

Endocrine System Imaging

Group of small organs that secrete hormones into the blood stream. These hormones control and regulate functions of other organs, and ultimately regulate metabolism and homeostasis.

Pituitary Gland

Consists of two parts anterior and posterior pituitary.

Several hormones released by pituitary are important to Nuclear Medicine

1. TSH: Thyroid Stimulating Hormone
2. FSH: Follicle Stimulating Hormone
3. ADH: Vasopressin, Controls urine output

Pituitary Gland receives stimuli from Hypothalamus, and/or from negative feedback system from the target organ.

Octreoscan – Pituitary Gland Imaging

Somatostatin receptor imaging. These receptors are present in malignant tissues of pituitary glands. Octreoscan (In111 DTPA) used after operation to visualize remaining cells and/or mets.

Octreoscan Protocol:

1. Patient injected with 5.0-6.0 mCi of In111-DTPA
2. 4 hour imaging: whole body and statics of the area
3. 24 hour imaging: whole body and statics of the area SPECT

Pituitary Disease:

From most appropriate SPECT slice calculate ROI vs. bkg.

Normal: 30:1 ratio, abnormal less than or greater than 30:1 ratio.

Thyroid Uptake and Scan

Anatomy and Function

- Normal Location
- Ectopic Tissue

T3 and T4 Production:

- Monoiodotyrosine
- Diiodotyrosine

T3 = MIT + DIT

T4 = DIT + DIT

Basics of Negative Feedback System

TSH vs. Thyroid function

Thyroid Uptake and Scan

Isotopes used for Thyroid Uptake and Scans:

- I131

- I123

- Tc99m

Methods of Localization

- I131

- I123

- Tc99m

Thyroid Uptake and Scan

1. Patient Prep
2. Uptake Procedure
3. Scanning Procedure
4. Common Pitfalls
 1. Uptake discrepancies? Was the prep followed? Any thyroid surgeries?
 2. Turn the camera not patient's head for oblique views.
5. Image Findings
 1. Uptake value findings:
 2. Scan findings:

Thyroid Uptake and Scan

Thyroid Uptake and Scan Protocols using I123

Thyroid Uptake and Scan Protocol using I131 and Tc99m

Whole body Metastatic Survey

Indications

Isotope

Patient Prep

Protocols

Imaging Findings

Stunning Effect

Parathyroid Imaging

Anatomy and Physiology

Isotopes Used and Methods of Localization

Parathyroid Scan

Indications

Patient Prep

Imaging Protocols

Image Subtraction (dual isotope protocol only)

Image Findings

Usefulness of SPECT

Adrenal Imaging

Indications

Patient Prep

Imaging Protocol

Image Findings

Delay imaging and Contrast relationship