Update on Thyroid Nodules and Differentiated Thyroid Cancer

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Thyroid Carcinoma

Histologic Classification

1. Papillary including follicular variant (80%)

2. Follicular including Hurthle cell variant (15%) *FNA & frozen section will be non diagnostic in follicular and Hurthle cell neoplasms

   ★ Well differentiated thyroid CA = papillary & follicular

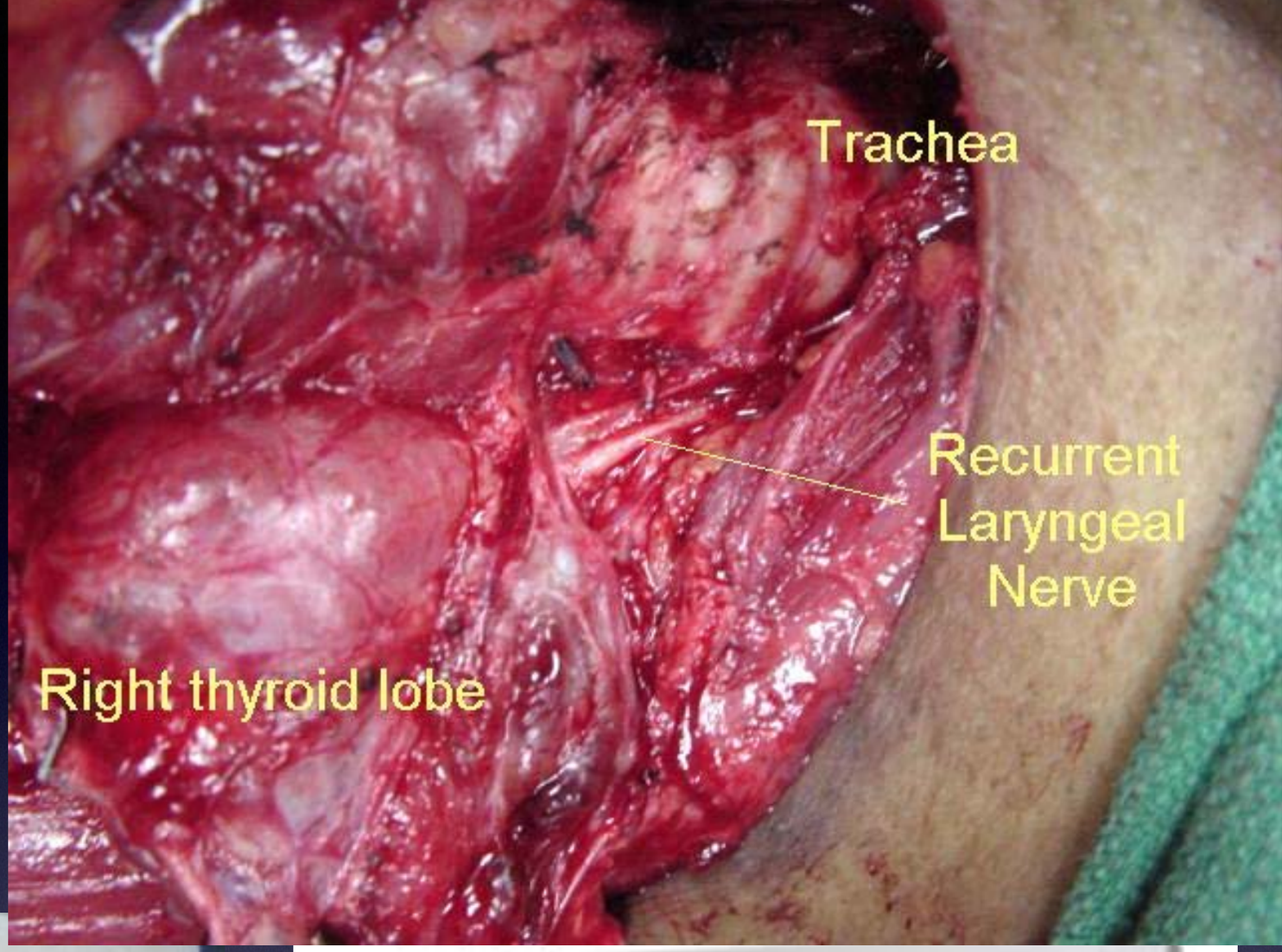
3. Medullary (5%)

