferior thyroid artery
Transverse cervical artery
Suprascapular artery
Subclavian artery and vein
Thyrocervical trunk
Right vagus nerve (X)
Right recurrent laryngeal nerve
Brachiocephalic trunk
Inferior thyroid veins
Superior vena cava
Aortic arch
Left brachiocephalic veins
Thyrohyoid membrane
Hyoid bone
Cricothyroid muscles
Superior laryngeal nerve
Internal branch of superior laryngeal nerve
Thyroid cartilage (lamina)
External branch of superior laryngeal nerve
Cricothyroid ligament
Cricoid cartilage
Pyramidal lobe of thyroid gland (often absent or small)
Right lobe of thyroid gland
Isthmus of thyroid gland
Left lobe of thyroid gland
Pretracheal lymph nodes
Phrenic nerve
Anterior scalene muscle
Left vagus nerve (X)
External jugular vein
Anterior jugular vein
1st rib (cut)
Left recurrent laryngeal nerve
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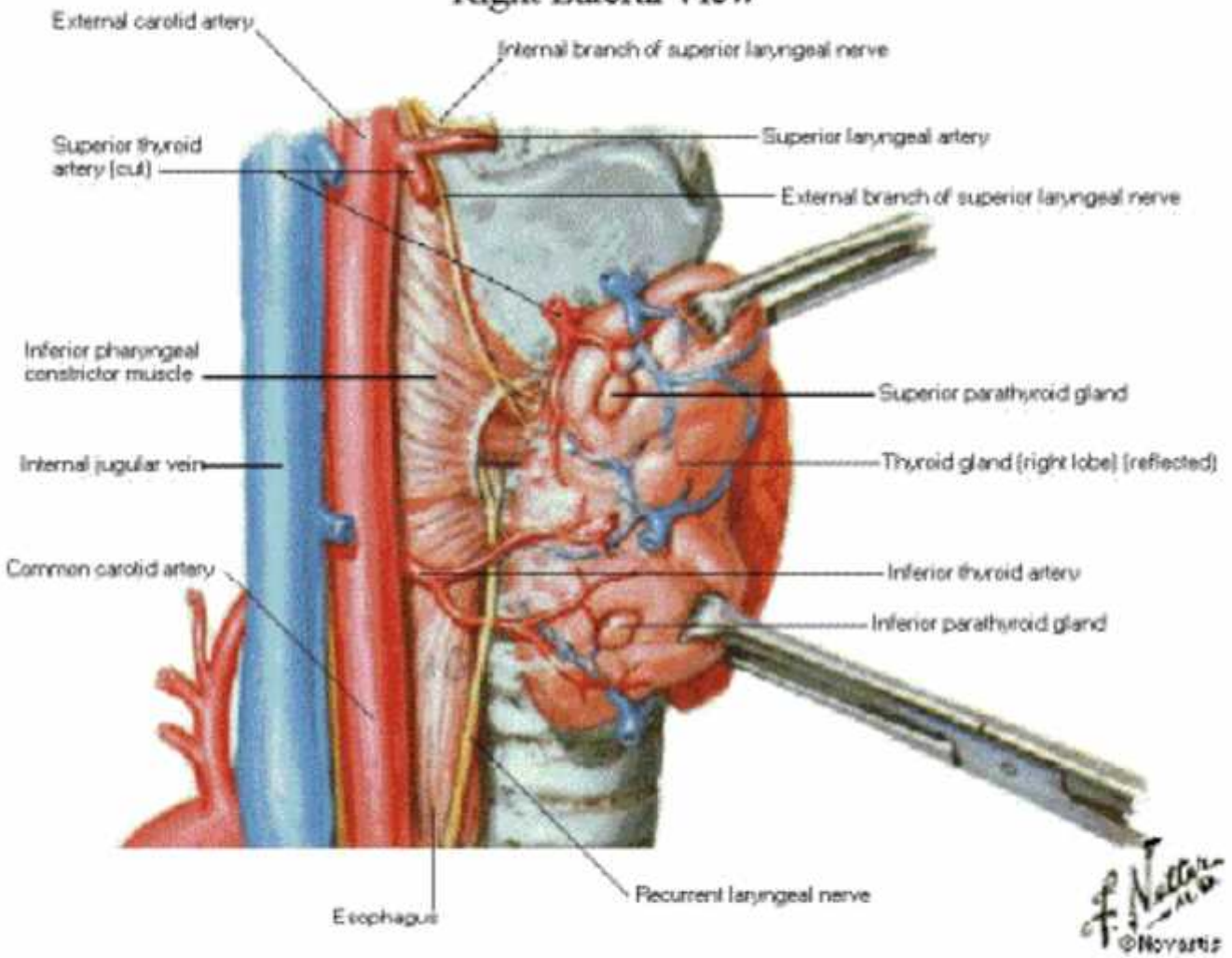
Parathyroid Glands

