Thyroid and Parathyroid Disease

RTC Conference

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Case Presentation # 1

- CC: Neck Mass
- HPI: 51f found to have a neck mass on routine PE. No dysphagia, odonyphagia, or voice changes. No h/o neck radiation.
- PMH:
  - Chronic Fatigue Syndrome
  - Anxiety
  - GERD
- PSH:
  - Breast Biopsy
  - Cesaran Section

Case Presentation # 1

- Medications: HCTZ, KCl, Nexium, Xanax.
- NKDA
- FH:
  - No h/o thyroid cancer or thyroid problems.
  - No h/o parathyroid problems or high calcium.
- SH: Married. No EtOH. No tobacco.
- ROS: +weight loss, +fatigue, +joint pain.

Case Presentation # 1

- Physical Exam:
  - Vitals: BP-130/83, P-68, Wt-125 lbs
  - Gen: A & O, NAD
  - HEENT: Palpable 2cm mass in midportion of the neck. Soft, mobile. No lymphadenopathy.
  - Pulm: CTA B.
  - CV: +S1 and S2, RRR.
  - Abd: Soft, NT, ND.
  - Ext: No C/C/E.

Case Presentation # 1

- Labs:
  - TSH-2.07
  - Free T4-0.92
  - BMP: Na-141, K-3.1, Cl-99, CO2-31, BUN/Creat-13/0.78, Ca-9.6
  - CBC: WBC-4.5, Hgb/Hct-12.9/39, Platelets-215

Case Presentation # 1

- Ultrasound
  - 1.9cm nodule occupying the isthmus, hypoechoic, regular borders, homogenous, +coarse calcifications. No other nodules in the thyroid gland. No lymphadenopathy.
- FNA
  - Papillary Thyroid Carcinoma

Case Presentation # 1

- Operative Procedure:
  - Total thyroidectomy with limited central neck dissection
- Pathology:
  - Multifocal papillary thyroid carcinoma involving isthmus and mid right lobe with extrathyroidal extension present, 2/2 LN with metastatic papillary carcinoma.
  - Pretracheal, prelaryngeal, and left level VI LN with metastatic papillary carcinoma.

Case Presentation # 1

- Post operative course complicated by hypocalcemia.
  - Evening of POD # 0: Perioral and distal ext numbness and tingling.
    - Received intermittent IV Ca and oral Ca supplements.
  - POD # 1: +Chevostek's sign and tingling; Ca-7.7
    - Continuous Ca IV infusion started and stopped POD # 4 when Ca normalized
    - Continued oral Ca and vit D supplement.
  - Discharged POD # 5
    - Ca-10.5, Ionized Ca-5.13

Thyroid Nodules

- Approximately 300,000 new thyroid nodules are identified yearly.
- Frequency increases with age.
- 4x more prevalent in women.
- Exposure to radiation (especially during childhood) is associated with increased prevalence of thyroid nodules and malignancy.

