



## Thyroid and Parathyroid Surgery

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Wednesday May 25th, 2016



### Objectives

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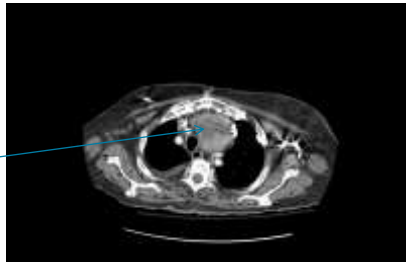
- Thyroid Surgery
  - Office evaluation
  - Surgical techniques
  - Use of frozen section
  - Post-operative expectations
- Parathyroid Surgery
  - Patient selection/indications for surgery
  - Pre-operative localization studies
  - Surgical approach

## Patient K.M. 85 year-old female

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- Hx severe CAD, CHF, s/p recent CABG/MVR
- Complicated post-op course, s/p tracheostomy
- PE, anticoagulated on Coumadin
- 7 cm left thyroid nodule seen on chest CT

Hurthle cell neoplasm

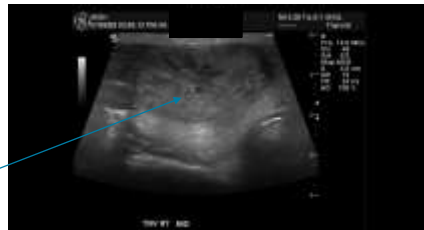


## Patient N.B. 26 year-old female

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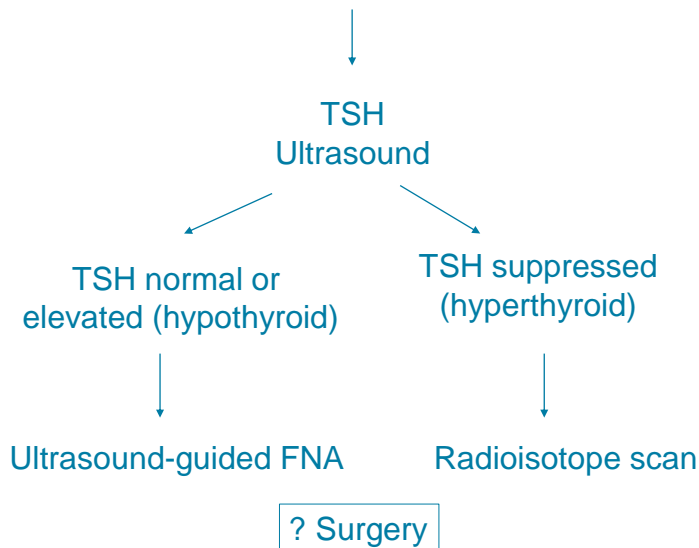
- Right thyroid nodule on exam
- U/S noted a solitary 3.5 x 3.2 x 2.8 cm nodule
- Otherwise healthy
- Concerned about lifelong dependence on thyroid hormone

Follicular neoplasm on biopsy



## Patient with thyroid nodule

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## Thyroid - Office Evaluation

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- Referring physician
- Review ultrasound and biopsy reports → who performed the U/S  
where was the bx read  
molecular testing
- Perform office ultrasound → importance of office-based U/S
- Discuss recommended treatment options
- Describe surgical approach → extent of surgery
- Review post-operative course → complications  
need for post-operative calcium  
voice changes  
pain control  
time off work/activity level

## 60 year-old male Office Ultrasound

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- Endocrinologist, noted left thyroid nodule
- Presented to his PCP - thyroid U/S and TFT's
- Thyroid U/S performed – dominant left sided nodule
- Requested biopsy of the left sided nodule

### FINDINGS:

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ECHOGENICITY: Normal and uniform echogenicity.