Right Lateral View

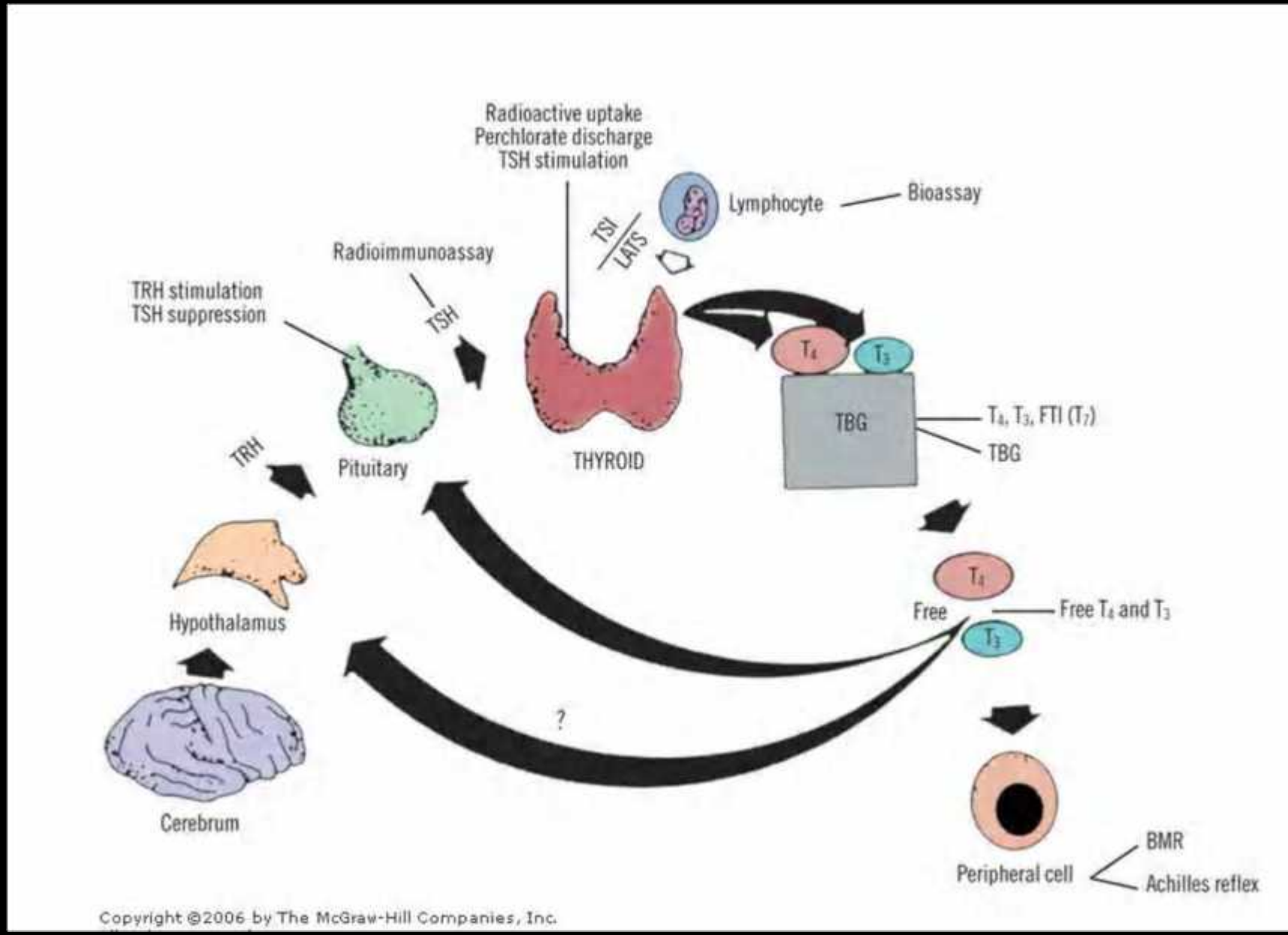


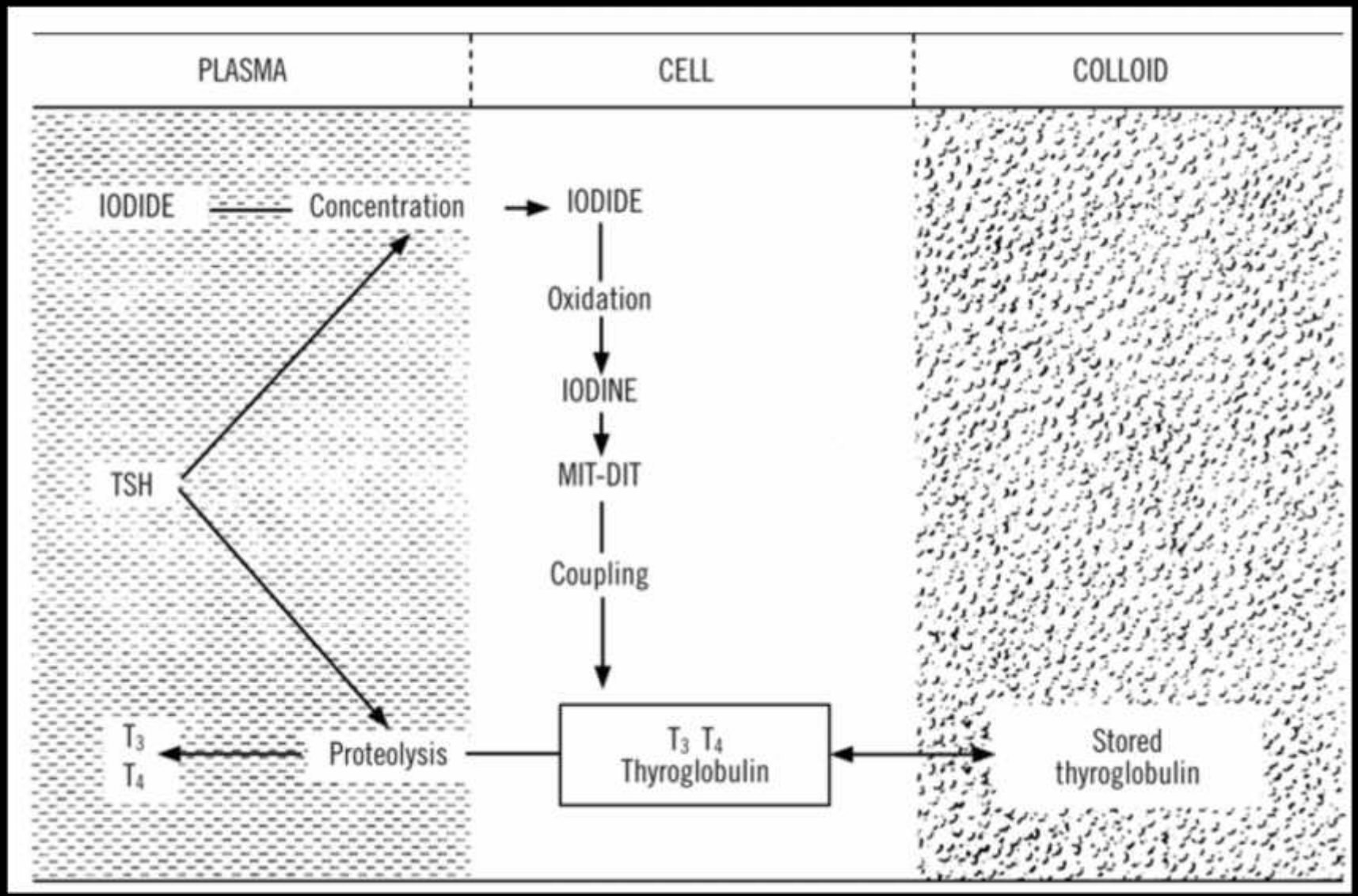
MIKROSKOPIS

- Lobulus terdiri dari 24 – 40 folikel
- Folikel berbentuk sferis dan berdiameter 30 µm
- Folikel berisi koloid yg dihasilkan sel epitel untuk menyimpan tiroglobulin

Fisiologi

- Penghasil hormon tiroid
- Iodine inorganik → oksidasi → iodine
- Iodine + thyrosine → iodothyrosine
- MIT dan DIT → T3 dan T4
- Dlm sirkulasi terikat pada TBG
- Diatur oleh TSH yg dihasilkan oleh lobus anterior kel hipofisis dan TRH yg dihasilkan oleh hipotalamus



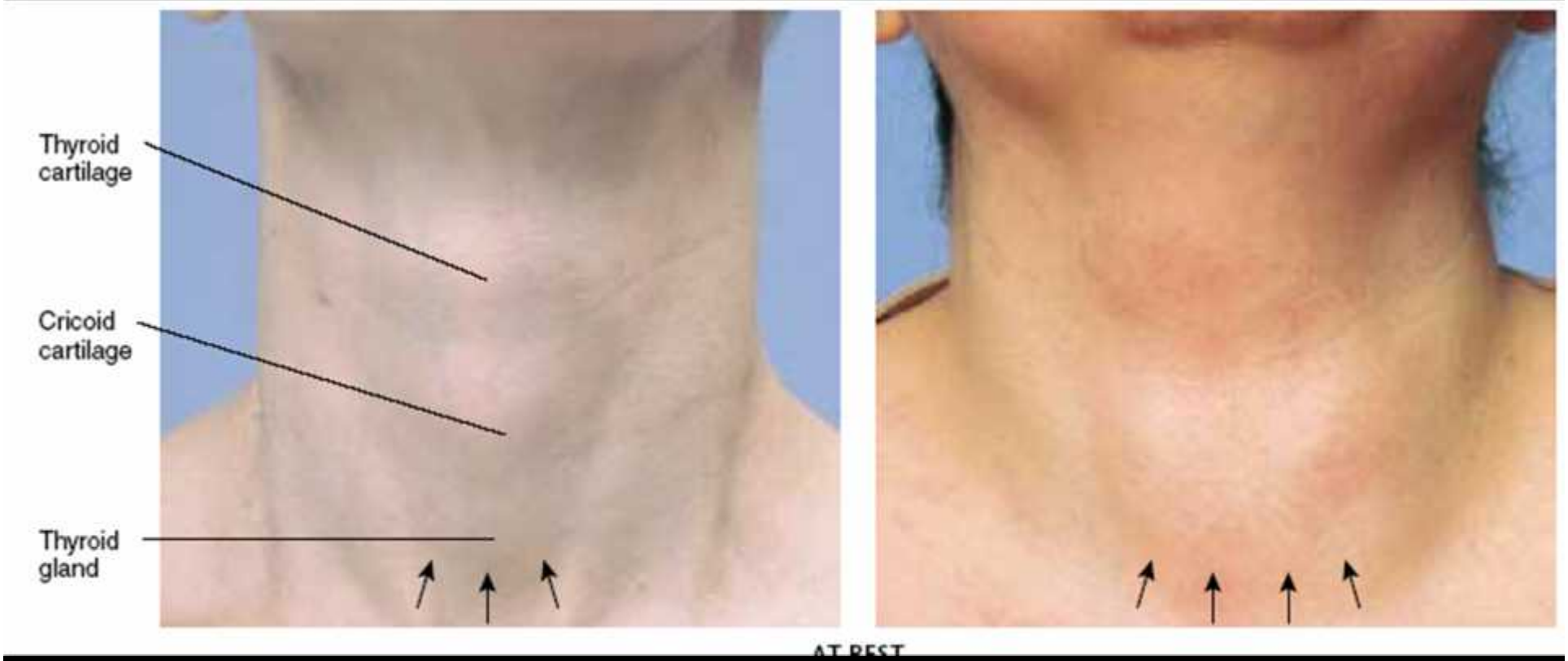

PLASMA
CELL
COLLOID
IODIDE
Concentration
IODIDE
Oxidation
IODINE
MIT-DIT
Coupling
TSH
T_3
T_4
Proteolysis
T_3 T_4
Thyroglobulin
Stored
thyroglobulin