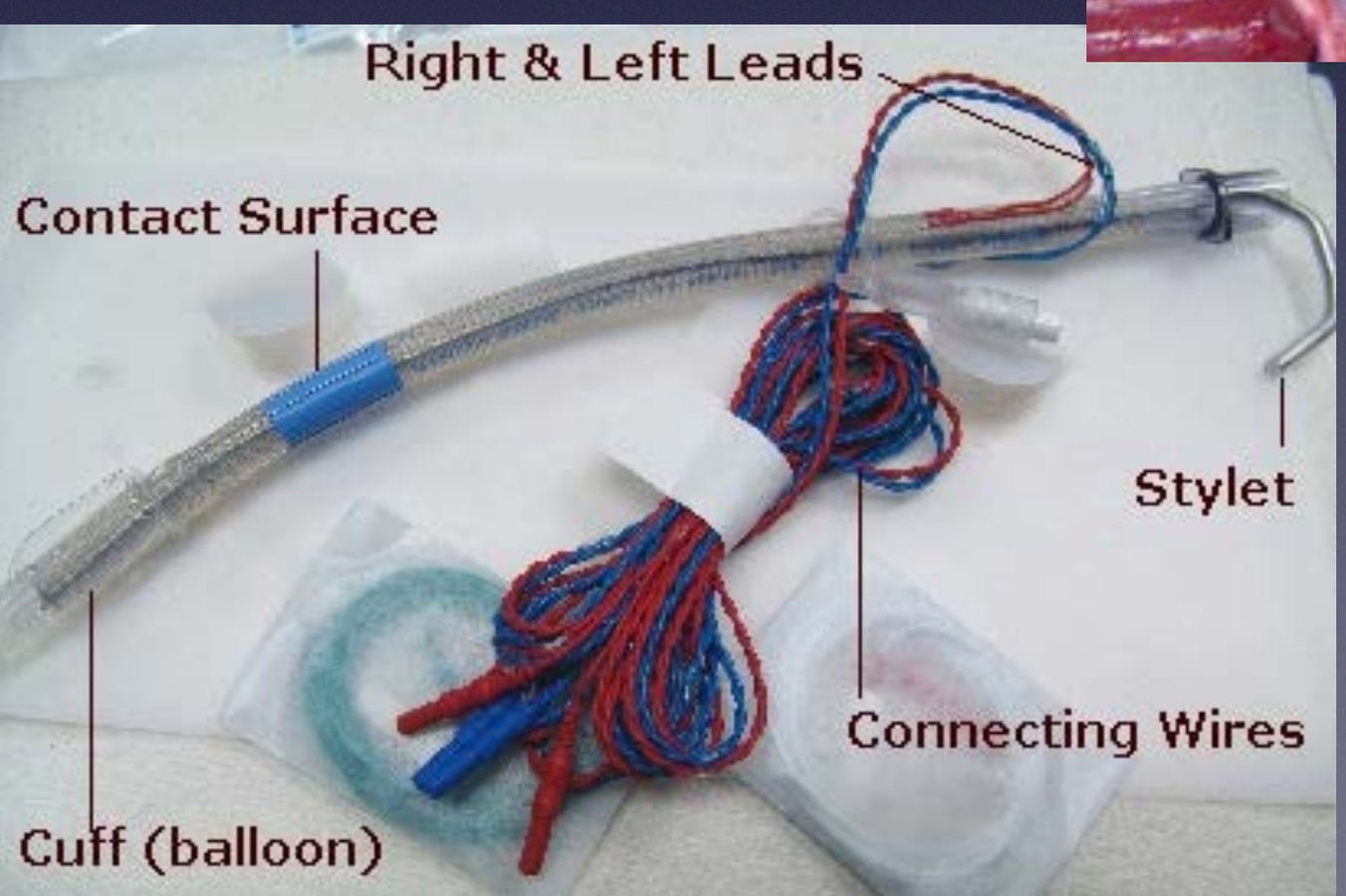
4. Anaplastic, Lymphoma, Metastatic (<1%)

Investigation of Thyroid Nodules

- 10% of thyroid nodules are malignant (radiation exposure increases risk up to 50%)
- Work up of nodule regardless of how it is found (symptoms, routine exam, incidentaloma on carotid doppler, CT/MRI chest/neck, PET, etc.)
- PET nodules more aggressive
  - PET nodules on FNA, 60% malig., 30% benign, 10% indeterminate


JUL 5 2002


Trachea
Recurrent Laryngeal Nerve
Right thyroid lobe


Right & Left Leads
Contact Surface
Stylet
Connecting Wires
Cuff (balloon)