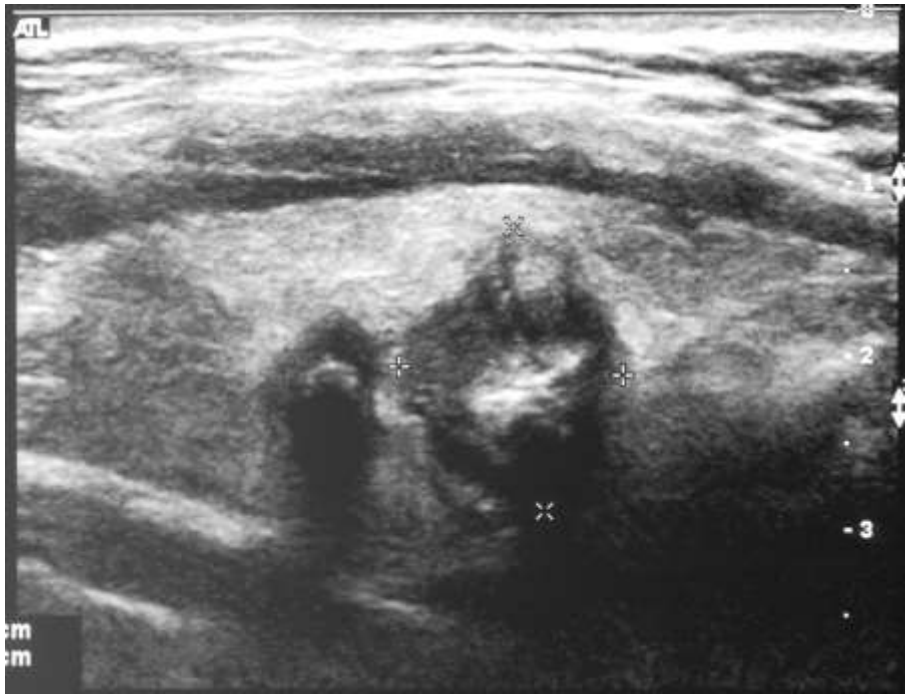
RIGHT THYROID LOBE: 51 X 24 X 21 mm. 10 mm midpole nodule. 9 mm mid to lower pole nodule.

LEFT THYROID LOBE: 46 X 16 X 22 mm. 34 x 15 x 17 mm mid to lower pole nodule.

ISTHMUS: Not thickened.

LYMPHADENOPATHY: None identified.





## Total versus Hemi for Indeterminate Nodules ?

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- Contralateral nodules
- Thyroid hormone replacement
- Patient age
- Patient risk factors
- Patient reliability
- Patient preference

## Frozen Section for Indeterminate Nodules

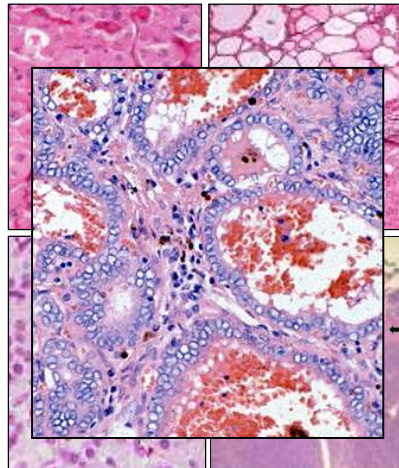
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To diagnosis follicular thyroid cancer,  
need capsular/vascular invasion

**Why not** to do a frozen:

- 87% defer to permanents
- \$500, 30 minutes of OR time
- Charge per informative FS – \$12,470