PEMERIKSAAN THYROID

- Anamnesis
- Pemeriksaan Fisik
- Uji metabolisme : BMR, Indeks Wayne
- Pemeriksaan Laboratorium : fungsi kelenjar thyroid
- Pemeriksaan radiologi / sidik radioaktif / thyro-scan
- Pemeriksaan sitologi / patologi

Pemeriksaan Fisik

- Normal : kel tiroid tidak terlihat dan sukar diraba



STEPS FOR PALPATING THE THYROID GLAND

- Ask the patient to flex the neck slightly forward to relax the sternomastoid muscles.
- Place the fingers of both hands on the patient's neck so that your index fingers are just below the cricoid cartilage.
- Ask the patient to sip and swallow water as before. Feel for the thyroid isthmus rising up under your finger pads. It is often but not always palpable.
- Displace the trachea to the right with the fingers of the left hand; with the right-hand fingers, palpate laterally for the right lobe of the thyroid in the space between the displaced trachea and the relaxed sternomastoid. Find the lateral margin. In similar fashion, examine the left lobe.

  The lobes are somewhat harder to feel than the isthmus, so practice is needed. The anterior surface of a lateral lobe is approximately the size of the distal phalanx of the thumb and feels somewhat rubbery.

- Note the *size, shape,* and *consistency* of the gland and identify any *nodules* or *tenderness*.

If the thyroid gland is enlarged, listen over the lateral lobes with a stethoscope to detect a bruit, a sound similar to a cardiac murmur but of noncardiac origin.

Inspeksi dari depan

Palpasi dari depan

Test fungsi tiroid

Thyroid functional state	TSH 0.3-3.3.mU L^{-1}	Free T4 10-30 nmol L^{-1}	Free T3 3.5-7.5 µmol L^{-1}
Euthyroid	Normal	Normal	Normal
Thyrotoxic	Undetectable	High	High
Myxoedema	High	Low	Low
Suppresive T4 therapy	Undetectable	High	High
T3 toxicity	Low/undetect-able	Normal	High

Simple goiter (euthyroid)

Diffuse Hyperplastic
- Physiological
- Pubertal
- Pregnancy

Multinodular

Inflammatory

Autoimmune : Hashimoto
Granulomatous : de Quervain's
Fibrosing : Riedel's thyroiditis
Infective : acute / chronic
Other : amyloid

Toxic

Diffuse : Grave's disease
Multinodular
Toxic adenoma

Neoplastic

Benign
Malignant

Wayne's Clinical Diagnostic Index

SYMPTOMS	Present	Absent	SIGNS	Present	Absent
Dyspnea d'effort	+1		Palpable thyroid	+3	-3
Palpitations	+2		Bruit over thyroid	+2	-2
Tiredness	+2		Exophthalmos	+2	
Preference for heat		-5	Lid retraction	+2	
Preference for cold	+5		Lid lag	+1	
Indifferent to temperature	0		Hyperkinetic movement	+4	-2
Excessive sweating	+3		Fine finger tremor	+1	
Nervousness	+2		Hands hot Hands moist	+2 +1	-2 -1
Appetite increased	+3		Casual pulse rate Auricular fibrillation	 +4	
Appetite decreased		-3	80 perminute		-3
Weight increased		-3	80 – 90 perminute	0	
Weight decreased	+3		90 perminute	+3	

Symptom score + Sign Score = Diagnostic Index
<11 = non toxic; 11-19 = equivocal; > 19 = toxic

