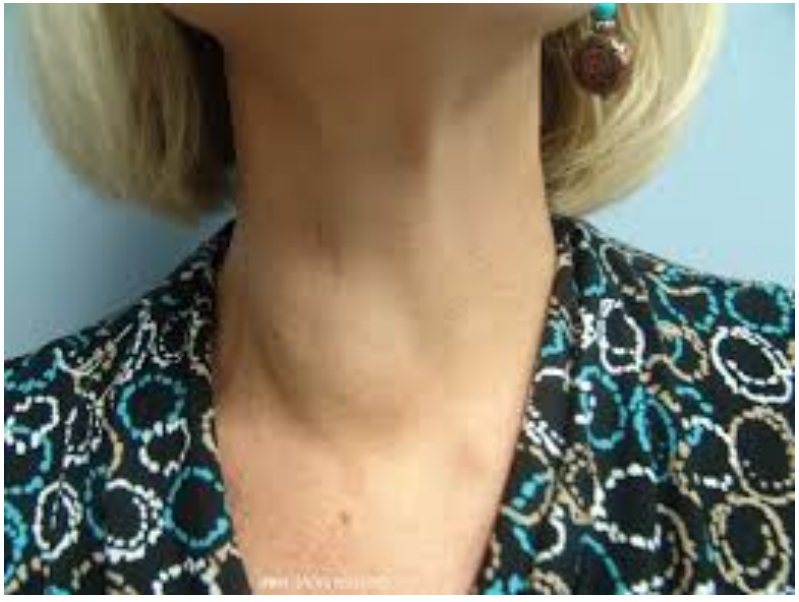
Neck swellings

Case 1

66yo Female
PMH: Previous breast ca s/p RT 3 years ago

HPC:
Noted right neck lump
No increase in size, no pain
No infective symptoms
No LOW, LOA
No compressive symptoms, change in voice
No hyper/hypo thyroid symptoms
No fhx of thyroid ca
Non-smoker
No etOH



O/E

4cm smooth right thyroid nodule

No cervical lymphadenopathy

Voice ok

?Nasendoscope

Investigations

- TFT
- US thyroid
- FNAC

US thyroid

The isthmus measures 0.2 cm.
The right lobe measures 4.8 x 0.8 x 0.9 cm.
The left lobe measures 5.8 x 3.0 x 1.9 cm.

The left thyroid lobe is enlarged. The thyroid gland shows heterogenous echotexture with multiple nodules.

ISTHMUS
0.8 x 0.5 x 0.3 cm solid cystic nodule with peripheral vascularity

RIGHT
Mid pole: 0.2 x 0.2 x 0.2 cm cystic nodule
Mid pole 2: 0.2 x 0.1 x 0.1 cm solid hyperechoic nodule
Mid/lower pole: 1.4 x 1.0 x 0.8 cm predominant solid isoechoic nodule with internal vascularity
Lower pole 1: 0.3 x 0.4 x 0.3 cm solid hyperechoic nodule with internal vascularity
Lower pole 2: 0.6 x 0.4 x 0.3 cm cystic nodule
Lower pole 3: 0.8 x 0.5 x 0.4 cm solid hypoechoic nodule with internal vascularity
Lower pole 4: 0.8 x 0.5 cm solid isoechoic nodule with internal and peripheral vascularity

LEFT
Upper /Mid pole: 3.5 x 2.7 x 1.6 cm cystic solid nodule with internal vascularity
Lower pole: 2.2 x 1.9 x 1.4 cm solid nodule with internal vascularity

No cervical lymphadenopathy is detected.

