Use of Ultrasound in Management of Hyperparathyroidism

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Sup. parathyroid gland (from 4th pouch)

Inf. parathyroid gland (from 3rd pouch)

Ultimobranchial body

Thymus

Thyroid

Foregut
Parathyroid ultrasound

Normal parathyroid is not seen on US

Typical Adenoma
- Hypoechoic
- Homogeneous
- Extrathyroid
- At least 2x normal

Parathyroid Ultrasound - Doppler
Parathyroid blood supply

- Inferior gland – Inferior thyroid artery > 80%
- Superior gland – Inferior thyroid artery > 60%
- Additional contribution from superior thyroid artery, thymic artery

Parathyroid Ultrasound - doppler

Feeding (polar) artery arborizes around periphery and enters adenoma
Parathyroid Ultrasound – Power Doppler

Location of inferior parathyroid glands
Build a database IV: Create queries for a new Access database
Parathyroid Ultrasound – Superior glands
Right Inferior or Descended Superior?
Right Inferior or Descended Superior?

Build a database IV: Create queries for a new Access database
Atypical appearing adenomas

Build a database IV: Create queries for a new Access Database
Atypical appearing adenomas
Tertiary HPT

Intrathyroid Parathyroid

Build a database IV: Create queries for a new Access database
Parathyroid cyst

Parathyroid carcinoma

No characteristic ultrasound features
Should be in differential diagnosis if:
- High calcium
- High PTH
- Ultrasound
  - irregular indistinct borders
  - wider than tall
Parathyroid Ultrasound - limitations

1. Retroesophageal adenoma (ectopic superior)
2. Mediastinal adenomas (ectopic inferior)
3. Thyroid pathology
   - Hashimoto

Parathyroid vs Lymph node
Parathyroid Ultrasound - limitations

1. Retroesophageal adenoma (ectopic superior)
2. Mediastinal adenomas (ectopic inferior)
3. Thyroid pathology
   - Hashimoto
   - Large goiter
4. Short, deep neck