Medtronic
NIM-Response 3.0

Investigation of Thyroid Nodules

1. TSH
   - Low TSH (hyperthyroid) lower risk of CA, obtain nuclear scan and compare US —> HOT nodule
   - High TSH (hypothyroid) higher risk of CA —> COLD nodule
2. Diagnostic US
   - size (10 mm), solid/cystic, calcifications, vacularity, shape, hypoechoic, irregular edges, elastonography (hardness)
3. US guided FNA (no FNA on purely cystic nodules)
   - FNA is most accurate, low risk, & cost-effective eval. of nodule
     - observation has risk of delay in diagnosis
     - thyroidectomy (surgical biopsy) has risks of anesthesia and surgery

≥ 10mm

> 5mm

any nodule size

Classification FNA Cytology

(Bethesda System for Rep of orting Thyroid Cytopathology)

I. Non-diagnostic (1-4% risk of malignancy) —> repeat FNA

II. Benign (0-3% risk) —> serial US follow up

III. AUS/FLUS Atypia/follicular lesion of undetermined significance (5-15% risk) —> repeat FNA or 2nd opinion on FNA

IV. SFN suspicious for follicular neoplasm - follicular or Hurthle cell neoplasm, indeterminate (15-30% risk) —> thyroid lobectomy but risk of 2nd surgery if malignant on permanent

V. Supicious for malignancy (60-75% risk) —> total thyroidectomy

VI. Malignant (97-99% risk) —> total thyroidectomy

Gerhard, Rene & Boerner, Scott. The Value of Second Opinion in Thyroid Cytology: A Review. Cancer Cytopathology. August 2014, 611-619.

Benign Thyroid Nodules

- If FNA is benign, —> recommend repeat US in 6-18 months, and then every 3-5 years if stable
  (I repeat US in 6 months then repeat yearly for 2 years)

- If nodule increases in size, —> repeat FNA
  (20% increase in at least 2 dimensions or 50% increase in volume regarding the solid portion)

- Routine suppression therapy with benign thyroid nodules is not recommended

Surgery on Benign Nodules

- Symptomatic or cosmetic concerns
- Patient preference (several nodules, dislike of multiple FNAs, fear of missing cancer, “just be done with it”), trouble regulating thyroid function,
- Consider surgery even with benign FNA: nodules > 3cm
  (false negative rate 5% for < 3cm and 12% for nodules > 3cm; false negatives were mainly follicular variant of papillary or follicular CA)
- High risk (radiation exposure, posterior nodules)

Giles WH et al. False Negative Cytology in Large Thyroid Nodules. Ann Surg Oncol. 30 July 2014.


VISCOT
COVIDIEN

Indications for Surgery

- Surgery recommended for Bethesda V and VI (diagnostic or suspicious for CA)

- Follicular and Hurthle cell neoplasms need definitive biopsy (surgery)

- Nondiagnostic FNA need surgery (or very close observation)


FEB 4 2001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The Future: Indeterminate FNA

- Proto-Oncogene analysis on FNA may help avoid surgery in indeterminate cytology in the future