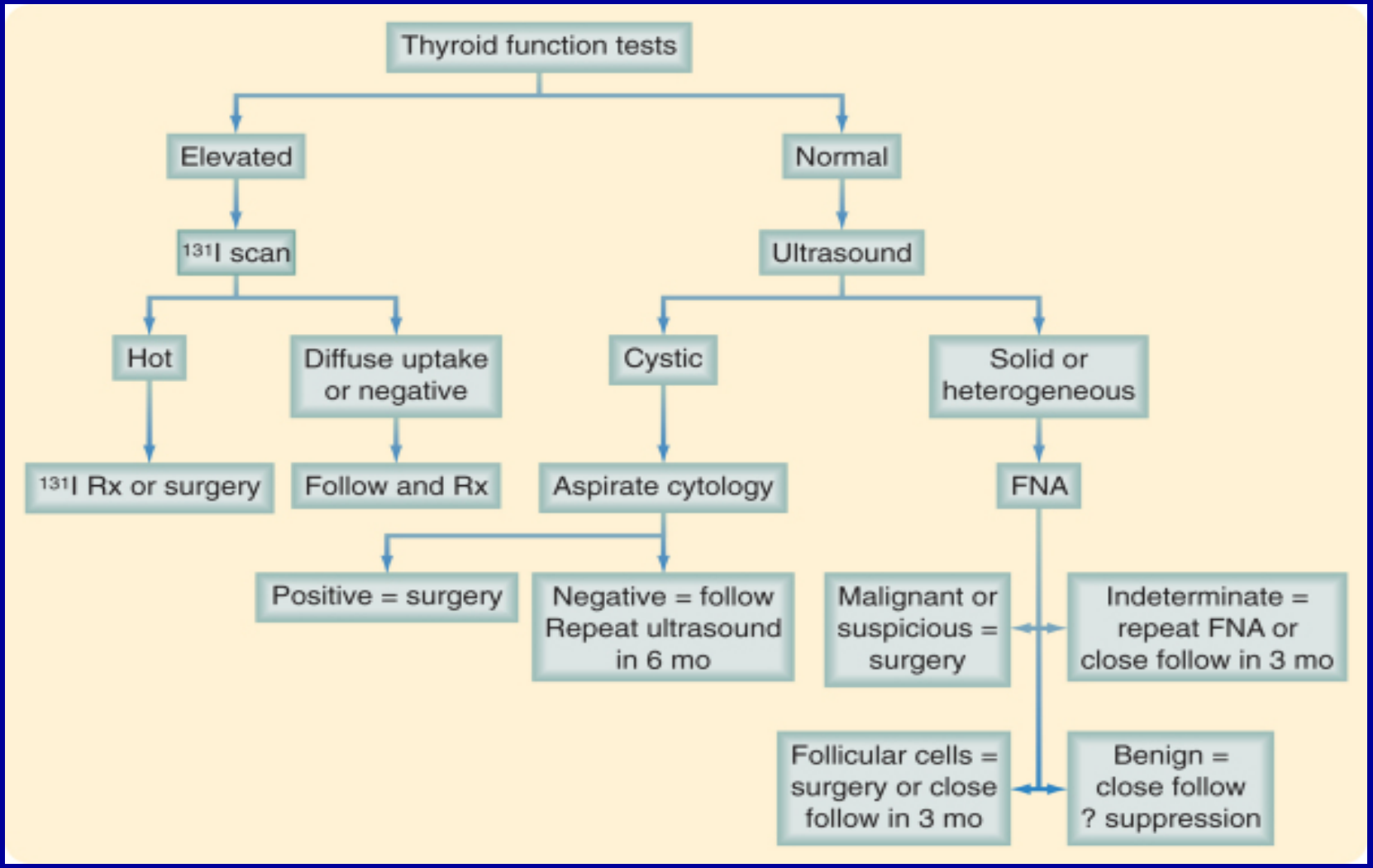
Diagnostic Evaluation

- Careful H&P
  - Possibility of cancer greatest in men older than 50
  - Exposure to radiation
  - Endocrine disorders (Medullary carcinoma, MEN type 2, or Papillary thyroid cancer)
  - Multiple nodules vs firm solitary nodule
- Labs
  - Thyroid function test (TSH and T4)

Diagnostic Evaluation Cont.

- Ultrasound
  - Features associated with malignancy:
    - Indistinct or irregular margins
    - Intranodular calcifications
    - Hypoechogenicity
    - A nodule that is taller than it is wide
    - Increased intranodular vascular markings
    - Suspicious lymph nodes
- Fine-Needle Aspiration (FNA)
  - 86% sensitivity rate and 91% specificity

Work-Up of Solitary Thyroid Nodule



Papillary Carcinoma

- Most common of the thyroid neoplasms.
- Pathologic classification:
  - Papillary
  - Follicular variant
  - Insular
  - Columnar
  - Tall cell
- Usually associated with an excellent prognosis (particularly female patients younger than 40).
- 95% 10-year survival rate for the most favorable stages.

Risk Classification for Patients with Well-Differentiated Thyroid Cancer

	Low Risk	High Risk
Age	<40	>40
Sex	Femle	Male
Extent	No local extension, intrathyroidal, no capsular invasion	Capsular invasion, extrathyroidal extension
Metastasis	None	Regional or distant
Size	<2 cm	>4 cm
Grade	Well differentiated	Poorly differentiated

- Age at diagnosis is the most important clinical prognostic factor.