**Note utility** of LN biopsy and frozen section

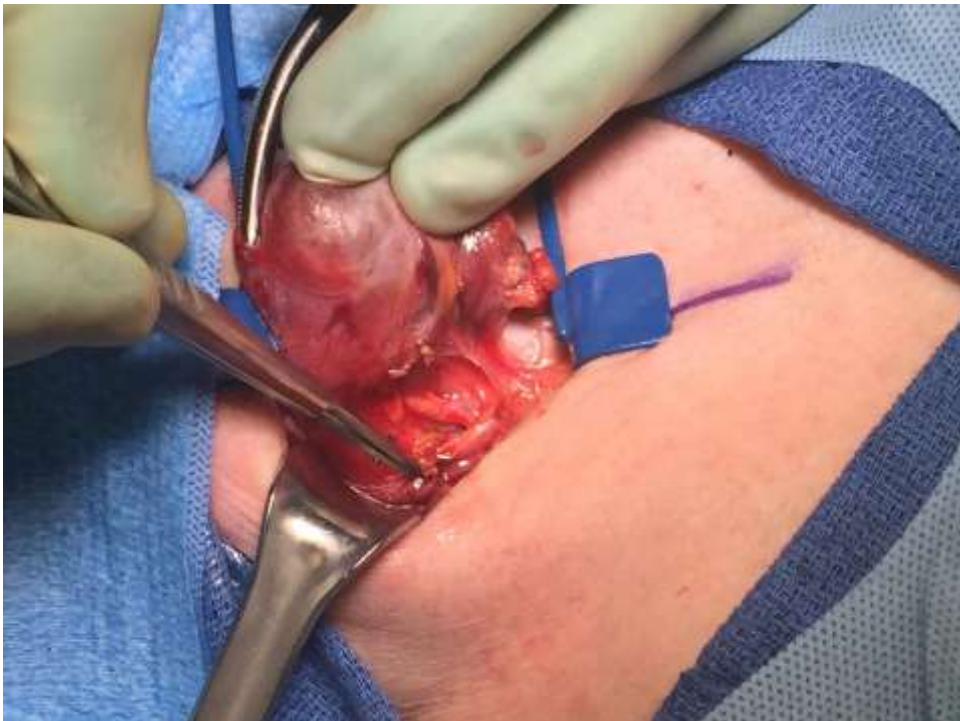


*Chen, Annals of Surgery, 1995*  
*Udelsman, Annals of Surgery, 2001*

## Complications - RLN

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- 1-4% of thyroidectomy procedures
- Breathy voice/weak cough/aspiration
- 3 types of injuries
  - Stretch (nodule traction)
  - Stun (bovie,nerve dissection)
  - Transection/Sacrifice (inadvertent,cancer)
- Use of the nerve monitor
- Importance of larynx/voice specialist





## Complications - Parathyroid

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- Temporary hypocalcemia common
- Patients at risk for hypocalcemia/hypoparathyroidism
- Flexibility with supplements and dosing
- Importance of patient education
  - Timing of calcium intake
  - Keeping calcium on hand
  - Avoiding calcium with concerns about thyroxine absorption
  - “11 am hypocalcemic crisis”

## Post-operative Course

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- Overnight stay
  - Same day discharge criteria
- No bed rest required
- Limited driving/exercise/heavy lifting
- Most desk jobs back at work < 1 week
- Manual labor up to 2 weeks
- 6 week post-operative TSH
- Use of anti-inflammatory medications

# 1<sup>o</sup> Hyperparathyroidism

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- Elevated calcium and PTH levels
- Low phosphorous level
- 24 hour urine calcium level (r/o FHH)
- Vitamin D levels



Patients with normal/borderline calcium and PTH levels

## Normocalcemic/NormoPTH Hyperparathyroidism

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- 62 yo female
- Ca 10.1 – 10.6, ionized 1.33
- PTH 31-43
- Most recent Ca 10.6 and PTH 43 (10/2014)
- Bone density femoral neck -2.7, spine -3.1
- U/S: Heterogeneous thyroid c/w Hashimoto's. No obvious parathyroid adenoma. Small hypoechoic lesion right lower pole mildly suspicious for an enlarged parathyroid gland.
- Sestamibi scan negative

Does this patient have HPT? Is surgery likely to have a positive impact?  
What is the risk/benefit ratio for neck exploration?

## Indications for Parathyroid Surgery Updated Guidelines 2014

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### **Guidelines for the Management of Asymptomatic Primary Hyperparathyroidism: Summary Statement from the Fourth International Workshop**

John P. Bilezikian, Maria Luisa Brandi, Richard Eastell, Shonni J. Silverberg,  
Robert Udelsman, Claudio Marcocci, and John T. Potts Jr

Columbia University College of Physicians & Surgeons (J.P.B., S.J.S.), New York, New York 10032; University  
of Florence (M.L.B.), 50121 Florence, Italy; University of Sheffield (R.E.), Sheffield S5 7AU, United Kingdom;  
Yale University School of Medicine (R.U.), New Haven, Connecticut 06510; University of Pisa (C.M.), 56124  
Pisa Italy; and Massachusetts General Hospital (J.T.P.), Boston, Massachusetts 02114

Are the new recommendations more supportive  
of surgical intervention in HPT?