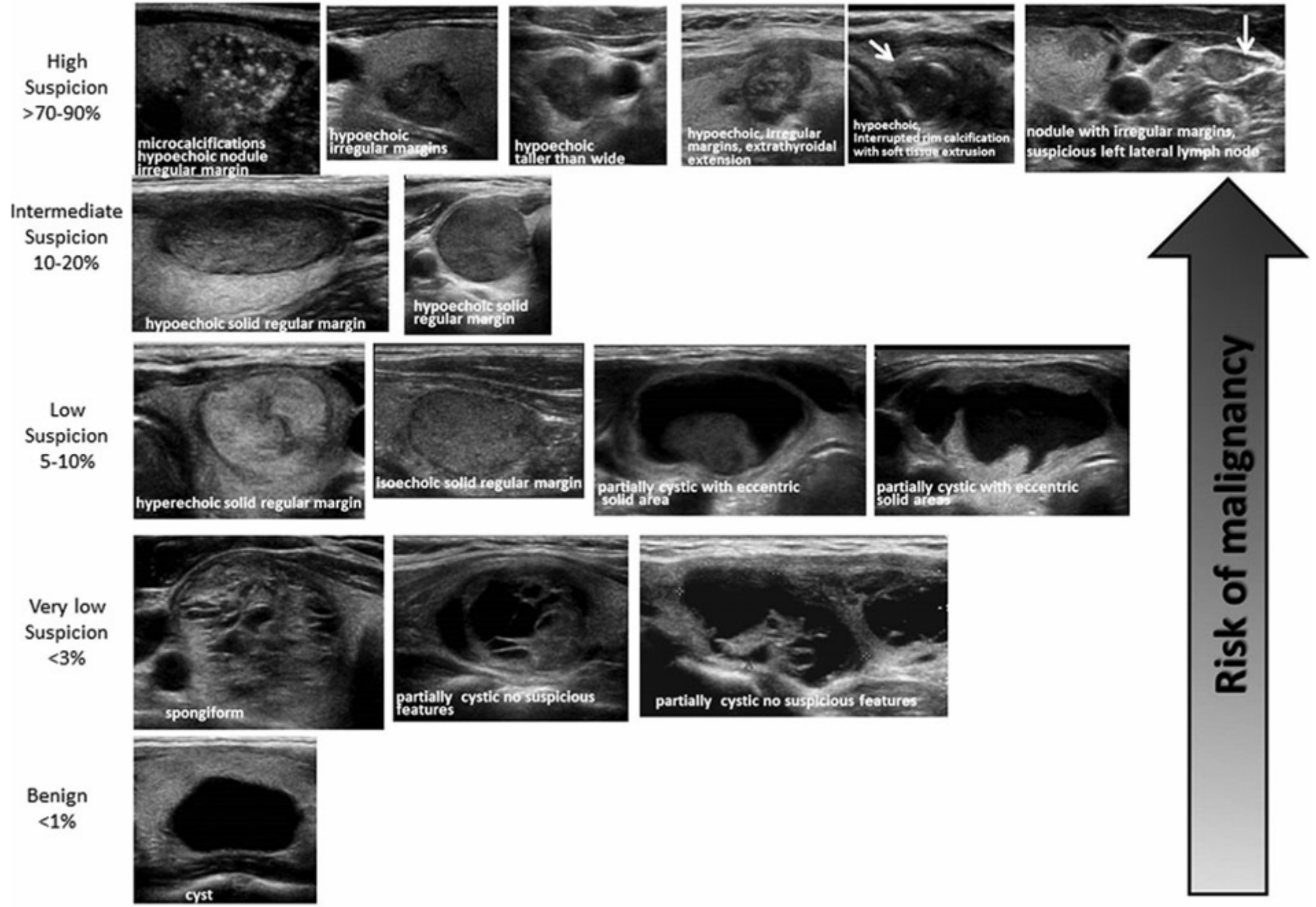

High Suspicion >70-90%
microcalcifications hypoechoic nodule irregular margin
hypoechoic irregular margins
hypoechoic taller than wide
hypoechoic, irregular margins, extrathyroidal extension
hypoechoic, interrupted rim calcification with soft tissue extrusion
nodule with irregular margins, suspicious left lateral lymph node
Intermediate Suspicion 10-20%
hypoechoic solid regular margin
hypoechoic solid regular margin
Low Suspicion 5-10%
hyperechoic solid regular margin
isoechoic solid regular margin
partially cystic with eccentric solid area
partially cystic with eccentric solid areas
Very low Suspicion <3%
spongiform
partially cystic no suspicious features
partially cystic no suspicious features
Benign <1%
cyst
Risk of malignancy

Table 6. Sonographic Patterns, Estimated Risk of Malignancy, and Fine-Needle Aspiration Guidance for Thyroid Nodules

Sonographic pattern	*US features*	*Estimated risk of malignancy, %*	*FNA size cutoff (largest dimension)*
High suspicion	Solid hypoechoic nodule or solid hypoechoic component of a partially cystic nodule ***with*** one or more of the following features: irregular margins (infiltrative, microlobulated), microcalcifications, taller than wide shape, rim calcifications with small extrusive soft tissue component, evidence of ETE	>70–90[a]	Recommend FNA at ≥1 cm
Intermediate suspicion	Hypoechoic solid nodule with smooth margins ***without*** microcalcifications, ETE, or taller than wide shape	10–20	Recommend FNA at ≥1 cm
Low suspicion	Isoechoic or hyperechoic solid nodule, or partially cystic nodule with eccentric solid areas, ***without*** microcalcification, irregular margin or ETE, or taller than wide shape.	5–10	Recommend FNA at ≥1.5 cm
Very low suspicion	Spongiform or partially cystic nodules ***without*** any of the sonographic features described in low, intermediate, or high suspicion patterns	<3	Consider FNA at ≥2 cm Observation without FNA is also a reasonable option
Benign	Purely cystic nodules (no solid component)	<1	No biopsy[b]

US-guided FNA is recommended for cervical lymph nodes that are sonographically suspicious for thyroid cancer (see Table 7).