Treatment

- Main treatment is surgical ablation.
  - Lesion <1 cm: Lobectomy plus isthmectomy.
  - Lesions 1-2 cm: Total thyroidectomy vs Lobectomy and isthmectomy when the lesion clearly involves only one lobe.
  - Lesions >2 cm: Total thyroidectomy +/- lymph node dissection.
- Postoperative radioiodine therapy for larger lesions.

Case Presentation # 2

- CC: Joint Pain
- HPI: 41m presents c/o ankle, hip, and wrist pain x 6 months. No h/o injury. No redness or swelling. Symptoms improved with ibuprofen.
- PMH: Kidney stones
- PSH: Negative
- Medications: Naproxen
- NKDA

Case Presentation # 2

- SHx: Denies tobacco and EtOH. Married with 1 child. Works in a factory.
- FHx: Sister – Hashimotos thyroiditis, kidney stones.
- ROS: +Fatigue.

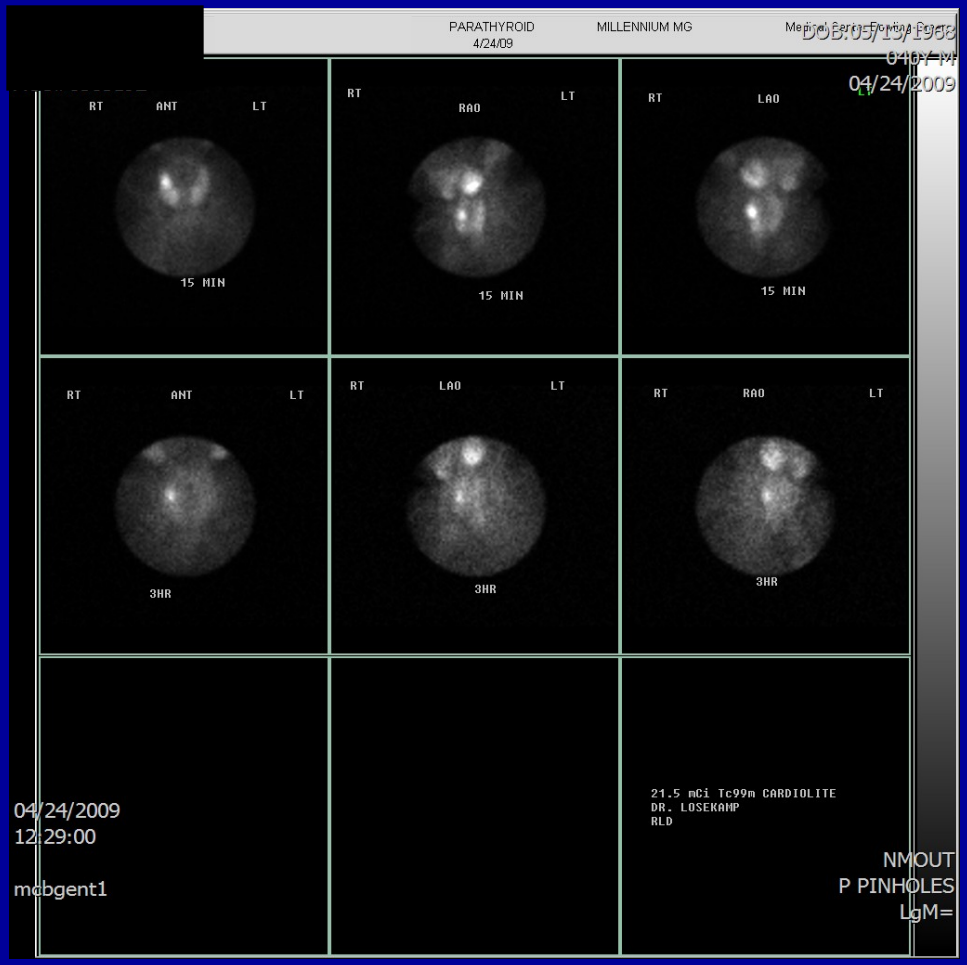
Case Presentation # 2

- Physical Exam:
  - Vitals: BP-137/100, P-111, Wt-271 lbs
  - Gen: A & O, NAD
  - HEENT: NC, AT, neck supple without tenderness or masses, thyroid normal in size and symmetric without nodules, NT, moves with swallowing
  - MS: B ankle tenderness. No surrounding redness or fluid collection. Full ROM in all joints. Sensation intact. Strength 5/5 B UE and LE.