Are neurocognitive symptoms addressed and considered  
an indication for surgery in HPT?

## Parathyroid Imaging Available Tests

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### First line studies

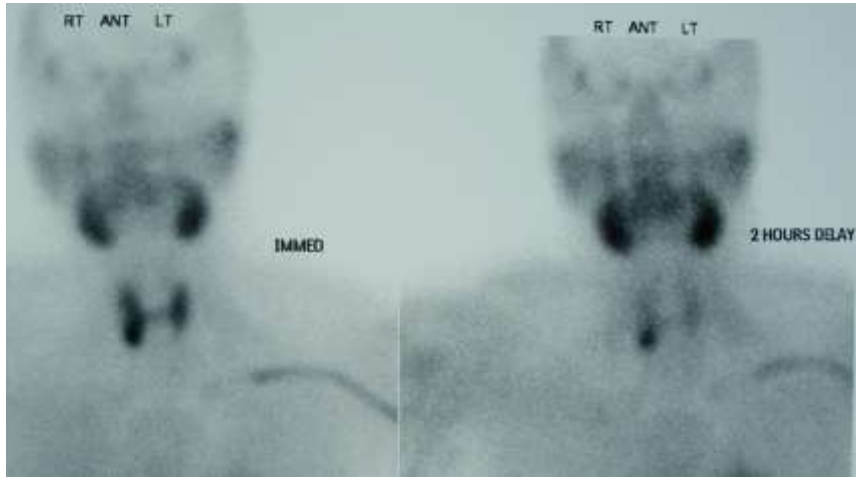
Sestamibi scan  
Neck U/S  
4D-CT scan

### Other localization tests

MRI  
PET scan

### Invasive, second line studies

(reserved for specific cases)  
Venous catheterization  
Arteriogram  
U/S guided FNA