Pembesaran Tiroid

Struma

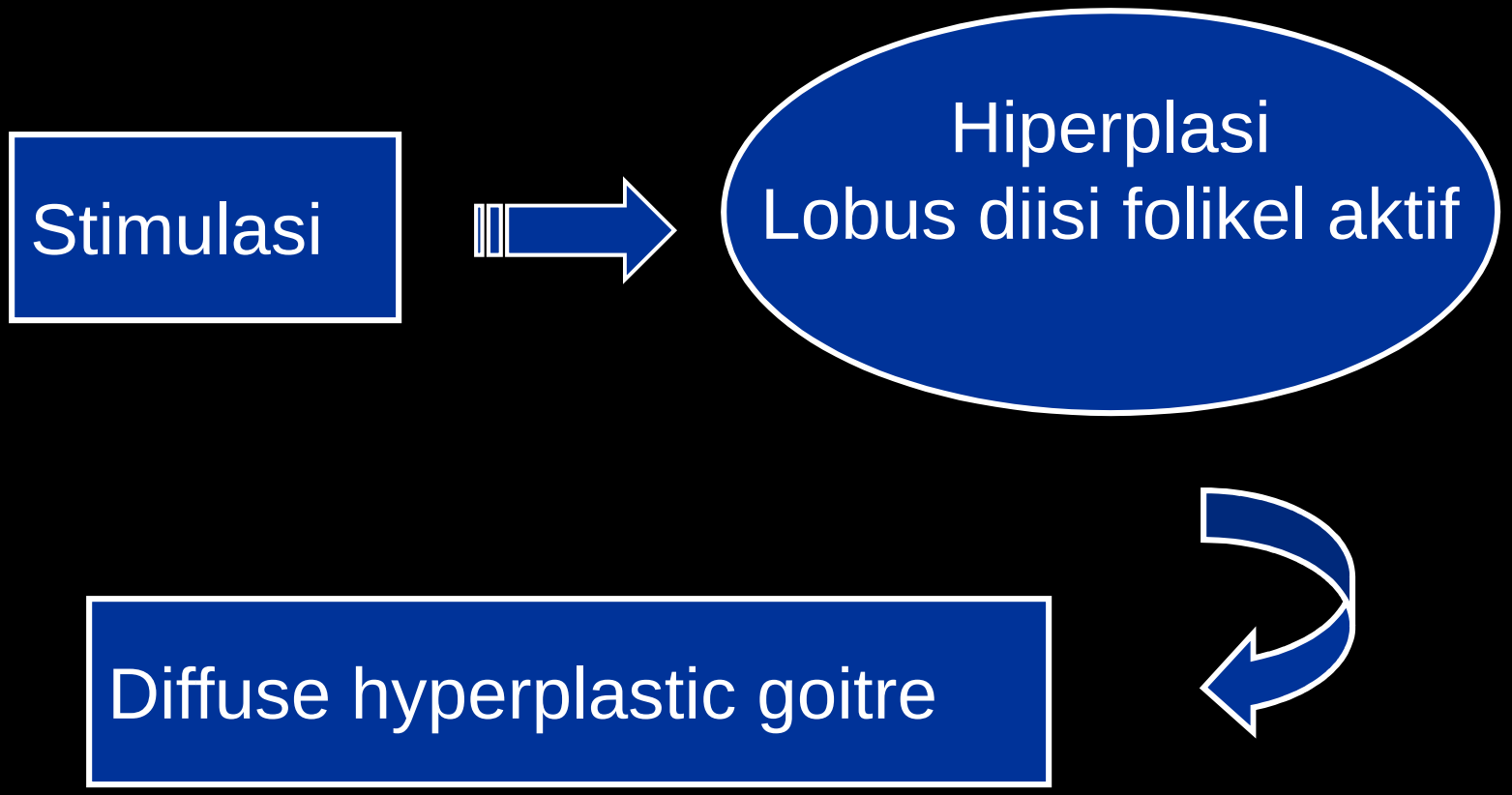
=

Goitre

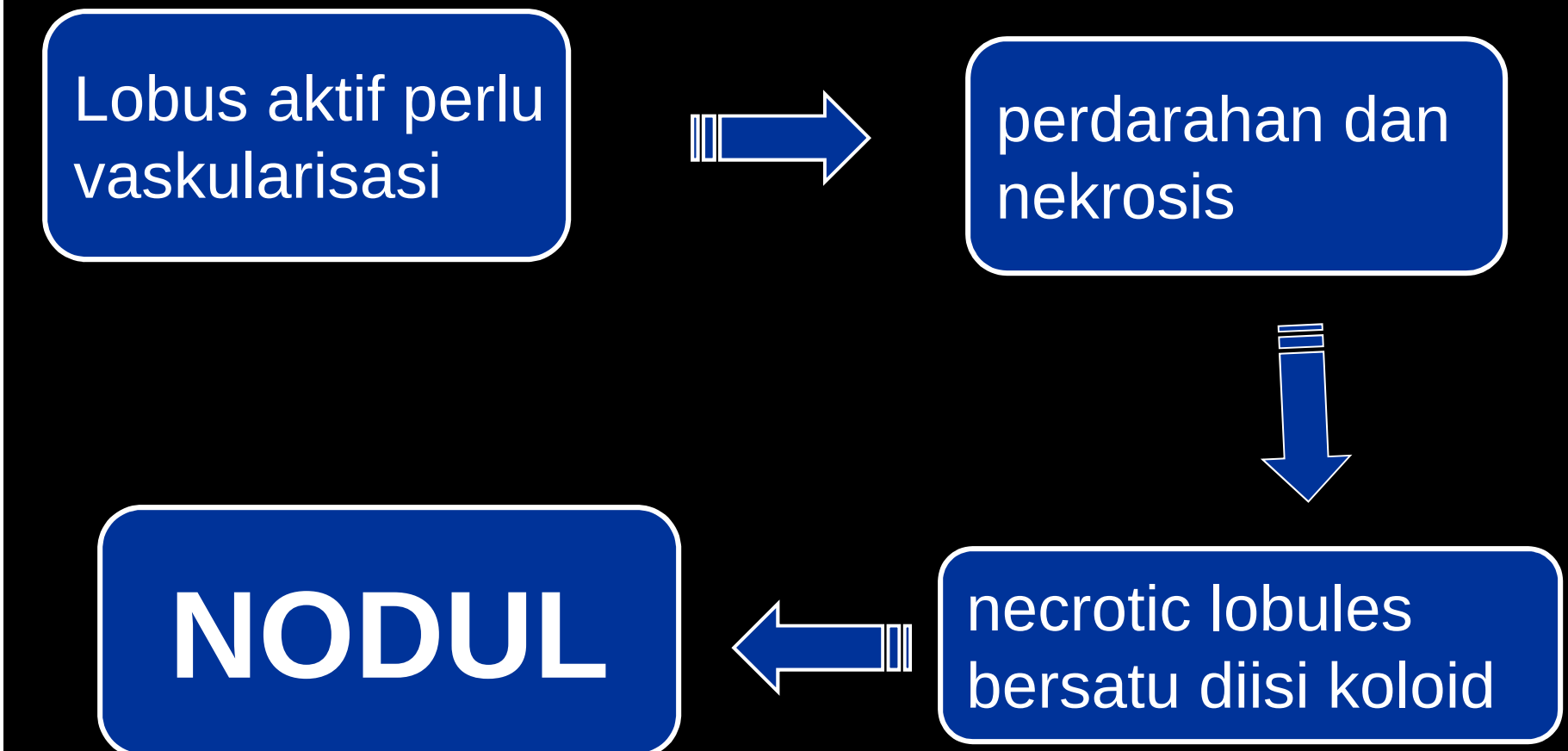
- Goitre (guttur = tenggorokan) : pembesaran kelenjar tiroid = struma
- Sebagai akibat rendahnya kadar hormon tiroid dalam darah
- Kebutuhan jodium : 0.1 – 0.15 mg perhari
- Rendahnya kadar tiroid :

1. Rendah pemasukan jodium
2. Kegagalan sintesis
3. Goitrogens : kol, obat-obatan

Struma difusa



Struma Nodosa



Pemeriksaan Fisik Struma

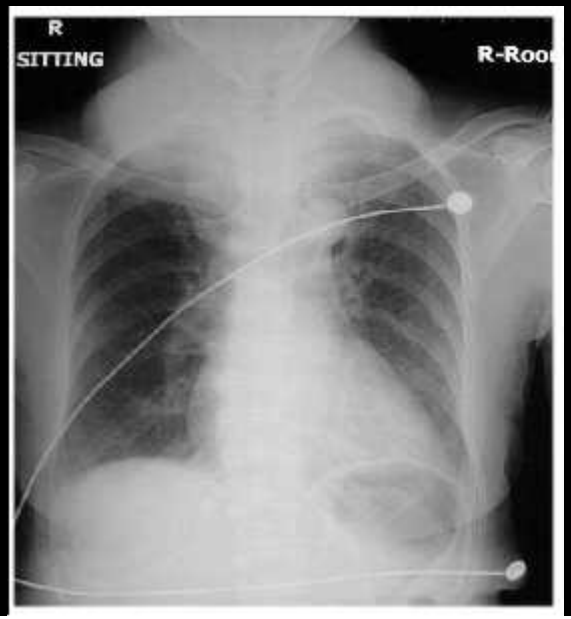
- Terlihat benjolan leher depan
- Warna sama dg kulit sekitarnya
- Licin, kenyal-padat (tidak keras)
- Ikut bergerak sewaktu menelan (kecil)
- Tidak nyeri dan pada perabaan suhu sama dg sekitarnya
- Tidak ada tanda toksis

Pemeriksaan Penunjang Struma

- Serum TSH dan hormon tiroid dlm batas normal
- USG dpt membedakan dg kista
- Radiologi : deviasi trakhea, retrosternal
- Bila curiga keganasan perlu mencari diagnosis adanya keganasan

Komplikasi

- Secondary thyrotoxicosis (30%)
- Obstruksi trakhea
- Trakheomalacia
- Berubah ganas : Ca - follikular
- Retrosternal : bendungan → sesak, pelebaran vena leher, trakheo-malacia



Penanganan Struma

- Bila masih difus, mungkin masih reversibel
- Setelah terbentuk nodul tidak dapat dipengaruhi terapi jodium
- Sering tidak mengganggu → tidak dilakukan operasi
- Nodul yg mengganggu (penekanan, kosmetik) dilakukan operasi

