Neck Ultrasound in follow up of papillary thyroid carcinoma and alcohol ablation for cervical recurrence

Tara L. Henrichsen MD
Assistant Professor of Radiology
Mayo Clinic
Rochester, MN
Disclosure

Relevant Financial Relationship(s)
• None

Off Label Usage
• None

Learning Objectives
• Indications for postoperative US
• Ultrasound appearance of recurrent thyroid carcinoma
• Accurate reporting
• Pitfalls of ultrasound in the post operative neck
• Alcohol ablation therapy
Papillary Thyroid Carcinoma

- 40% have nodal involvement at primary surgery
- 8-19% have nodal recurrences post operatively

Indications for postoperative US

- Ultrasound plays an important role in post operative surveillance
  - High risk
  - Increase in serum Tg
- US should not be performed in the immediate postoperative period as the amount of edema and gas obscure most findings.
- 6-12 months
Thyroid Ultrasound

Technique

- Patient positioning
  - Supine
  - Head extended
  - May need to place pad/sand bag under shoulders
Technique

- **Equipment**
  - High quality/resolution machine
  - 9-18mhz probe
  - High frequency
  - Linear Probes

Technique

- **Images acquired**
  - Transverse and longitudinal views of each nodule/lymph node
  - Cine of thyroid beds
  - Survey of the cervical lymph node chains
Normal Post-operative Thyroid Bed

Normal cervical lymph nodes
Ultrasound appearance of recurrent thyroid carcinoma

• Bed
Ultrasound appearance of recurrent thyroid carcinoma

• Bed
Ultrasound appearance of recurrent thyroid carcinoma
Ultrasound appearance of recurrent thyroid carcinoma

• Lymph nodes
Ultrasound appearance of recurrent thyroid carcinoma

- Lymph nodes
Ultrasound appearance of recurrent thyroid carcinoma

• Lymph nodes

Cystic nodes of metastatic papillary thyroid cancer
Ultrasound appearance of recurrent thyroid carcinoma
Ultrasound appearance of recurrent thyroid carcinoma

• Thyroid bed
  • Hypoechoic masses
  • Calcifications
  • Increased vascularity
  • Cystic change
• Lymph nodes
  • Enlarged, loss of fatty hilum
  • Calcifications
  • Increased vascularity, peripherally
  • Cystic change

Accurate reporting

• Size in 3 dimensions
• Echogenicity
• Cystic components
• Calcifications
• Vascular flow
• Depth in neck
• Level
• Superior/inferior position within each level
Accurate reporting
Maps
• Communication
• Reference
When to FNA

- 5mm in short axis diameter
- Worrisome features
  - Enlarged, loss of fatty hilum
  - Calcifications
  - Increased vascularity, peripherally
  - Cystic change
  - Greater than 3mm increase in size

Tg needle washout

Ultrasound guided FNA
Pitfalls of ultrasound in the post operative neck

• Post-operative change!
  scaring
  surgical clips, reverberation
  seromas
  neuroma/schwannoma, fusiform, painful
  suture granulomas, centrally hyperechoic
  sarcoidosis
  reactive lymph nodes
  remnant thyroid tissue
Pitfalls of ultrasound in the post operative neck

- Scarring
Pitfalls of ultrasound in the post operative neck

• Neuroma

Pitfalls of ultrasound in the post operative neck

• Cyst
Pitfalls of ultrasound in the post operative neck

- Normal lymph node

- Residual thyroid tissue
Pitfalls of ultrasound in the post operative neck

• Residual thyroid tissue

Alcohol ablation therapy

• UPEA, PEI
• First used at Mayo 1991, published 2001
• Selection
• Technique
• Complications
• Results
• Post treatment appearance and follow-up
Alcohol ablation therapy

• Selection
  • At least 5mm short axis diameter
  • FNA positive/TG washout positive
  • Post surgery
  • RAI unresponsive
  • Not a surgical candidate or prefer no additional surgery

Alcohol ablation therapy

• Technique
  • Sterile technique
  • 1% lidocaine at skin and around the targeted lymph node
  • At least 98% dehydrated alcohol
  • Tb syringe, 25 g needle
  • Volume = EtoH injected
Alcohol ablation therapy

- **Technique**
  - Ultrasound guided free hand technique
  - Multiple locations throughout the lymph node
  - 2 sessions, on subsequent days
  - Follow-up 3-6 months, 25% will need 2\textsuperscript{nd} treatment at that time
    - Persistent vascularity

Alcohol ablation therapy

- **End points**
  - Increased echogenicity - from gas microbubbles
  - Absent vascularity
  - Back pressure leakage
  - Cellular toxicity
    - Coagulation necrosis
    - Hemorrhage
    - Scar tissue
  - Vascular thrombosis
Alcohol ablation therapy

• Post treatment appearance and follow-up
Alcohol ablation therapy

• Complications
  • Nerve injury
    • Recurrent laryngeal
    • Vagus
    • Brachial plexus
    • Cervical nerve roots
  • Horner’s syndrome
    • Sympathetic fibers exit at T1, cervical sympathetic chain at apex, ascend along carotid to superior cervical ganglion at bifurcation and continued along the ICA

Alcohol ablation therapy

• Complications
  • Parathyroid
  • Local pain
Alcohol ablation therapy

• Results
  • 2013 study by Hay et al
    • 25 patients with 37 positive lymph nodes
    • 95% decrease in size
    • Absence of doppler flow in 100%
    • 86% decreased Tg
    • Significant decreased cost for patients
    • No complications, local temporary discomfort

Alcohol ablation therapy

• Results
  • Helio et al
    • 63 patients, 109 lesions
    • 38 month mean follow-up
    • 93% response to PEI
    • 84% complete response
Alcohol ablation therapy

• Results
  • Meta analysis PEI vs Surgery
  • Success rate
    • Surgery 94.8%
    • PEI 87.5%
  • Complication rate
    • Surgery 3.5%
    • PEI 1.2%

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THANK YOU.