- PTC (papillary thryoid cancer) - BRAF, Ras, RET/PTC, NTRK1

- FTC (follicular thyroid cancer) - PAX8, PPAR-gamma-1, HRAS, NRAS, KRAS

TNM Classification

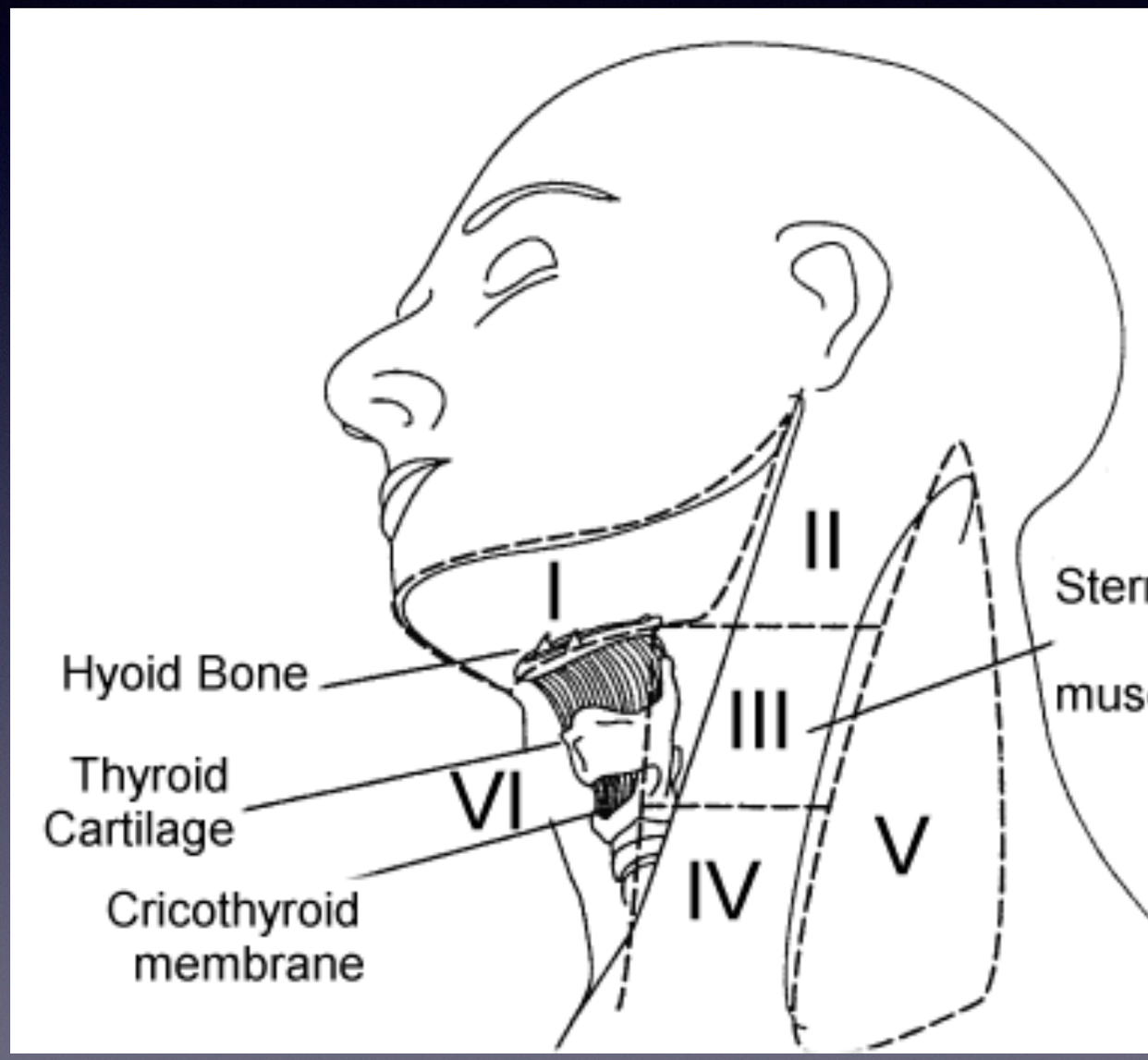
for Differentiated Thyroid Carcinoma

- T1 tumor diameter ≤ 2cm
- T2 tumor diameter >2 to 4cm
- T3 > 4cm with minimal extrathyroidal extension
- $T4_a$ extends beyond capsule to invade subQ tissues of larynx, trachea, esophagus, or nerve
- $T4_b$ invades prevertebral fascia or encases carotid artery or mediastinal vessels

TNM Classification

for Differentiated Thyroid Carcinoma

- N0 no metastatic nodes
- $N1_a$ mets to level VI nodes
- $N1_b$ mets to ipsi/contra/bilateral cervical nodes or superior mediastinal nodes
- NX nodes not assessed at surgery
- M0 no distant mets
- M1 distant mets
- MX distant mets not assessed

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TNM Classification

for Differentiated Thyroid Carcinoma

	< 45 years old	≥ 45 years old
Stage I	Any T, any N, M0	T1 N0 M0
Stage II	Any T, any N, M1	T2 N0 M0
Stage III		T3 N0 M0
		T1-3, N1a, M0
Stage IVA		T4a, N0-1a, M0
		T1-3, N1b, M0
		T4a, N1b, M0
Stage IVB		T4b, Any N, M0
Stage IVC		Any T, Any N, M1

Take Home Points

- Work up includes TSH & ultrasound
- US guided FNA for nodules ≥ 10mm
- If benign, repeat US in 6 months
  - ☑ and refer if nodule increases in size
- ☑ Refer for surgery if FNA inconclusive or CA
- ☑ Refer for symptomatic goiter


That's
all
folks!