[a]The estimate is derived from high volume centers, the overall risk of malignancy may be lower given the interobserver variability in sonography.

[b]Aspiration of the cyst may be considered for symptomatic or cosmetic drainage.

ETE, extrathyroidal extension.

FNAC

GROSS DESCRIPTION
The specimen is labelled with the patient's particulars and designated as "Left thyroid nodule FNA".
No of passes: 2
No of slides prepared on-site: 4
A1. 2 Pap and 2 Hemacolor stained slides were prepared.
Preliminary screening of slides prepared on-site showed an adequate cell yield.

MICROSCOPIC DESCRIPTION
The 4 smears examined show a paucicellular yield.
Blood and some macrophages are present.
Abundant colloid is observed in the background.
There is an atypical cell cluster of unknown significance and origin.

DIAGNOSIS
LEFT THYROID NODULE FNA: RARE ATYPICAL CELLS OF UNKNOWN SIGNIFICANCE, SEE COMMENT.

Comment: The atypical cells may represent reactive cells, however, a neoplastic lesion can not be excluded. The specimen may not be representative of the lesion. Repeat FNA or excision biopsy maybe indicated if a malignant diagnosis is under consideration. Please correlate clinically.

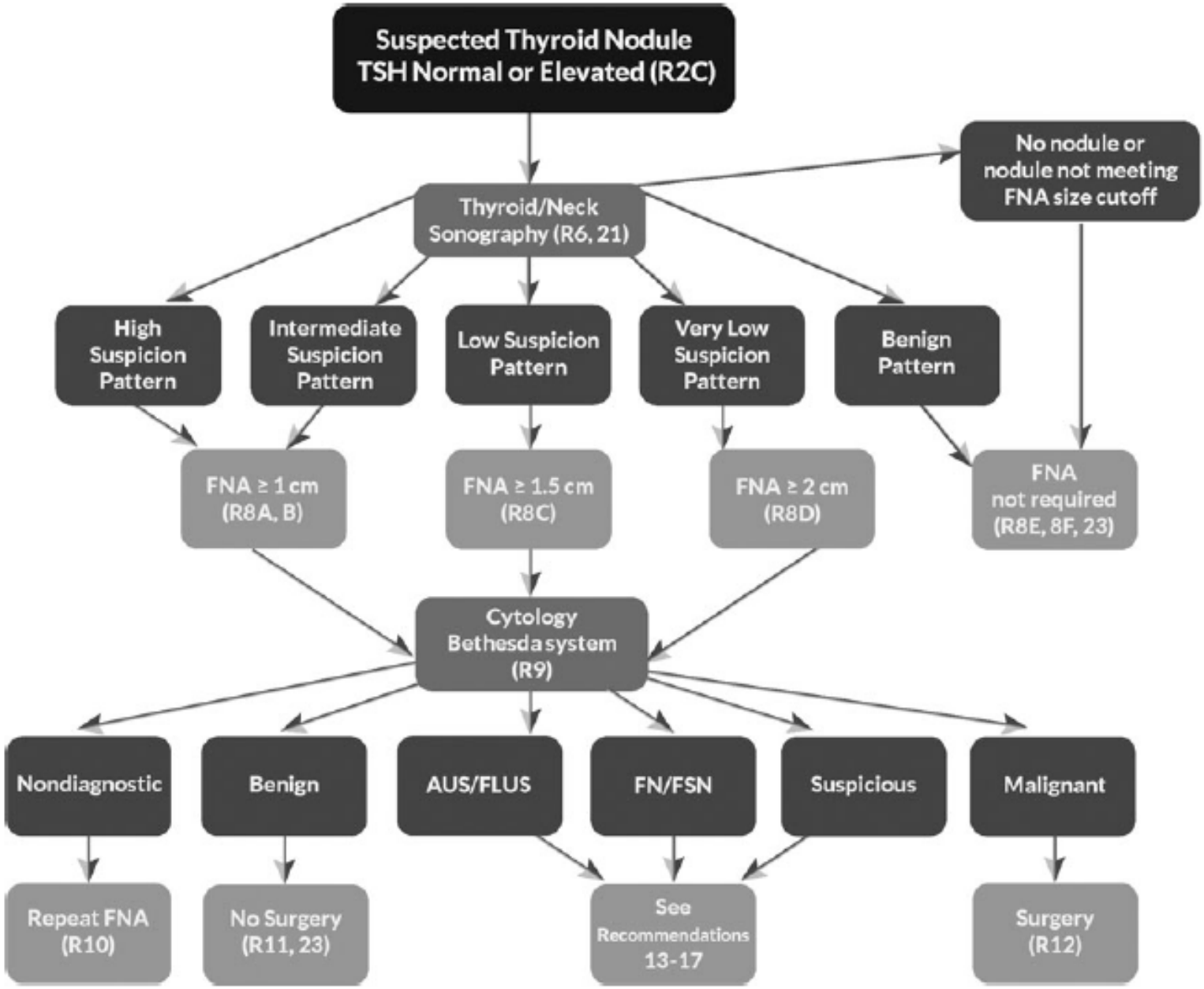
Specimen Adequacy for Interpretation: Satisfactory for evaluation.
General Diagnosis Category: Atypical.

