Never Say No: Tricks for That Impossible Access

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Expanding indications for biopsies

- Response to treatment
- Differential biology
- Treatment response stratification
  - Marker positivity
  - Gene expression
  - Immune therapy
Is a percutaneous biopsy indicated?

Will there be a clear benefit to the patient?

Will treatment decisions be affected by outcome?
CT Guidance
Using laser light marker helps achieve ‘in-plane’ needle path
Gantry Angulation

Rarely used in imaging now with volumetric acquisition

Useful for “out of plane” CT procedures
Know your target

64yo F – incidental lung nodule on CXR
Non-contrast CT = peripheral nodule
Referred for CT-guided lung biopsy

Contrast = Fills!
Diagnosis: Pulmonary AVM
Target highest “yield” site

If primary and metastatic lesions: biopsy met first to confirm diagnosis AND stage

49M with right ureteral thickening and left abdominal soft tissue mass. ?Metastatic TCC

First biopsy node, if negative or not consistent with TCC, THEN sample ureter
Target highest “yield” site

Biopsy soft tissue components of mixed bone / tissue lesions

54M h/o HIV and back pain with new L1 lesion
Watch your background!

Take approach that limit potential risk of injuring structures behind the target.
Deciding the path to the target
Choice depends on organ and suspected diagnosis

*Kidney* = parenchymal usually more vascular than tumor, so try and enter tumor directly

*Liver* = go through normal tissue to reduce risk of tumor seeding / bleeding
Pelvic biopsy: transgluteal

- Prone position
- Through greater sciatic foramen
- Below pyriformis muscle
- As close to coccyx as possible to avoid sciatic nerve

89M hx Prostate CA s/p resection and XRT, BPH, mass encasing distal ureters
TRICKS
73F new onset dysphagia, drooling, ear and neck pain. DD: nasopharyngeal CA vs. lymphoma

ENT declined to biopsy / anesthesia felt patient would require intubation and may not be able to extubate

**Good patient prep = can do with 1% local lidocaine**
Patient positioning

Several ways to reach the adrenal gland

Transhepatic

Posterior paravertebral

Posterior transpulmonary
59yo M with right adrenal mass

Path: poorly differentiated/high grade carcinoma
Pelvic biopsy

- Slight decubitus will shift bowel, abdominal wall structures
- Avoid vessels (iliacs, inferior epigastric), ureter
- Be mindful of what is beyond the lesion when firing biopsy gun
Pelvic biopsy: transvaginal approach

Watch out for bowel, vessels, bladder

33-year-old woman 2 months after total abdominal hysterectomy and bilateral salpingo-oophorectomy for uterine sarcoma. Biopsy showed recurrent uterine leiomyosarcoma
Coaxial technique

• Biopsy / FNA needle through coaxial needle
• Larger / one gauge difference
  – 17G coaxial needle
  – 18G biopsy
• Multiple biopsies can be obtained with one access tract
• Can plug tract in high-risk cases with gelfoam
Sharp vs blunt stylet

• Coaxial needles – sharp and blunt stylets
• Blunt stylets can be very effective at traversing intra-abdominal spaces without puncturing viscera or vessels
59M w/ cirrhosis, HCC, new adenopathy

• Trans-visceral access with a co-axial needle, through which biopsy is performed
• Access tract can be embolized with gelfoam
61 yo M with intrahepatic cholangiocarcinoma
Path: metastatic cholangiocarcinoma
24M h/o FAP with abdominal mass, s/p colectomy - ? malignancy vs. desmoid

Initial CT = intervening bowel

Sharp stylet to peritoneum / Blunt stylet to target

Pathology: desmoid
55yo M w/ abdominal pain and pancreatic mass

EUS-guided FNA was non-diagnostic – request for biopsy

Can this be safely biopsied?

• Venous collaterals from splenic vein occlusion
• Intervening bowel
• Intervening posterior structures
Can this be safely biopsied? YES.

Co-axial needle and blunt stylet used to navigate intervening bowel and vascular structures.
Traversing intervening structures

- Can cross bowel with small caliber needles
  - 19g co-axial for 20-22g FNA
- Consider antibiotics
  - Especially with colon
67M w/ new mediastinal mass

- s/p CABG w LIMA graft and sternotomy wires
  - Request for biopsy

Approach?
Consider trans-osseous route to cross intervening bone

Bone drill (OnControl)
11G trocar needle
Core biopsy needle through
57M with right neck pain

Use contrast to identify and avoid critical vascular structures during biopsy
54 yo M with neck pain

- C1-2 joint effusion
- Right C2 facet effusion and irregularity
21G needle used to aspirate pus from the facet joint
Pus aspirated with 20G spinal needle
53yo M
HCV cirrhosis, HCC, s/p TACE and RFA, elevated AFP
Sharp, then blunt, to sharp again

Biopsy: HCC
Maximizing yield - target the right area!

- Targeting sites of maximal yield
- Infection – soft tissue components
- Solid vs. cystic portions of tumor
- Match to metabolic portions of tumor = FDG-avid on PET
67M with cavitary mass

Biopsy of the soft tissue wall

Make sure patient is comfortable and stable
Quality assurance

• Was the biopsy successful?
• Regular review of pathology result matched to imaging findings
  – Concordant = match
  – Discordant = significant difference => re-biopsy
  – Indeterminate = surveillance imaging vs. re-biopsy
• Review complication rates
• @BIDMC: qweekly biopsy review; qmonthly complications
Thank you!

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Special thank you to my colleagues Dr Ahmed and Dr Siewert