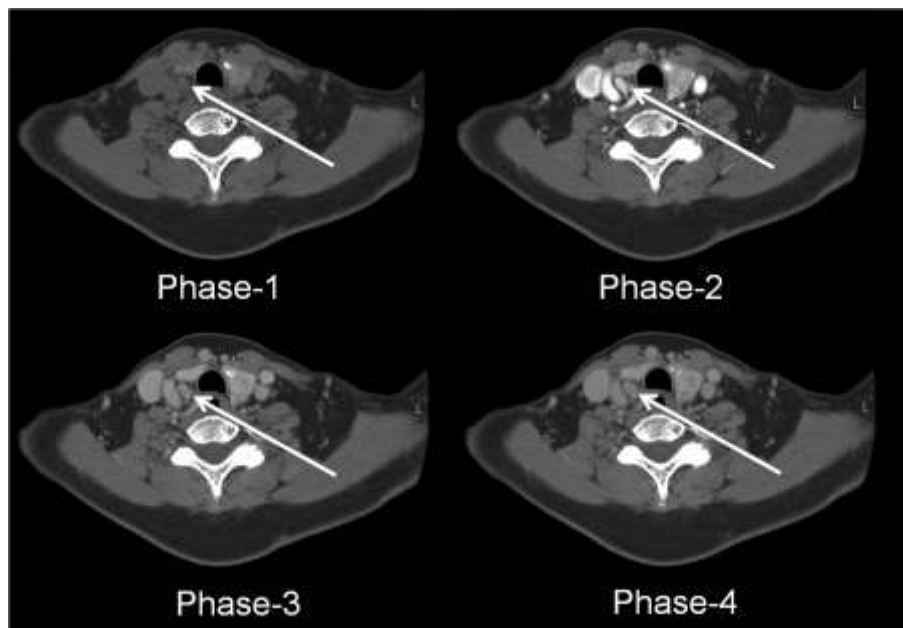
Left upper parathyroid

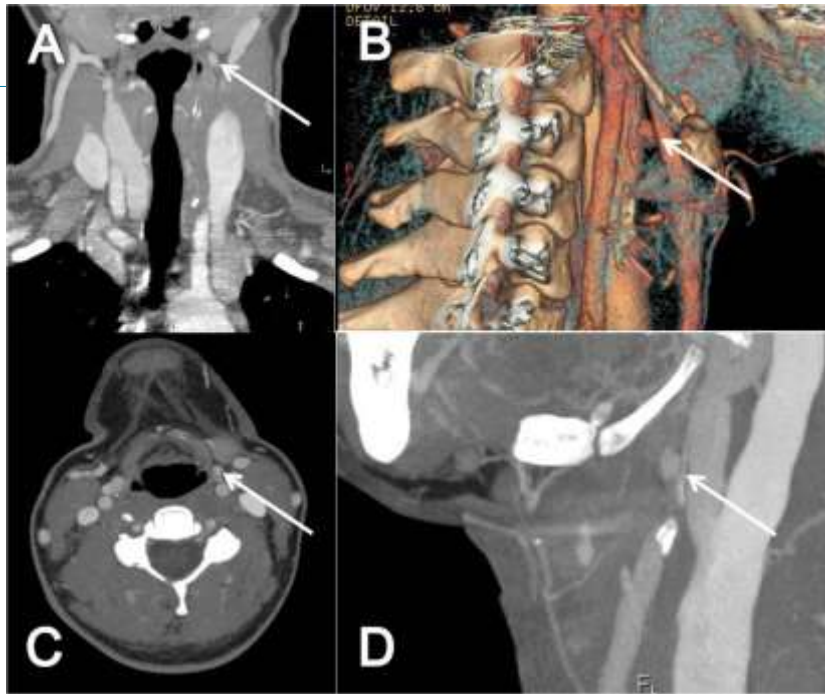


## 4D CT scan

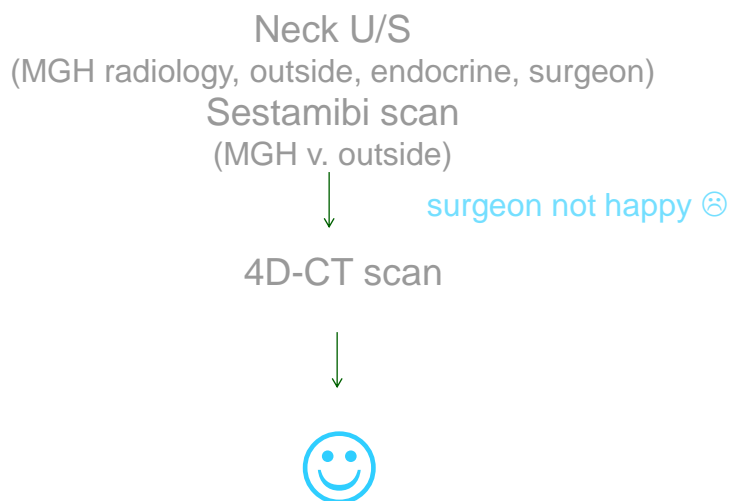
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- CT scan of the neck and upper mediastinum
- Multiphasic
  - 1. Precontrast axial images
  - 2. During infusion
  - 3. 30 second delay
- 3-D multi-projection images
- Anatomic lesions and perfusion characteristics are evaluated



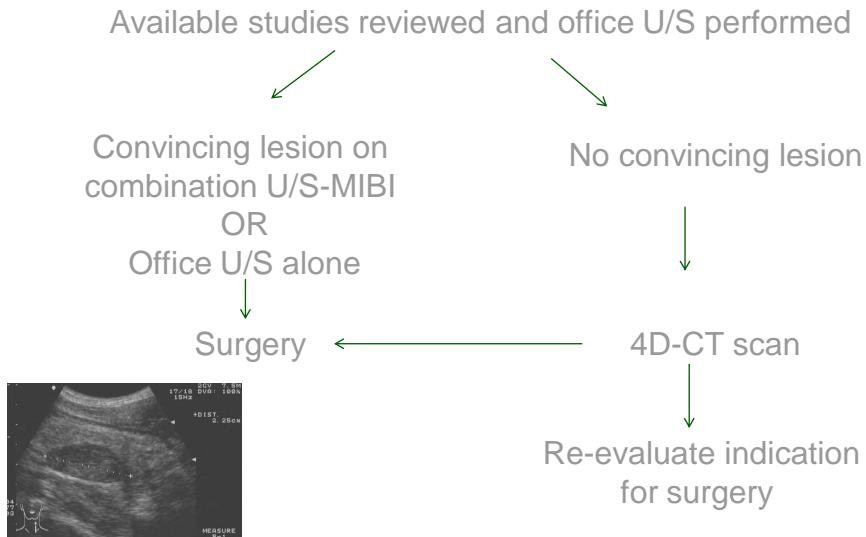


## Pre-operative Localization



## Pre-operative Localization

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### Case # 1 H.Q. 74 yo female