TABLE 8. THE BETHESDA SYSTEM FOR REPORTING THYROID CYTOPATHOLOGY: DIAGNOSTIC CATEGORIES AND RISK OF MALIGNANCY[a]

Diagnostic category	*Estimated/predicted risk of malignancy by the Bethesda system, %*[a]	*Actual risk of malignancy in nodules surgically excised, % median (range)*[b]
Nondiagnostic or unsatisfactory	1–4	20 (9–32)
Benign	0–3	2.5 (1–10)
Atypia of undetermined significance or follicular lesion of undetermined significance	5–15	14 (6–48)
Follicular neoplasm or suspicious for a follicular neoplasm	15–30	25 (14–34)
Suspicious for malignancy	60–75	70 (53–97)
Malignant	97–99	99 (94–100)

[a]As reported in The Bethesda System by Cibas and Ali (1076).

[b]Based on the meta-analysis of eight studies reported by Bongiovanni *et al.* (103). The risk was calculated based on the portion of nodules in each diagnostic category that underwent surgical excision and likely is not representative of the entire population, particularly of nondiagnostic and benign diagnostic categories.


Suspected Thyroid Nodule
TSH Normal or Elevated (R2C)
No nodule or nodule not meeting FNA size cutoff
Thyroid/Neck Sonography (R6, 21)
High Suspicion Pattern
Intermediate Suspicion Pattern
Low Suspicion Pattern
Very Low Suspicion Pattern
Benign Pattern
FNA ≥ 1 cm (R8A, B)
FNA ≥ 1.5 cm (R8C)
FNA ≥ 2 cm (R8D)
FNA not required (R8E, 8F, 23)
Cytology Bethesda system (R9)
Nondiagnostic
Benign
AUS/FLUS
FN/FSN
Suspicious
Malignant
Repeat FNA (R10)
No Surgery (R11, 23)
See Recommendations 13-17
Surgery (R12)

Thyroid ca

- Papillary
  - 70% of all thyroid ca
  - 6% familial
  - Risk factors:
    - Radiation exposure, gardner syndrome, Peutz-Jeghers syndrome, Cowden syndrome familial polyposis
  - Spread by lymphatics (more likely nodal mets)
- Follicular
  - 10% of all thyroid ca
  - Risk factor: Radiation exposure, Cowden disease
  - More likely distant mets
  - Can be hyperfunctioning
  - FNAC cannot differentiate adenoma from carcinoma
- Hurtle cell
  - 3% of all thyroid ca
  - More aggressive than follicular
- Medullary
  - 5% of all thyroid ca
  - Test for RET mutation
  - Genetic counselling
  - Check CEA and calcitonin
  - If bulky nodal disease, consider CT neck + thorax + liver, bone scan
  - Surgery: Total thyroidectomy with TEG clearance +/- bilateral level 2-5ND
- Anaplastic
  - Most aggressive
  - Most have pre-existing PTC or FTC

TABLE 10. AJCC 7TH EDITION/TNM CLASSIFICATION SYSTEM FOR DIFFERENTIATED THYROID CARCINOMA

	Definition
T0	No evidence of primary tumor
T1a	Tumor ≤1 cm, without extrathyroidal extension
T1b	Tumor >1 cm but ≤2 cm in greatest dimension, without extrathyroidal extension
T2	Tumor >2 cm but ≤4 cm in greatest dimension, without extrathyroidal extension.
T3	Tumor >4 cm in greatest dimension limited to the thyroid ***or*** Any size tumor with minimal extrathyroidal extension (e.g., extension into sternothyroid muscle or perithyroidal 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 of any size invading prevertebral fascia or encasing carotid artery or mediastinal vessels
N0	No metastatic nodes
N1a	Metastases to level VI (pretracheal, paratracheal, and prelaryngeal/Delphian lymph nodes).
N1b	Metastases to unilateral, bilateral, or contralateral cervical (levels I, II III, IV, or V) or retropharyngeal or superior mediastinal lymph nodes (level VII)
M0	No distant metastases
M1	Distant metastases