Case Presentation # 2

- Labs:
  - BMP: Na-134, K-4.6, Cl-102, CO2-29, BUN/Creat-10/0.7, Ca-10.7
  - Intact PTH: 102 pg/ml

Parathyroid Nuclear Scan



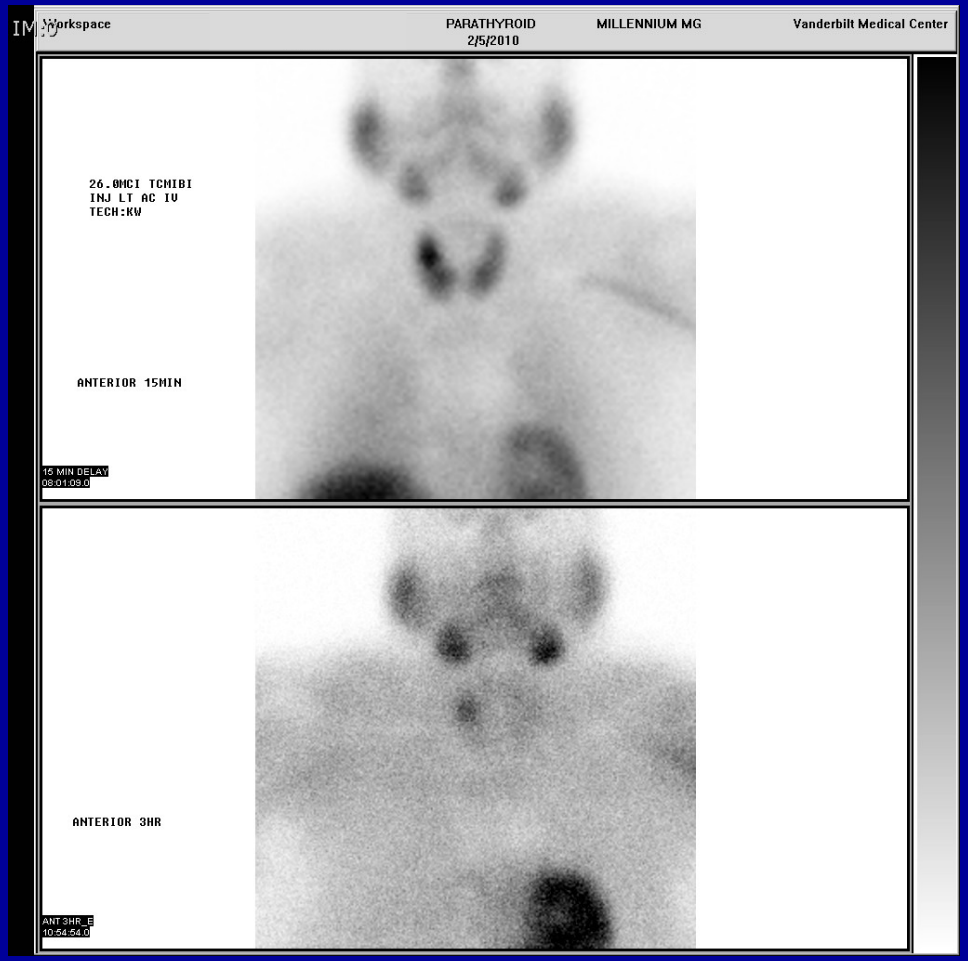
Operative Procedure

- Right lower lobe parathyroidectomy on 9/8/09
  - Frozen section: Hypercellularity consistent with adenoma.
  - Weight: 300 mg

Postoperative Course

Date	Ca	PTH
9/16/09	10.9	41
1/6/10	10.5	84

Sestamibi Parathyroid Scan



Operative Procedure

- Reoperative parathyroidectomy and right thyroid lobectomy
  - Findings: Mass within the right lobe of the thyroid.
    - Pre-excision PTH: 171 pg/ml
    - Post-excision 10 min PTH: 24 pg/ml
  - Pathology: Hypercellular parathyroid (1.2g) with unremarkable thyroid gland