Tumor Ganas Tiroid

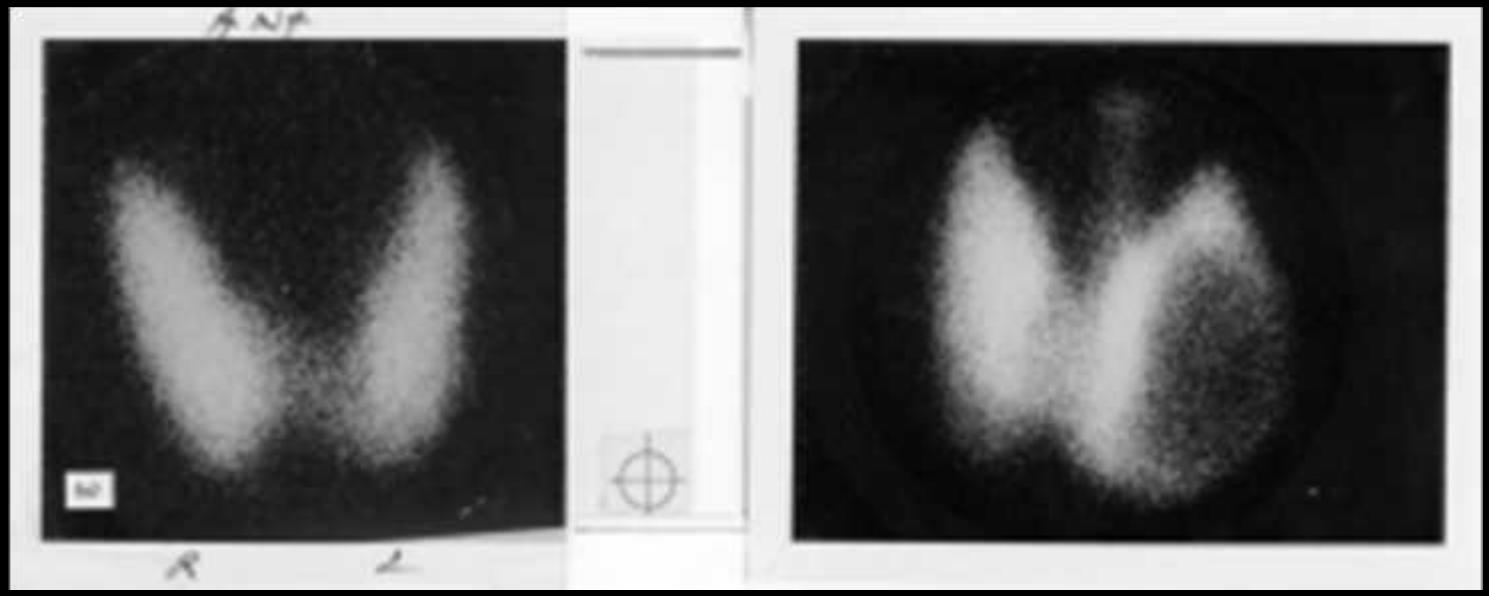
Etiologi

- Seperti keganasan lain, etiologi yg pasti belum dapat ditentukan
- Pada anak yg mendapat terapi radiasi pada tiroid, diketahui akan timbul keganasan pada tiroid
- Karsinoma folikuler banyak didapati di daerah endemis struma → stimulasi TSH?
- Auto-immun?

Pemeriksaan penunjang

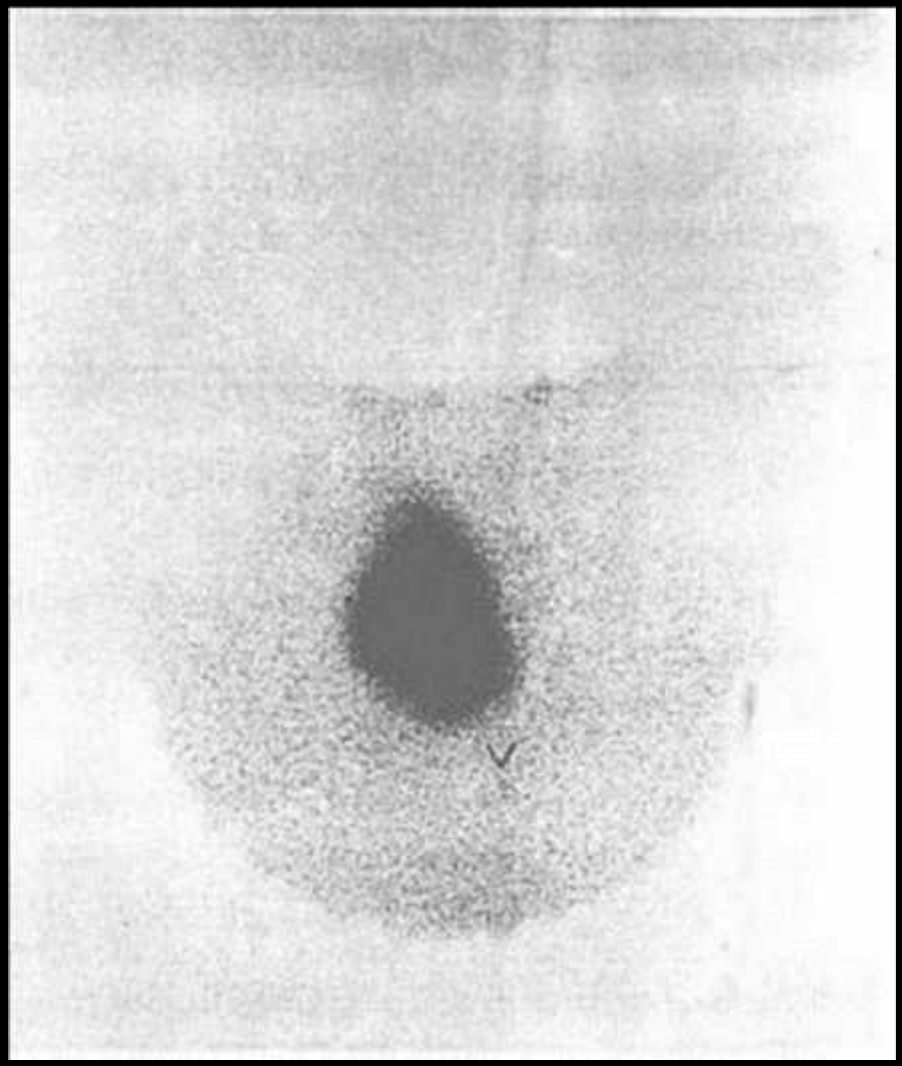
- Fungsi tiroid (TSH, T3,T4 dll)
- Sitologi : FNAB (fine needle aspiration biopsy)
- Radiologi : USG, foto thoraks penekanan, kalsifikasi, metastasis
- Pemeriksaan radioaktif / thyro-scan : Iodium 131 (^{131}I) atau Tc99m (^{99m}Tc)

USG



Cold Nodule pada thyroscan
→ ganas?