	Patient age <45 years old at diagnosis		
I	Any T	Any N	M0
II	Any T	Any N	M1
	Patient age ≥45 years old at diagnosis		
I	T1a	N0	M0
	T1b	N0	M0
II	T2	N0	M0
III	T1a	N1a	M0
	T1b	N1a	M0
	T2	N1a	M0
	T3	N0	M0
	T3	N1a	M0
IVa	T1a	N1b	M0
	T1b	N1b	M0
	T2	N1b	M0
	T3	N1b	M0
	T4a	N0	M0
	T4a	N1a	M0
	T4a	N1b	M0
IVb	T4b	Any N	M0
IVc	Any T	Any N	M1

TABLE 11. ATA 2009 RISK STRATIFICATION SYSTEM WITH PROPOSED MODIFICATIONS

ATA low risk	Papillary thyroid cancer (with all of the following): • No local or distant metastases; • All macroscopic tumor has been resected • No tumor invasion of loco-regional tissues or structures • The tumor does not have aggressive histology (e.g., tall cell, hobnail variant, columnar cell carcinoma) • If ^{131}I is given, there are no RAI-avid metastatic foci outside the thyroid bed on the first posttreatment whole-body RAI scan • No vascular invasion • Clinical N0 or ≤5 pathologic N1 micrometastases (<0.2 cm in largest dimension)[a] Intrathyroidal, encapsulated follicular variant of papillary thyroid cancer[a] Intrathyroidal, well differentiated follicular thyroid cancer with capsular invasion and no or minimal (<4 foci) vascular invasion[a] Intrathyroidal, papillary microcarcinoma, unifocal or multifocal, including *BRAF*^{V600E} mutated (if known)[a]
ATA intermediate risk	Microscopic invasion of tumor into the perithyroidal soft tissues RAI-avid metastatic foci in the neck on the first posttreatment whole-body RAI scan Aggressive histology (e.g., tall cell, hobnail variant, columnar cell carcinoma) Papillary thyroid cancer with vascular invasion Clinical N1 or >5 pathologic N1 with all involved lymph nodes <3 cm in largest dimension[a] Multifocal papillary microcarcinoma with ETE and *BRAF*^{V600E} mutated (if known)[a]
ATA high risk	Macroscopic invasion of tumor into the perithyroidal soft tissues (gross ETE) Incomplete tumor resection Distant metastases Postoperative serum thyroglobulin suggestive of distant metastases Pathologic N1 with any metastatic lymph node ≥3 cm in largest dimension[a] Follicular thyroid cancer with extensive vascular invasion (> 4 foci of vascular invasion)[a]

Management

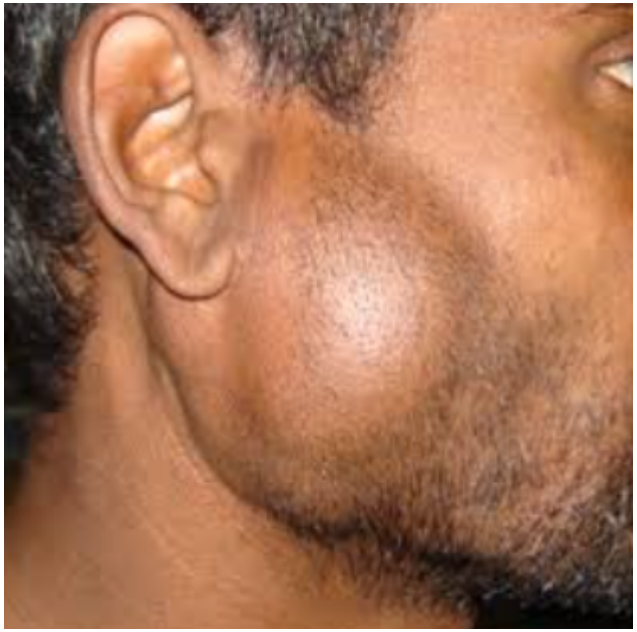
- Surgery
- Post-op RAI
  - Not for microPTC
- Monitor Tg
- Post-op TSH suppression
  - Low risk
    - Non-stimulated Tg<0.2ng/mL, TSH 0.5-2mU/L
    - If non-stimulated Tg>= 0.2ng/mL, TSH 0.1-0.5mU/L
  - Intermediate risk
    - TSH 0.1-0.5mU/L
  - High risk
    - TSH<0.1mU/L