Primary Hyperparathyroidism

- Inappropriate or excessive secretion of PTH by one or more of the parathyroid glands leading to hypercalcemia.
- Prevalence between 1 and 5 patients per 1000 persons.
- Primary hyperparathyroidism is caused by:
  - Solitary parathyroid adenoma: 80% to 85% of cases
  - Multiglandular hyperplasia: 15% to 20% of cases
  - Parathyroid carcinoma: 1% of cases

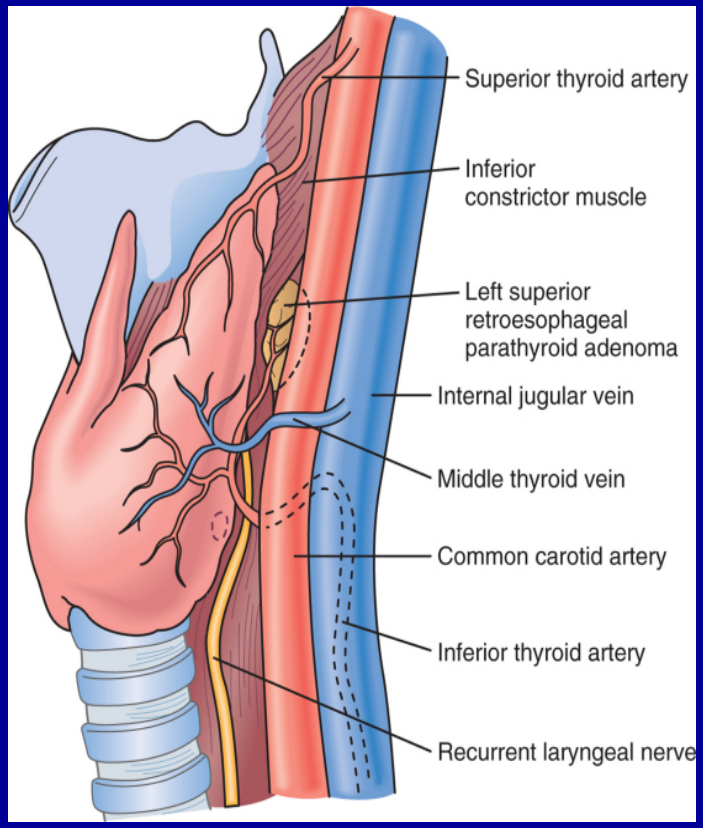
Indications for Surgery

- Symptomatic
  - Constipation, anorexia, muscle weakness, depression, memory loss
    - “Moans, groans, and psychiatric overtones”
- Guidelines for Surgical Intervention in Asymptomatic Patients:
  - Age < 50
  - Ca $\geq$ 1 mg/dl above normal
  - 24-hour urinary calcium > 400 mg
  - Creatinine clearance reduced by 30%
  - Bone mineral density t score $\leq$ 2.5 any site
  - Failure of medical managment