Hot Nodule



Benign : Follicular adenoma

Malignant

1. Primary

Follicular epithelium – differentiated

Follicular

Papillary

Follicular epithelium – undifferentiated

Anaplastic

Parafollicular cells

Medullary

Lymphoid cells

Lymphoma

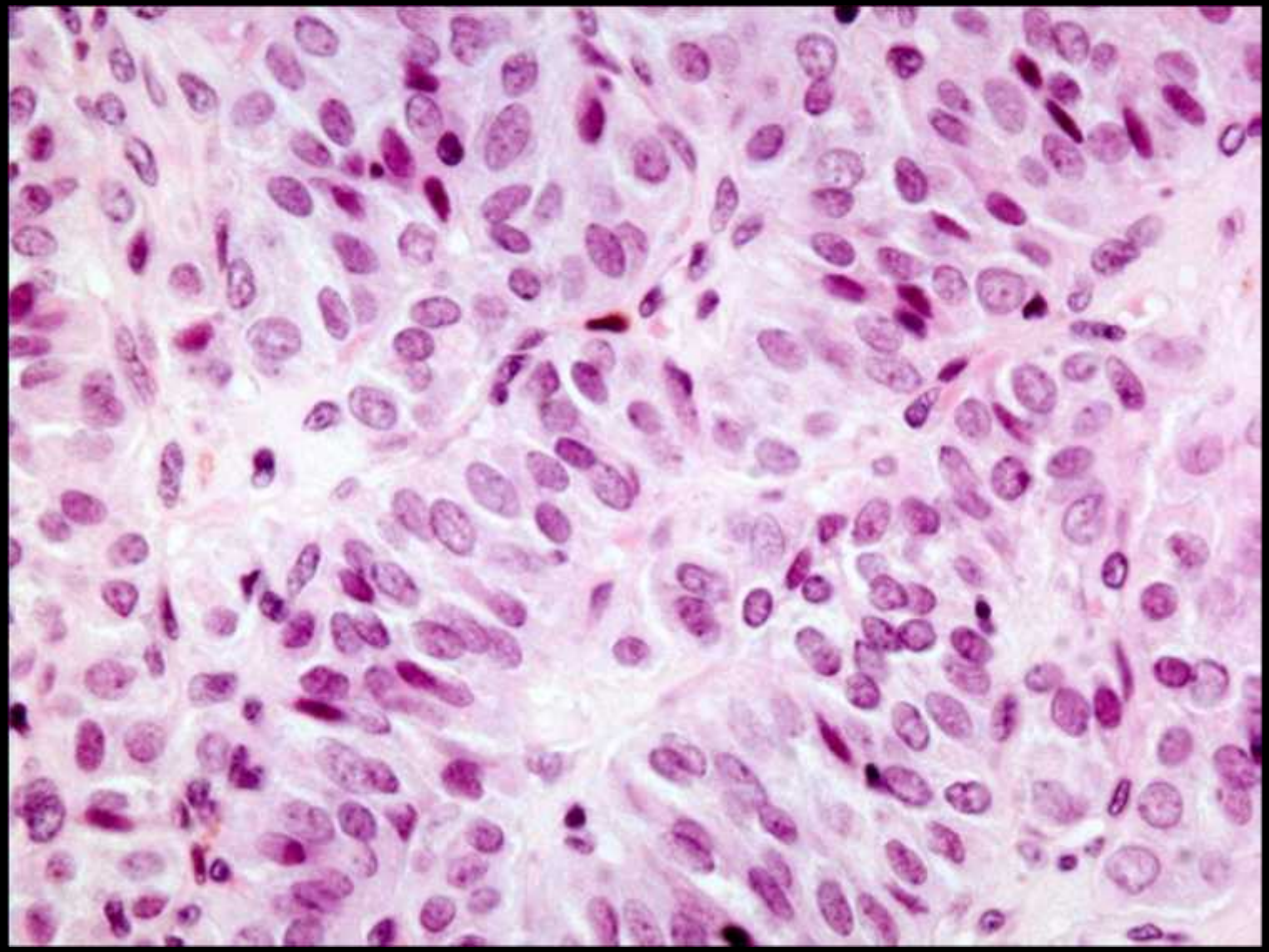
2. Secondary : metastatic

KARSINOMA PAPILER

- Paling sering didapati (60-80%)
- Insidens wanita : laki-laki = 2 : 1
- Umur penderita rata-rata 35 tahun
- Teraba sebagai benjolan padat sampai keras
- Sering didapati kalsifikasi
- Fungsi tiroid normal / euthyroid

KARSINOMA PAPILER

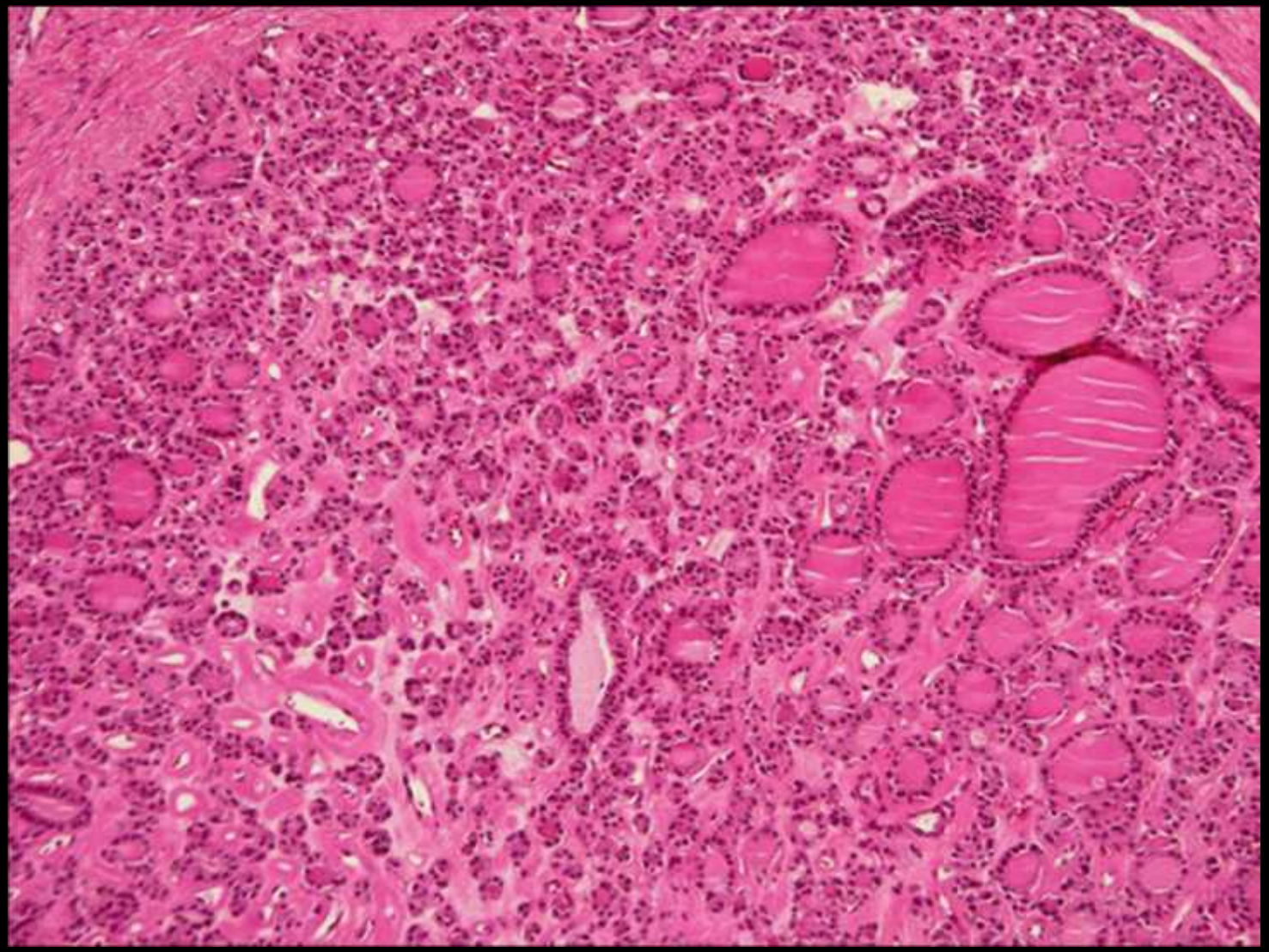
- Penanganan berupa tindakan operasi
- Bila kecil cukup dengan lobektomi dan isthmectomy
- Bila besar dilakukan total atau “near total” thyroidectomy
- Prognosis : relatif baik



Karsinoma papiler

KARSINOMA FOLIKULER

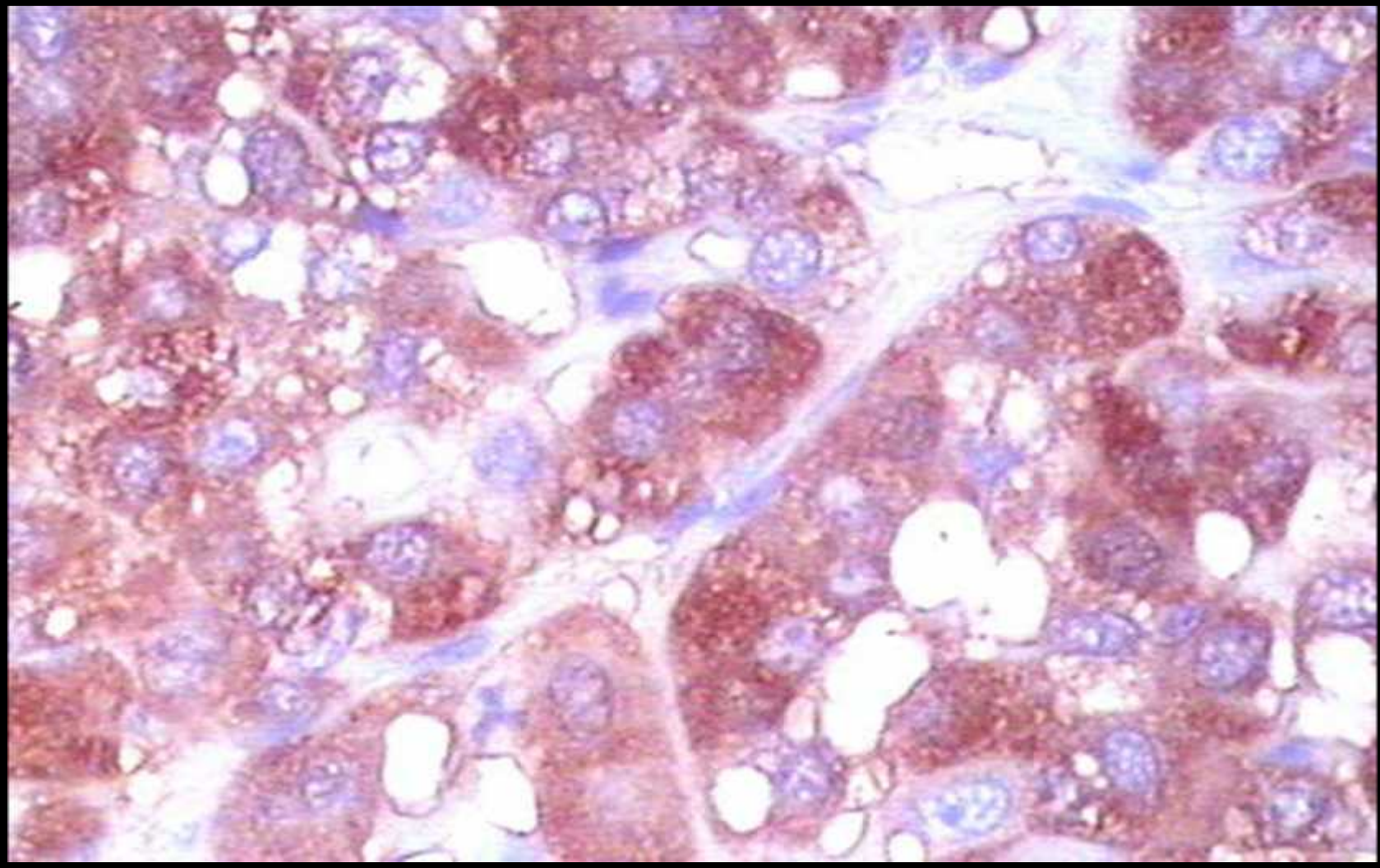
- Didapati 10-20% dari keganasan tiroid
- Wanita : laki-laki = 3 : 1
- Umur penderita rata-rata 50 tahun
- Penyebaran sering hematogen ke tulang, paru-paru dan hepar
- Penanganan : operasi
- Prognosis : lebih jelek dibanding papiler