Thyroidectomy

- Landmarks for RLN
  - Berry's ligament
  - Cricothyroid joint
  - Posterior to ITA 70% of the time
  - Between tubercle of zuckerkandl and trachea
- Complications
  - RLN
  - External branch of SLN
  - Parathyroid glands
  - Haematoma

Case 2

- 68yo Male
- PMH: DM, HTN, HLD



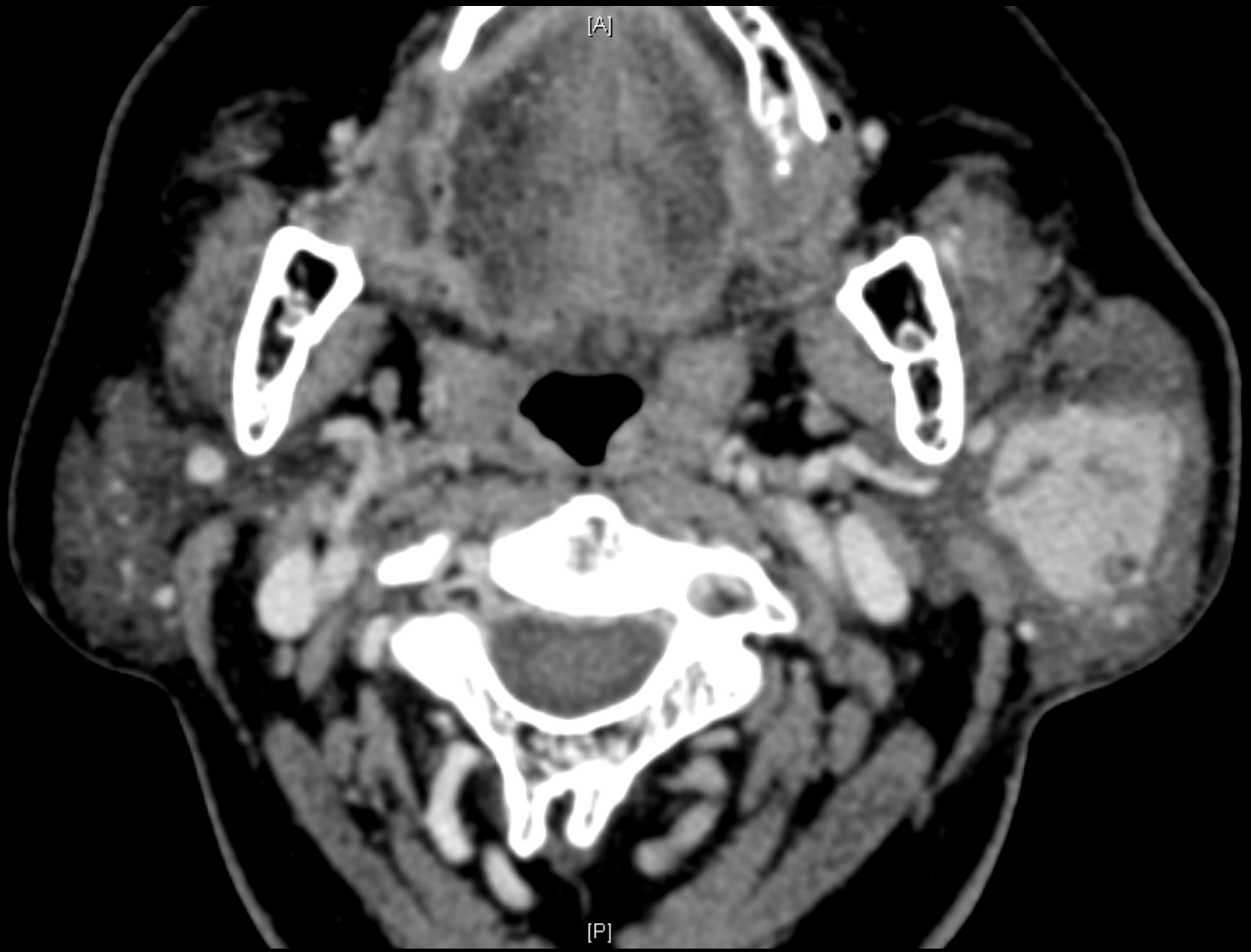
- **HPC:**
- Right neck swelling for 6 months, gradually getting larger.
- Non-tender
- No recent infective features
- No epistaxis, haematemsis, haemoptysis, LOW, LOA
- Smoker 50packyears
- No etOH
- No fhx of head and neck ca