Preoperative Localization

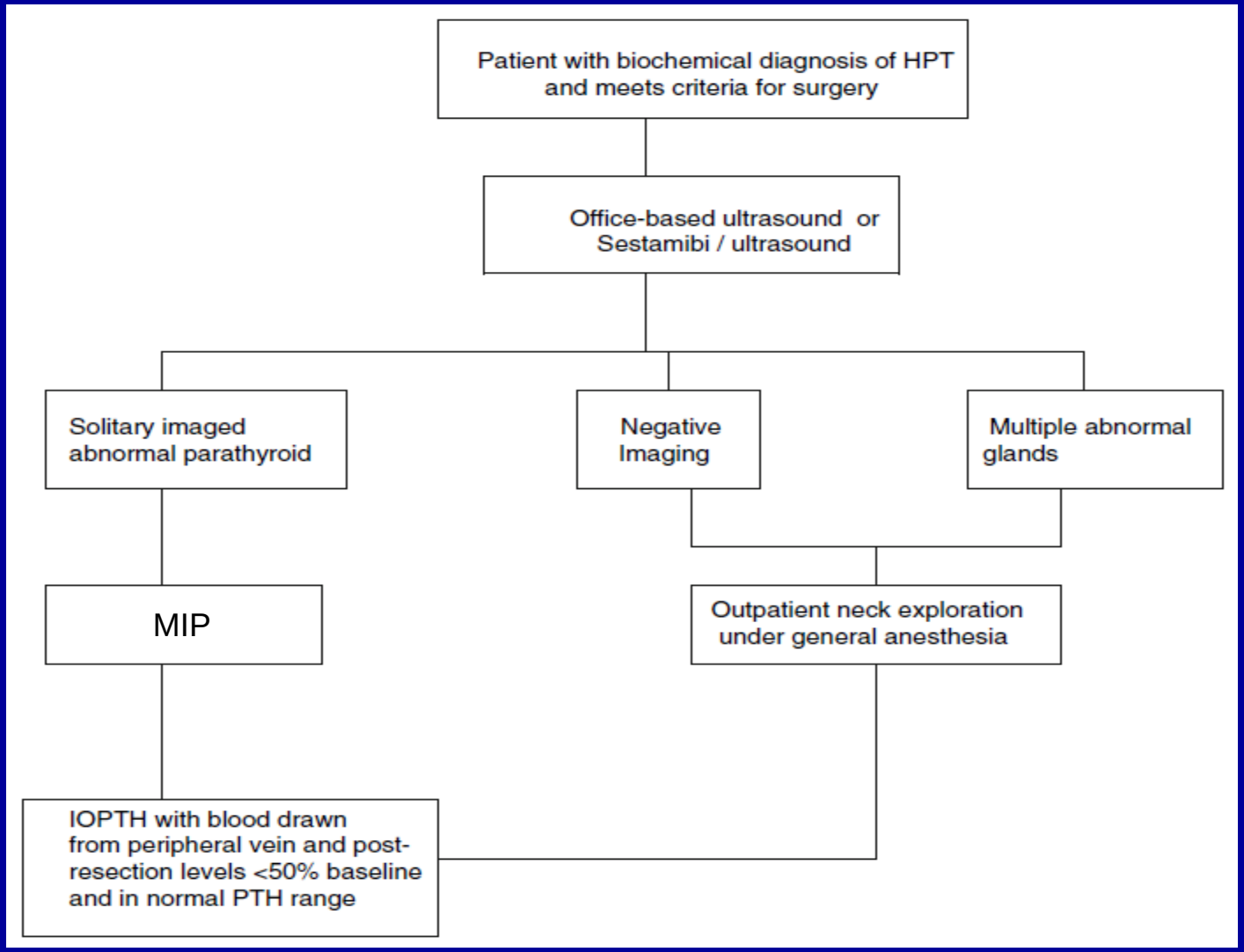
- 2002 NIH workshop recommends that all patients referred for surgical evaluation should have a preoperative localization study.
  - Sestamibi scan +/- single photon emission CT (SPECT)
    - Sensitivity between 67% and 90%
  - US
  - CT
  - MRI
  - PET-CT

Parathyroid Anatomy



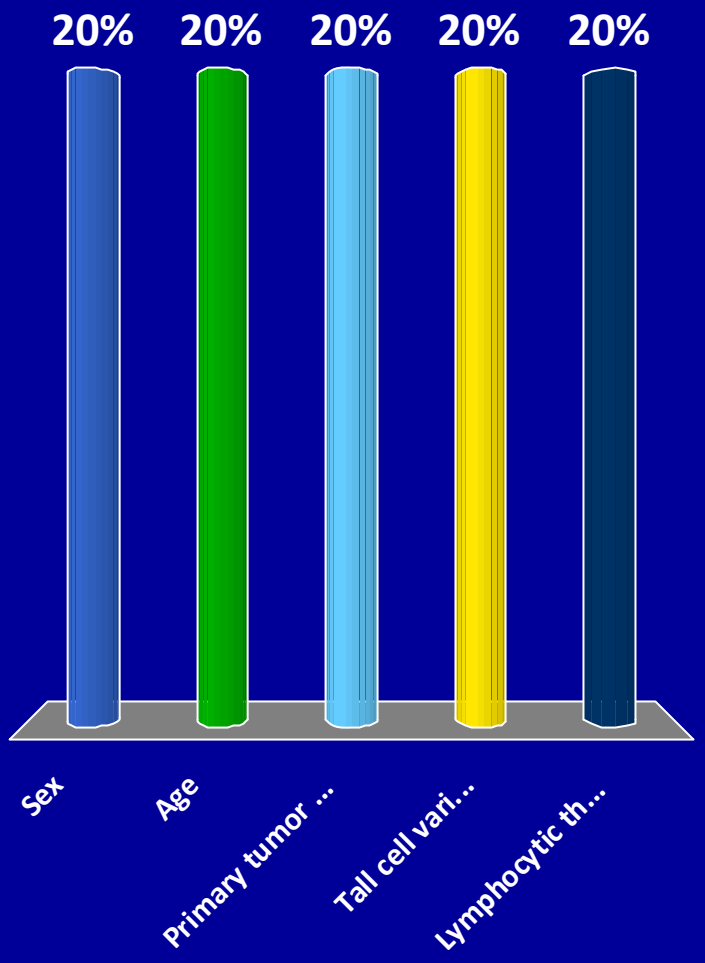
Intraoperative Algorithm for Searching for a “Missing” Parathyroid Gland
Open and inspect the thyroid capsule
⇩
Dissect the superior thymic/paratracheal tissue
⇩
Mobilize the pharynx and esophagus to look in the parapharyngeal and retropharyngeal and esophageal spaces
⇩
Open the carotid sheath and expose the common carotid throughout its course in the neck; inspect for potential parathyroid glands
⇩
Ligate the inferior thyroid artery and/or perform a thyroid lobectomy.
⇩
Terminate procedure; follow the patient for evidence of persistent hypercalcemia. Reimage the pt for evidence of ectopic parathyroid adenoma.

