Parathyroid Ultrasound Protocol Rev. 4/2022

I. Patient Preparation

a. None

II. Equipment

a. Performed with real-time scanner using a linear 14 MHz transducer. Occasionally a linear 18 MHz transducer may be needed for optimization.

III. Indications:

a. Signs or symptoms associated with hyperparathyroidism
b. Abnormal lab values (increased parathyroid hormone, hypercalcemia)
c. Abnormal findings on other imaging studies
d. Follow up known parathyroid abnormalities
e. Evaluate for recurrent disease in the setting of previous parathyroid surgery or ablation

IV. Procedure Protocol

a. Patient Positioning
    1. Patient is supine on stretcher/bed with pillow placed underneath shoulders.
    2. Neck is hyper-extended over top edge of pillow.
    3. Low collared shirt, remove jewelry around neck, towel across shoulders/chest, pillow or towel can be placed under shoulders.

b. Basic scan technique:
    1. Review any prior imaging including ultrasound and nuclear medicine sestamibi scans, making note of abnormalities or other findings requiring further evaluation.
    2. A complete examination includes the tissues around the thyroid gland in the anticipated locations of the parathyroid glands (superior, posterior, or inferior to the thyroid lobes extending to the thoracic inlet). Include potential ectopic location in the region of the carotid bulbs and sternal notch.
    3. The soft tissues surrounding the thyroid gland and the central compartment of the anterior neck should be surveyed from the carotid arteries to the midline (longitudinal) and from the carotid bifurcation to the thoracic inlet (transverse), bilaterally.
    4. Take care to adjust depth and focus to satisfactorily image the tissues deep to the thyroid gland. Imaging with the head turned to the opposite direction may aid in “uncovering” parathyroid glands located in the tracheoesophageal groove.
    5. The upper mediastinum may be imaged by angling under the sternum from the sternal notch.
    6. Normal parathyroid glands are not seen by ultrasound. Abnormal parathyroid glands are enlarged; typically, hypoechoic soft tissue nodules; usually posterior or inferior to the thyroid gland; and may exhibit a dominant feeding vessel.
    7. In most cases, there is only one abnormal parathyroid but there may be multiple, especially in the setting of tertiary hyperparathyroidism (multiglandular disease). If present, document only one thyroid nodule or enlarged cervical node on either side.

8. Obtain greyscale transverse and longitudinal images of the following:
    i. Superior to the right thyroid lobe
    ii. Posterior to the right thyroid lobe
    iii. Inferior to the right thyroid lobe
    iv. Right carotid bulb
    v. Inferior to thyroid isthmus
    vi. Sternal notch
    vii. Superior to the left thyroid lobe
    viii. Posterior to the left thyroid lobe
    ix. Inferior to the left thyroid lobe
    x. Left carotid bulb
9. Suspected parathyroid glands should be documented with size measurements in 3 orthogonal planes, and with/without color Doppler. Relationship to the thyroid gland should also be noted.