Examination

- Size and consistency
- Stone?
- Facial nerve

Investigations:

- FNAC
- CT neck/parotid


[A]
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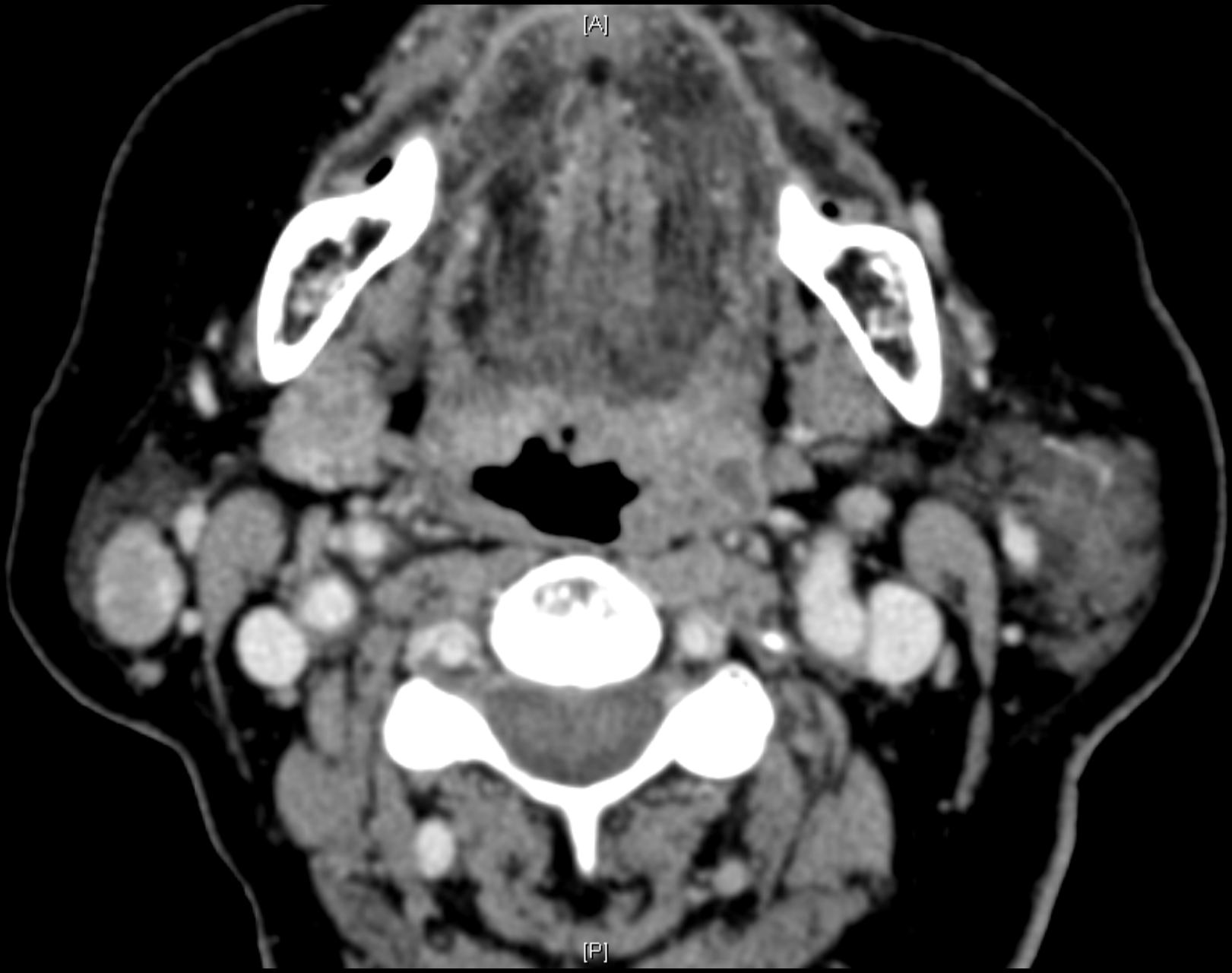
[A]
[P]