Primary Hyperparathyroidism Algorithm



46f with a palpable neck mass. FNA reveals papillary cells. Pt undergoes a total thyroidectomy and pathology reveals a 4-cm tall cell variant papillary cancer and lymphocytic thyroiditis. No lymphatic invasion. Which of the following gives a more unfavorable prognosis?

1. Sex
2. Age
3. Primary tumor size
4. Tall cell variant
5. Lymphocytic thyroiditis

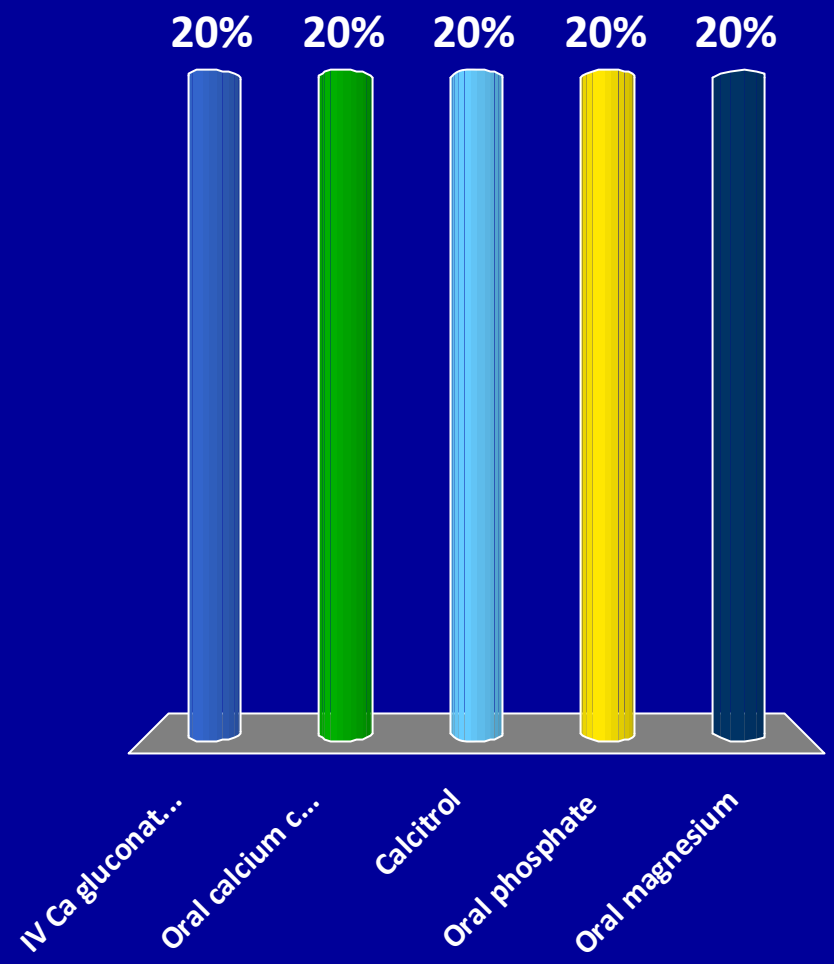


4. Tall cell variant

- Age less than 50 for women and 40 for men portends a favorable prognosis.
- Lymphatic invasion is associated with poorer prognosis but there is no correlation with risk of recurrence of lymphocytic thyroiditis.
- Tall cell variant of papillary carcinoma is associated with more aggressive disease and has a more unfavorable prognosis.