Karsinoma folikuler

KARSINOMA MEDULER

- 5% dari keganasan tiroid
- Berasal dari C cells / para follicular cells (penghasil kalsitonin)
- Disertai nyeri, disfagi, dispnea dan disfoni
- Wanita : laki-laki = 1.5 : 1
- Umur penderita sekitar 50 – 60 tahun
- Operasi pilihan : total thyroidectomy



Karsinoma meduler

KARSINOMA ANAPLASTIK

- Paling ganas dari keganasan tiroid
- Tumbuh cepat, dapat merupakan perubahan dari yang berdiferensiasi
- Disertai nyeri, disfoni dan dispnoe
- Jarang yg dapat hidup 6 bulan sesudah diagnosis, umumnya 3 bulan sudah meninggal
- Tidak ada modalitas terapi yg memuaskan

Staging (2002 AJCC 6th Edition)

Table 1

American Joint Committee on Cancer (AJCC)
TNM Staging For Thyroid Cancer

Primary Tumor (T)

Note: All categories may be subdivided: (A) solitary tumor, (b) multifocal tumor (the largest determines the classification).

- **TX** Primary tumor cannot be assessed
- **T0** No evidence of primary tumor
- **T1** Tumor 2 cm or less in greatest dimension limited to the thyroid
- **T2** Tumor more than 2 cm but not more than 4 cm in greatest dimension limited to the thyroid
- **T3** Tumor more than 4 cm in greatest dimension limited to the thyroid or any tumor with minimal extrathyroid extension (eg, extension to sternothyroid muscle or perithyroid soft tissues)
- **T4a** Tumor of any size extending beyond the thyroid capsule to invade subcutaneous soft tissues, larynx, trachea, esophagus, or recurrent laryngeal nerve
- **T4b** Tumor invades prevertebral fascia or encases carotid artery or mediastinal vessels

All anaplastic carcinomas are considered T4 tumors.

- **T4a** Intrathyroidal anaplastic carcinoma –surgically resectable
- **T4b** Extrathyroidal anaplastic carcinoma – surgically unresectable

Regional Lymph Nodes (N)

Regional lymph nodes are the central compartment, lateral cervical, and upper mediastinal lymph nodes.

- **NX** Regional lymph nodes cannot be assessed
- **N0** No regional lymph node metastasis
- **N1** Regional lymph node metastasis
- **N1a** Metastasis to Level VI (pretracheal, paratracheal, and prelaryngeal/Delphian lymph nodes)
- **N1b** Metastasis to unilateral, bilateral, or contralateral cervical or superior mediastinal lymph nodes

Distant Metastasis (M)

- **MX** Distant metastasis cannot be assessed
- **M0** No distant metastasis
- **M1** Distant metastasis

Stage grouping:

Separate stage groupings are recommended for papillary or follicular, medullary, and anaplastic (undifferentiated) carcinoma.

Papillary or Follicular
Under 45 Years

Stage I	Any T	Any N	M0
Stage II	Any T	Any N	M1

Papillary or Follicular
45 Years and Older

Stage I	T1	N0	M0
Stage II	T2	N0	M0
Stage III	T3	N0	M0
	T1	N1a	M0
	T2	N1a	M0
	T3	N1a	M0
Stage IVA	T4a	N0	M0
	T4a	N1a	M0
	T1	N1b	M0
	T2	N1b	M0
	T3	N1b	M0
	T4a	N1b	M0
Stage IVB	T4b	Any N	M0
Stage IVC	Any T	Any N	M1

Medullary Carcinoma

Stage I	T1	N0	M0
Stage II	T2	N0	M0
Stage III	T3	N0	M0
	T1	N1a	M0
	T2	N1a	M0
	T3	N1a	M0
Stage IVA	T4a	N0	M0
	T4a	N1a	M0
	T1	N1b	M0
	T2	N1b	M0
	T3	N1b	M0
	T4a	N1b	M0
Stage IVB	T4b	Any N	M0
Stage IVC	Any T	Any N	M1

Anaplastic Carcinoma

All anaplastic carcinomas are considered Stage IV

Stage IVA	T4a	Any N	M0
Stage IVB	T4b	Any N	M0
Stage IVC	Any T	Any N	M1

Histopathologic Type

There are four major histopathologic types:

- Papillary carcinoma (including follicular variant of papillary carcinoma)
- Follicular carcinoma (including Hurthle cell carcinoma)
- Medullary carcinoma
- Undifferentiated (anaplastic) carcinoma

Table 1
Staging System for Thyroid Carcinoma
Established by the American Joint Committee on Cancer

Stage	Papillary or follicular		Medullary,	Anaplastic,
	Age <45 yr	Age ≥45 yr	any age	any age
I	M0	T1	T1	…
II	M1	T2-3	T2-4	…
III	…	T4 or N1	N1	…
IV	…	M1	M1	Any