TABLE 115.1 THE WORLD HEALTH ORGANIZATION HISTOLOGIC CLASSIFICATION OF TUMORS OF THE SALIVARY GLANDS

Malignant epithelial tumors
Acinic cell carcinoma
Mucoepidermoid carcinoma
Adenoid cystic carcinoma
PLGA
Epithelial-Myoepithelial carcinoma
Clear cell carcinoma, NOS
Basal cell adenocarcinoma
Sebaceous carcinoma
Cystadenocarcinoma
Low-grade cribriform cystadenocarcinoma
Mucinous adenocarcinoma
Oncocytic carcinoma
Salivary duct carcinoma
Adenocarcinoma NOS
Myoepithelial carcinoma
Carcinoma ex pleomorphic adenoma
Carcinosarcoma
Metastasizing pleomorphic adenoma
Squamous cell carcinoma
Small cell carcinoma
Large cell carcinoma
LEC
Sialoblastoma

Benign epithelial tumors
Pleomorphic adenoma
Myoepithelioma
Basal cell adenoma
Warthin tumor
Oncocytoma
Canalicular adenoma
Sebaceous adenoma
Lymphadenoma
  Sebaceous
  Nonsebaceous
Ductal Papillomas
  Inverted ductal papilloma
  Intraductal papilloma
  Sialadenoma papilliferum
Cystadenoma

Soft tissue tumors
Hemangioma

Hematolymphoid tumors
Hodgkin lymphoma
Diffuse large B-cell lymphoma
Extranodal marginal zone B-cell lymphoma

Secondary tumors

Benign salivary gland tumours

- Pleomorphic Adenoma
  - Commonest benign tumour
  - Mesenchymal stroma may consists of chondroid, osteoid, myxoid, fibroid tissue
  - Risk of malignant transformation
- Warthin tumour
  - Aka papillary cystadenoma lymphomatosum
  - Occurs mostly in the parotid, bilateral
  - Risk factor: Smoking

Malignant salivary neoplasms

- Mucoepidermoid carcinoma (30-35%)
  - Low grade:
    - higher proportion of mucous cells to epidermoid cells
    - Rarely invade and metastasise
  - High grade:
    - higher proportion of epidermoid cells
    - Aggressive tumours
    - Rx: Parotidectomy KIV neck dissection KIV adj RT

Malignant salivary neoplasm cont'd

- Adenoid cystic carcinoma (10%)
  - Slow growing but multiple local recurrence after surgical excision
  - Perineural invasion
  - Distant spread more common than to nodal mets
  - Histological patterns: Cribriform, tubular, solid (worst prognosis)
  - Rx: Parotidectomy + adj RT

Malignant salivary neoplasm cont'd

- Carcinoma Ex Pleomorphic Adenoma (2-5%)
  - Arises from pre-existing or recurrent PA
  - Malignant component is usually purely epithelial
  - Neurovascular invasion and necrosis
  - Classification:
    - Non-invasive ie. In-situ
    - Minimally invasive <1.5mm
    - Invasive >1.5mm **most common
  - Local and distant mets common
  - Rx: Parotidectomy + neck dissection + adj RT

Low Risk	High Risk
Acinic cell carcinoma	Sebaceous carcinoma and lymphadeno carcinoma
Low-grade mucoepidermoid carcinoma	High-grade mucoepidermoid carcinoma
Epithelial–myoepithelial carcinoma	Adenoid cystic carcinoma
Polymorphous low-grade adenocarcinoma	Mucinous adenocarcinoma
Clear cell carcinoma	Squamous cell carcinoma
Basal cell adenocarcinoma	Small cell carcinoma
Low-grade salivary duct carcinoma (low-grade cribriform cystadenocarcinoma)	Large cell carcinoma
Myoepithelial carcinoma	LEC
Oncocytic carcinoma	Metastasizing pleomorphic adenoma
Carcinoma ex pleomorphic adenoma (intracapsular/minimally invasive or with low-grade histology)	Carcinoma ex pleomorphic adenoma (widely invasive or high-grade histology)
Sialoblastoma	Carcinosarcoma
Adenocarcinoma NOS and cystadenocarcinoma, low grade	Adenocarcinoma and cystadenocarcinoma, NOS, high grade

Superficial low grade ca → superficial parotidectomy

High grade ca → Surgical resection +/- neck dissection

Superficial parotidectomy

- Landmarks for facial nerve
  - 1cm deep and inferior to tragal pointer
  - 6-8mm deep to the tympanomastoid fissure
  - Retrograde dissection of distal branches
  - Diagastric muscle attachment to diagastric groove
  - Nerve within the temporal bone
- Complications
  - Damage to GAN
  - Damage to facial nerve
  - Frey's syndrome
  - Seroma

Submandibular gland excision

- Complications
  - Injury to Marginal mandibular nerve
  - Injury to Lingual nerve
  - Injury to Hypoglossal nerve