On the 3rd day after thyroidectomy, a pt develops perioral numbness of tingling of the fingers. The best treatment of this condition would be

1. IV Ca gluconate
2. Oral calcium carbonate
3. Calcitrol
4. Oral phosphate
5. Oral magnesium

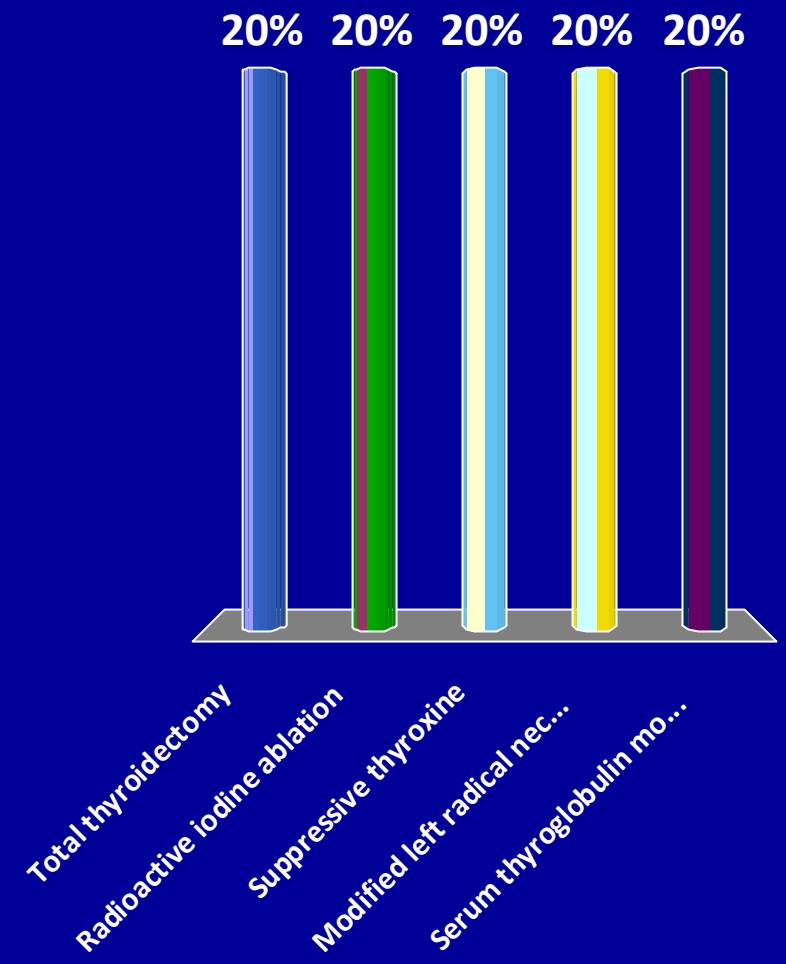


2. Oral calcium carbonate

- Postoperative hypocalcemia can manifest as perioral numbness, tingling of the fingers, muscle cramps, anxiety, etc.
- Mild symptoms should be treated with oral Ca carbonate.
- If symptoms are moderate increase oral Ca carbonate or oral calcitrol should be prescribed.
- Severe symptoms should be treated with IV Ca.

60m has a 4cm left thyroid nodule. FNA reveals papillary cancer. No LN are palpable. Management should include all of the following EXCEPT:

1. Total thyroidectomy
2. Radioactive iodine ablation
3. Suppressive thyroxine
4. Modified left radical neck dissection
5. Serum thyroglobulin monitoring



4. Modified left radical neck dissection

- Patients over 40 with 4 cm nodules are at higher risk of thyroid cancer.
- In this high risk patient, total thyroidectomy followed by radioactive iodine and TSH-suppressive thyroxine is the treatment of choice.