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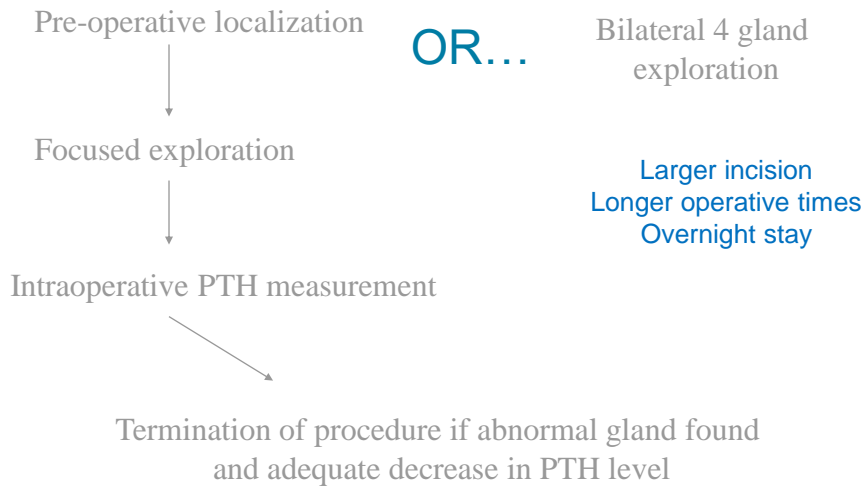
- Calcium – 13, PTH - 114
- U/S – large MNG, no parathyroid adenoma
- Sestamibi scan – negative
- 4D-CT scan
  - Likely parathyroid adenoma in the superior mediastinum below the clavicle
  - 10 x 6 x 5 mm





## Parathyroidectomy Focused Approach

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## Surgical Approach

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- Assemble all relevant pre-operative information
  - Patient age
  - Ca and PTH values
  - Pre-operative imaging
- Approach surgery with an open perspective
- Utilize intra-operative tools
  - Intra-operative PTH
  - Frozen section

## Patient case

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- 74F diagnosed with pHPT in 2011
  - Fatigue, abdominal pain, muscle weakness
  - PTH 170, Ca 10.5, Vit D 29
  - Sestamibi scan -> ? R inferior parathyroid adenoma
- 5/12 Neck exploration at OSH

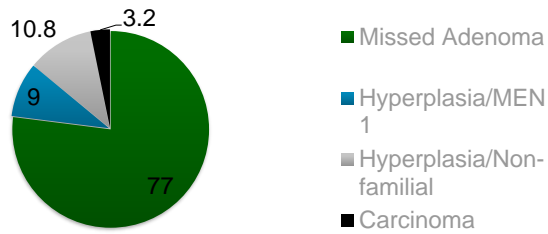
## Patient case

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- 74F diagnosed with pHPT in 2011
  - Fatigue, abdominal pain, muscle weakness
  - PTH 170, Ca 10.5, Vit D 29
  - Sestamibi scan -> ? R inferior parathyroid adenoma
- 5/12 Neck exploration-> Normal R inferior gland, superior not identified, L glands normal. No parathyroid glands removed
- 7/15 labs: PTH 145, Ca 11.2, Vit D 26.2
  - Repeat sestamibi -> adenoma in R Lower pole
- 10/15 Referred to MGH

# What to consider

- Cure rates for initial parathyroidectomy:
  - High volume center: >95%
  - Low volume center: 85-90%
- Most common causes of failure:



## Take Home Points

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- Every patient with HPT should be considered for surgery
- Shift in localization studies
- Intra-operative PTH is useful!
- Individualized approach to each surgery

Your first shot is your best shot.....