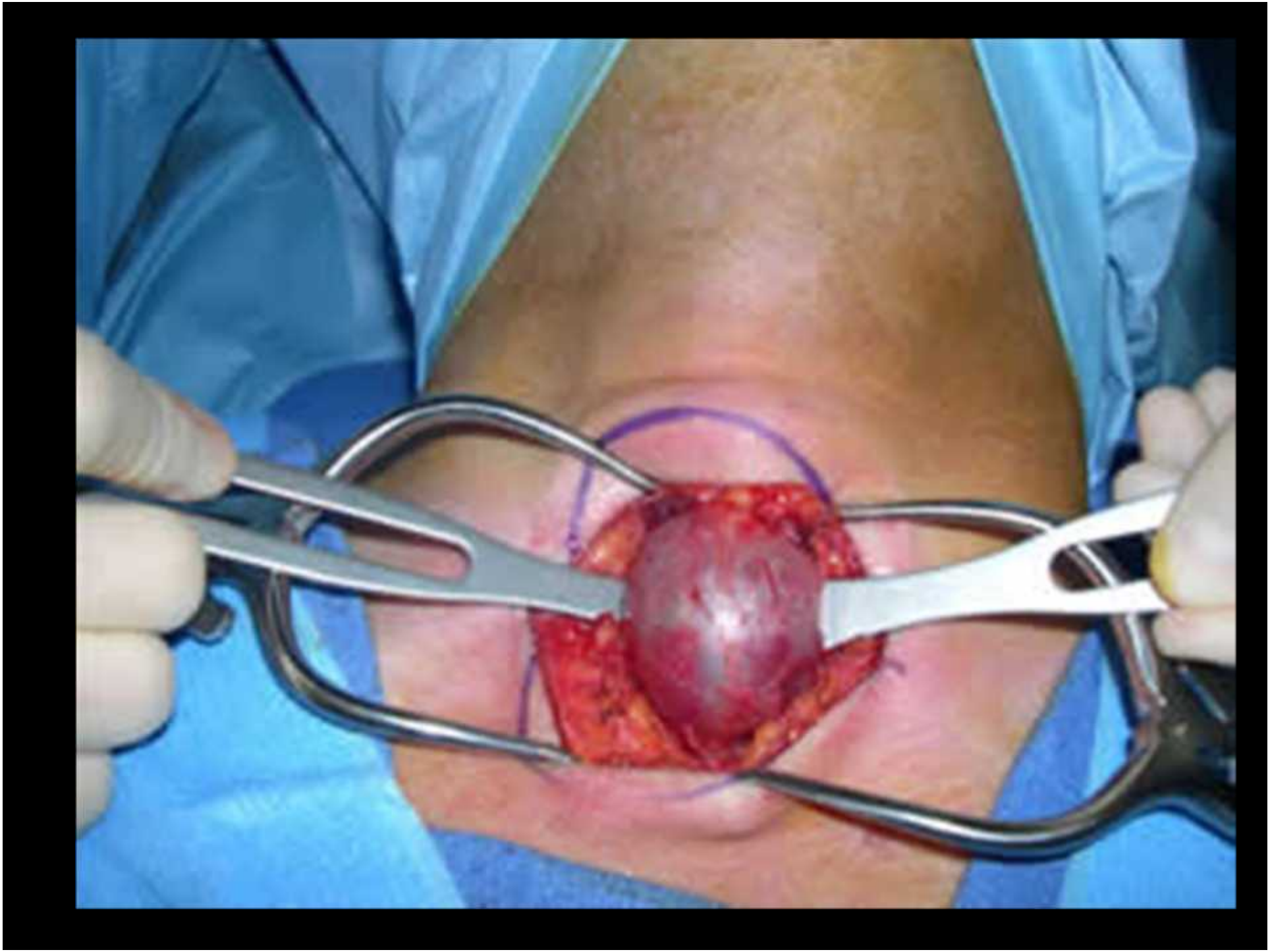
Relative incidence	%
Papillary Ca	60
Follicular Ca	20
Anaplastic Ca	10
Medullary Ca	5
Malignant lymphoma	5

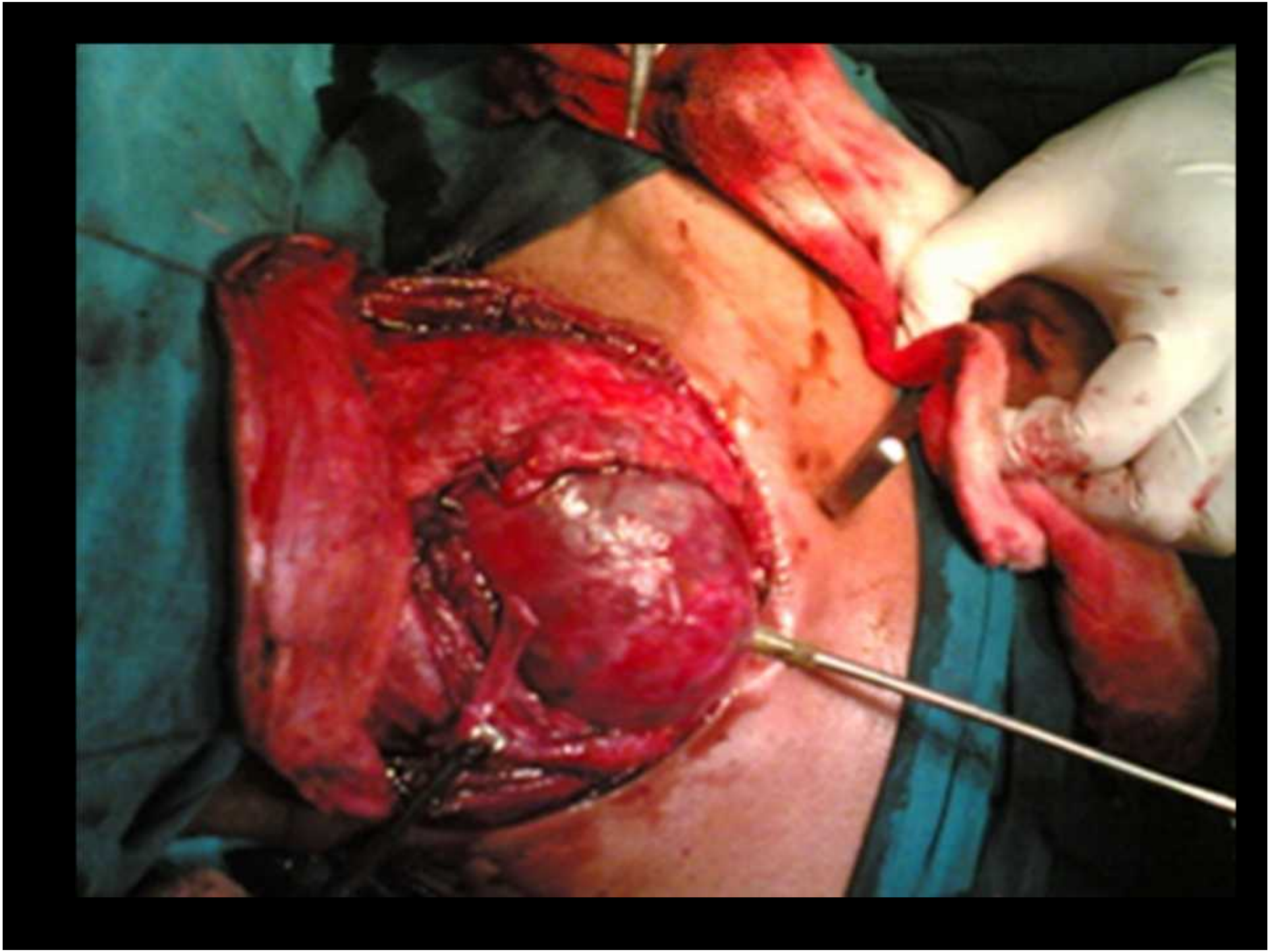
Perbedaan Ca papiler dan Folikuler

	Papillary %	Follicular %
Male incidence	22	35
Lymph node metastasis	35	13
Blood vessel invasion	40	60
Recurrence rate	19	29
Overall mortality rate	11	24

Tindakan Bedah Tiroid

TINDAKAN	INDIKASI
Biopsi insisi	Struma difusa (utk diagnosis)
Biopsi eksisi	Tumor/nodul terbatas (diagnosis)
Tiroidektomi	Hipertiroidi / Graves
Subtotal tiroidektomi	Struma nodosa
Hemitiroidektomi	Adenoma unilateral
Tiroidektomi total	Keganasan
Tirodektomi radikal	Keganasan dgn metastasis





KOMPLIKASI

- Perdarahan
- Hematoma
- Tracheomalacia
- Edema laring
- “Thyroid storm” / krisis tiroid
- Terpotongnya N recurrens
- Terangkatnya paratiroid

QUESTIONS

SUMMARY

- Pembesaran kel tiroid umumnya jinak, berupa struma
- Struma diffusa masih reversibel
- Struma nodosa bila ada keluhan dan curiga ganas → operasi
- Keganasan yang berdiferensiasi baik prognosisnya baik, terutama karsinoma papiler
- Karsinoma anaplastik prognosisnya paling buruk

- Tindakan bedah untuk hipertirodi, tiroiditis diperlukan bila medikamentosa tidak memuaskan