Thyroid Fine-Needle Aspiration
Indications and Technique

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Thyroid FNA Indication

- Clinical Thyroid Nodule (s) > 1 cm?
- Hypo-functioning (cold)
- History
  - Age & Sex
  - Neck Irradiation
  - Family History of Cancer
  - Growth Pattern
Thyroid Nodules

- Clinically apparent nodules affect 4-7% of US population.
- More common in women and up to 95% are benign.
Prevalence of Thyroid Nodules

Mazzaferri, 1993
History and physical examination lack the sensitivity and specificity sufficient for diagnosing thyroid cancer
Sutton’s Law of Medicine

“Because that’s where the money is.”
Go for the “Nodule”
Initial Diagnostic Evaluation of Patients with Thyroid Nodules

**FIRST STEP**
TSH

Not Indicated
Radionuclide scans
CT or MRI
Antithyroid antibodies
T4, free T4, T3
TSH assay is the optimal screening test in ambulatory healthy patients

- **TSH**
  - LOW
    - <0.5mU/L
    - HYPERTHYROID
  - NORMAL
    - 0.5-5.0mU/L
    - EUTHYROID
  - HIGH
    - >5.0mU/L
    - HYPOTHYROID
Hyperfunctioning “hot” left nodule

These “hot” nodules do not need to be aspirated
95% of nodules are hypofunctioning “cold”
Road to FNA

Check TSH

- Normal → FNA
- High → T4 Rx → FNA
- Low → Scan
Thyroid FNA Technique

- Manual
- Guided
  - Ultrasound
  - Other Imaging Modalities
Thyroid Needle Biopsy

- Fine Needle Aspiration (FNA)
  - 23-25 gauge needle
- Large Needle Biopsy (LNB)
  - 16-18 gauge needle
- Core Needle Biopsy (CNB)
  - 14 gauge needle
Recommended Thyroid FNA Technique

- **Maximum 3 punctures/nodule**
  - Use of thin 25 gauge (0.5 mm) needle
  - No local anesthesia
ALL PATIENTS SHOULD HAVE AN ULTRASOUND EITHER BEFORE OR AFTER FNA
What is the role of ultrasound in the evaluation and management of thyroid nodules?
Ultrasound Use in Nodular Thyroid Disease

- Multinodular consistency on exam
- Hashimoto’s thyroiditis
- Difficult neck exam
- Surveillance in patients with known nodules or thyroid cancer
  - Growth in nodule with previous benign FNA cytology
  - F/u of thyroid cancer to evaluate lymph nodes
a) Are we truly feeling a nodule?

Of patients with one palpable nodule, 16% will have NO nodules found on ultrasound.

Brander 1992, Marqusee 2000
b) Is the nodule solitary?

A palpable solitary nodule is part of a multinodular thyroid gland on US in ~50% of patients. The size of the other nodules is usually <1.0 cm in the majority but 10-15% of patients will have a second nonpalpable nodule of >1.0 cm

Palpable left nodule,
Nonpalpable isthmus nodule
Specimen Preparation
– Smears
  • Concentration direct (two) smears/puncture
  • On-site evaluation
  • Concentration processing remaining material

– Liquid Base Techniques
  • ThinPrep
  • Surepath
Common On-site Cytosmears

- **Direct smear**
  - Thin and thick
  - Butterfly
  - Cobblestone
  - Splatter

- **Concentration smear**
  (Recommended)
Types of Cytosmears
Types of Cytosmears

Concentration Smear
Problems: Cytopreparations
In 1922 Morton introduced iodized salt to help prevent simple goiter.
As significant as that was, it was the only thing Morton had done for salt.
It's not likely they would have stopped America's salt favority for 50 years.
No salt salts like Morton Salt salts.
When it rains it pours.
PHOTO ABOVE: Ramavati, a resident of Rajapur village in Uttar Pradesh, points toward her large goiter—a manifestation of iodine deficiency disorder.
References:


