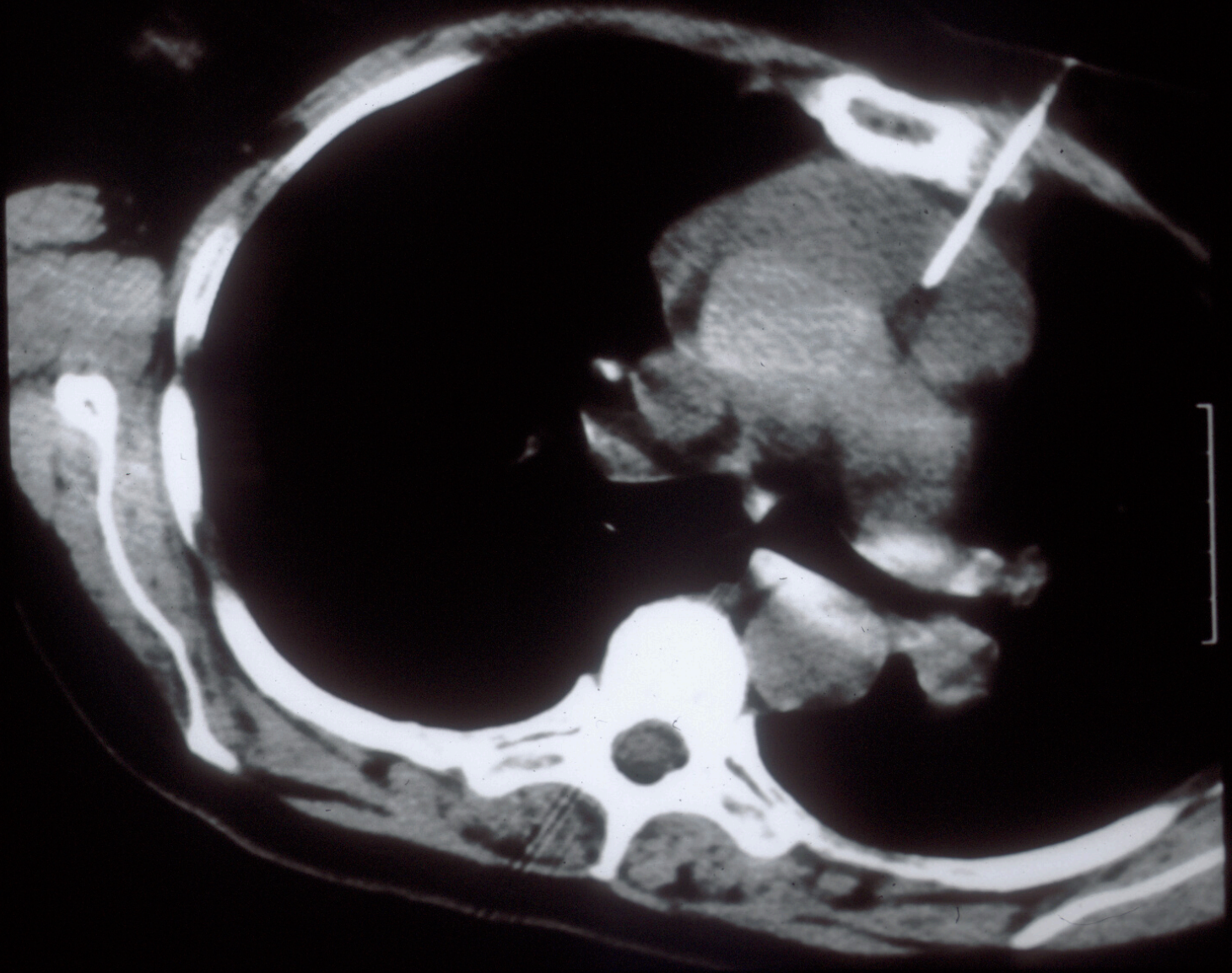


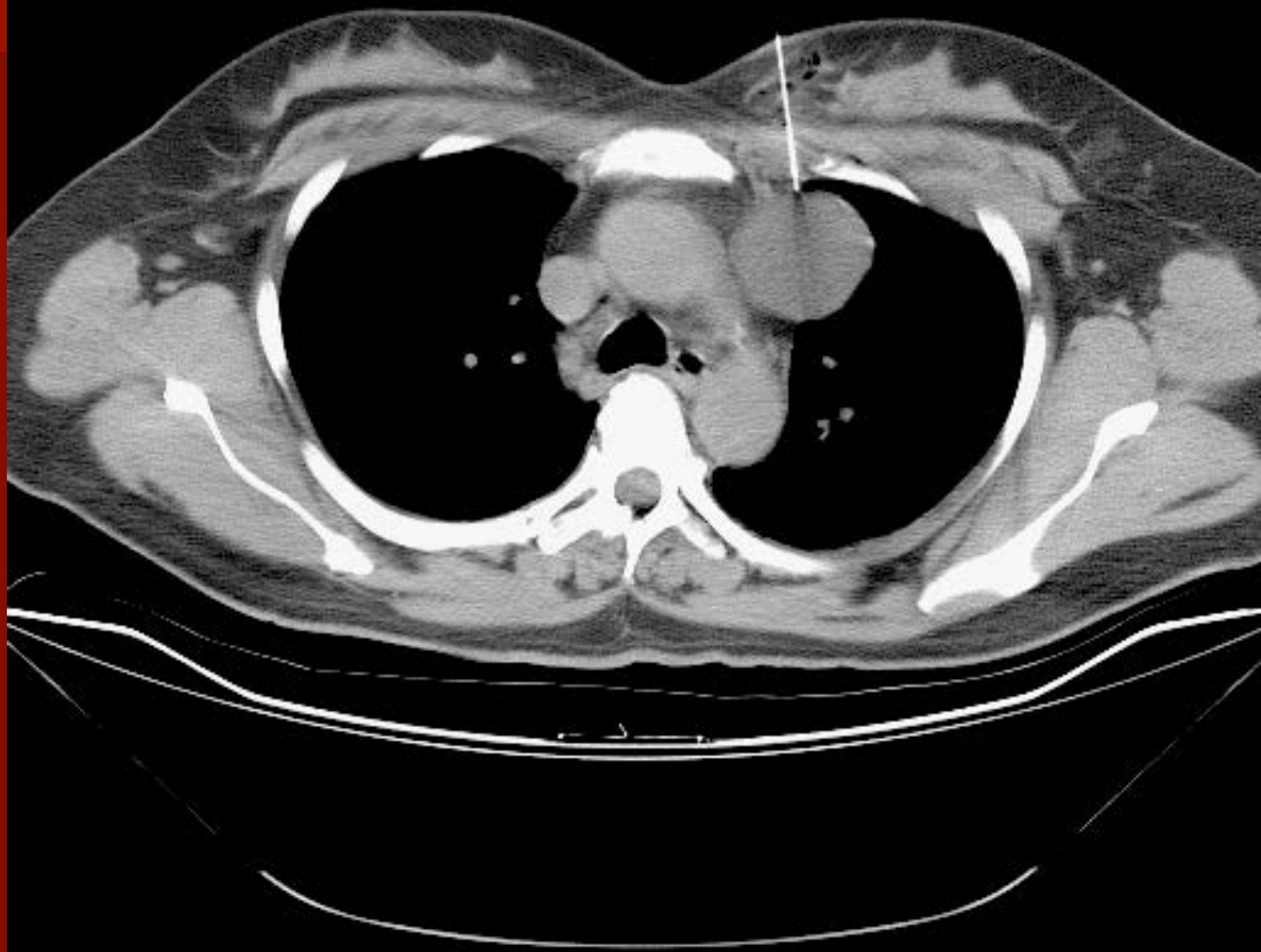
# Panel Discussion Role of CT relative to other modalities

# Preferred Roles for CT guidance

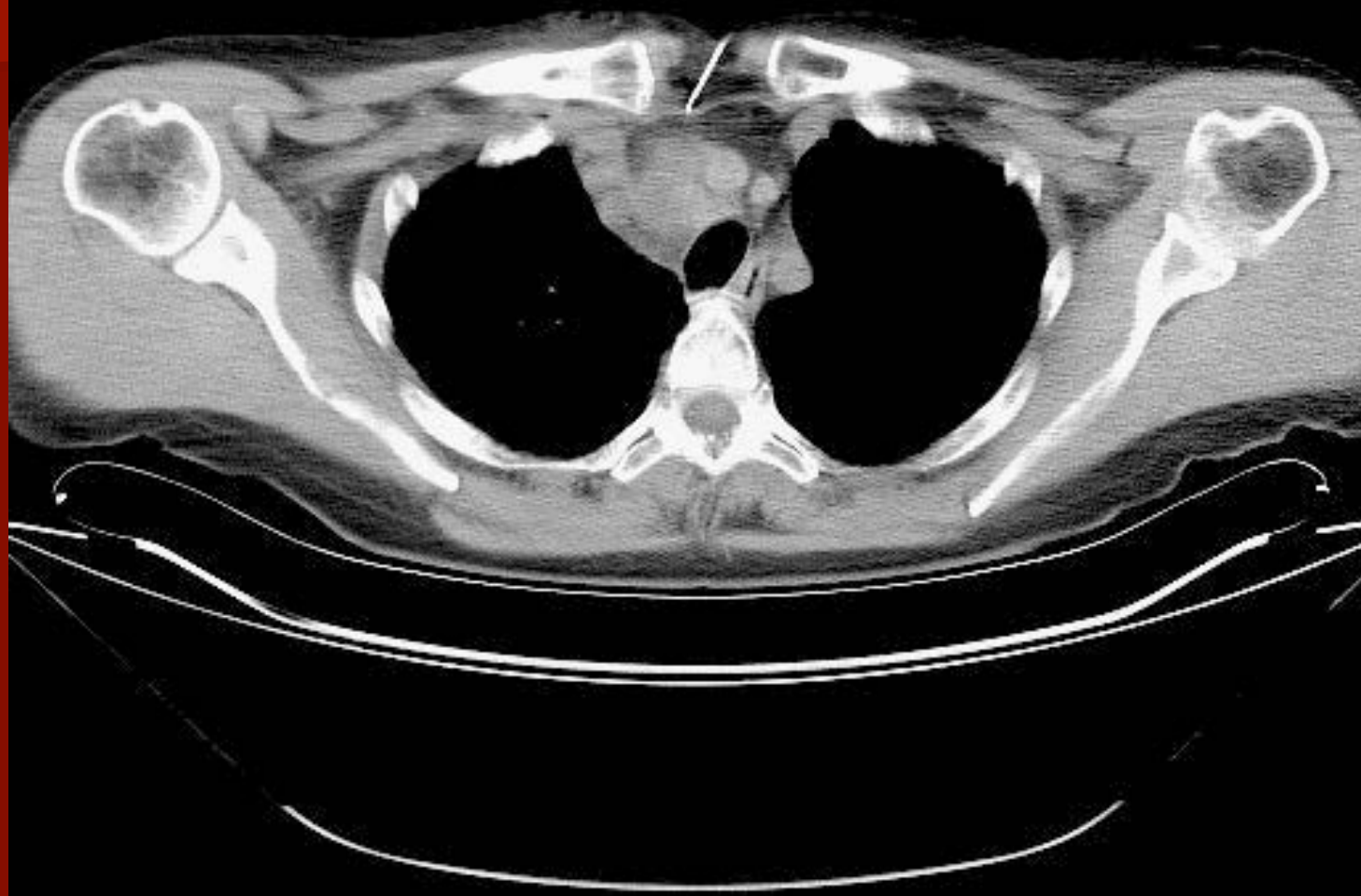
- Lung and mediastinum
- Retroperitoneum
- Difficult cases due to access, i.e. bowel crossing pathways, proximity to vessels, etc. Clarity of anatomy and instrument, special techniques
- Abscesses: able to define full extent of abscess, plan and execute multiple tube insertions
- Celiac nerve blocks
- Cryoablations- better able to visualize completeness of treatment, effects on adjacent anatomy
- Fiducial marker placement/Cyberknife radiation Rx

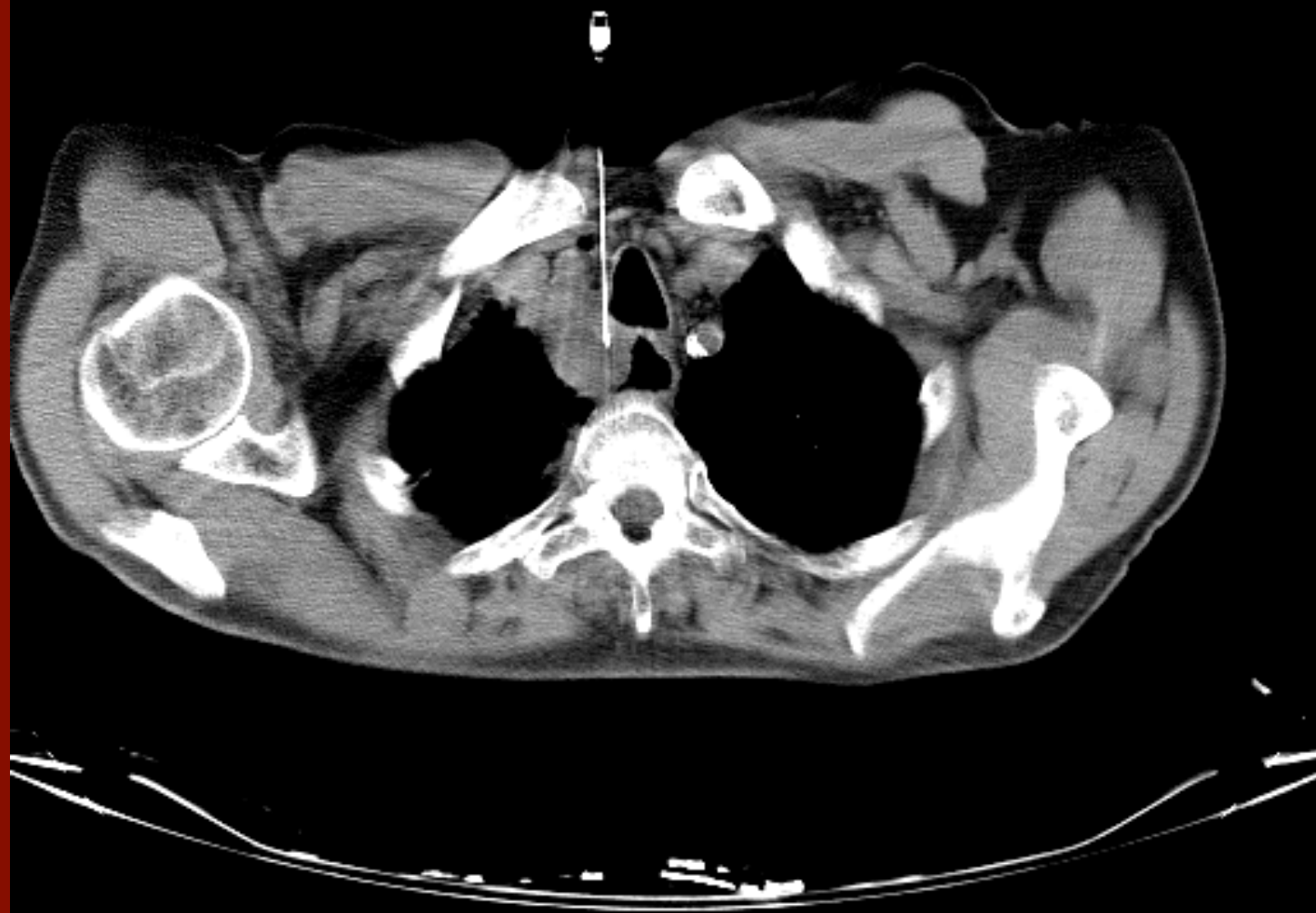




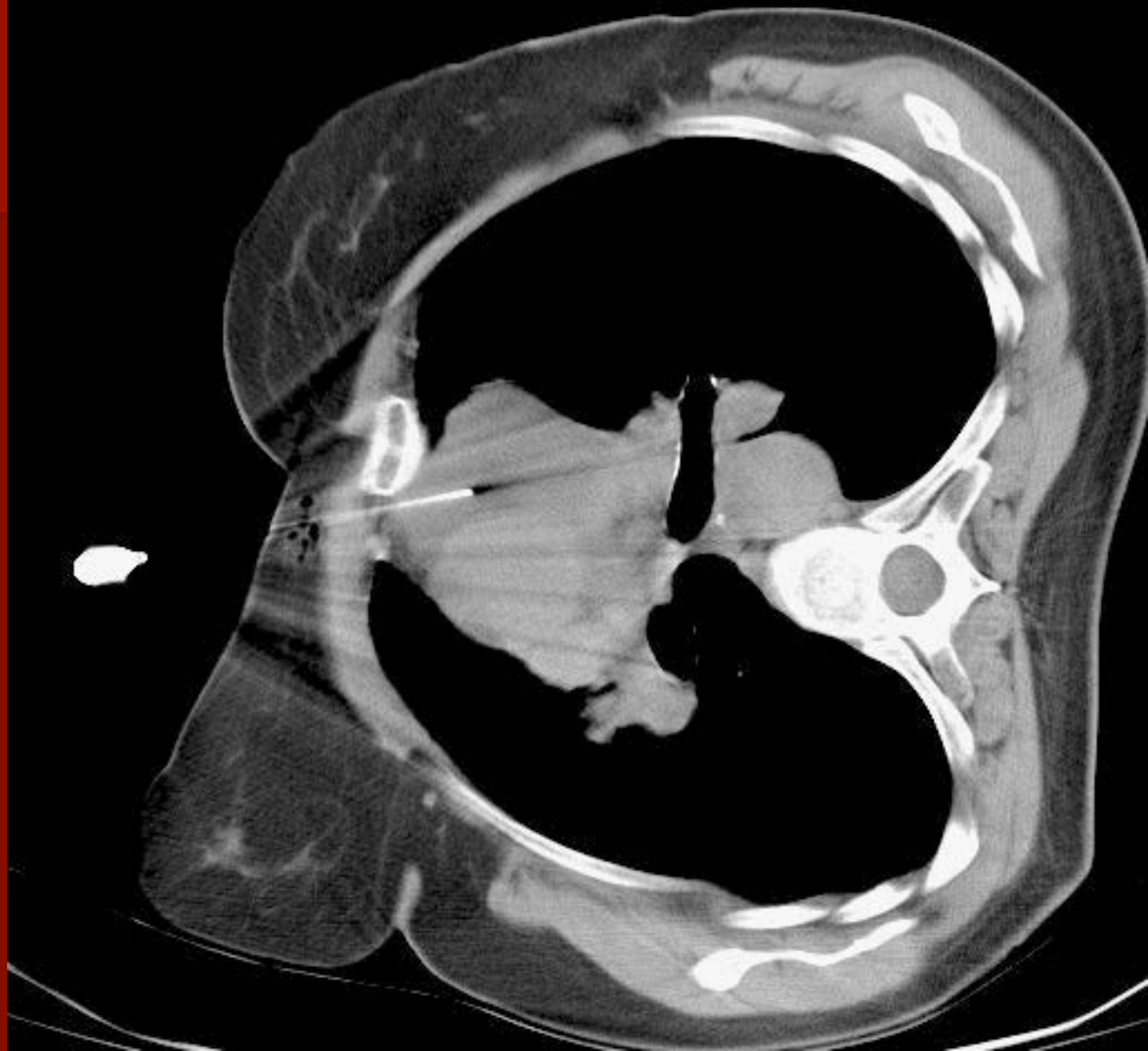




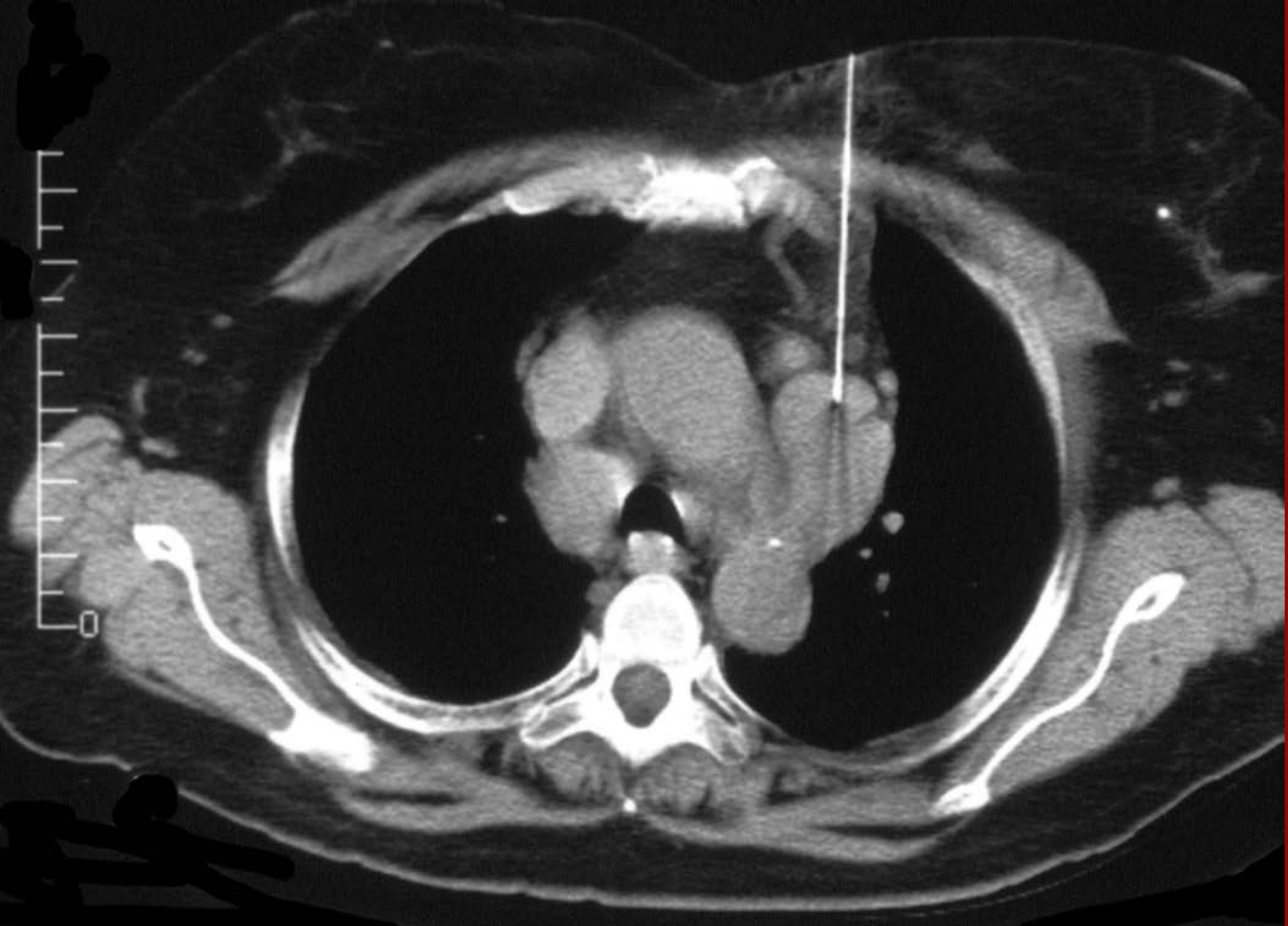






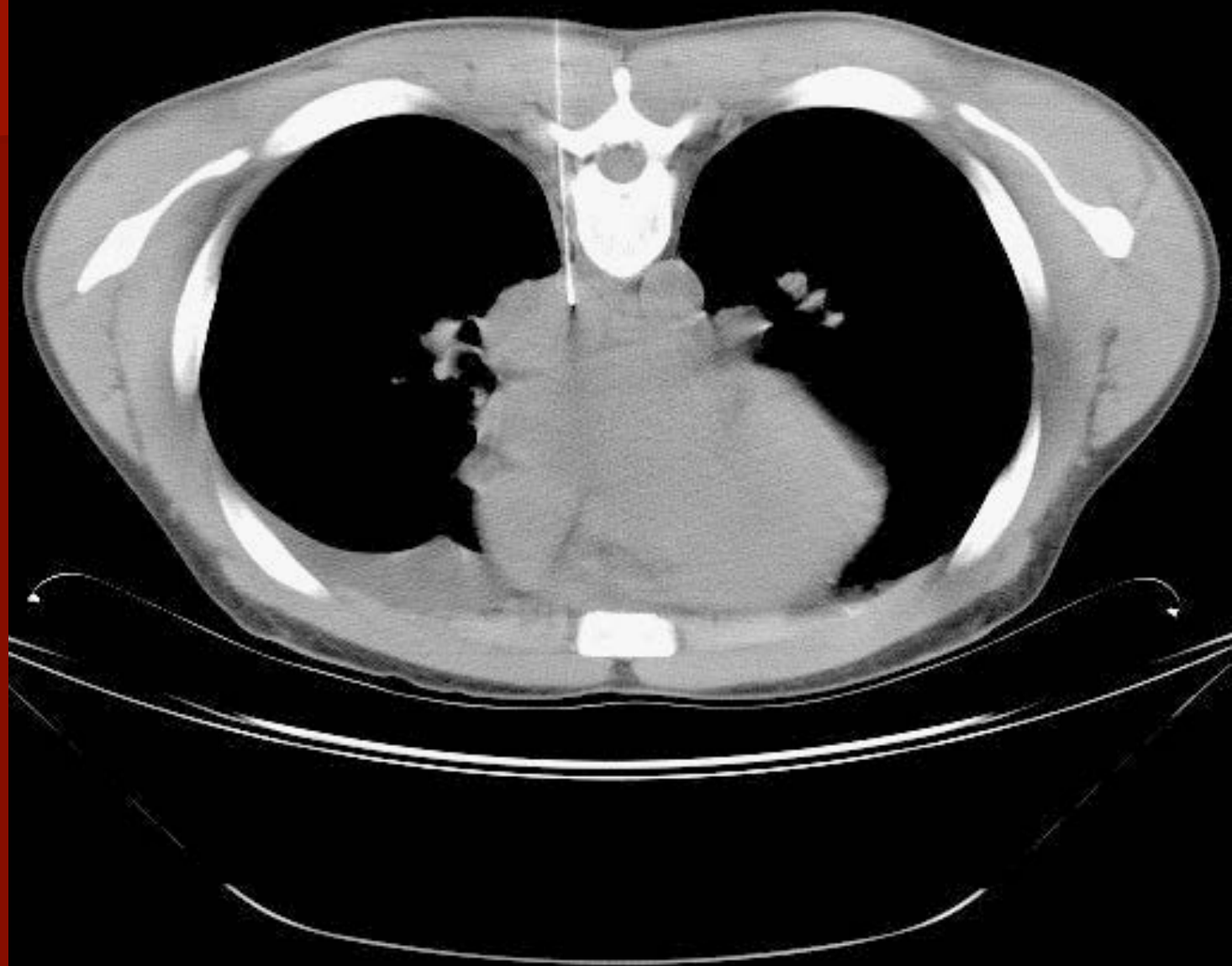




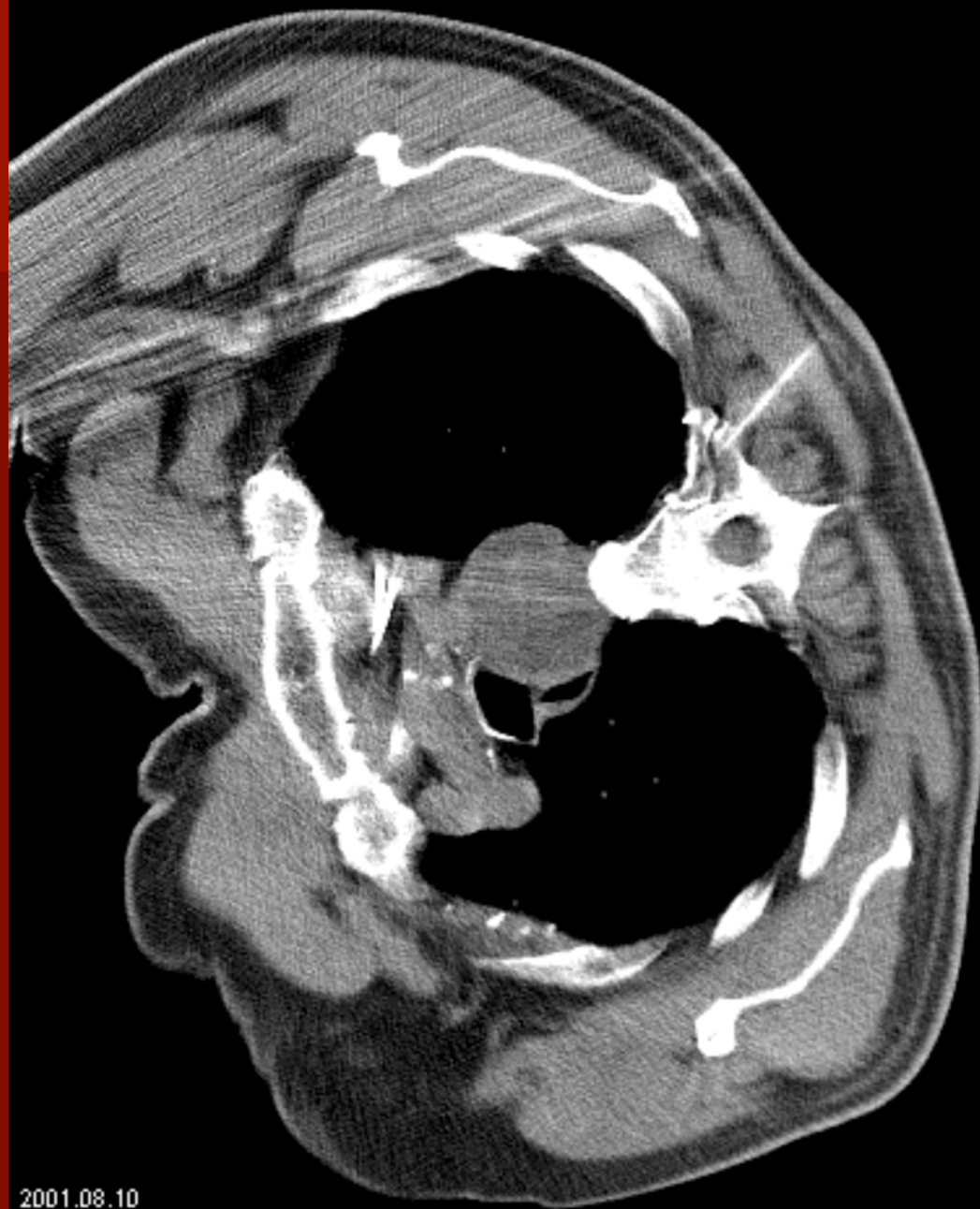






















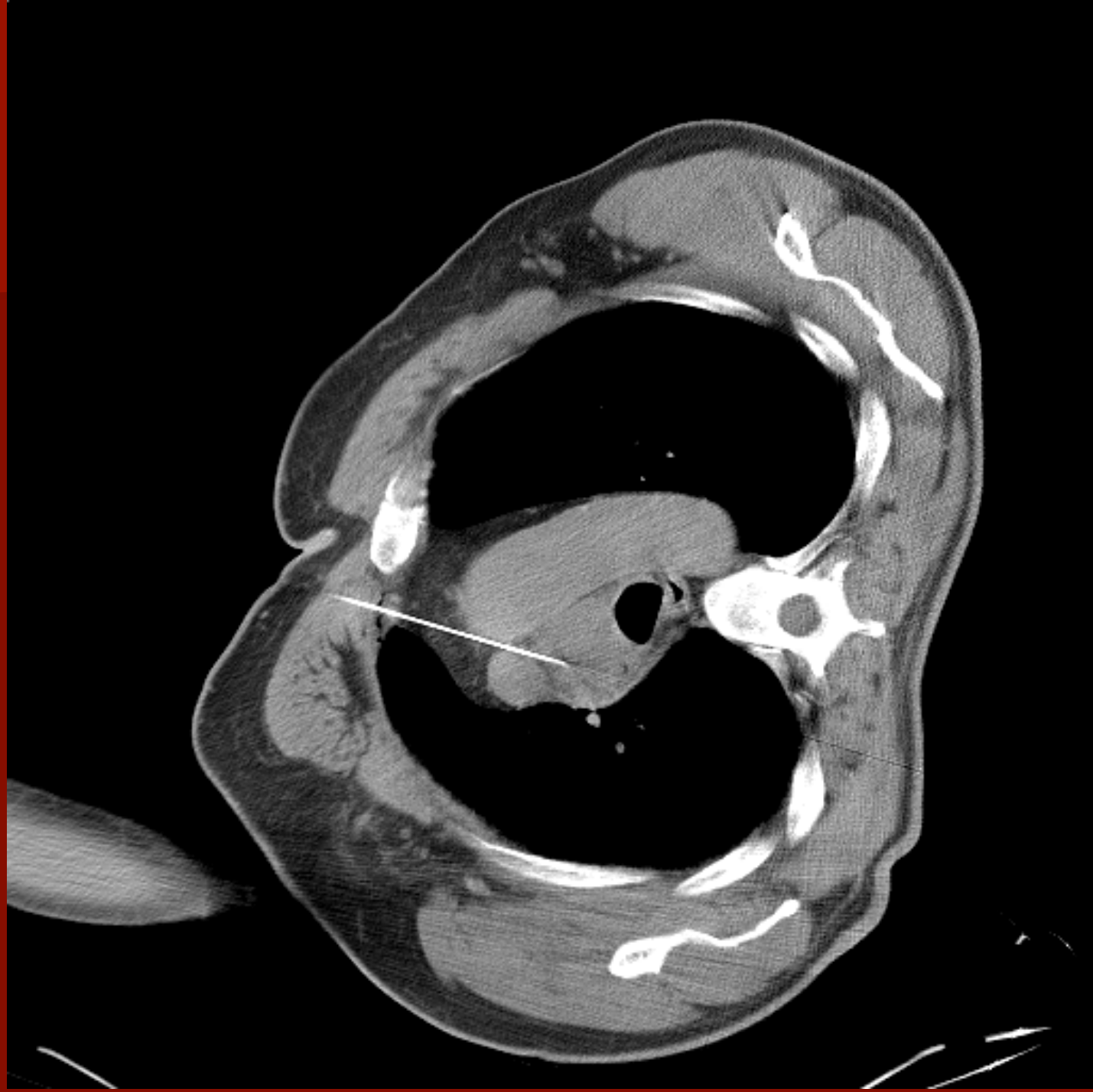


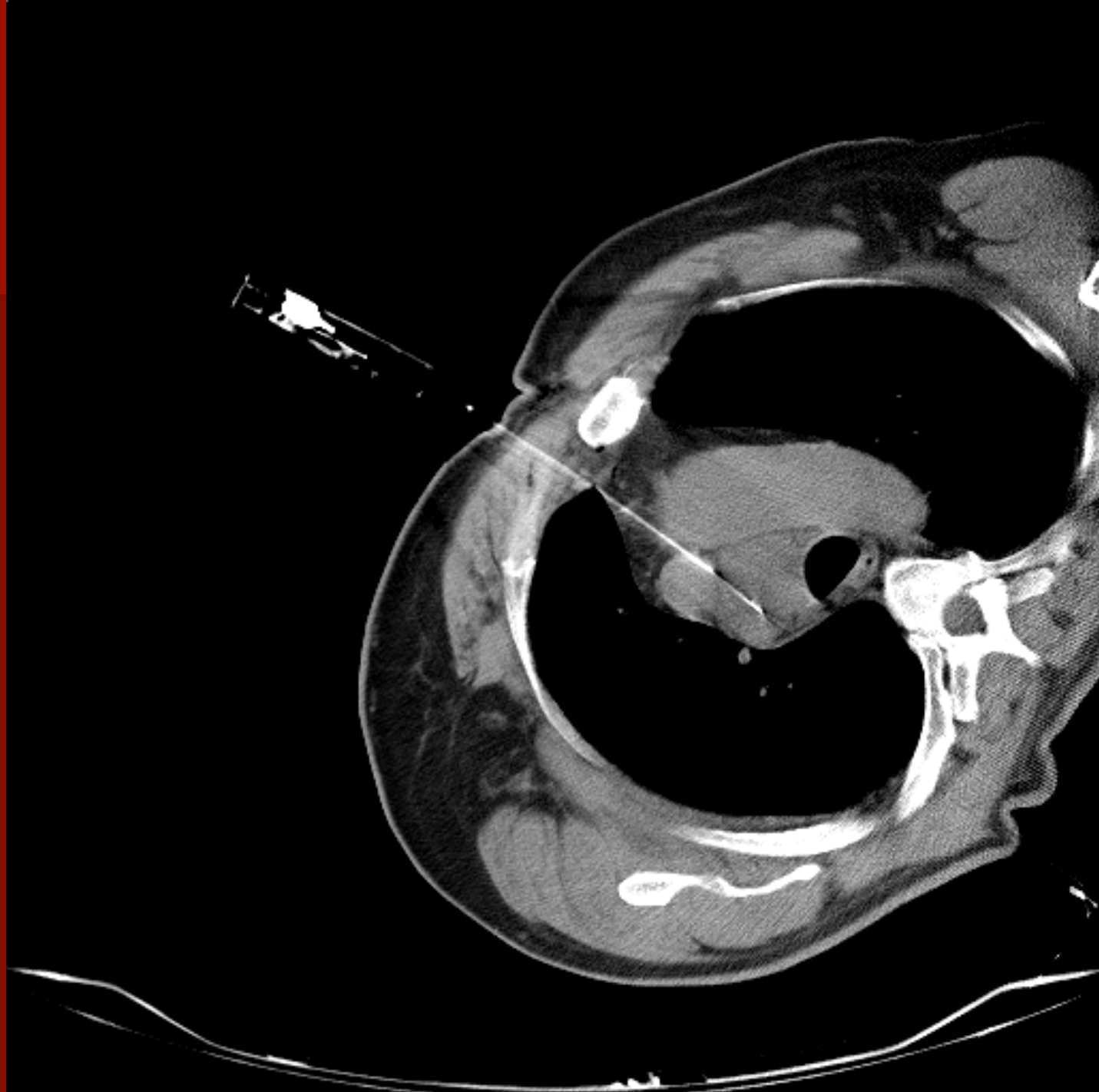




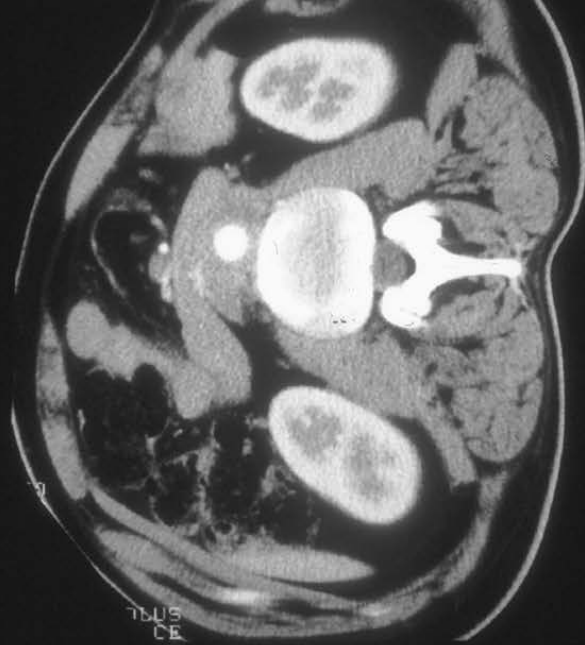










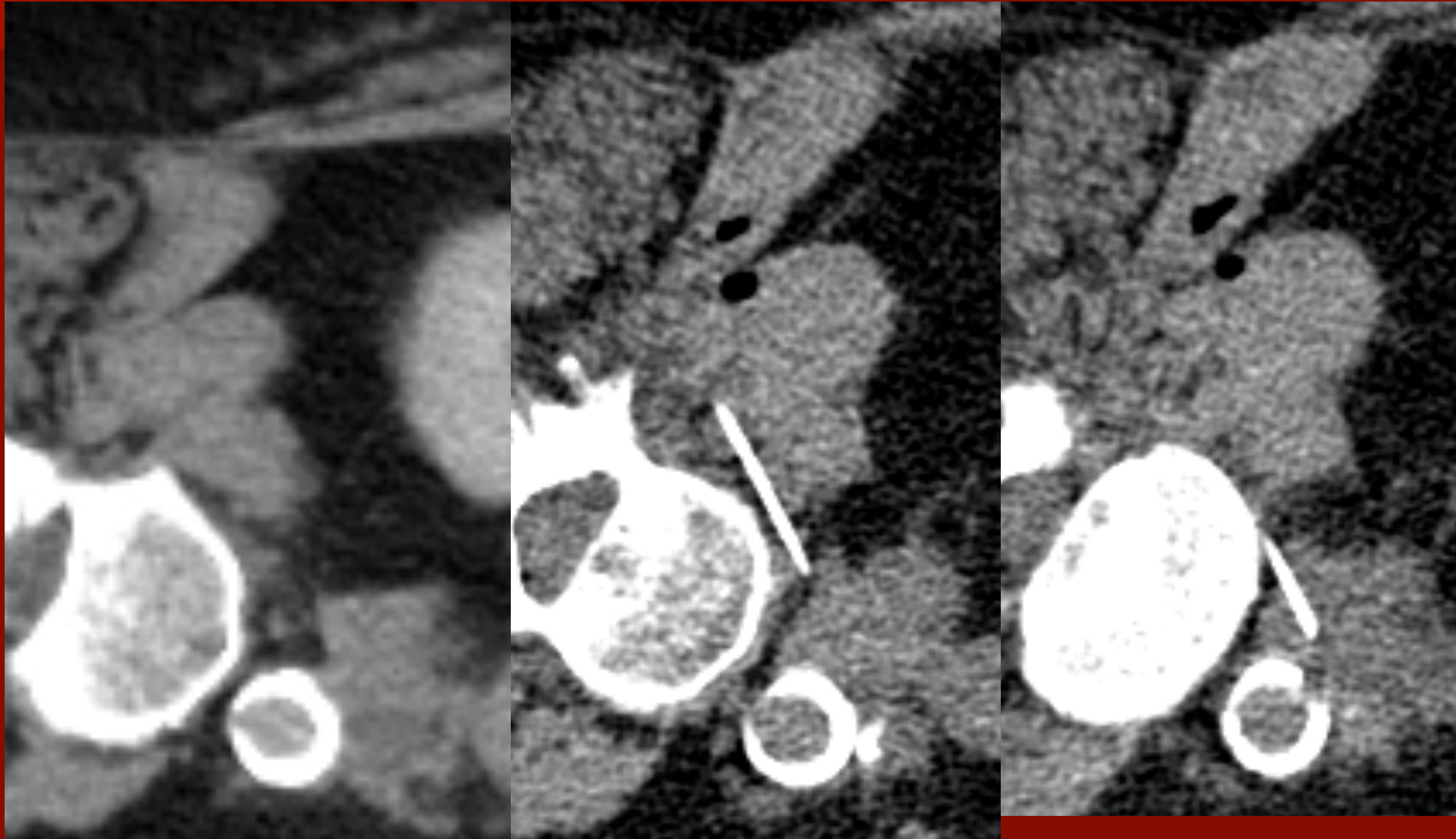


A

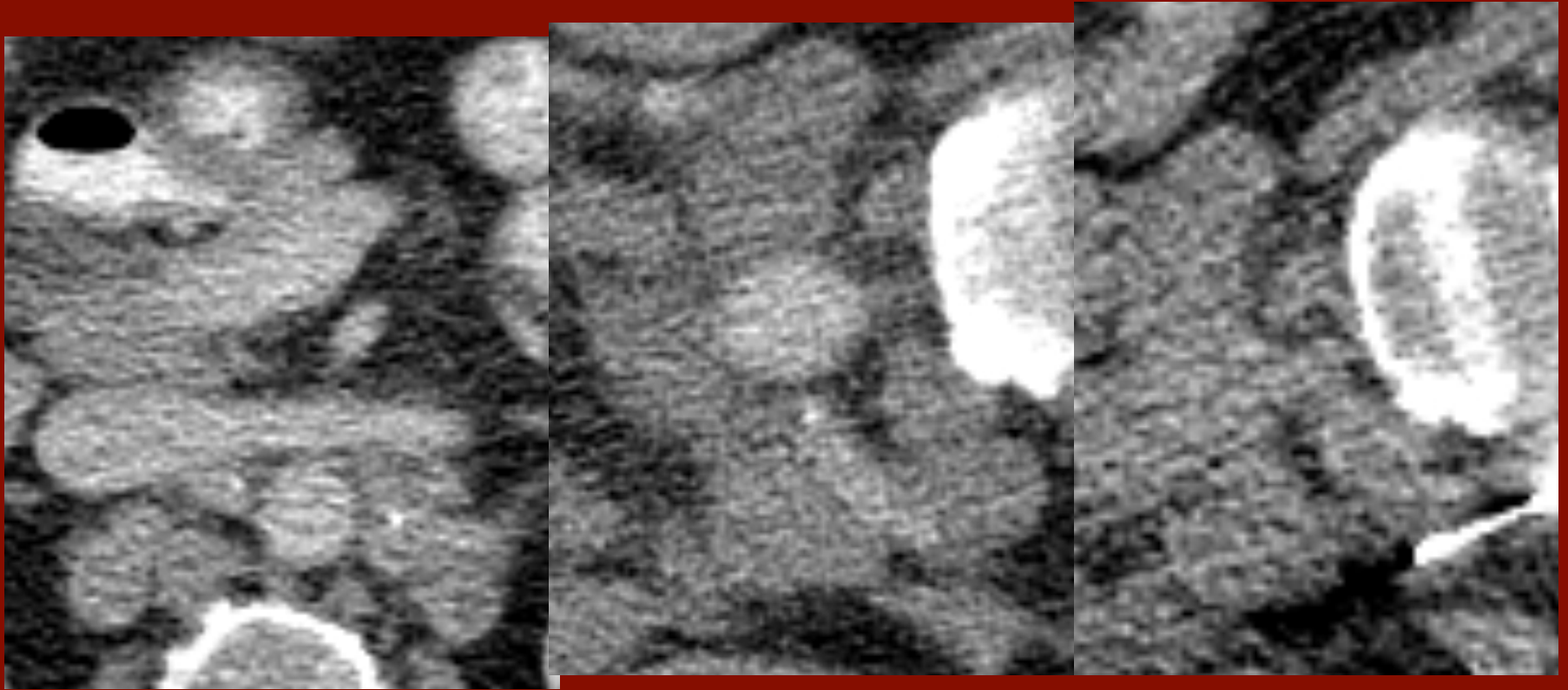


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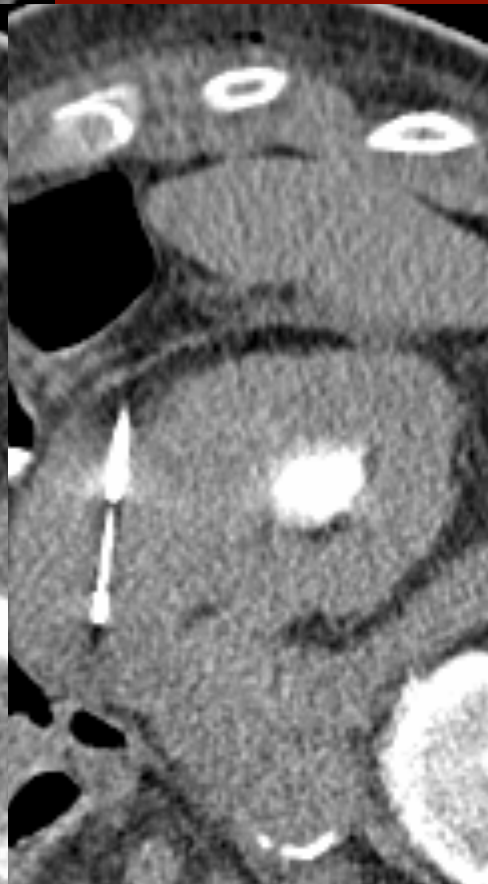
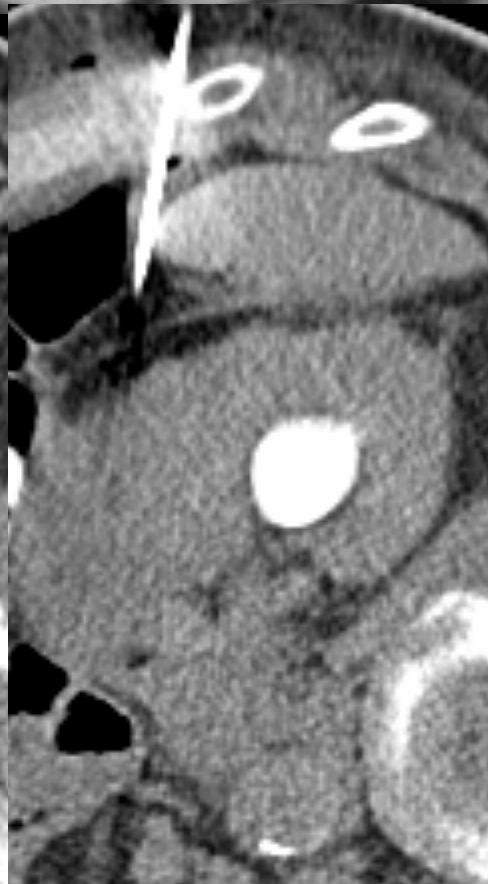
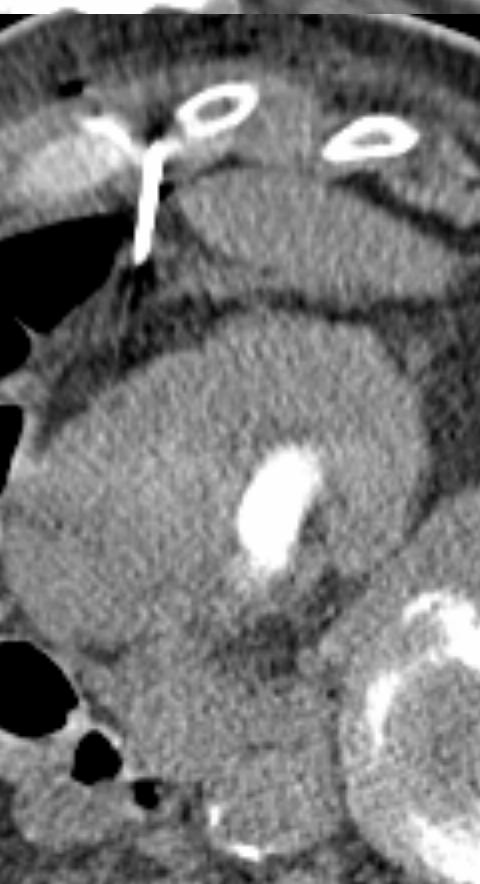
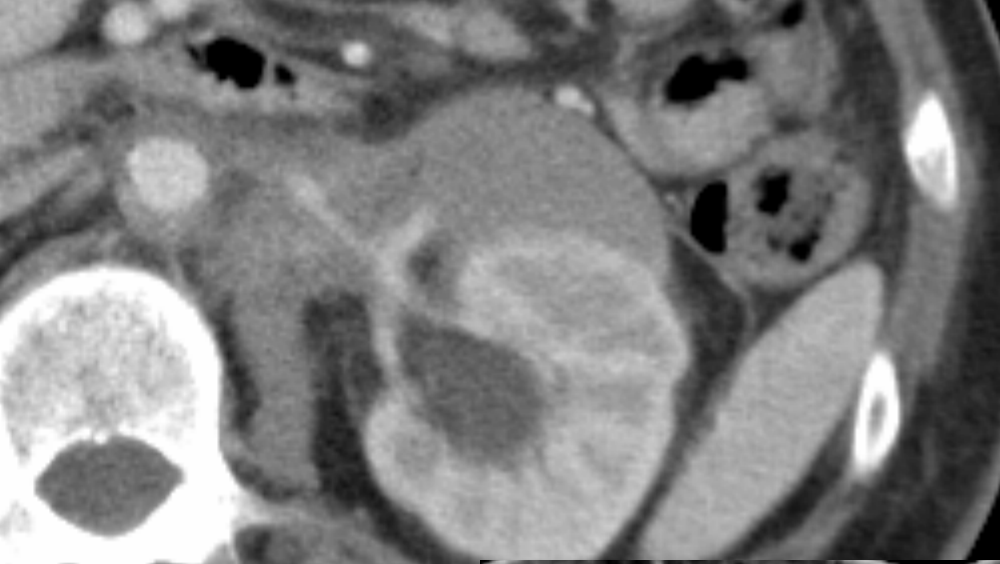
# CT Best technique for Retroperitoneum Bx LN between aorta and cava

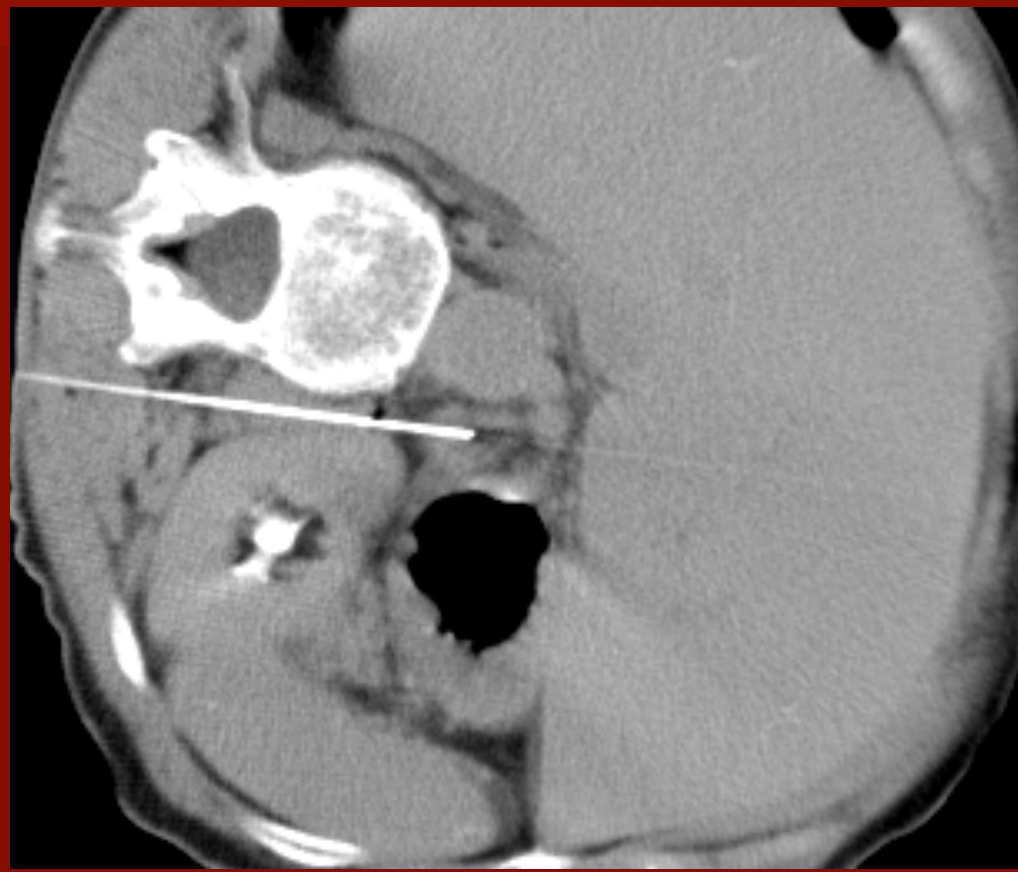
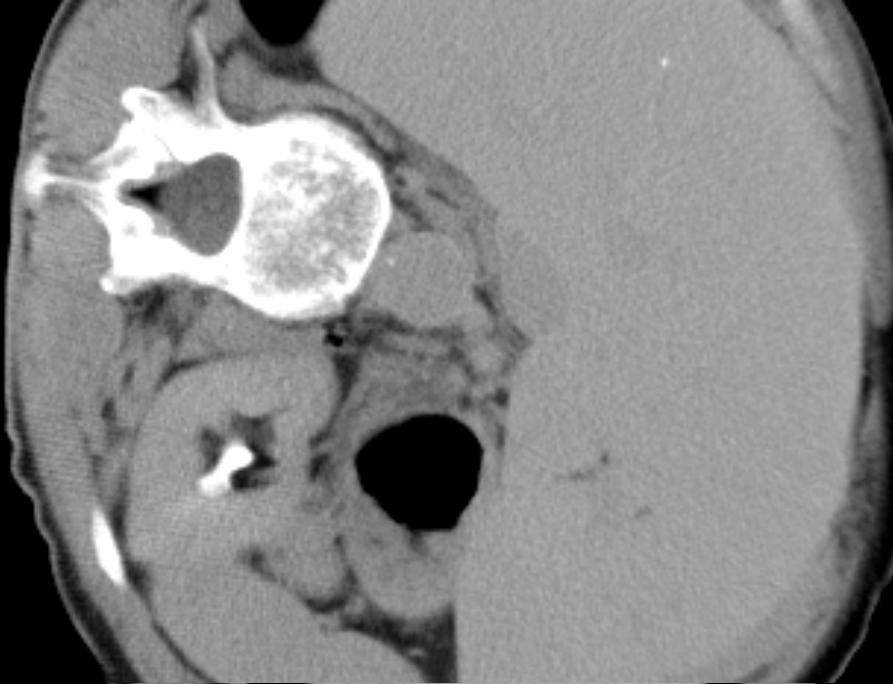


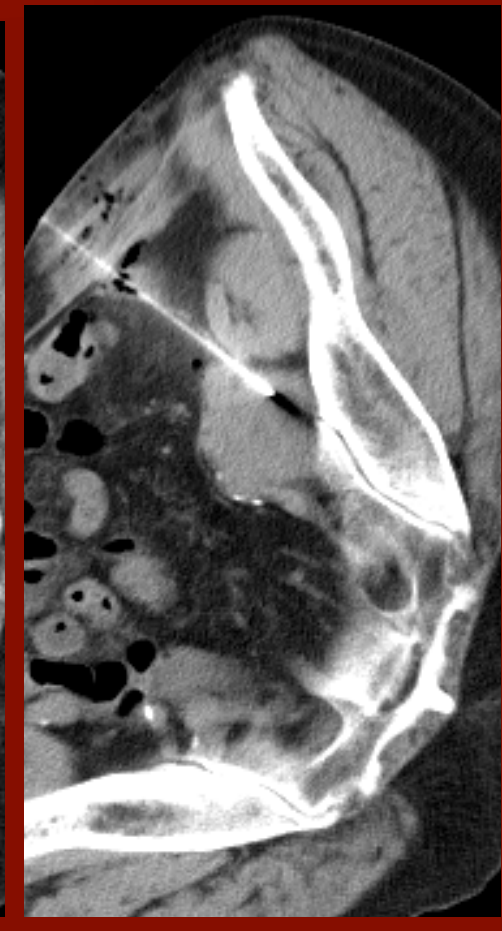
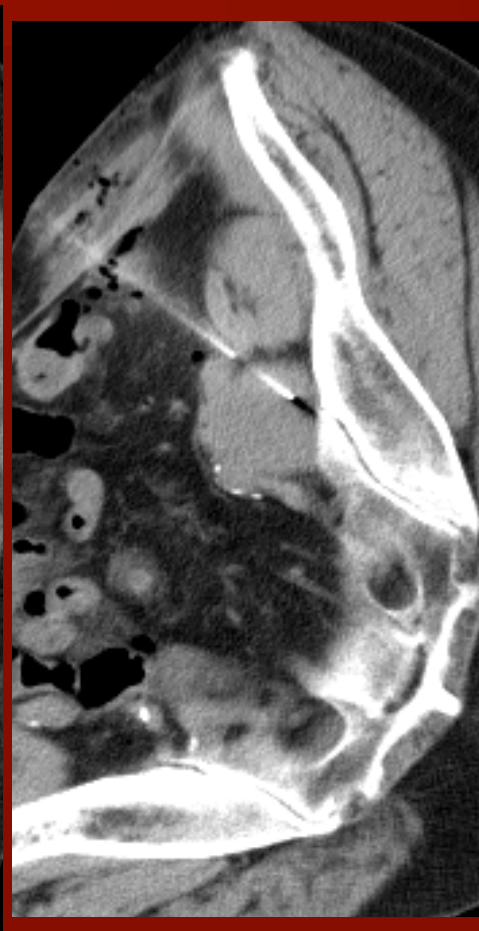
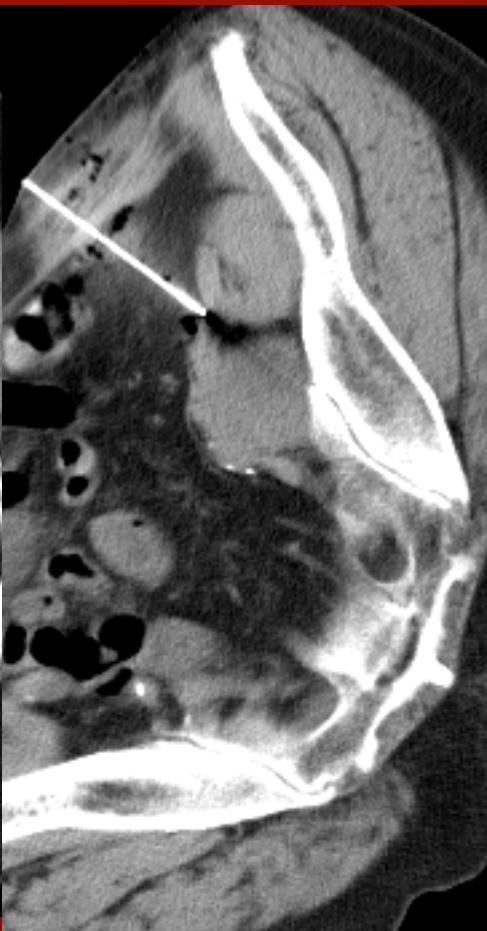
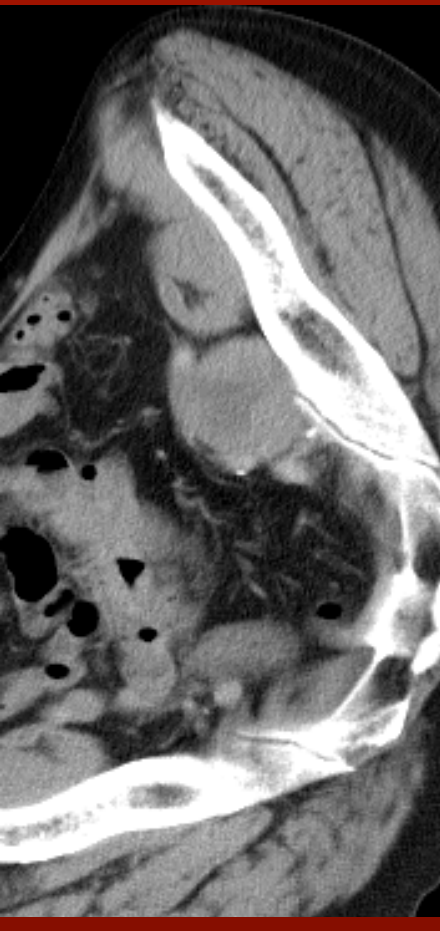
# Paracaval LN biopsy, to avoid unseen vessel









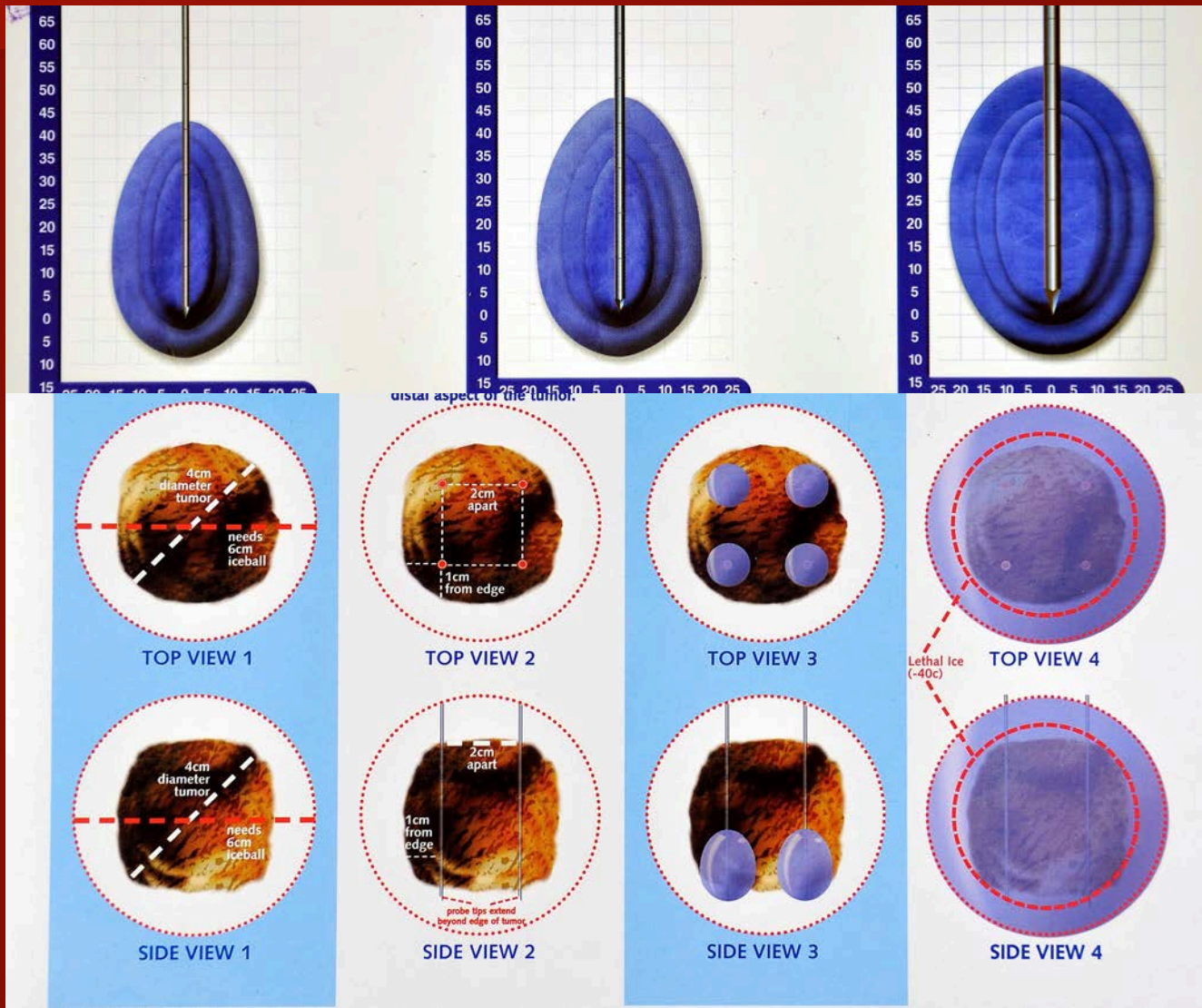




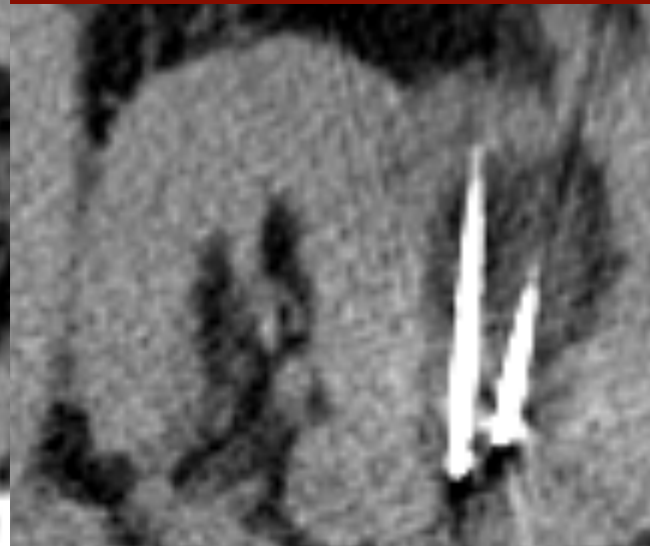
# Method and Advantages of cryo

- Insertion of probes, selected to optimize Rx plan
- Plan should include mass and 1cm peripheral area, accounting for potential heat sinks from vessels
- Standard protocol is two freeze cycles and two thaw cycles, 10 min freeze followed by 8-10 min thaw, refreeze 10 min
- Modified protocol, limit time or percent freeze depending upon ice ball, multiple freezes..each freeze increases iceball size
- Clear advantage of cryo over heat is clear visibility of iceball due to tissue changes.

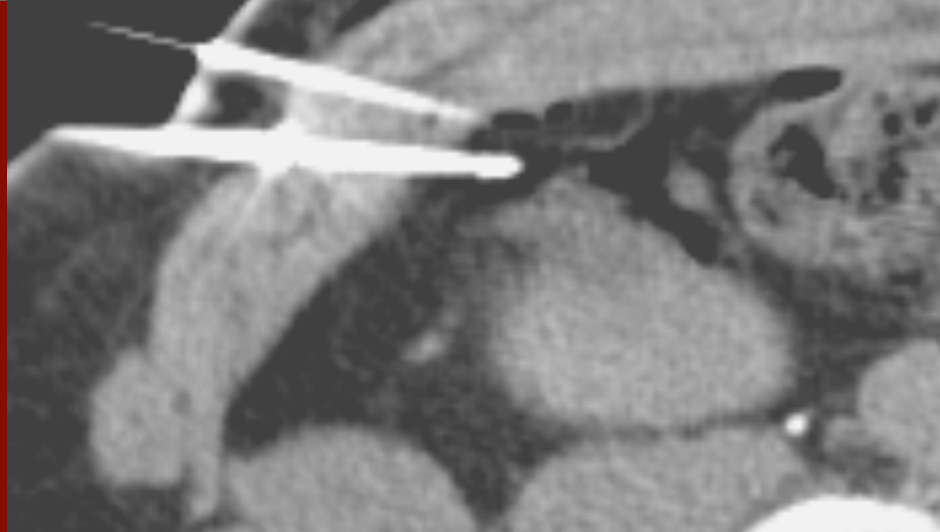
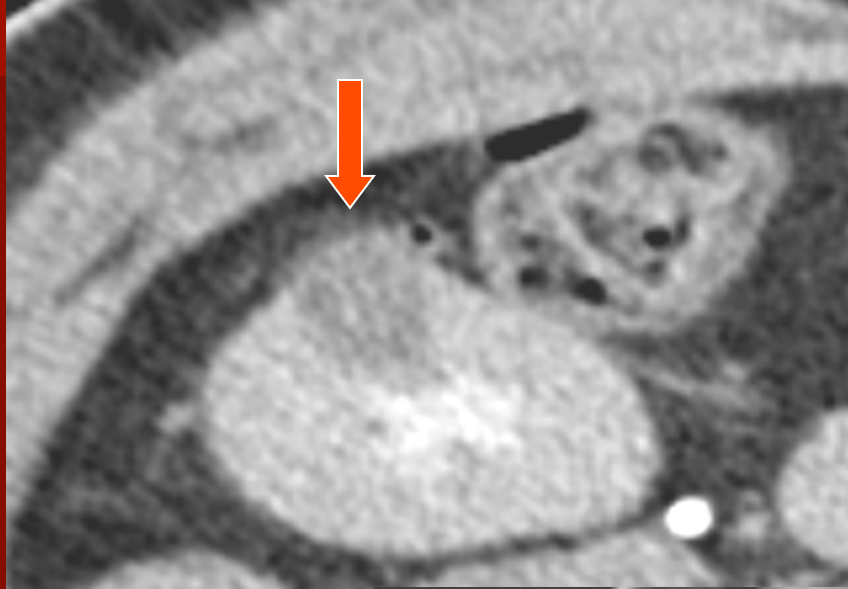
# Various probes create variable iceball: Challenge match tumor



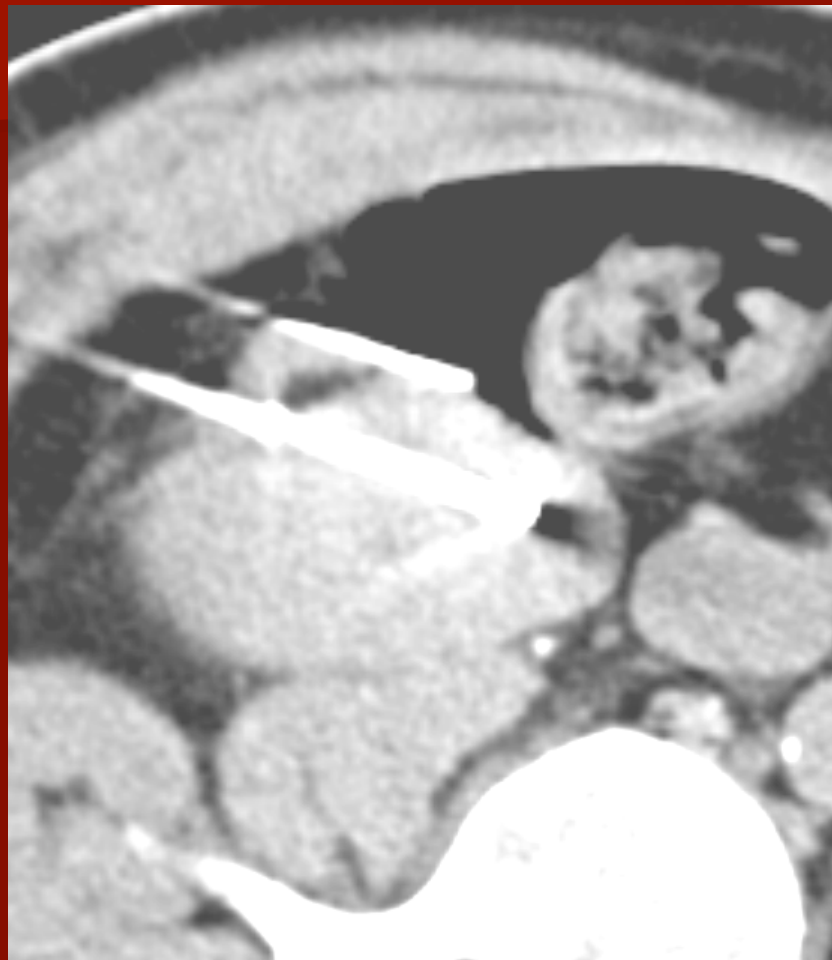
CT best for Thermal ablations.  
RF prongs or cryoprobe/ice ball well  
seen. Permits adjustments. Detects  
Issues. MRI expensive, US shadows



# Close position of cecum and appendix needs injection of fluid/air

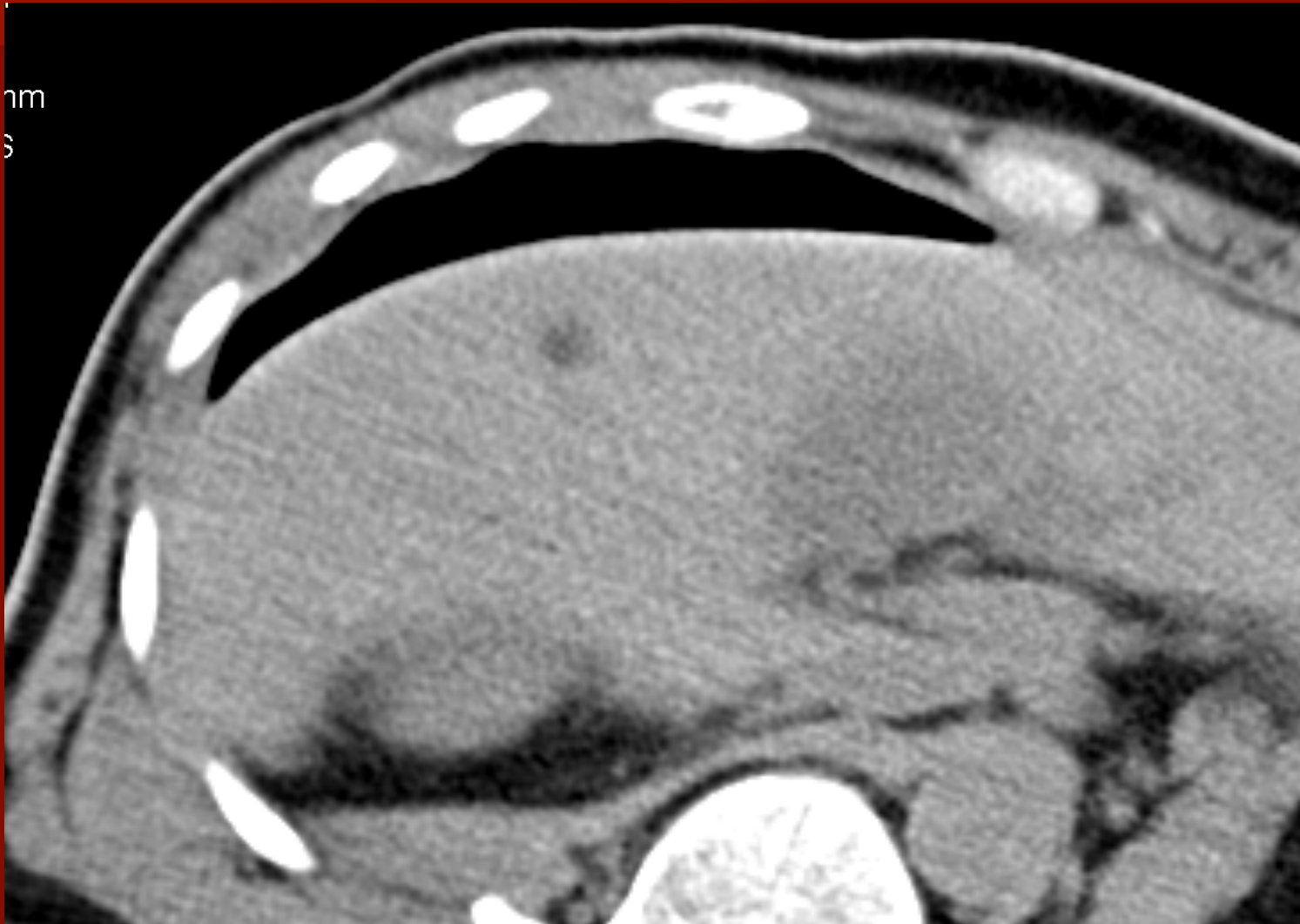




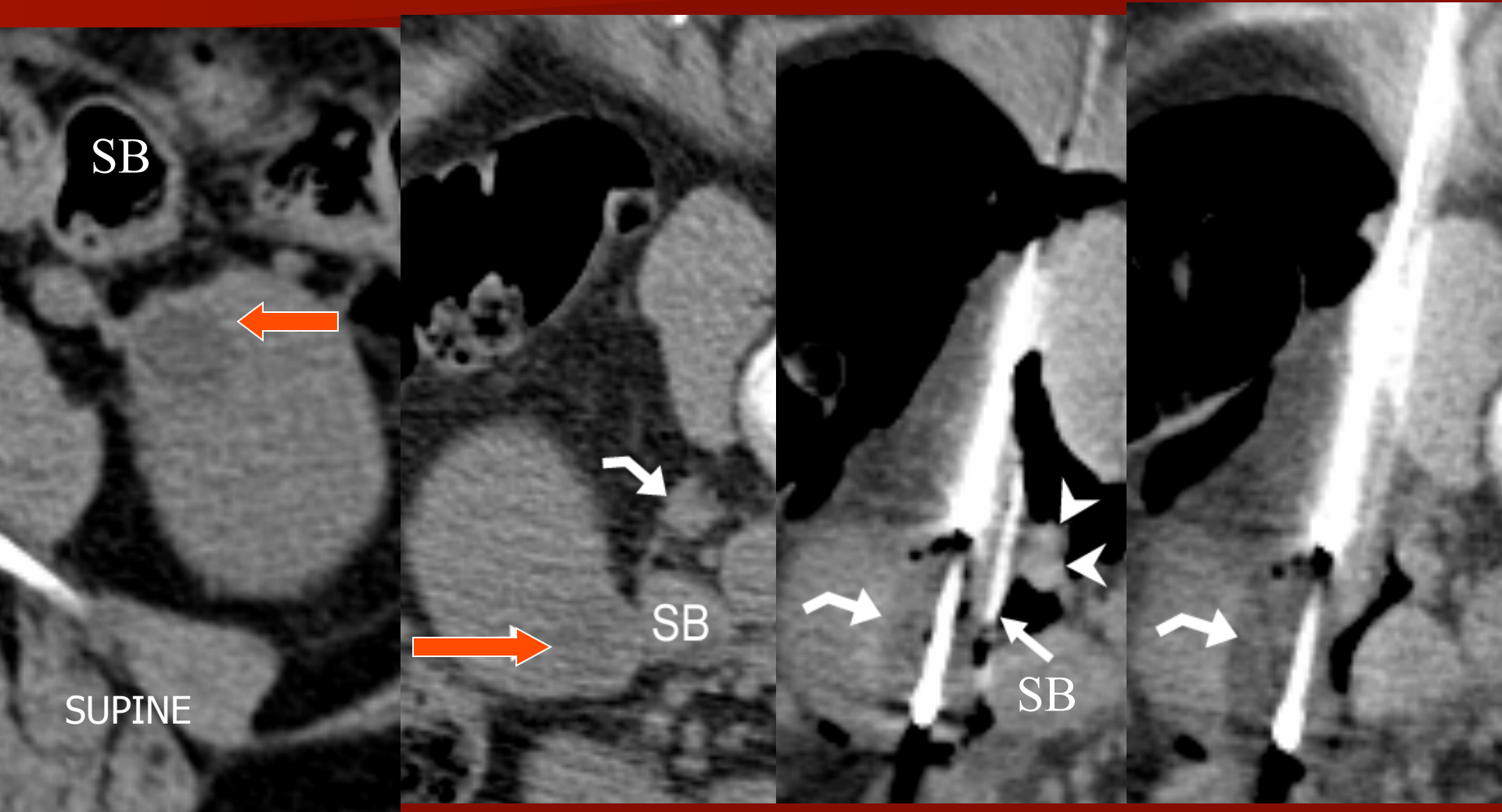




Problem of fluid or air is that it dissects along tissue planes



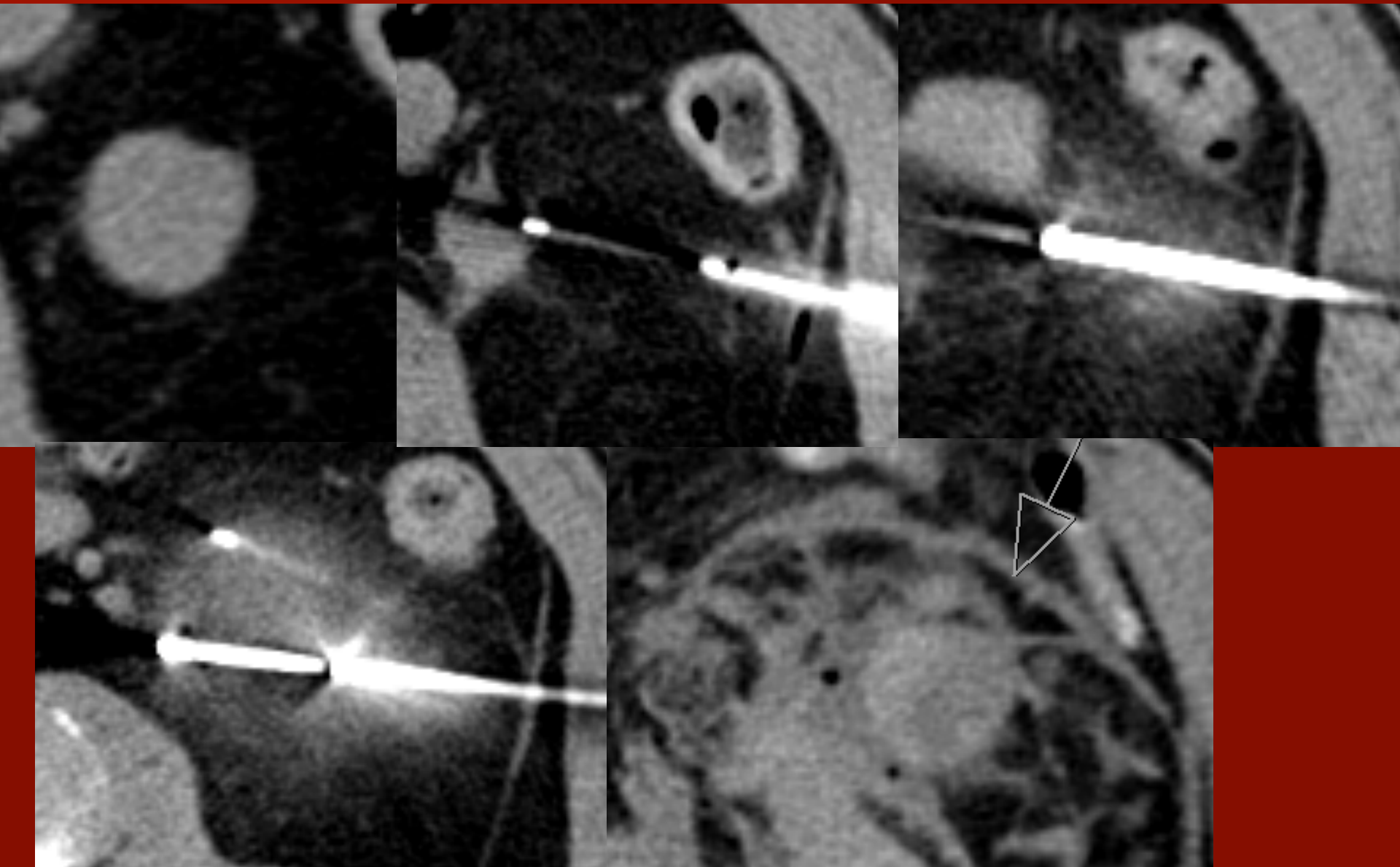
# Air facilitates difficult cases: protect imv & gonadal veins and bowel



Air outlines veins in lower retroperitoneum protecting them from freezing

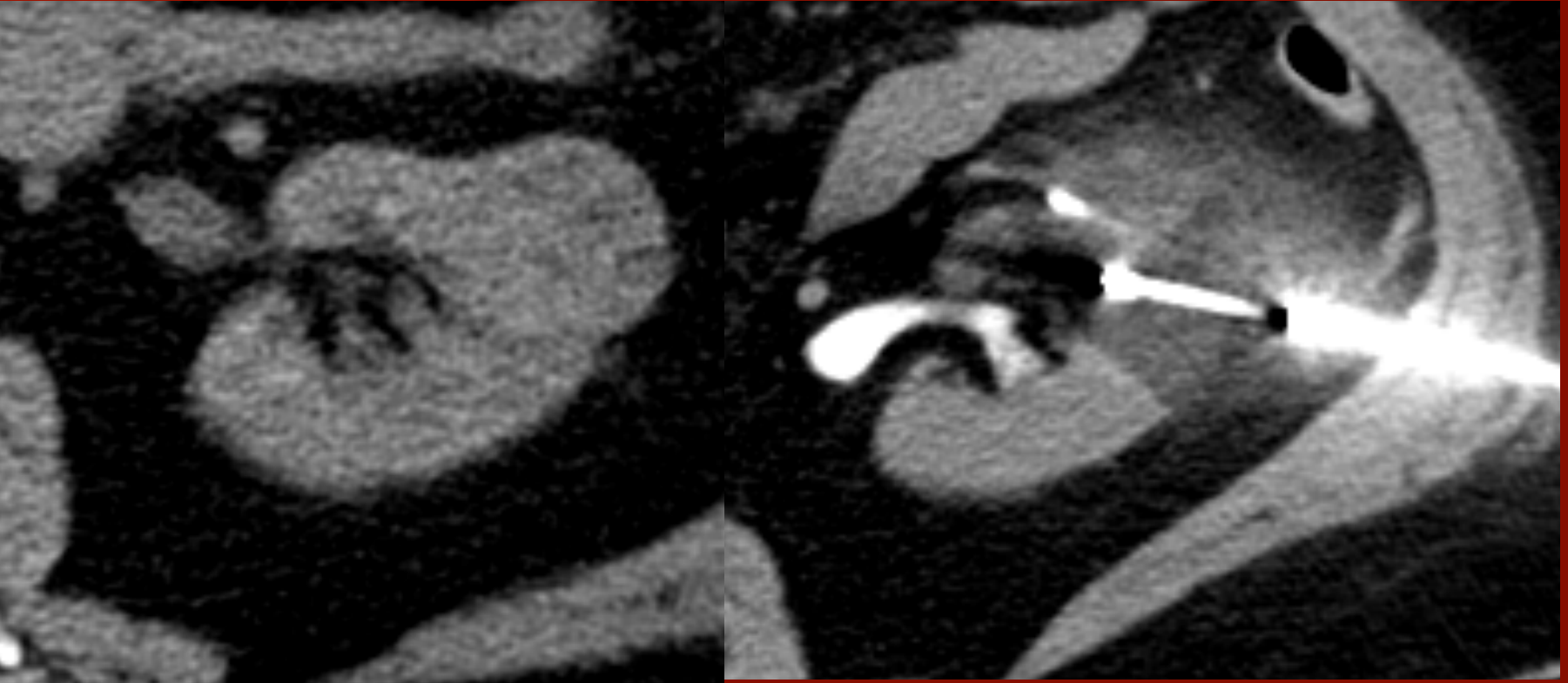


# Extra treatment bleeding/?seeding

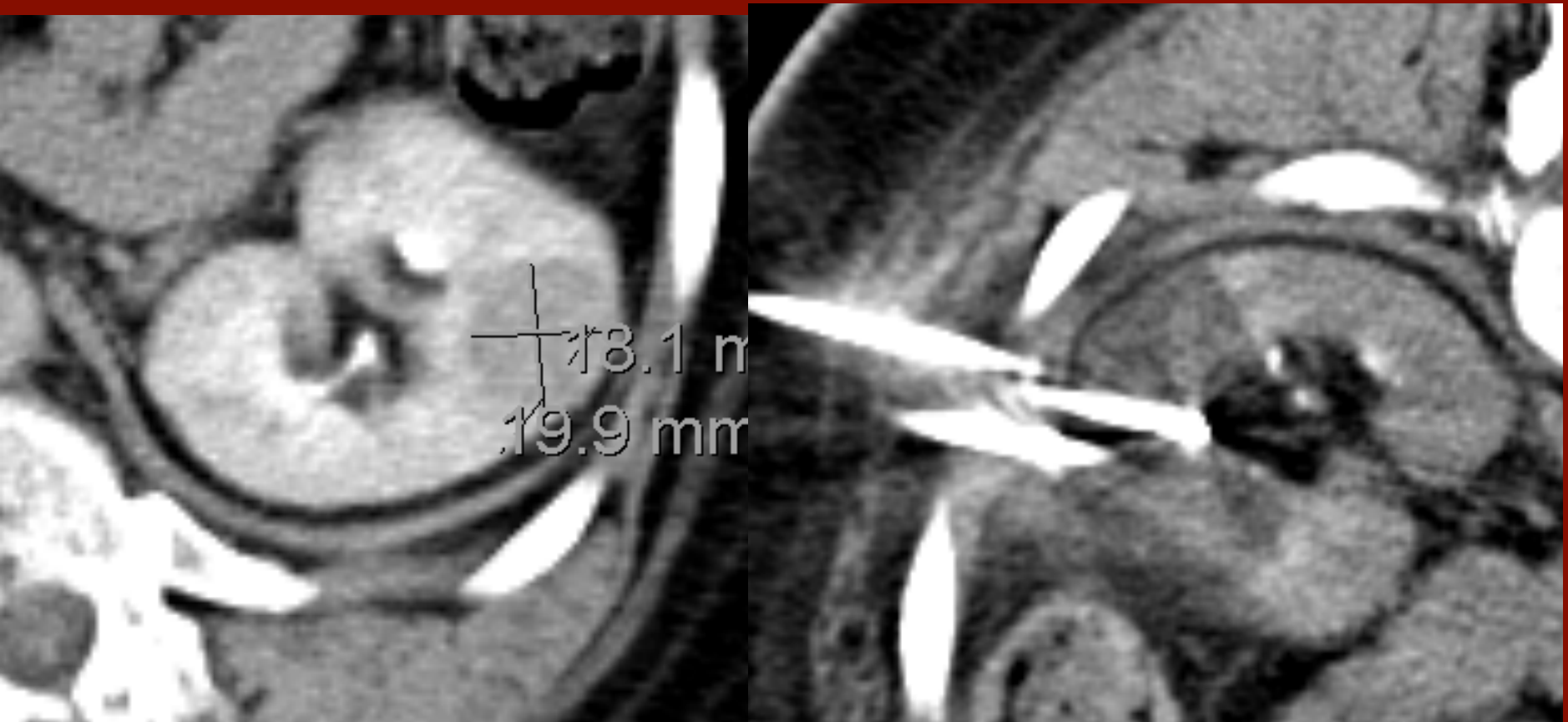




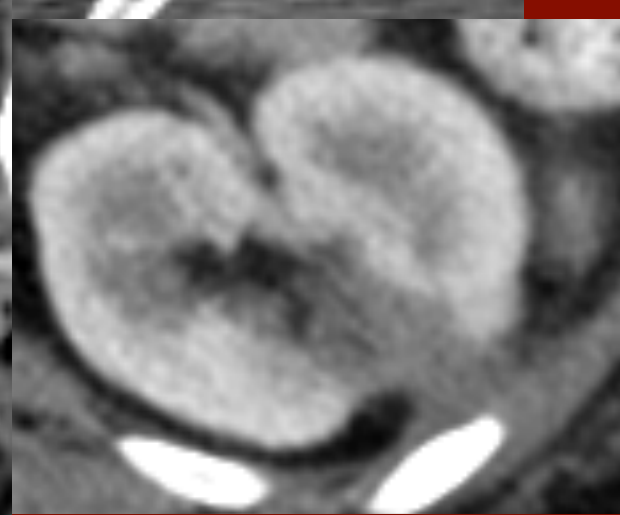
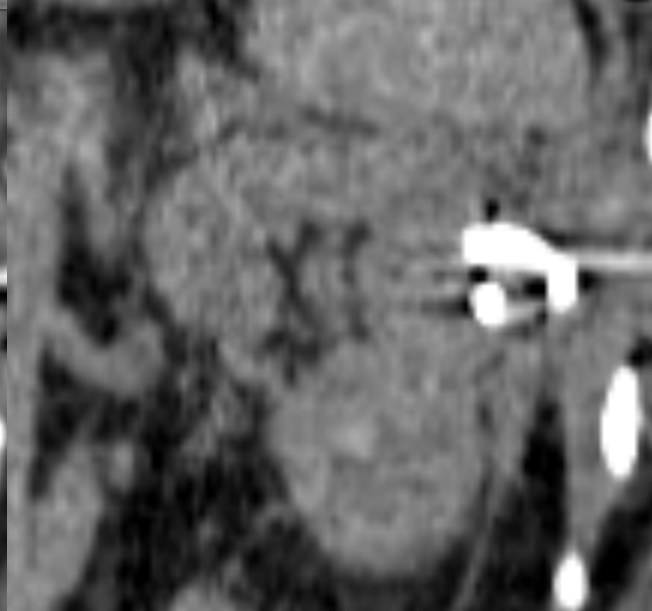
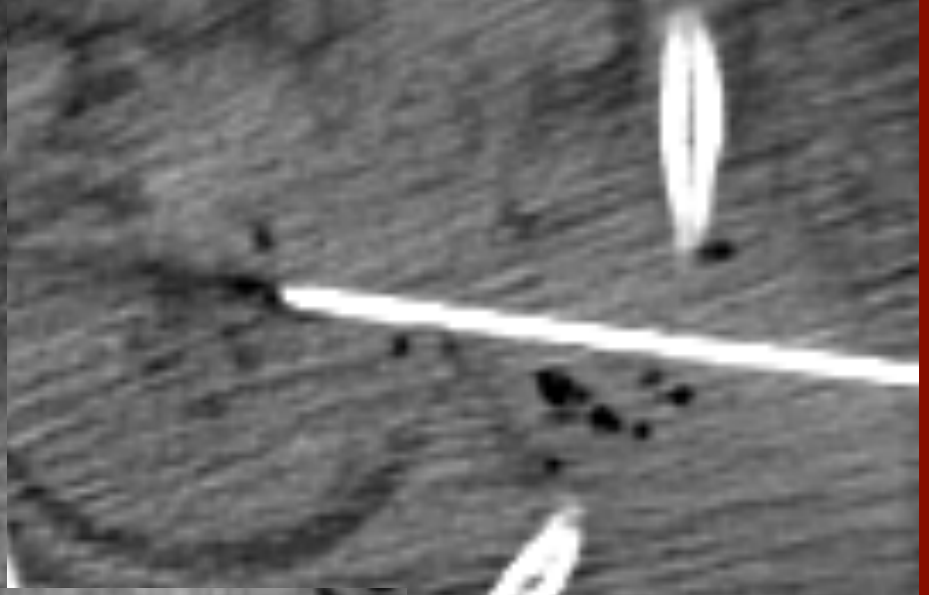
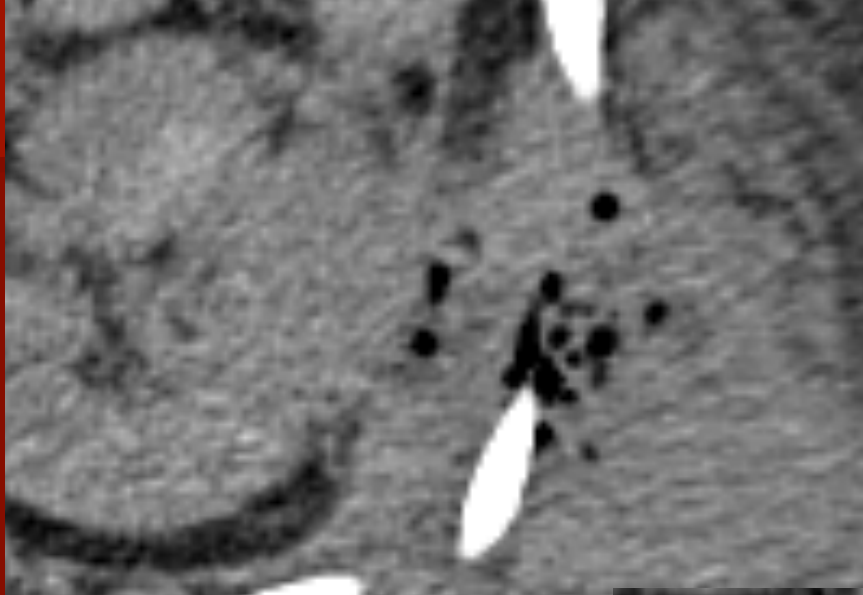
Try to avoid calyx if possible but secondary concern



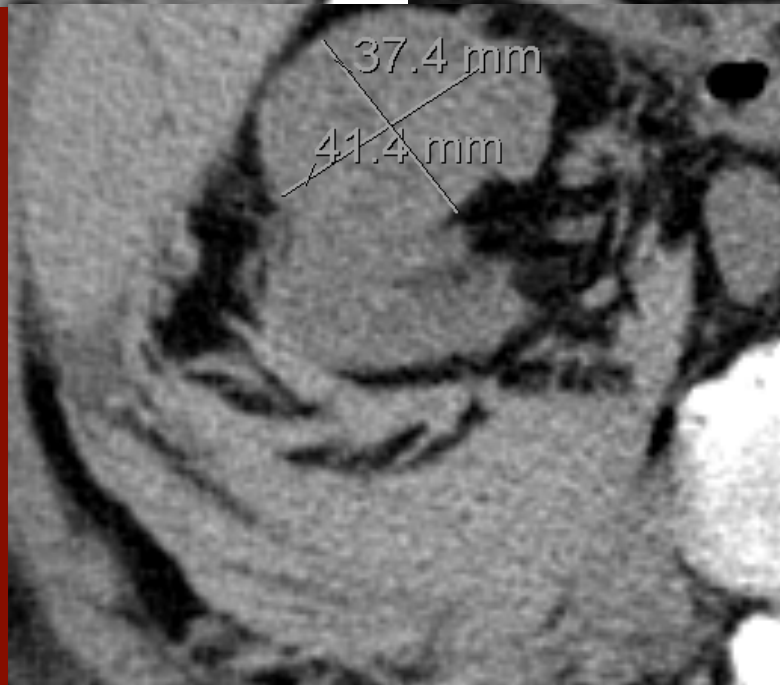
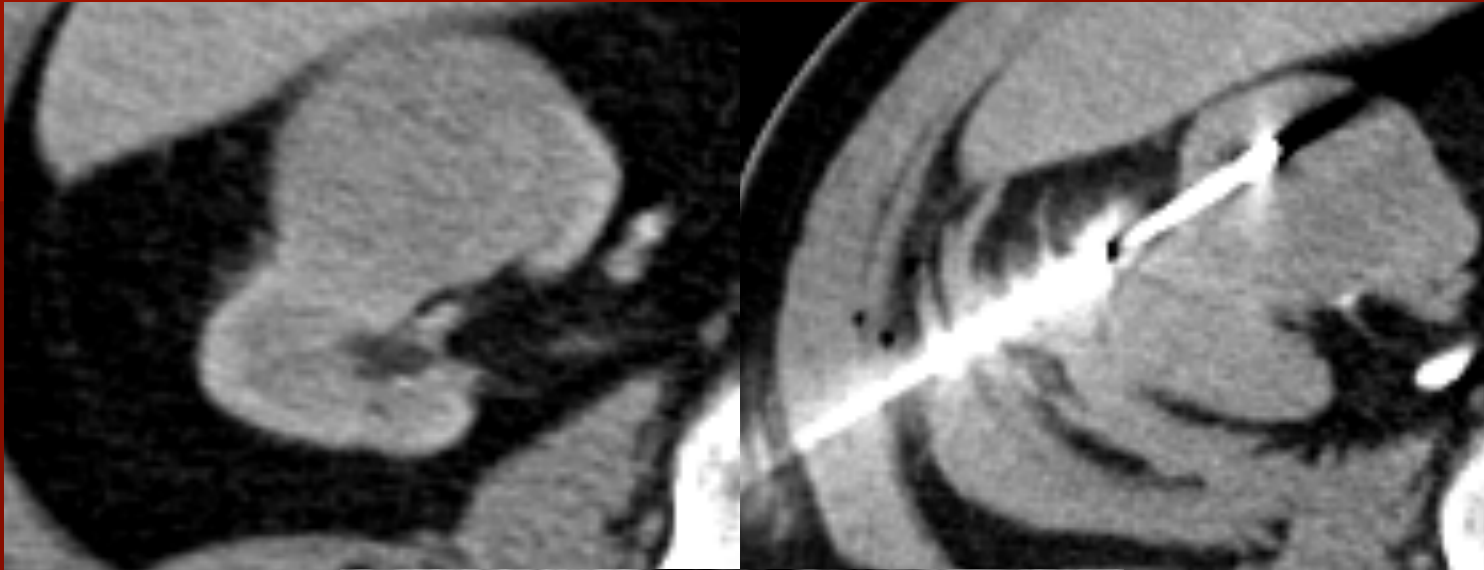
Mantra-cannot freeze calyces is not true. Should try to avoid calyx but secondary to curative Rx.



# ABSCCESS formation :can be damaged,drained, healed



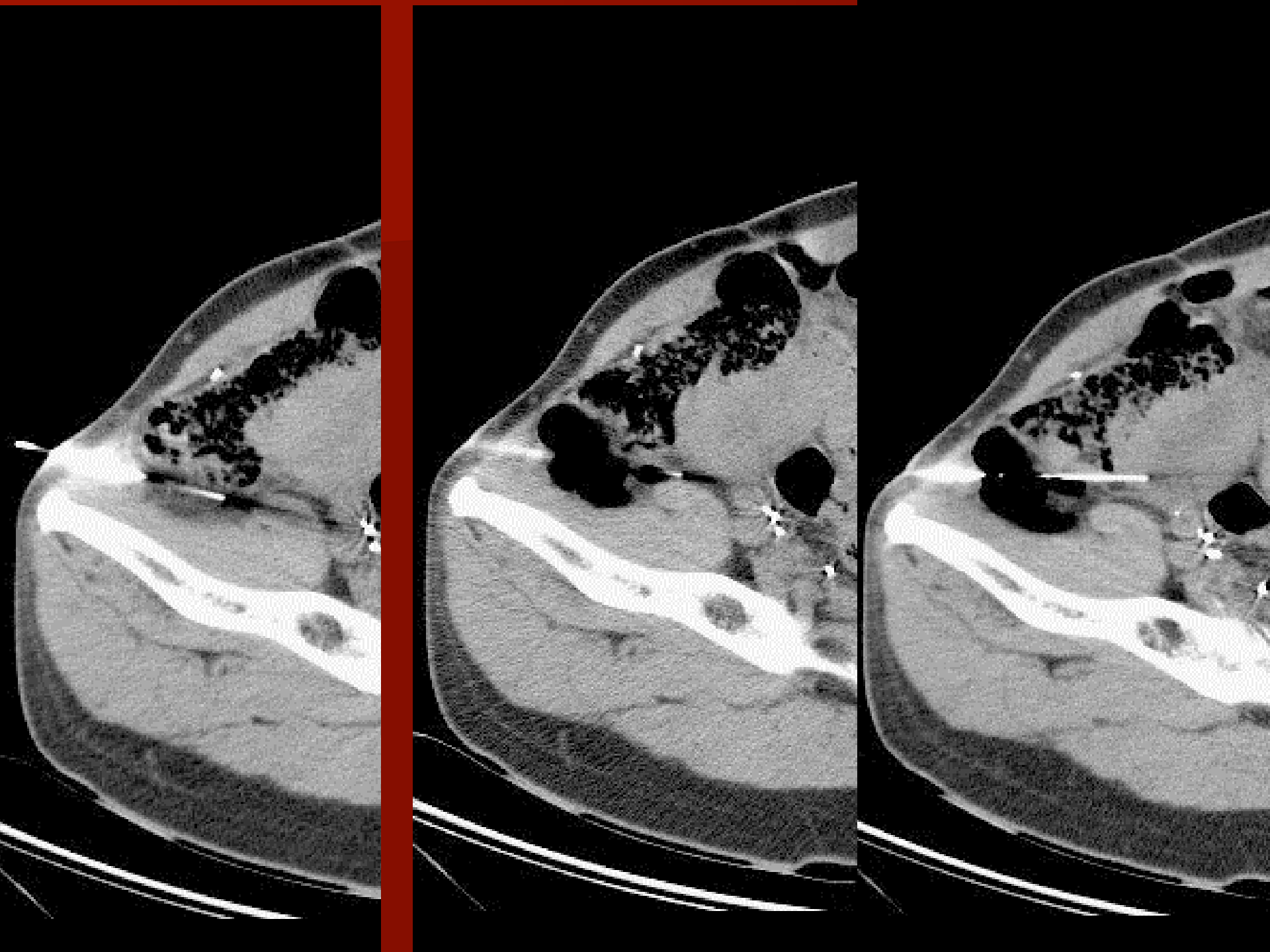
# Procedures goes bad-stop, reschedule



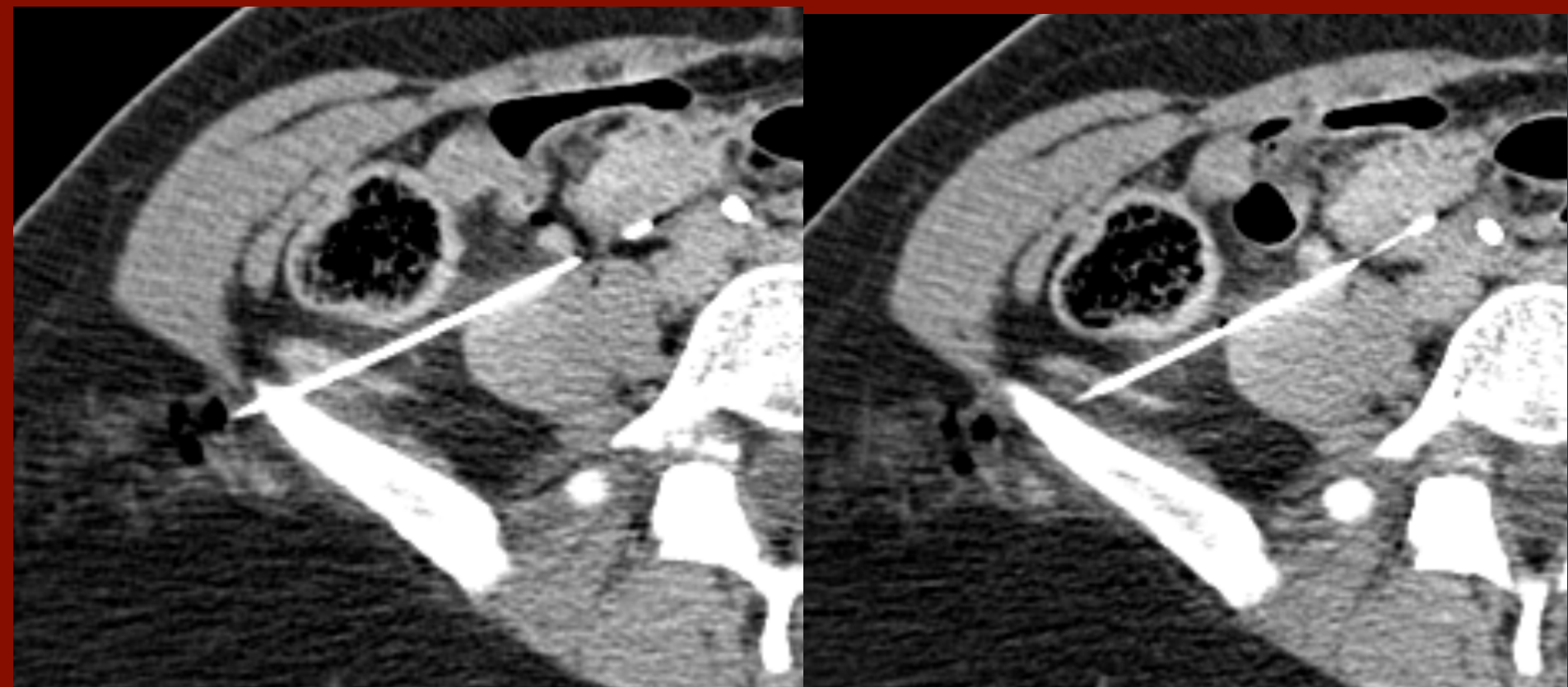


# Movement of organs or planes by injection of gas or fluid

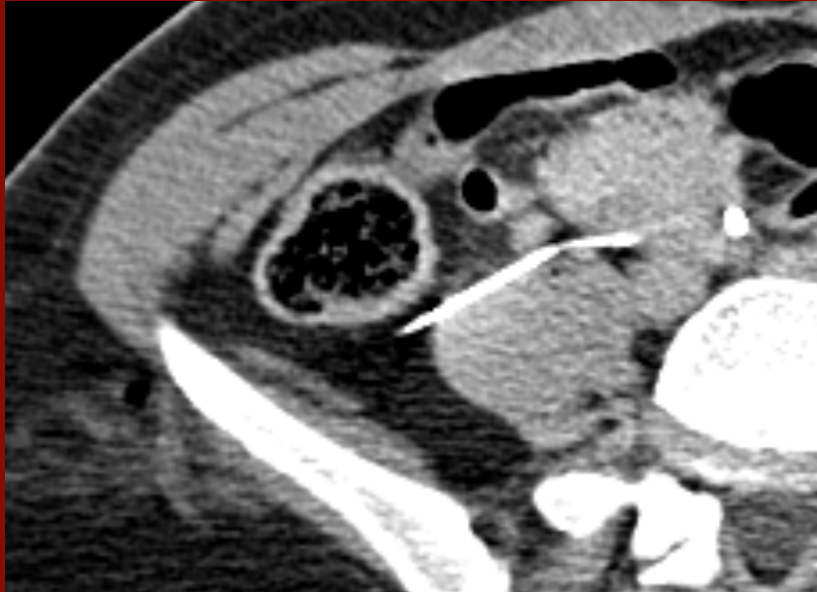
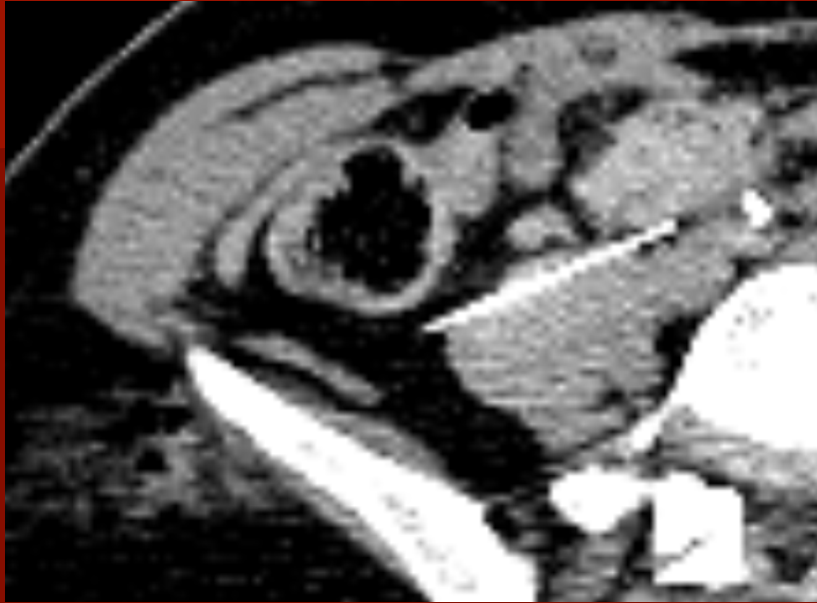
- CO<sub>2</sub> or air will effectively push bowel out of pathway but does not work with solid organs because they are heavier and the gas compresses
- Saline or sterile water can push planes more easily and some organs, to clear pathway for safe procedure
- Both materials dissect along longitudinal pathway and are absorbed so the leverage is lessened.



In unusual cases the unexpected events can be visualized, helpful to plan or at least know what is happening?

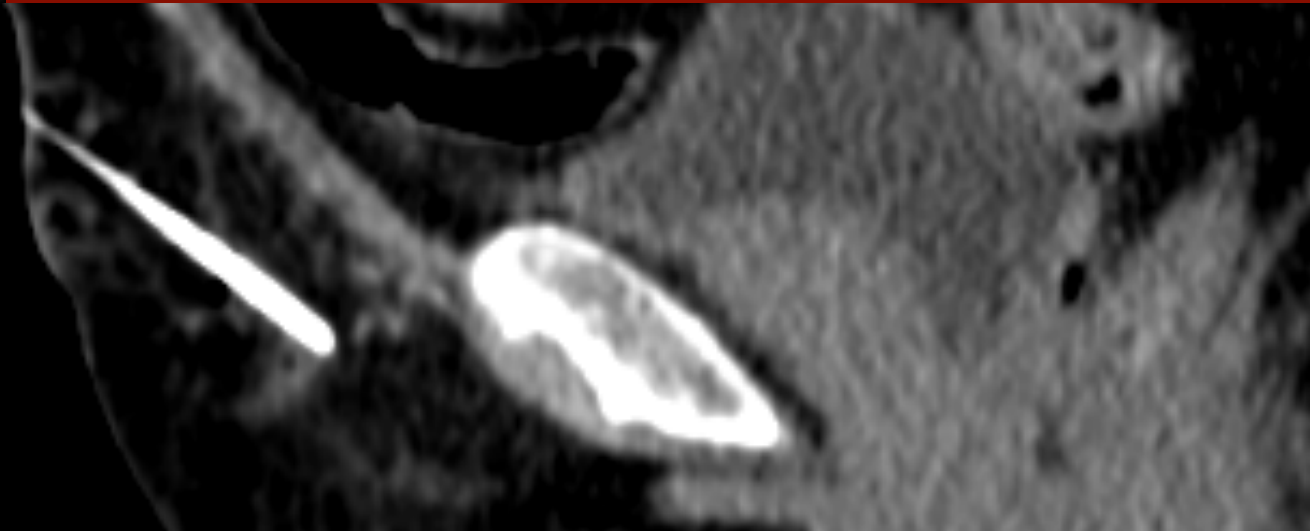


Oh Oh!!! we have a PROBLEM





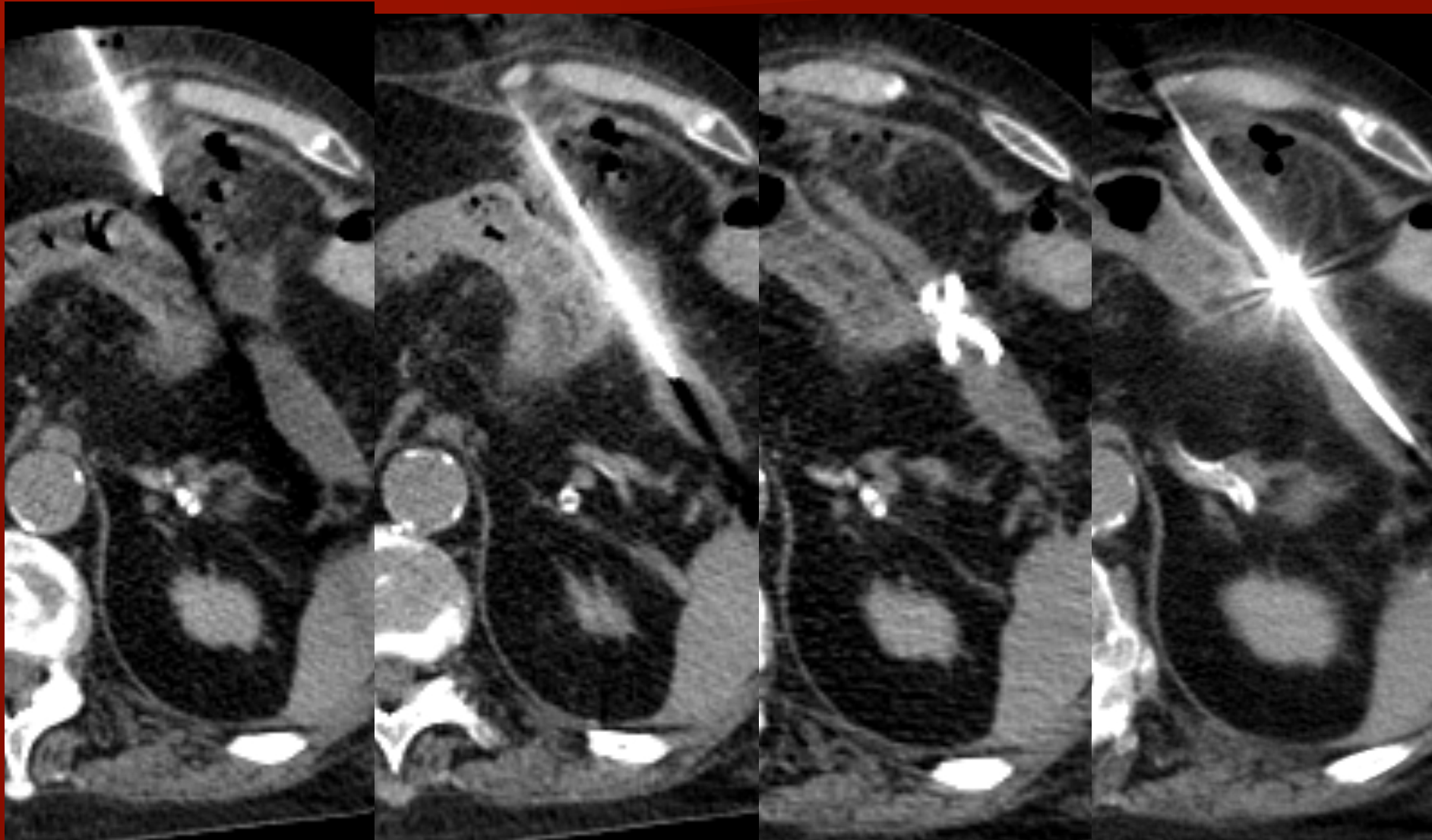
Even in the most unusual case, possible to clearly define, plan, and execute procedure. Mass in front of bladder.



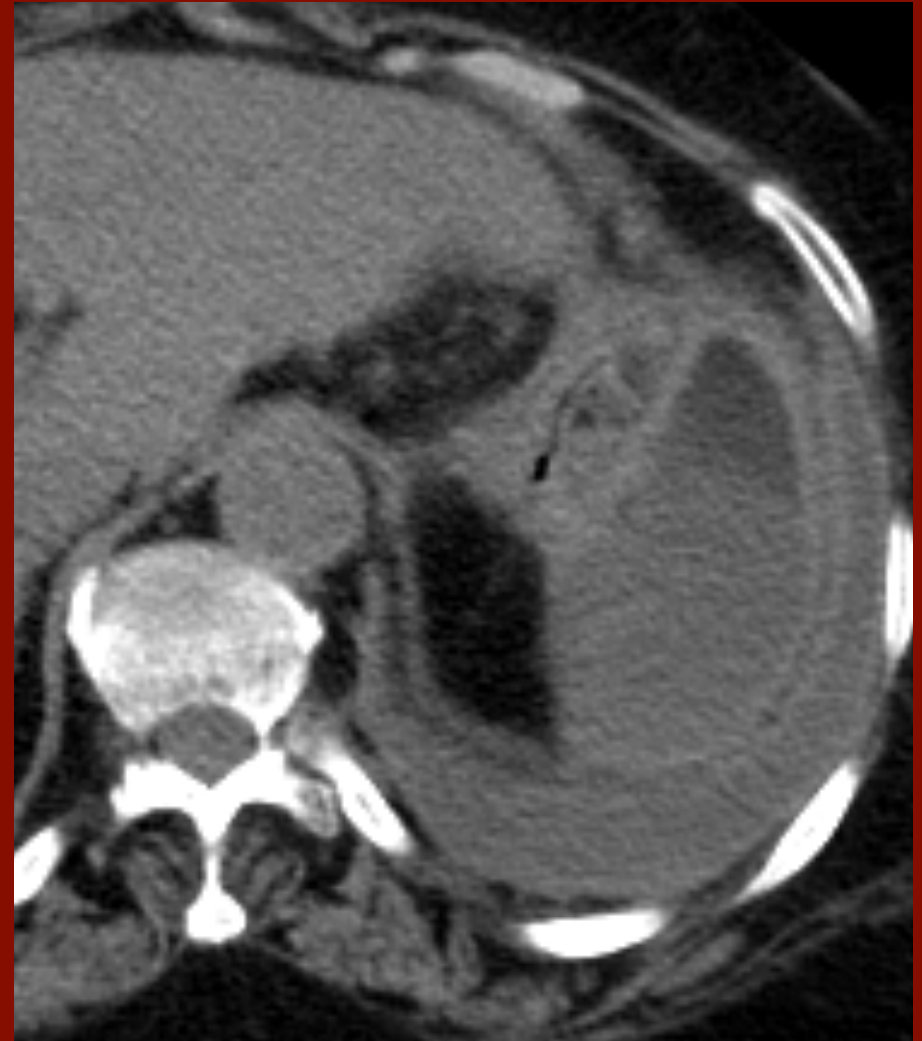
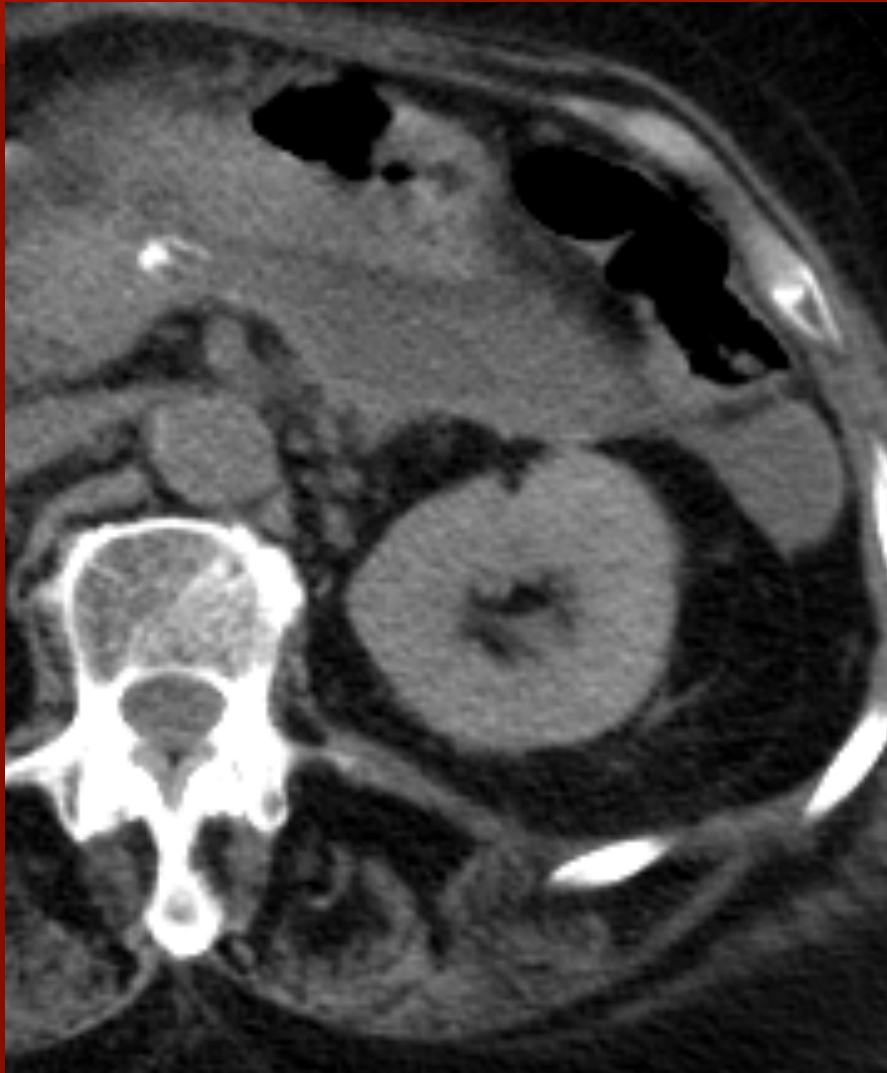
Sequentially adjust needle with 3D  
reconstructions to obtain sample.  
Benign fibroadenoma??????



# Difficult Abscesses

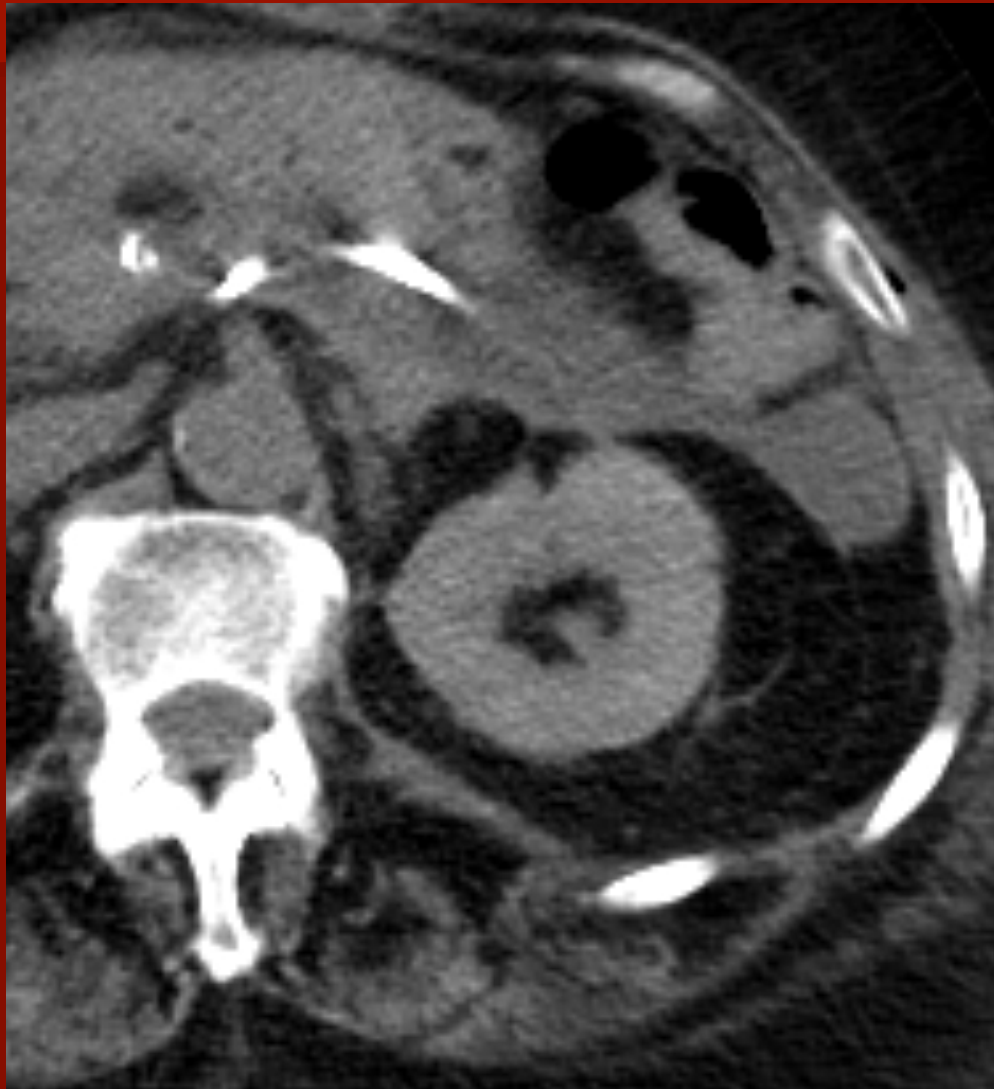


# Complicated, intercommunicating, multicavity abscesses

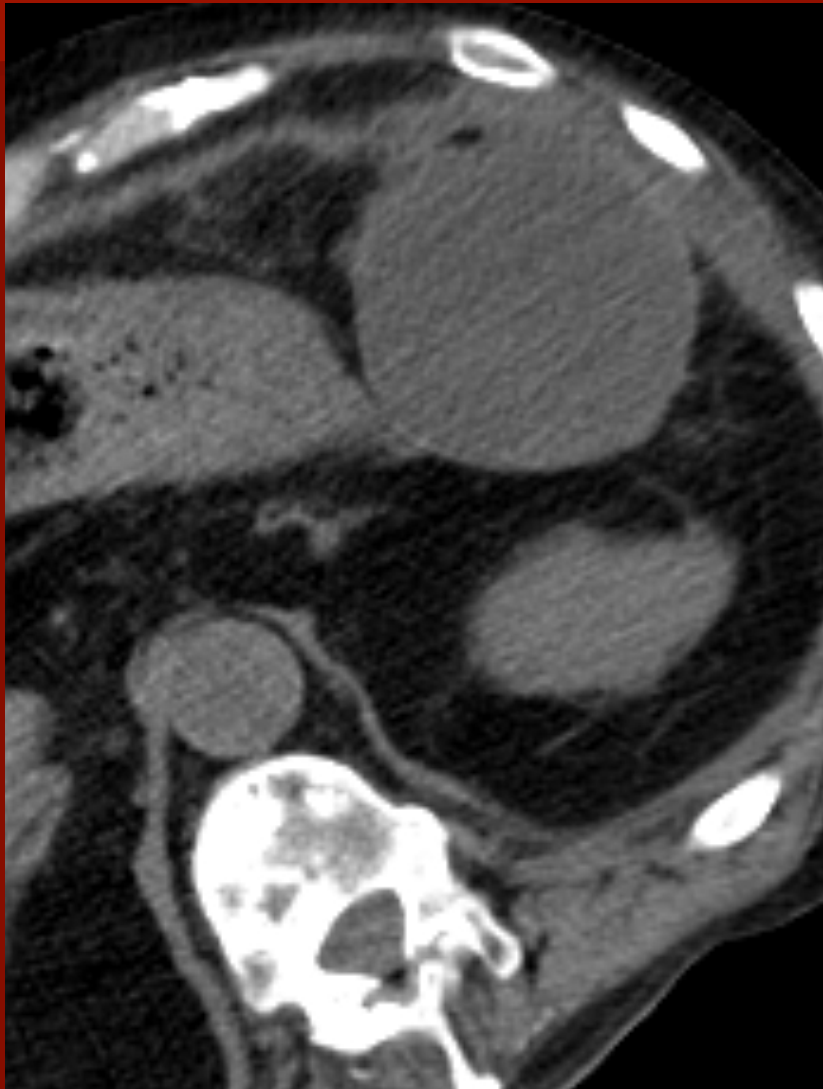




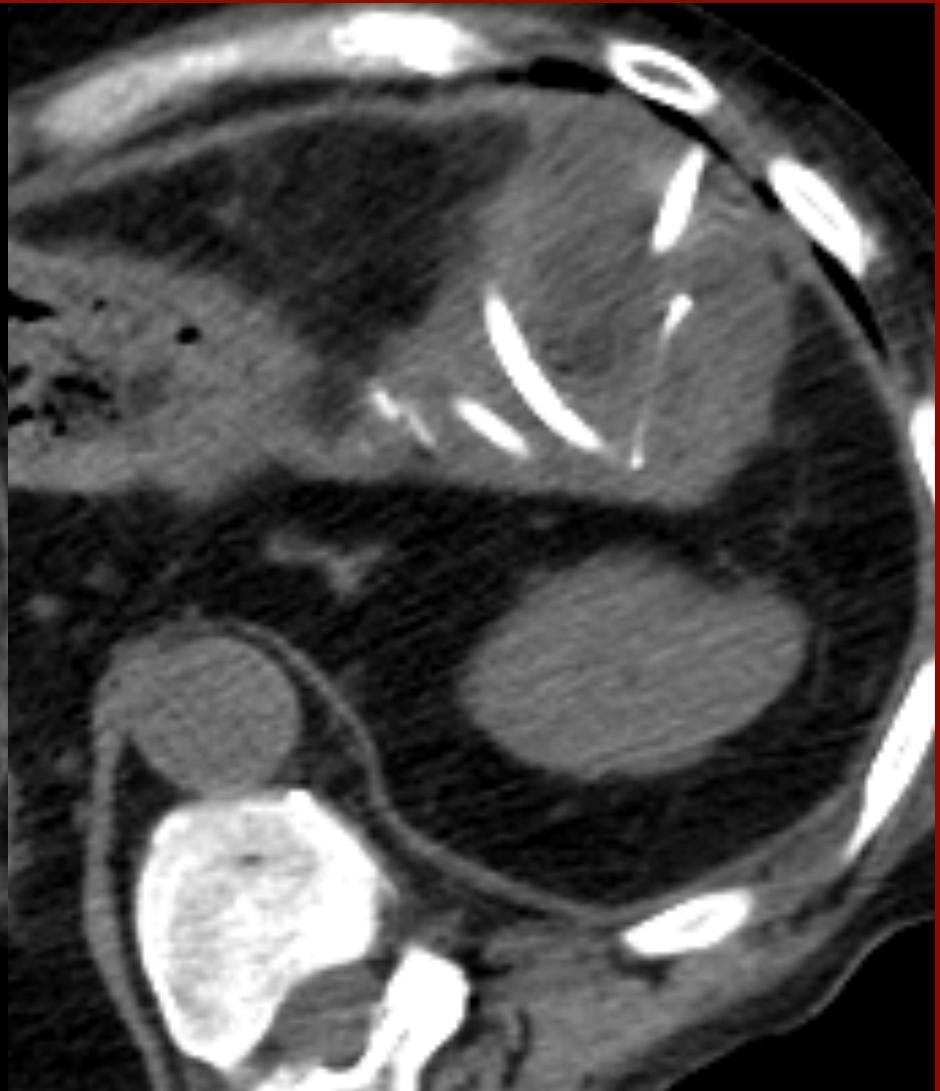
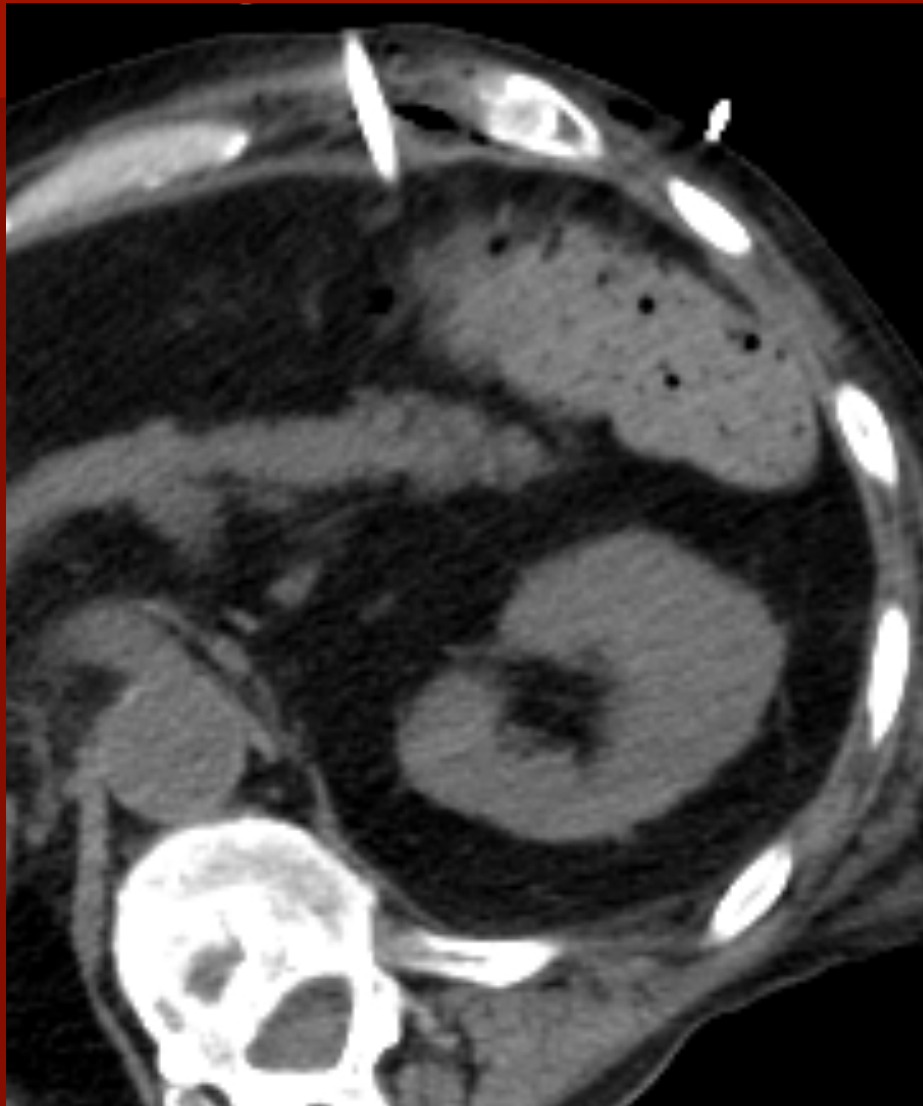
# Complicated, intercommunicating, multicavity abscesses



# Abscess Drainage: Unforeseen Issues Detected & Resolved

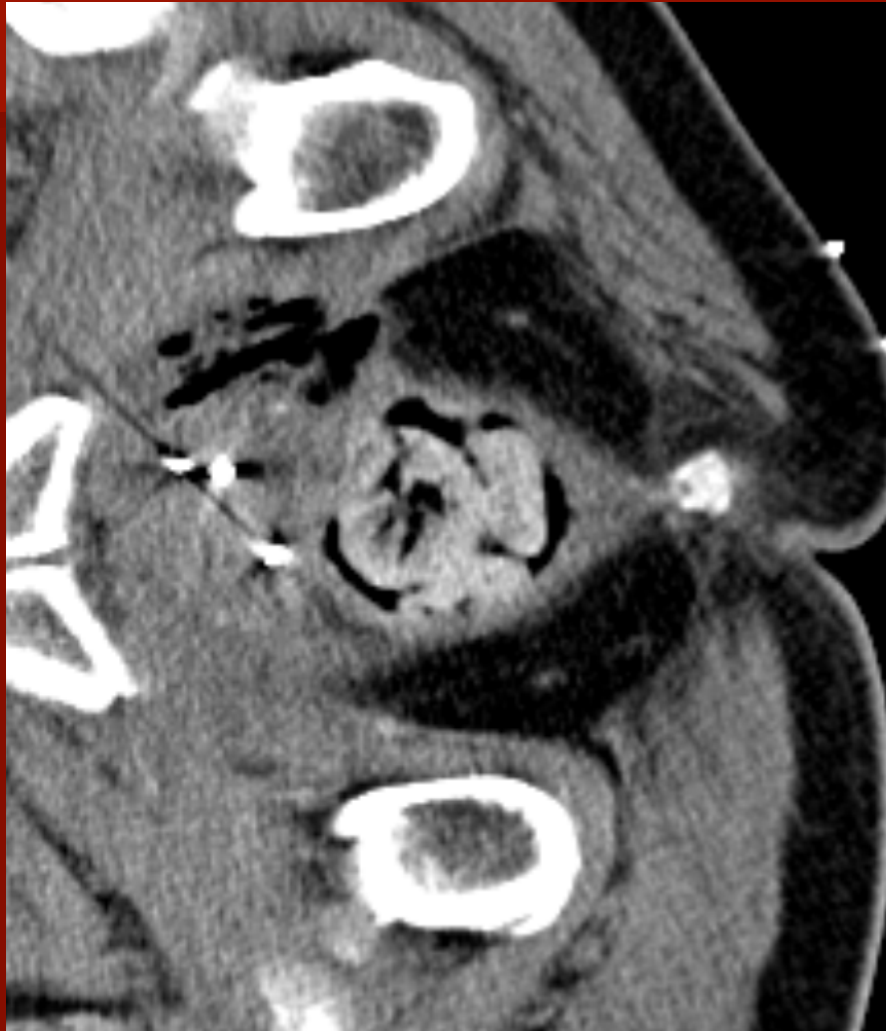


# Issue resolved with 2<sup>nd</sup> Catheter



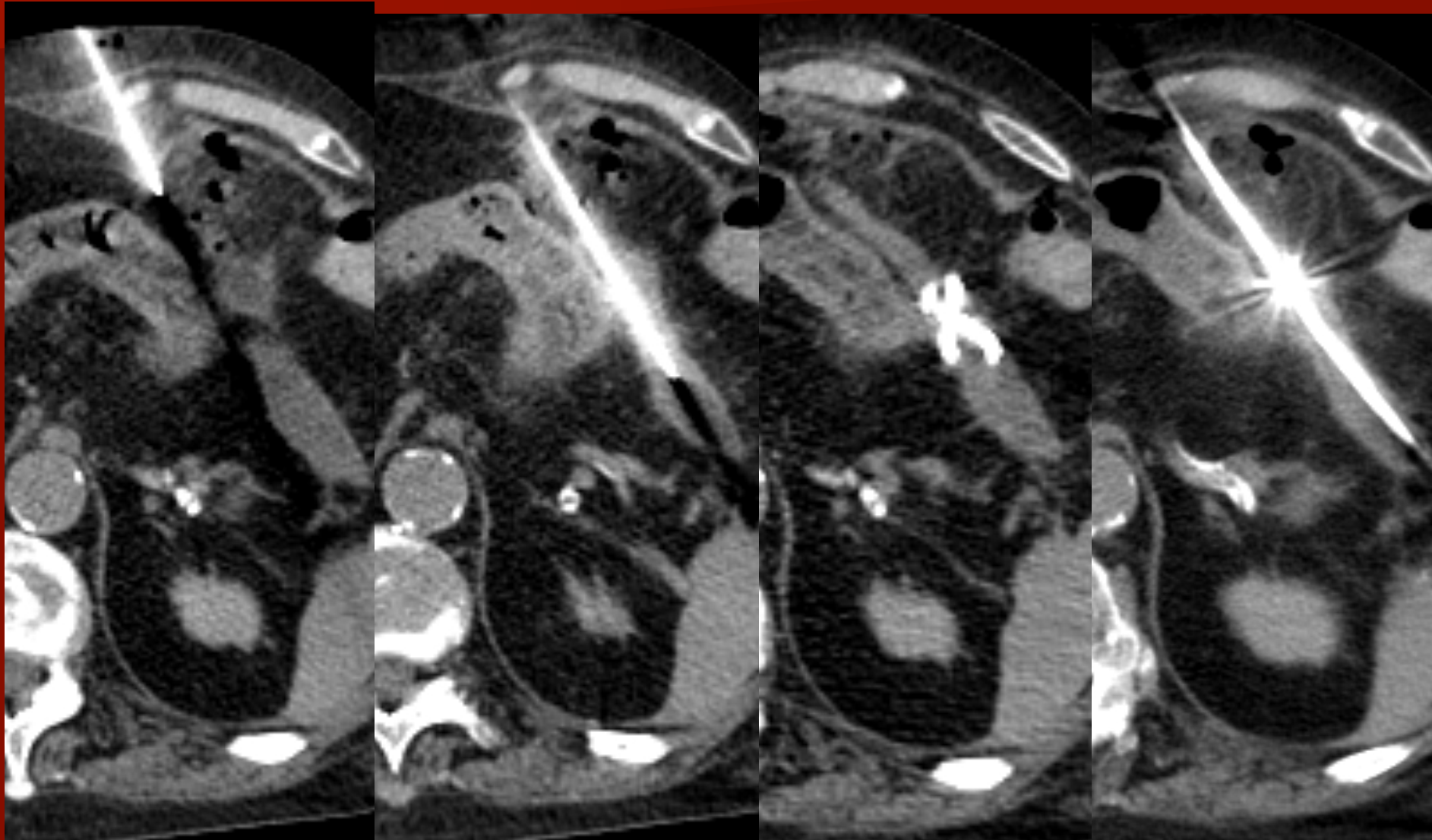


# Prostate Abscess

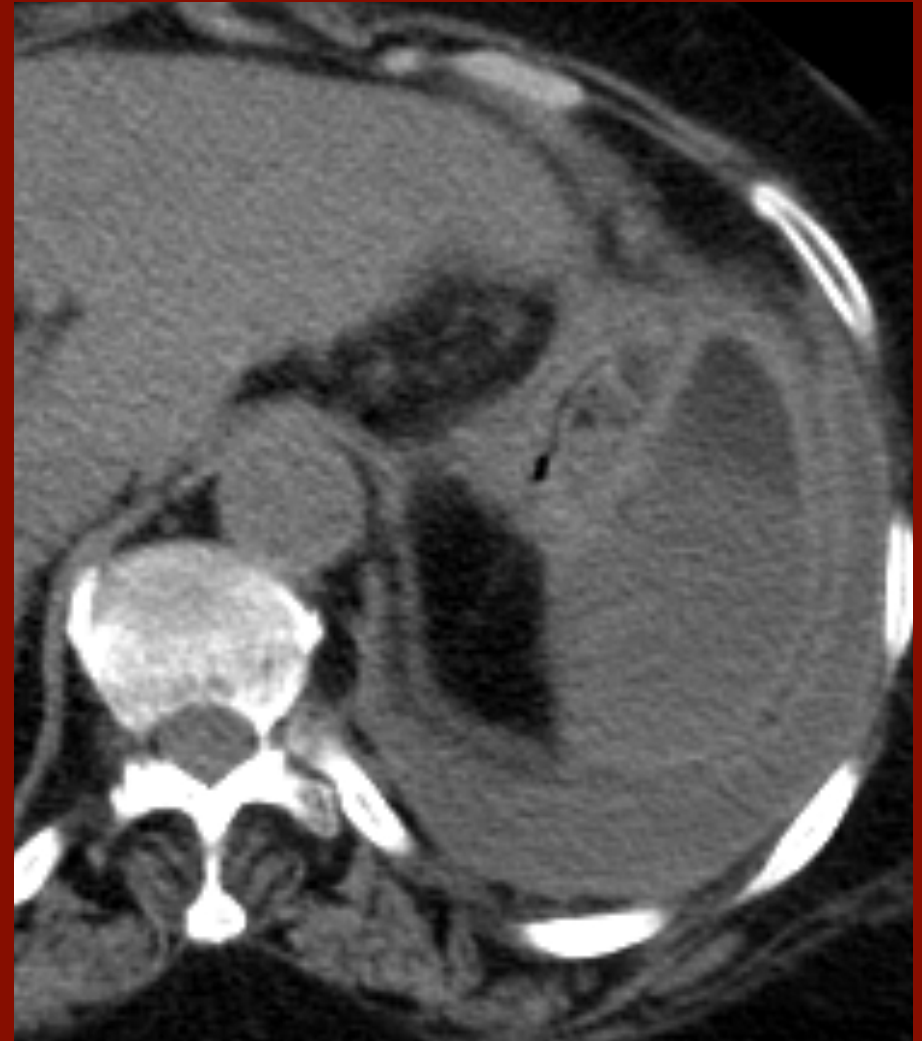
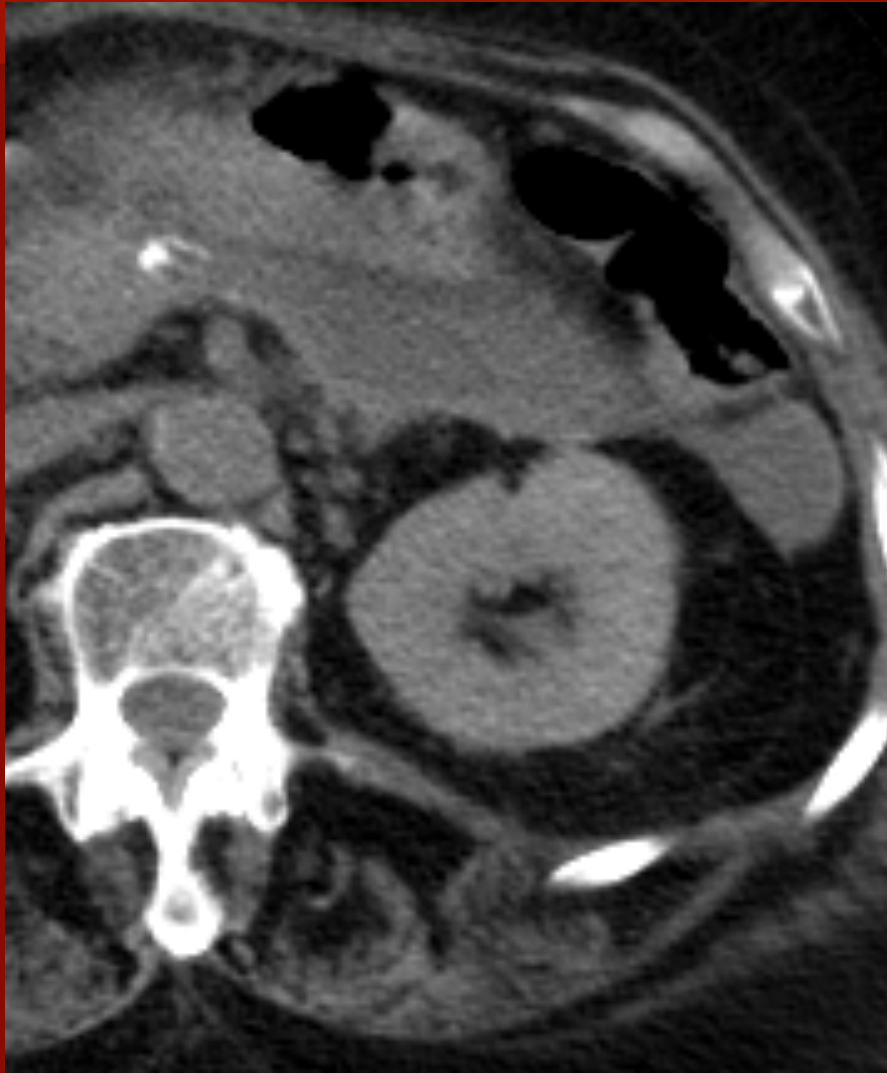




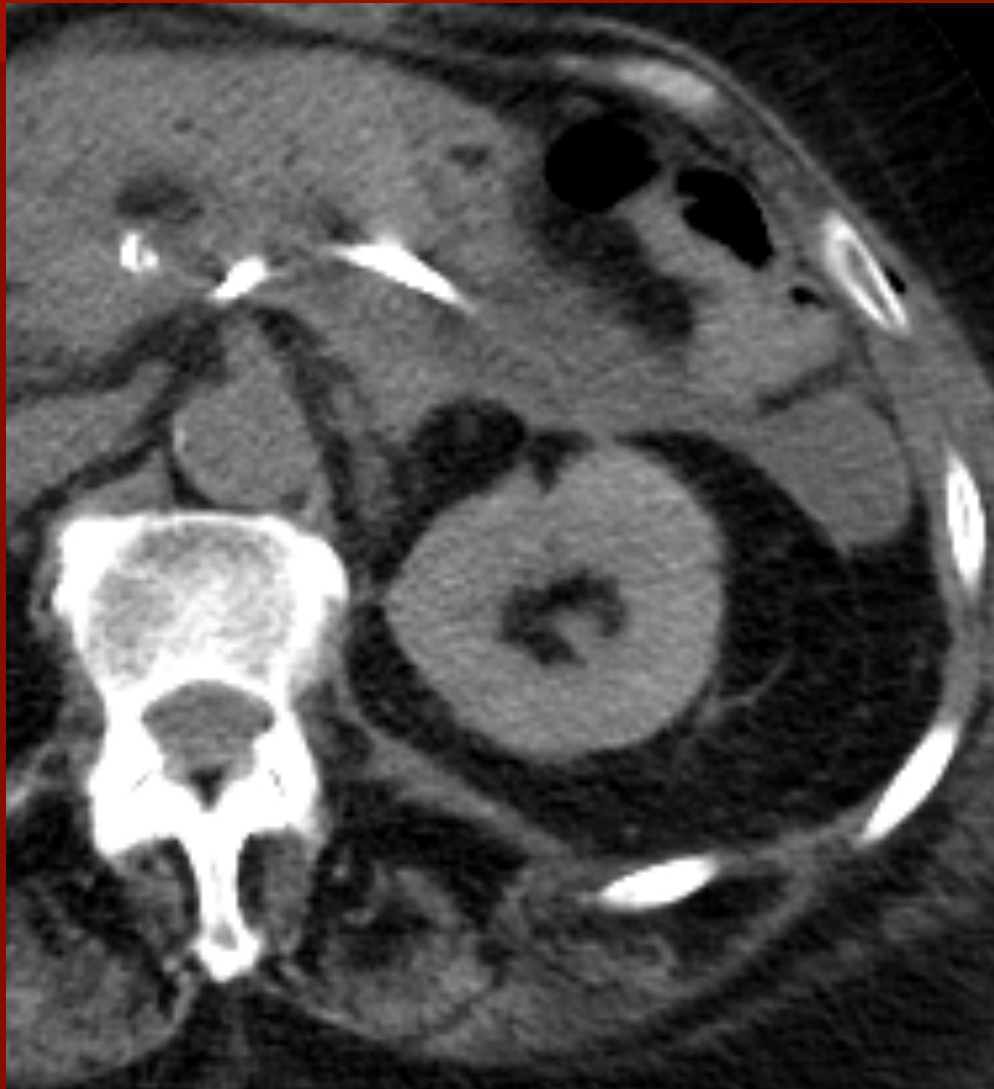
# Difficult Abscesses



# Complicated, intercommunicating, multicavity abscesses

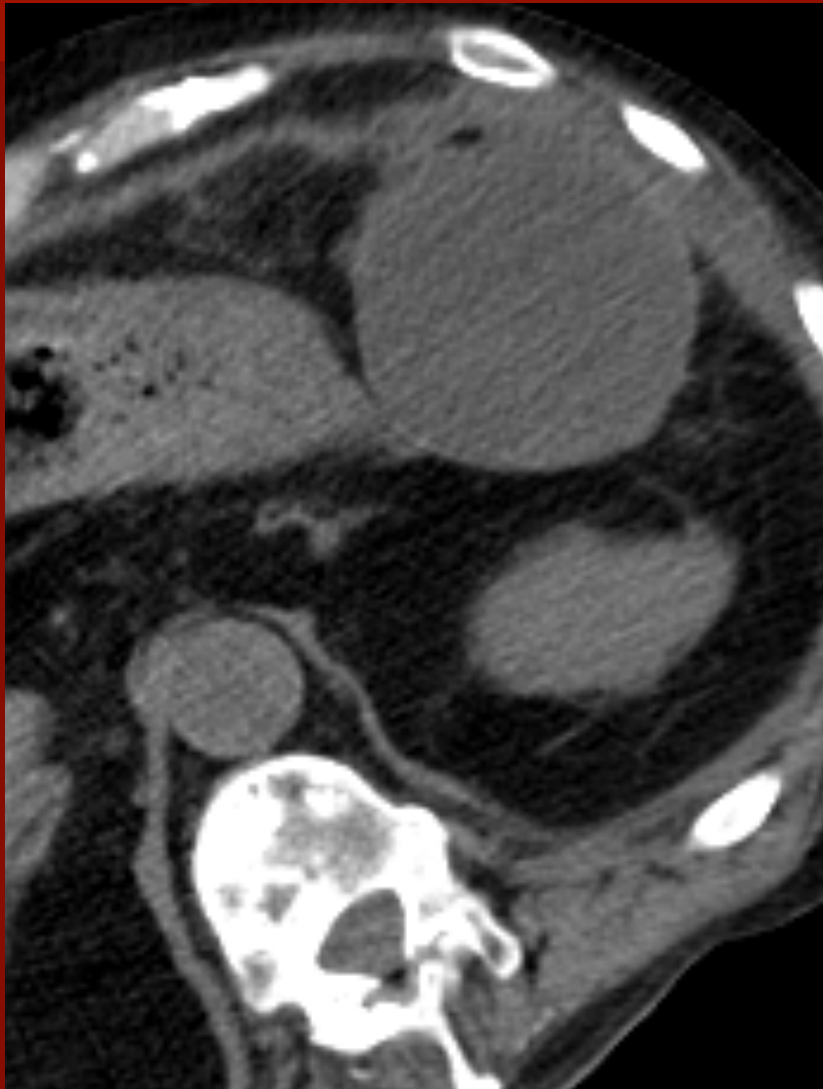


# Complicated, intercommunicating, multicavity abscesses



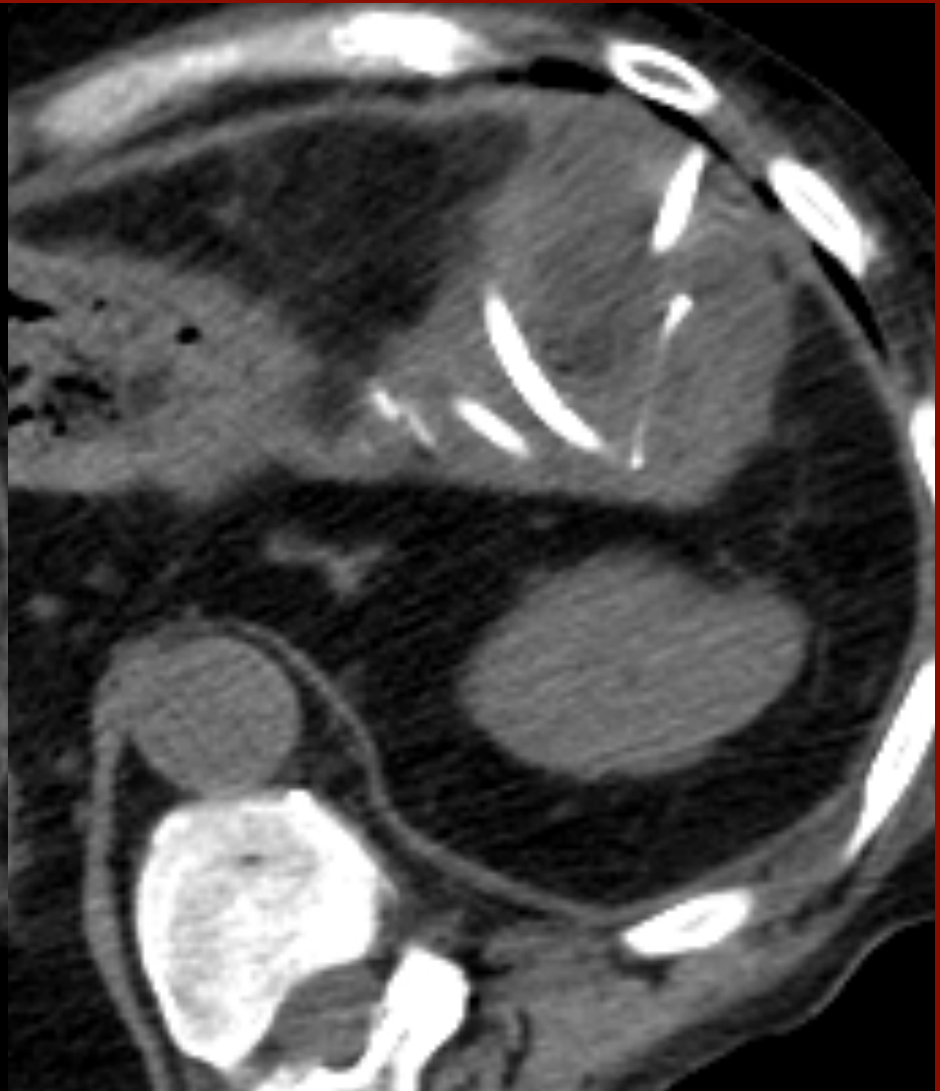
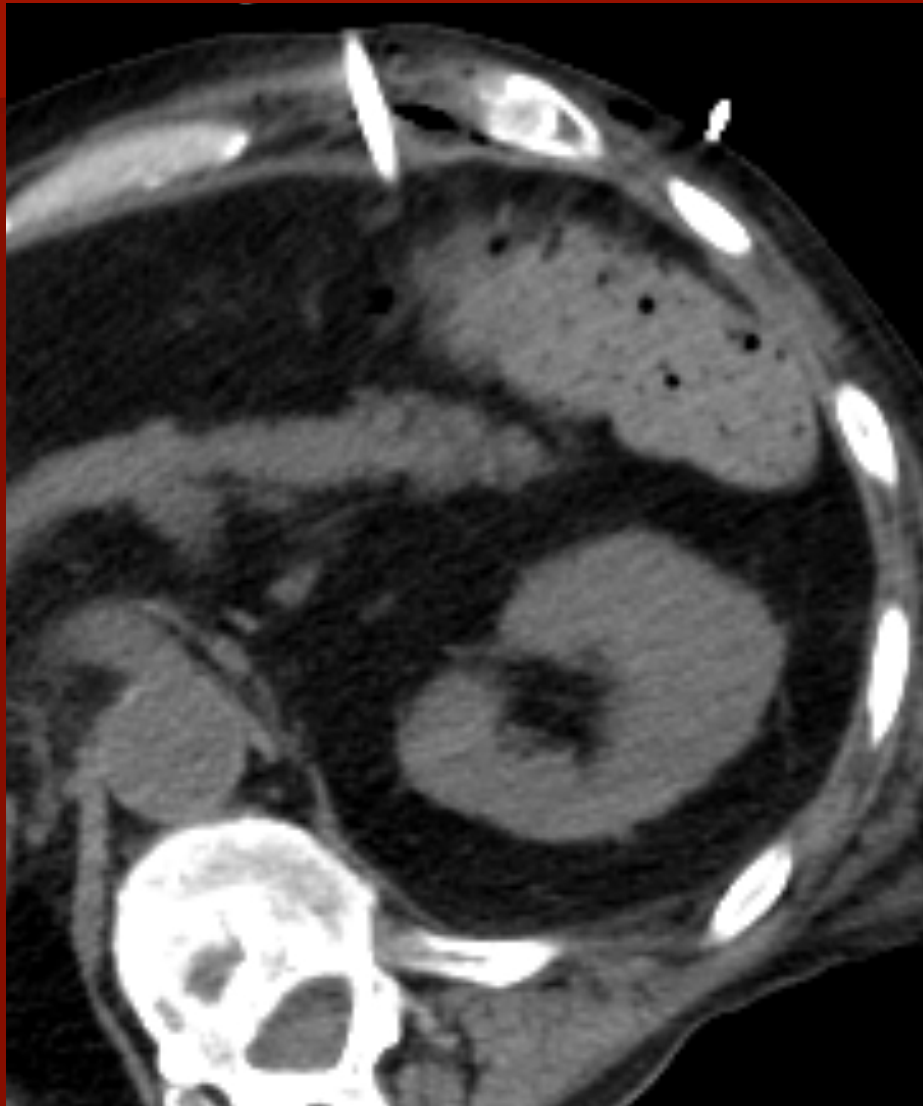


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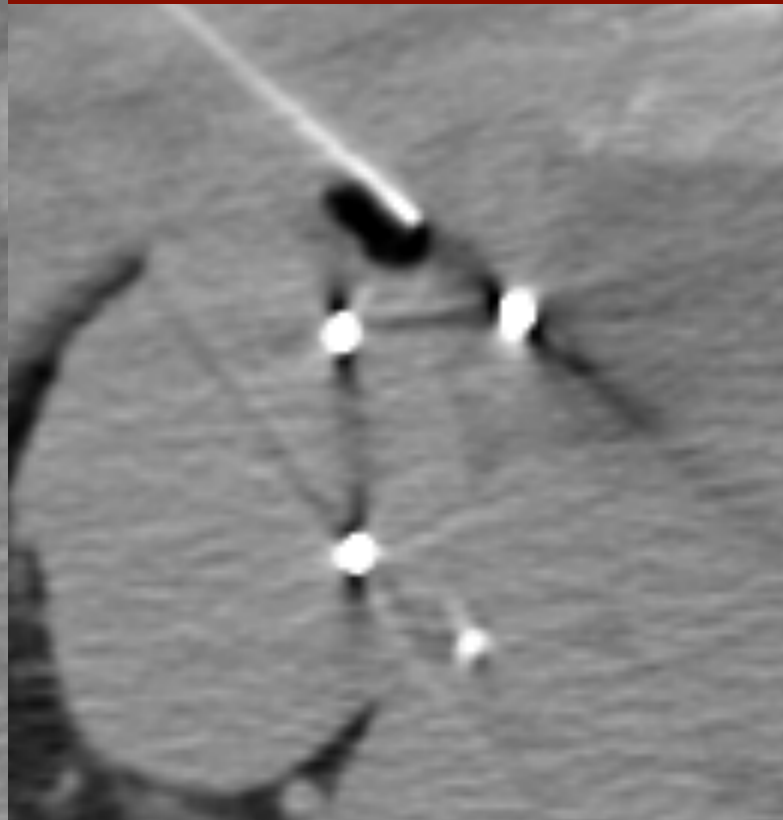
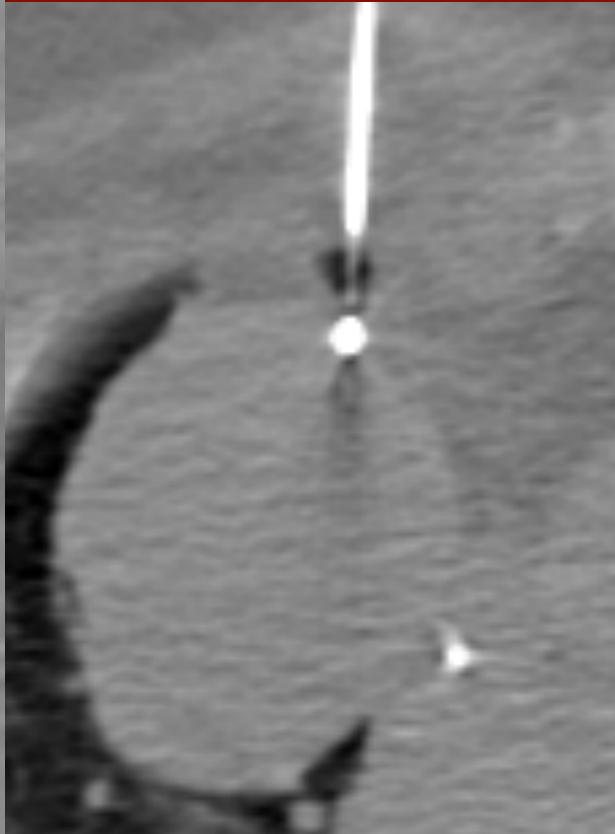
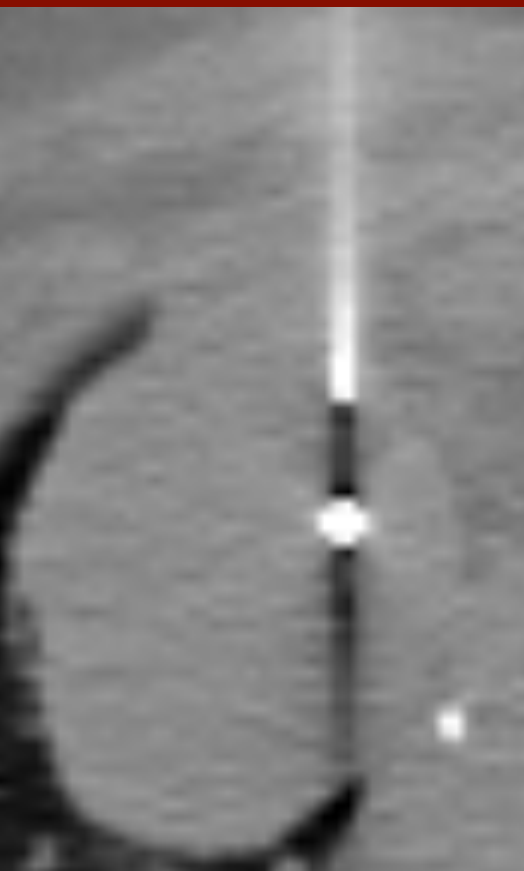




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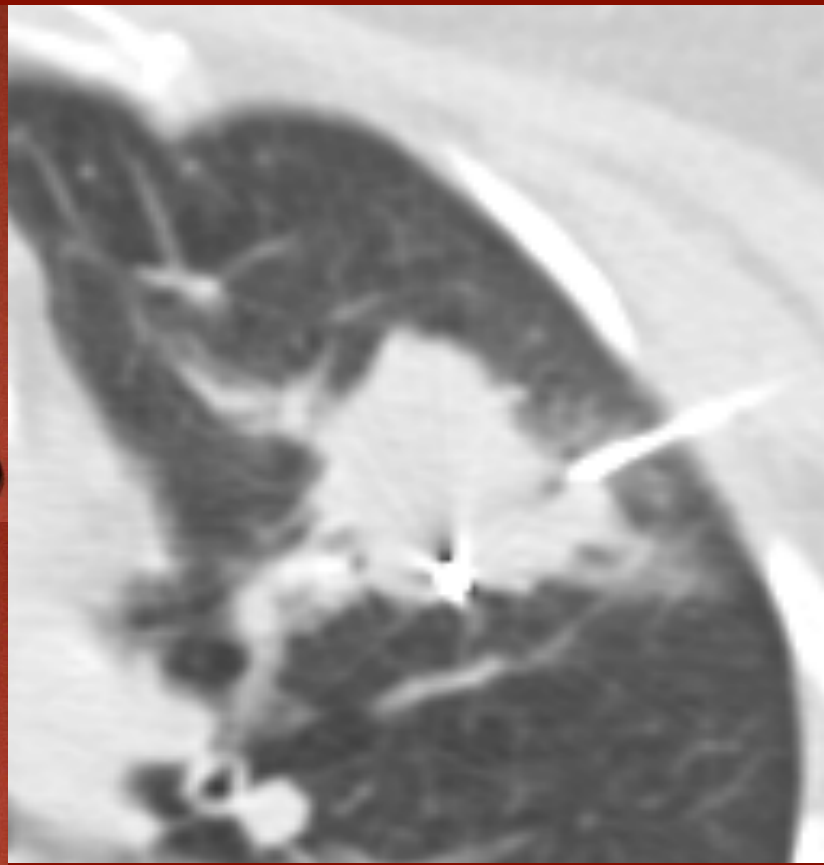
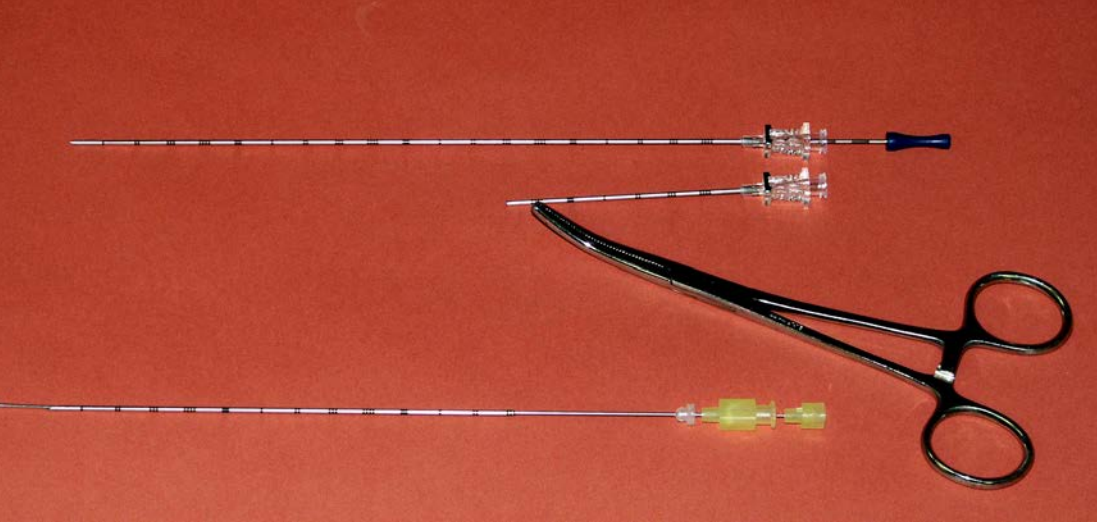
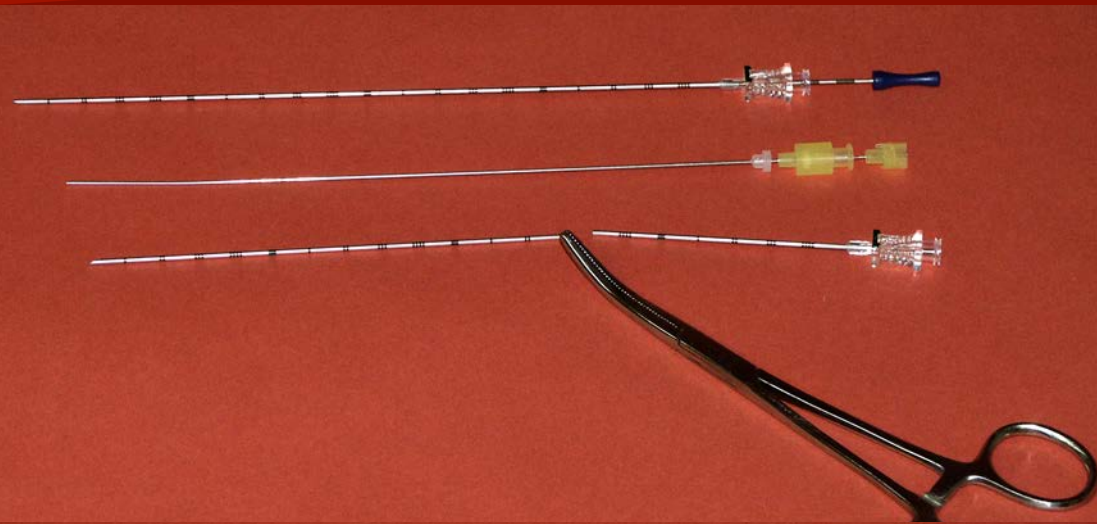
# Fiducial Placement simplified by using single site and cannula for multiple placements



# Reloading In Place cannula



If biopsy is also necessary can use fiducial cannula for guidance. Break off brittle needle, and insert needle

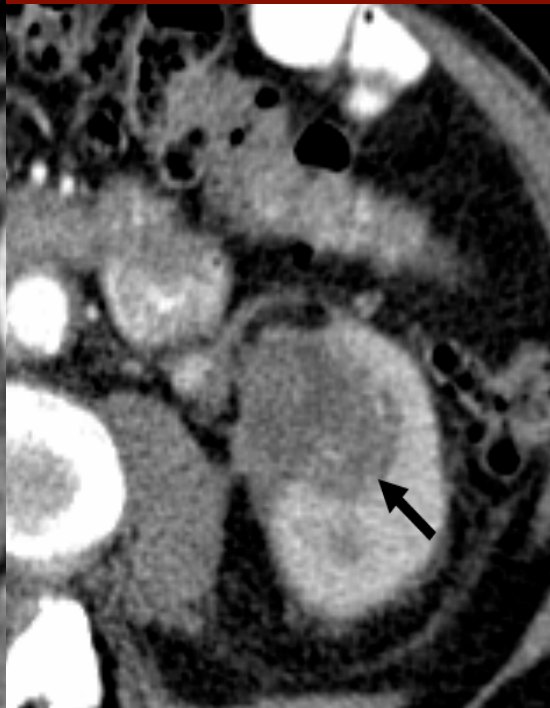
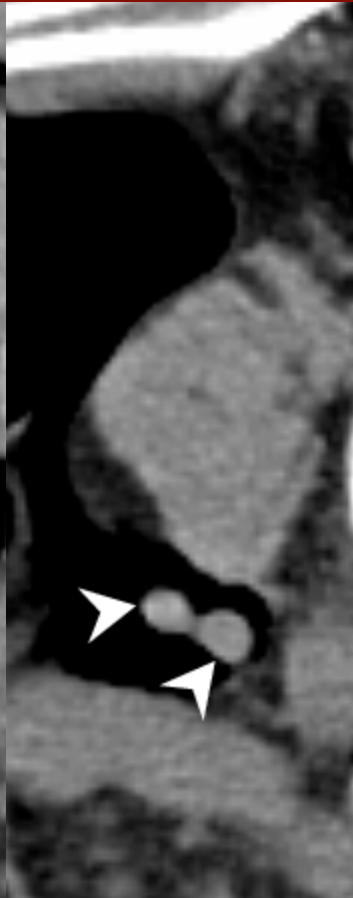
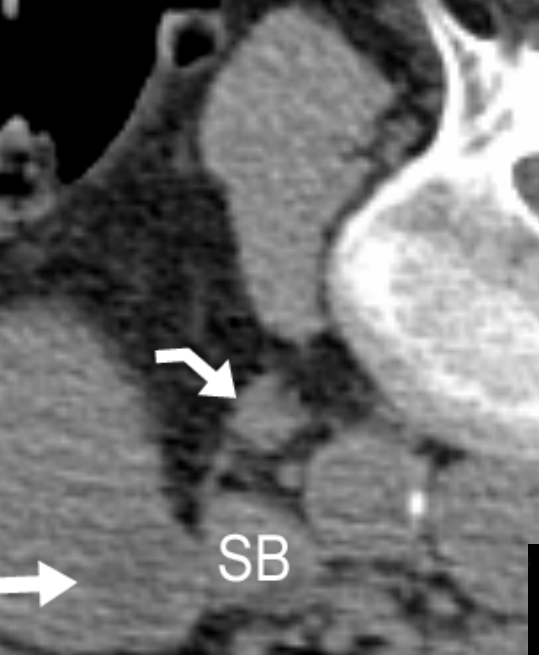




# Movement of organs or planes by injection of gas or fluid

- CO<sub>2</sub> or air will effectively push bowel out of pathway but does not work with solid organs because they are heavier and the gas compresses
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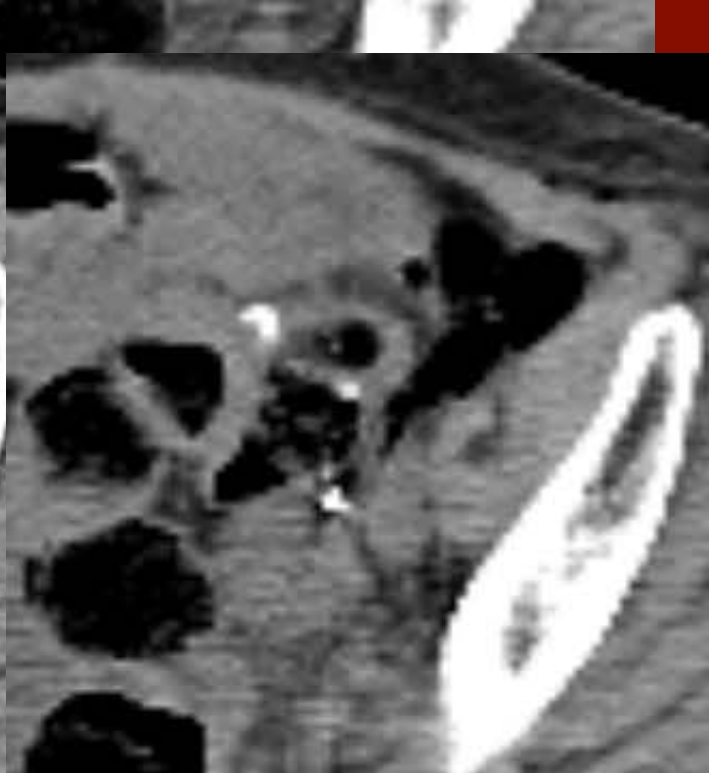
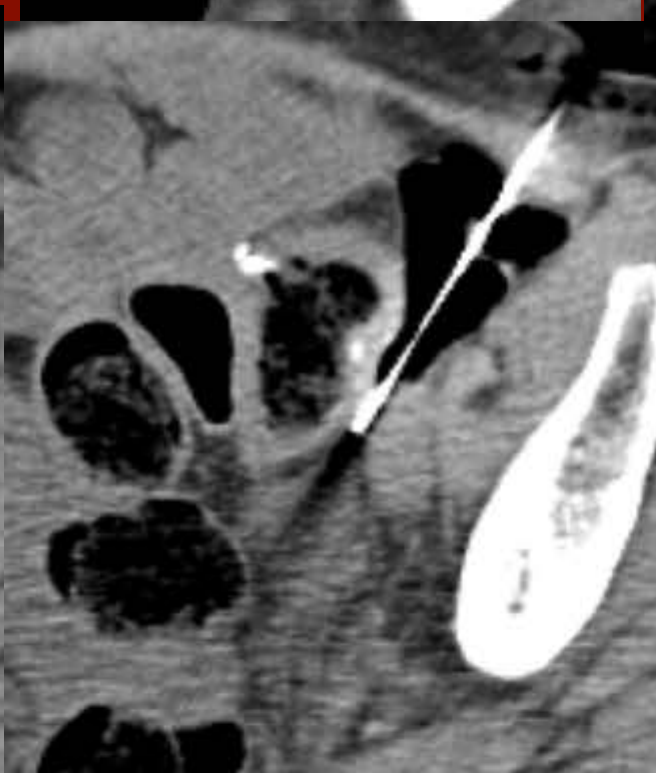
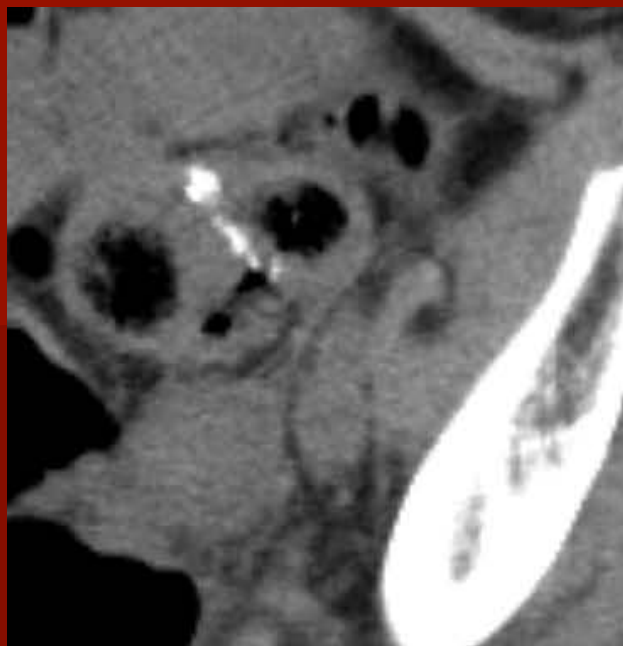
With thermoablation fluid or air can be used an insulator: air is better but requires more volume



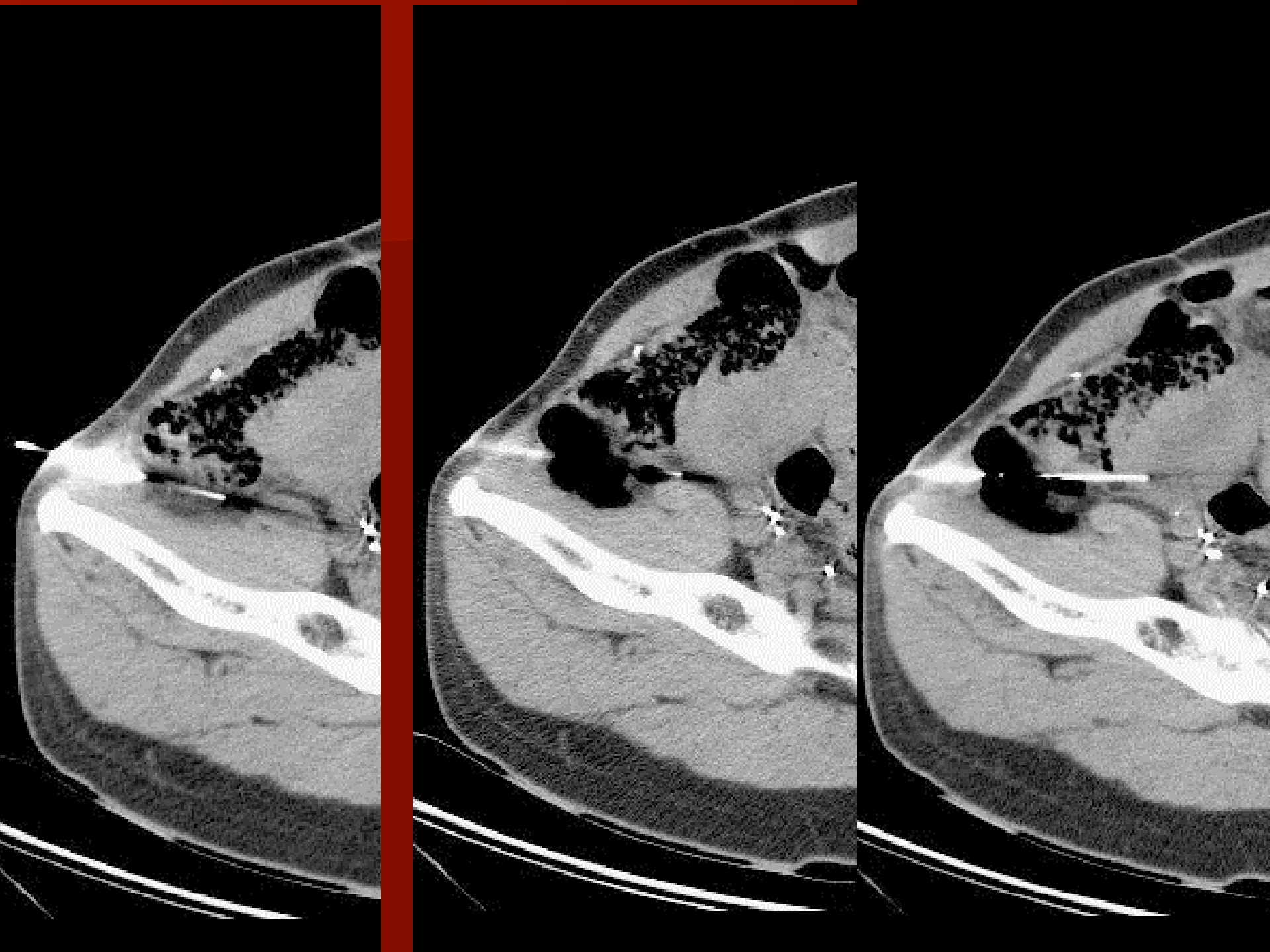
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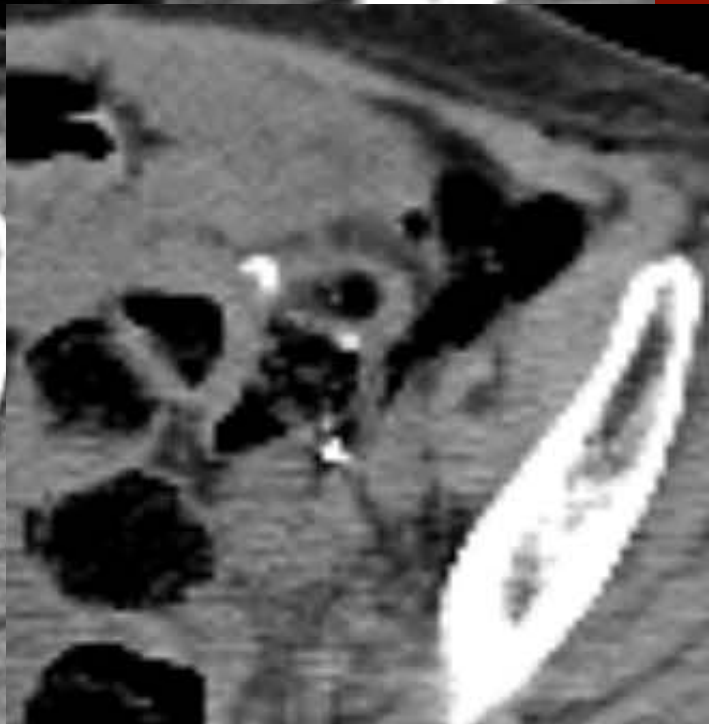
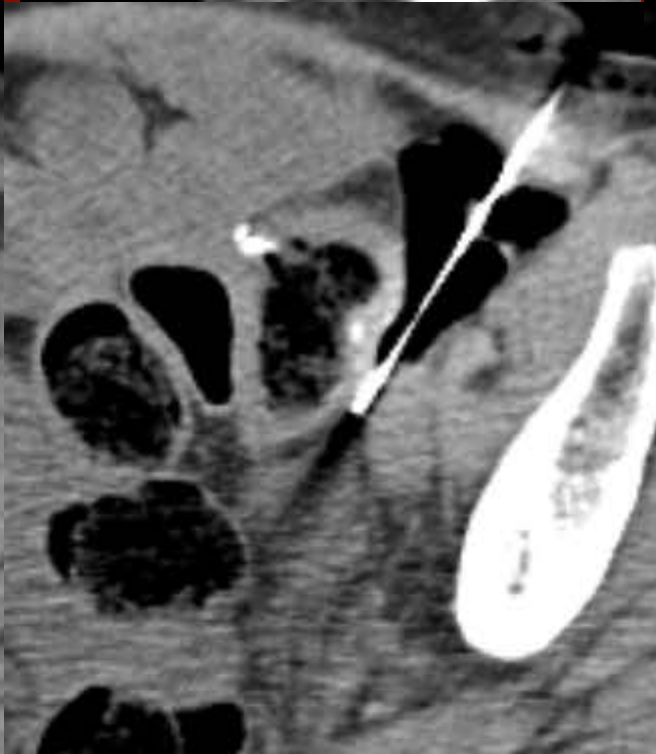
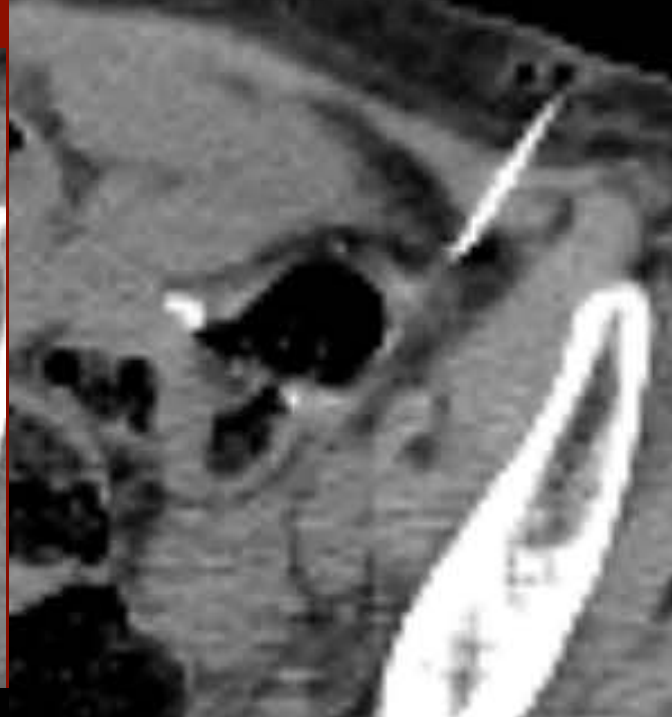
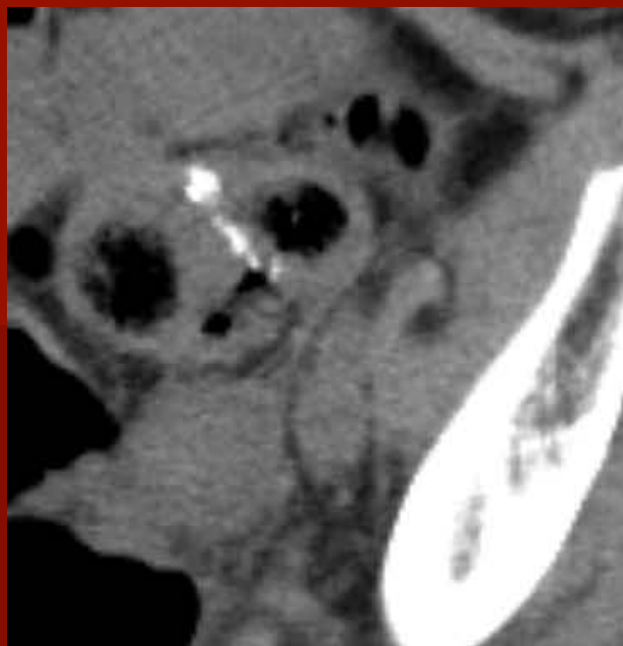
# Fiducial







# Fiducial









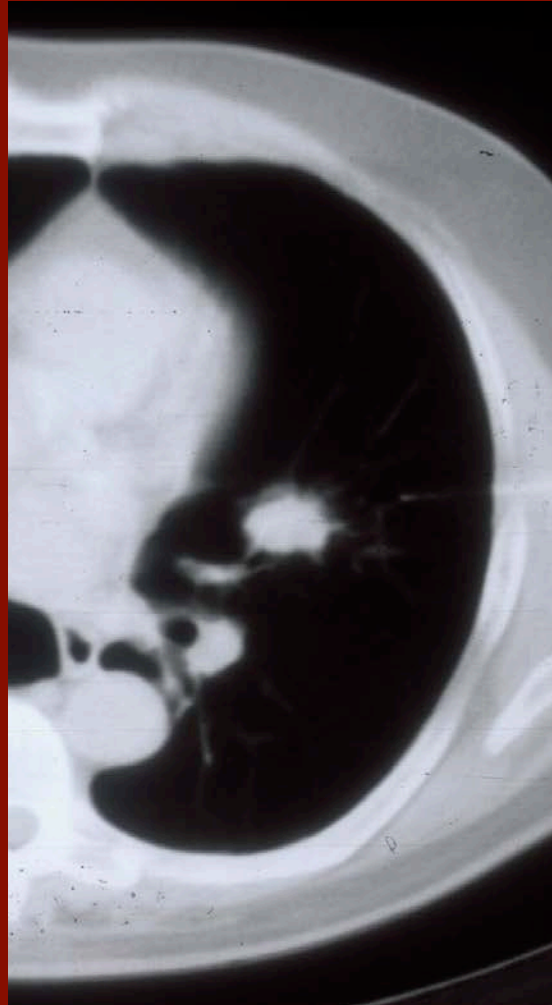
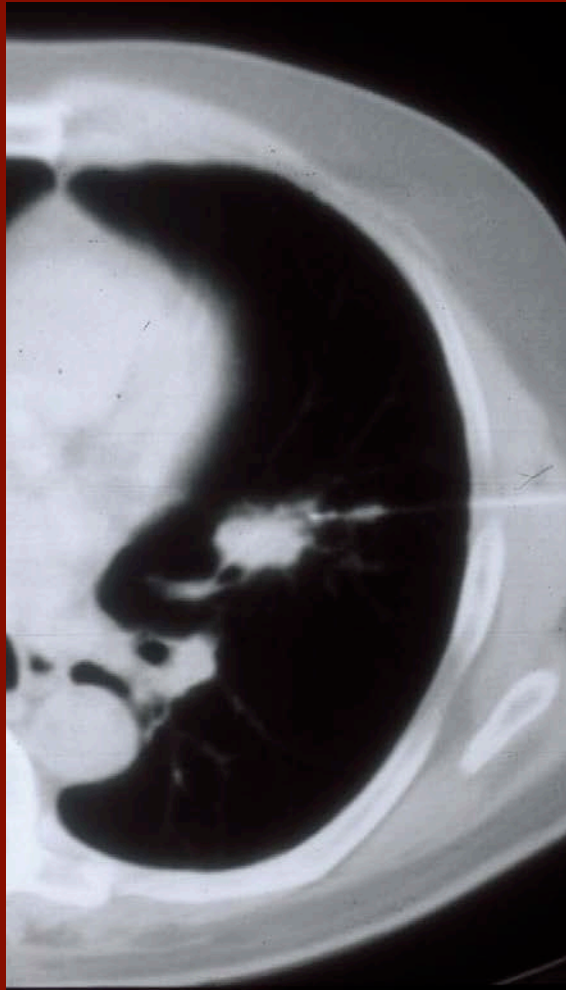




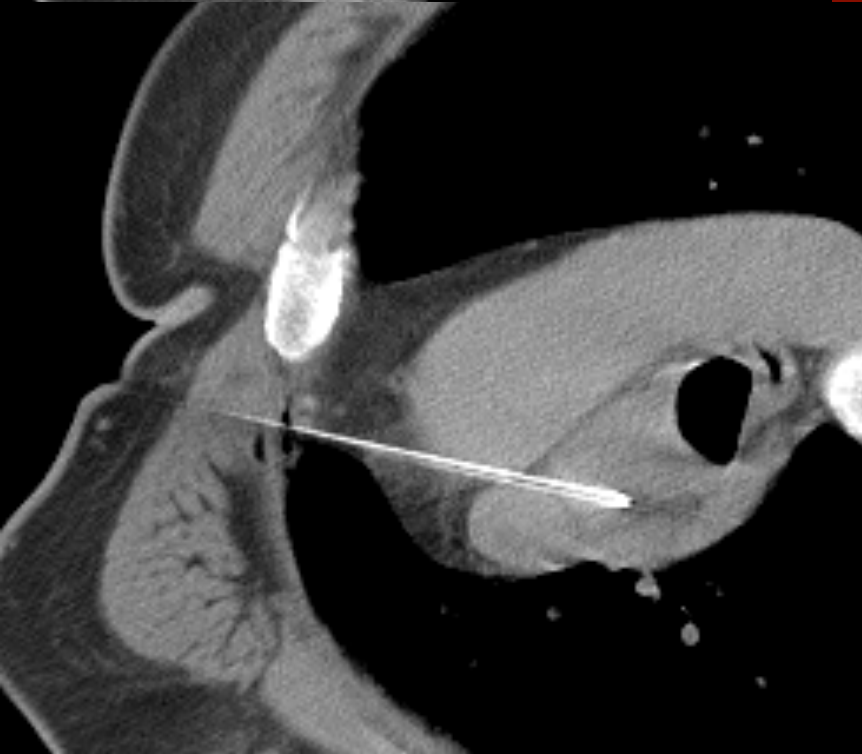
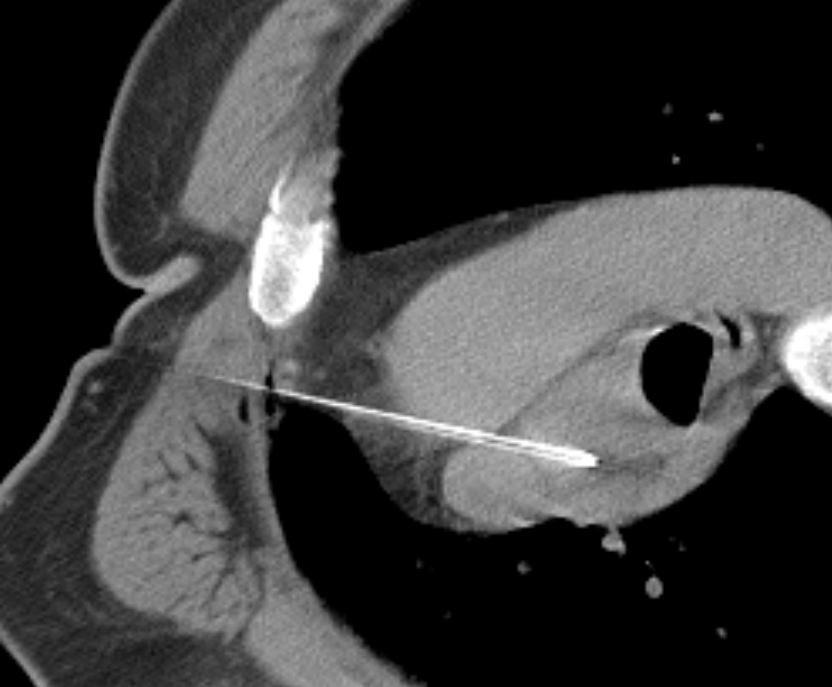
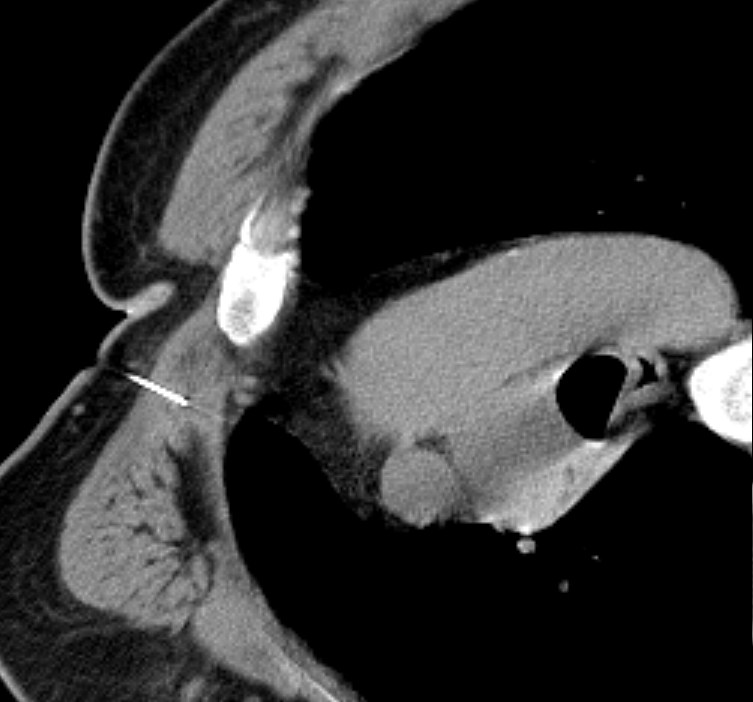




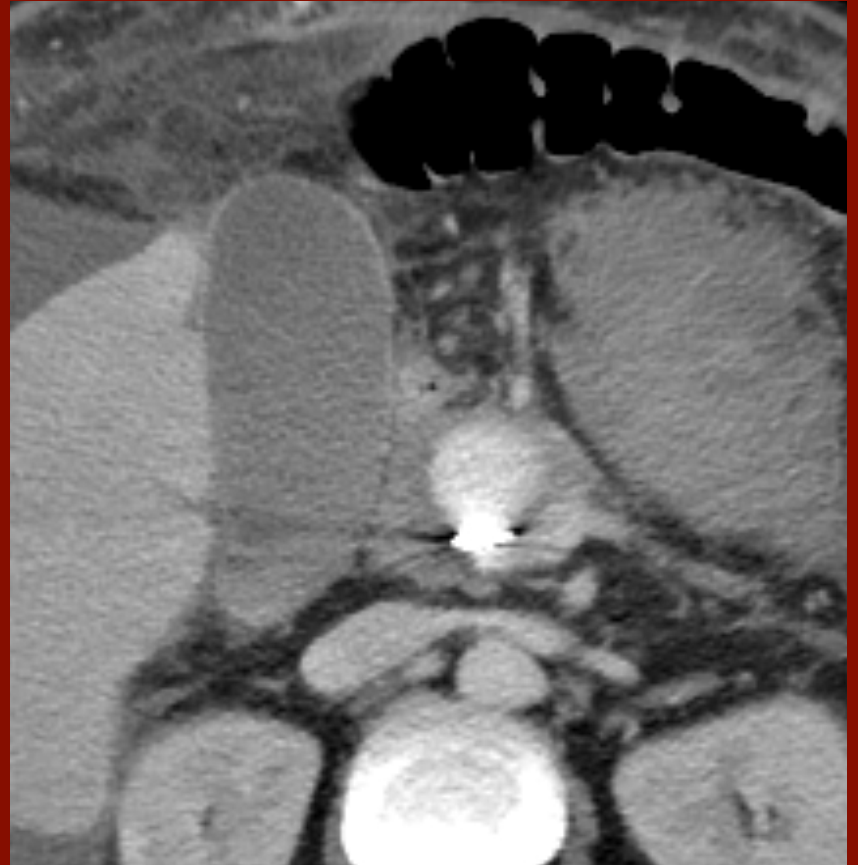


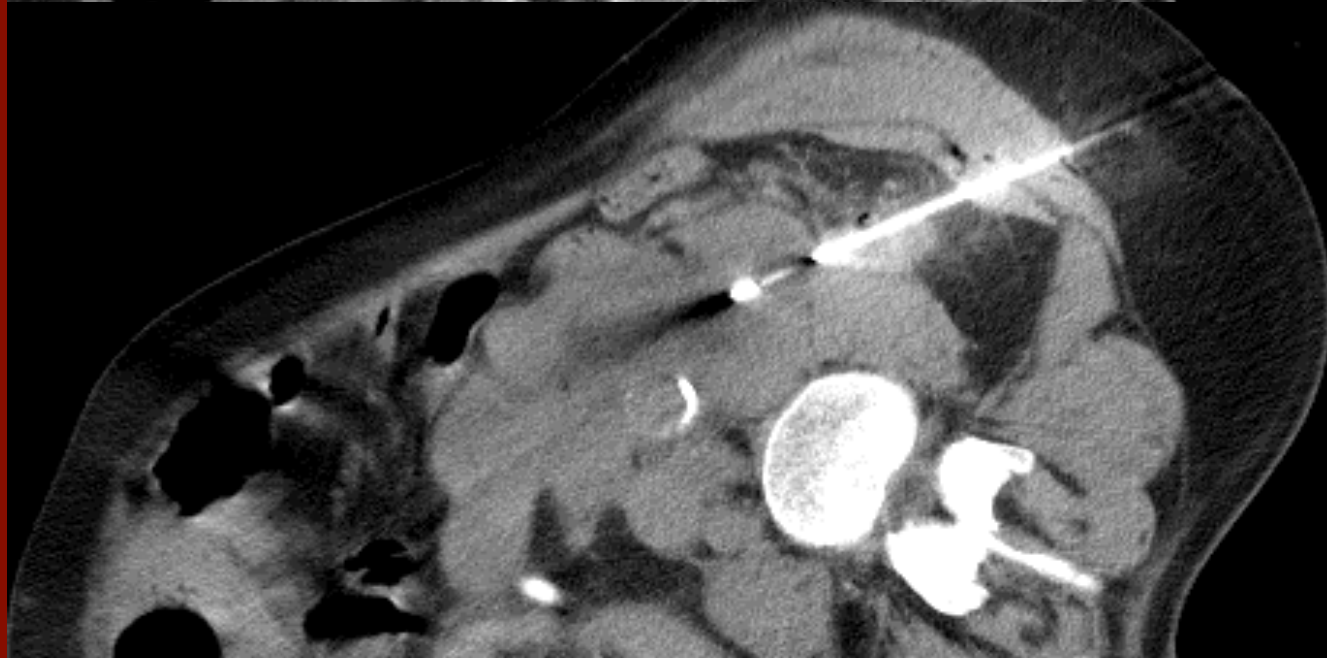






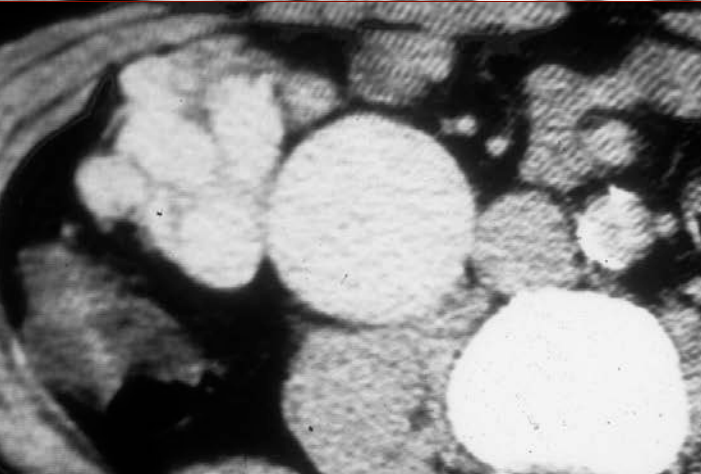
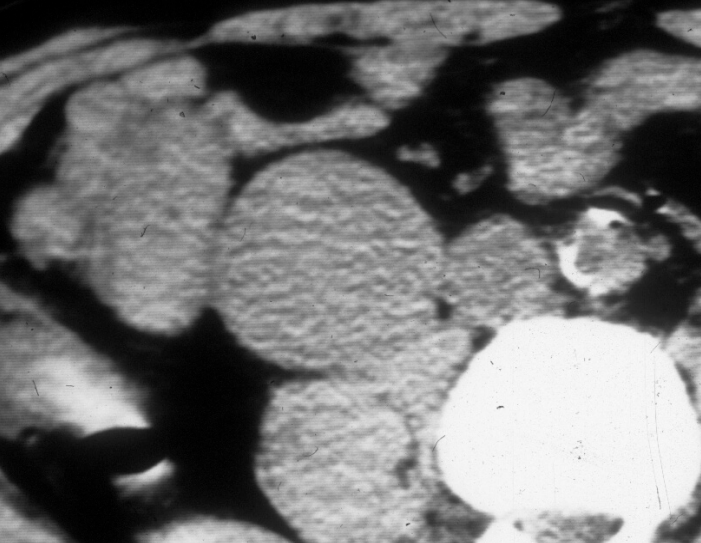
# Bolus injection reveals pseudoaneurysm







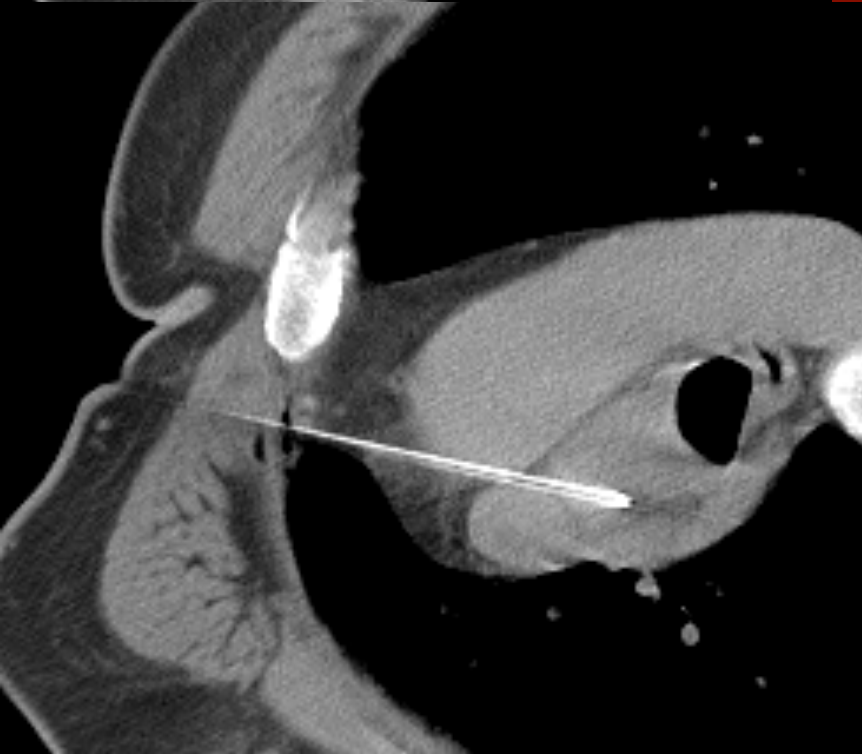
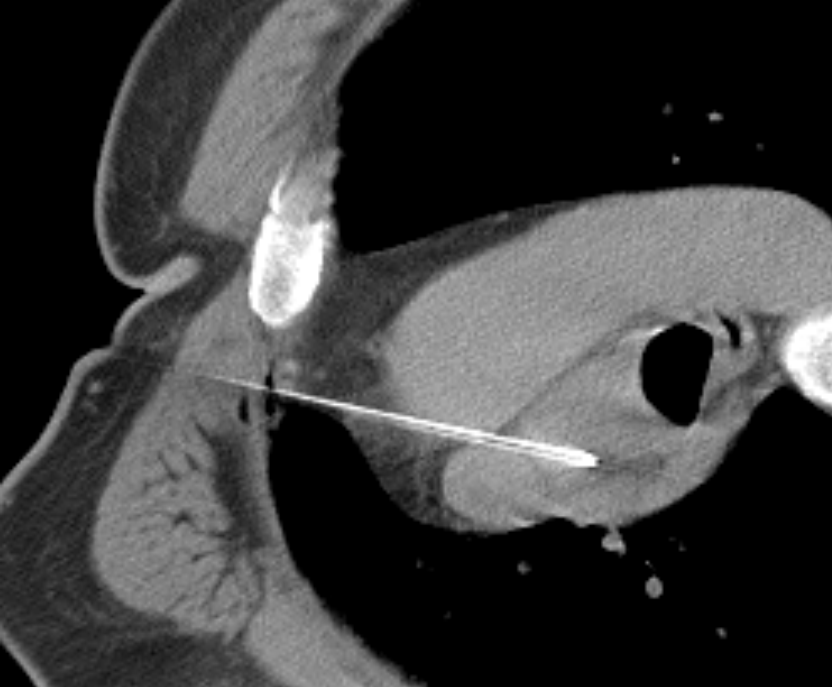
# Large retroperitoneal varix simulating LN; schedule BX cancelled



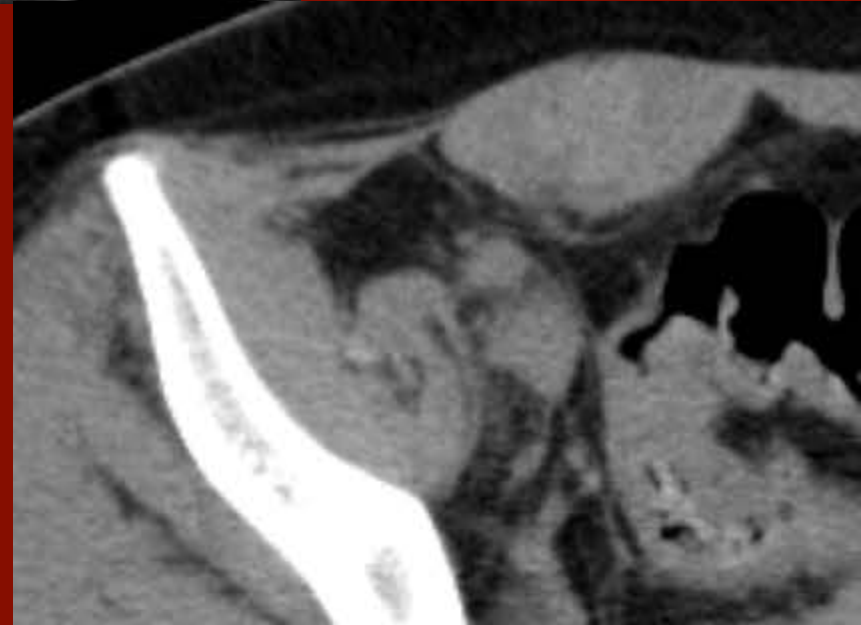
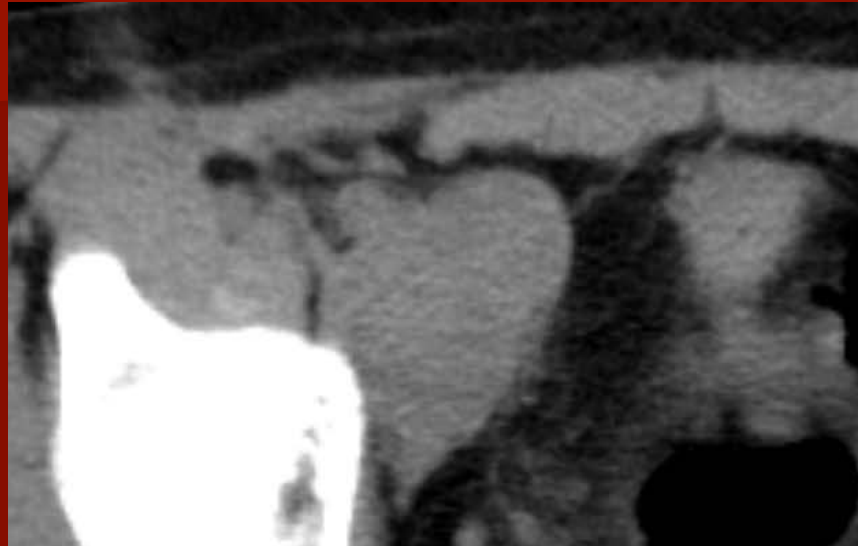


# Celiac Nerve blocks

- Blind technique or fluoroscopy
- Purpose to destroy celiac nerve plexus to provide pain relief for intractable pain, i.e pan CA
- Chemical injection
- RF ablation
- Cryoablation-from 35 yr experience, cryoablat. Method of choice: more effective, permits treatment of cancer invasion of plexus, fewer complications because local effect, major vessels are not affected



If stab wound continues to bleed  
check and recheck lab record,ask

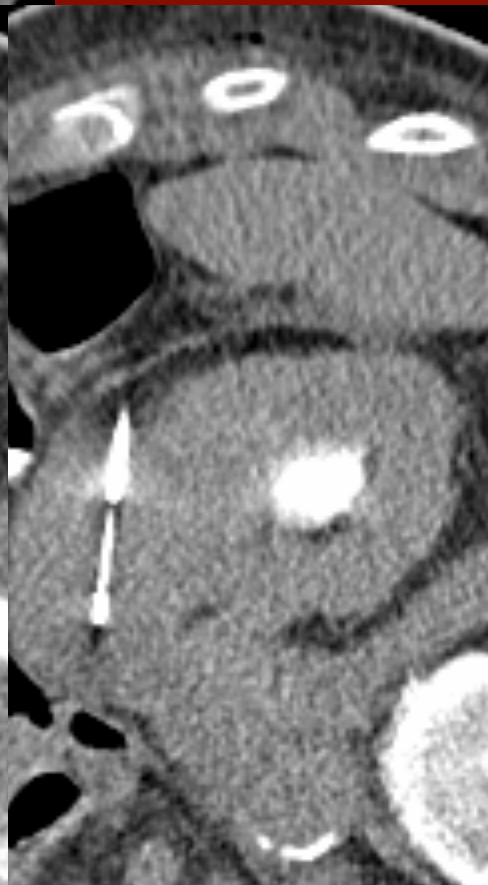
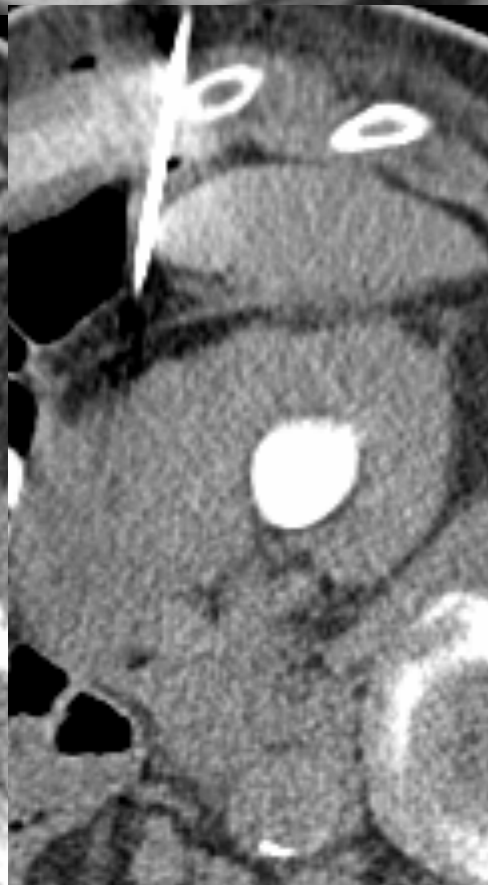
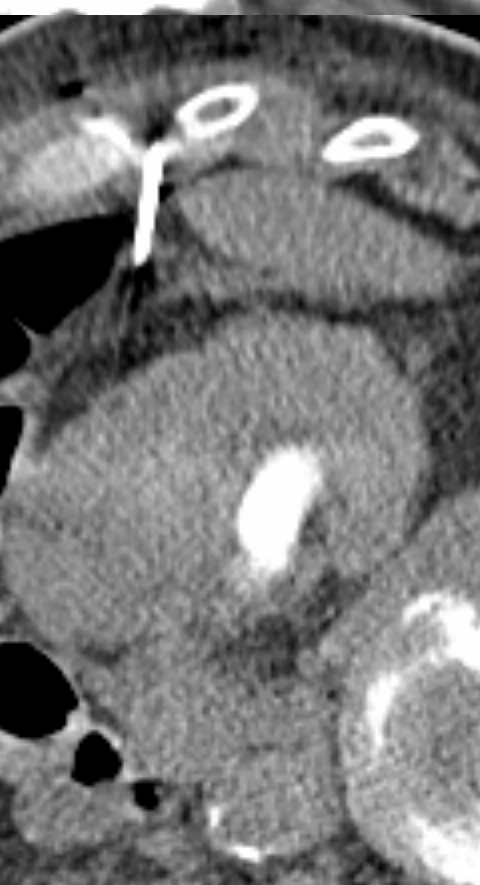
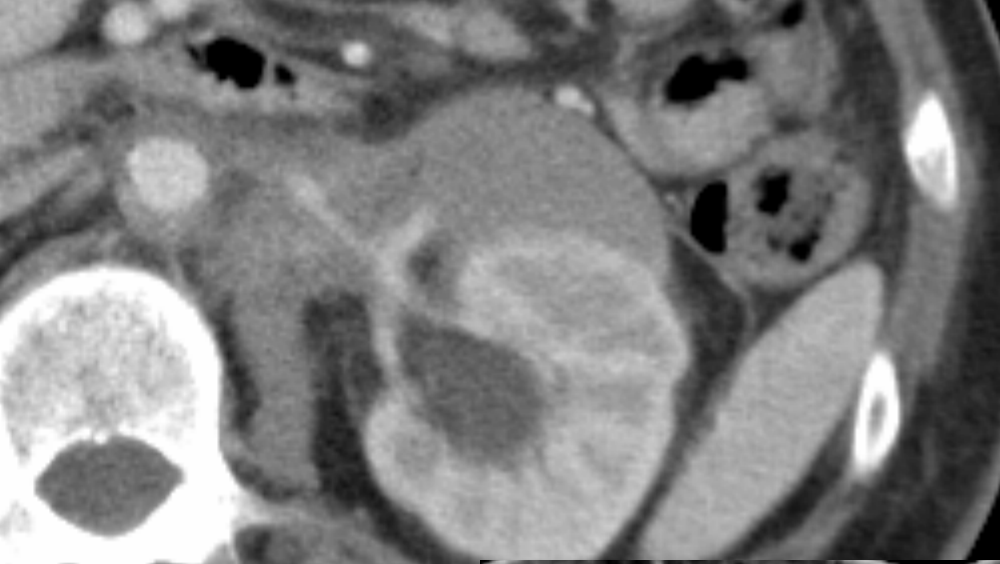


# Preliminary results Randomized Prospective comparison system correction versus LIBE (26 cases)

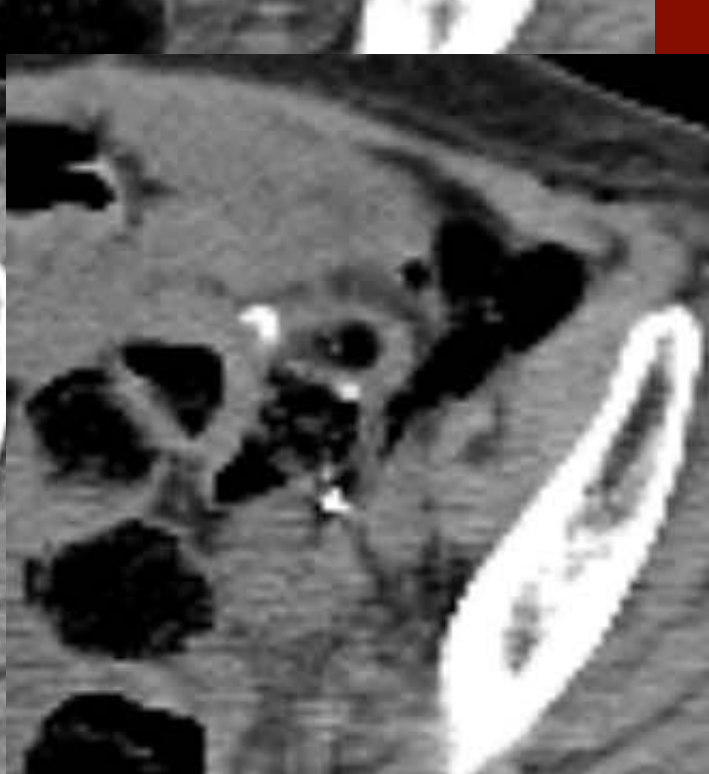
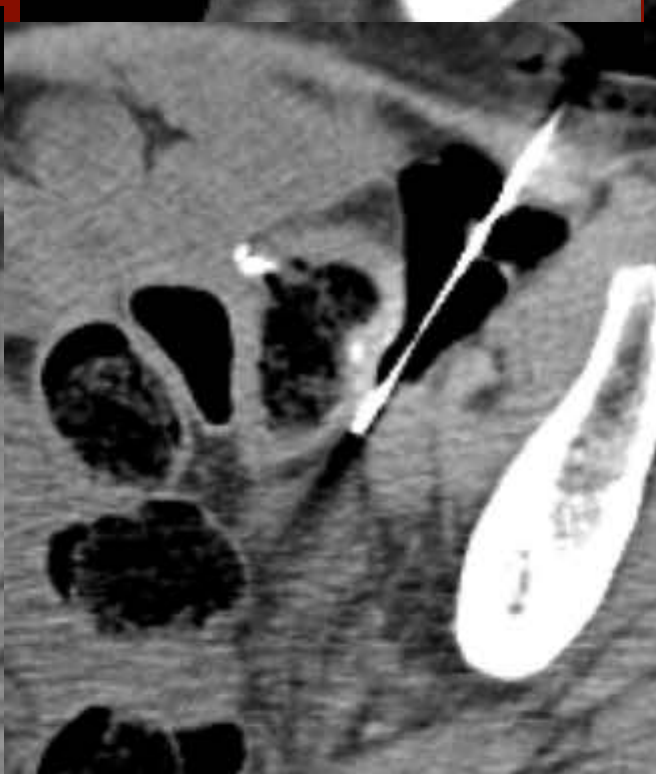
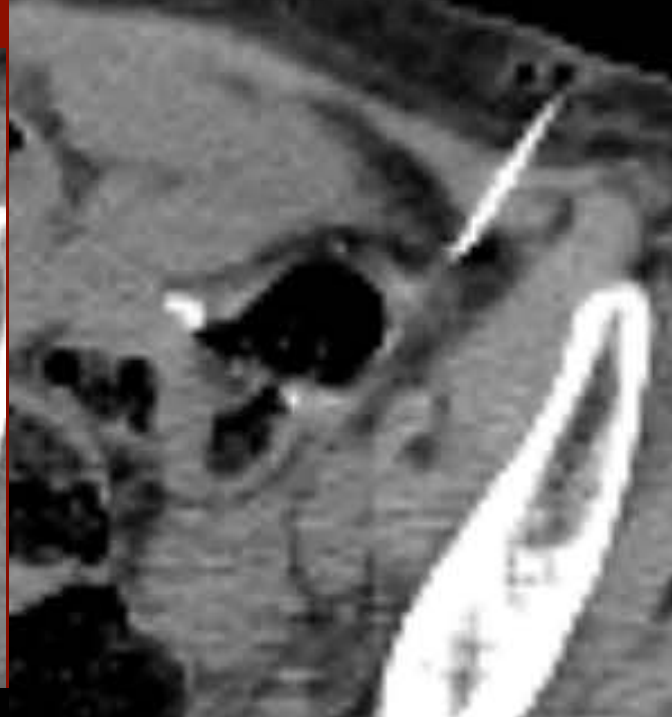
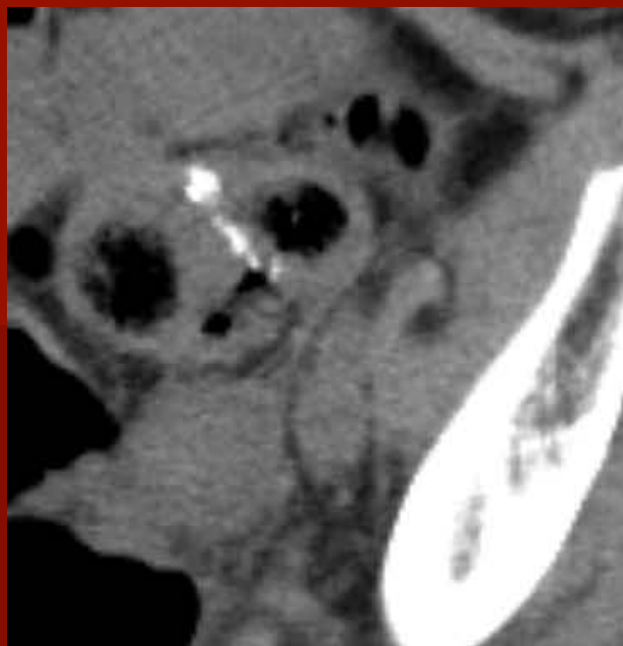
- Time interval between procedure request and performance: systemic 30 hours, LIBE 8 hours
- Amount of blood product used: systemic average 8 units, LIBE less than 1 unit
- Complications: 1)no bleeding either group  
2)one anaphylactic/idiosyncratic-systemic  
3)congestive heart failure-systemic

Not FDA approved but consistent with Belmont

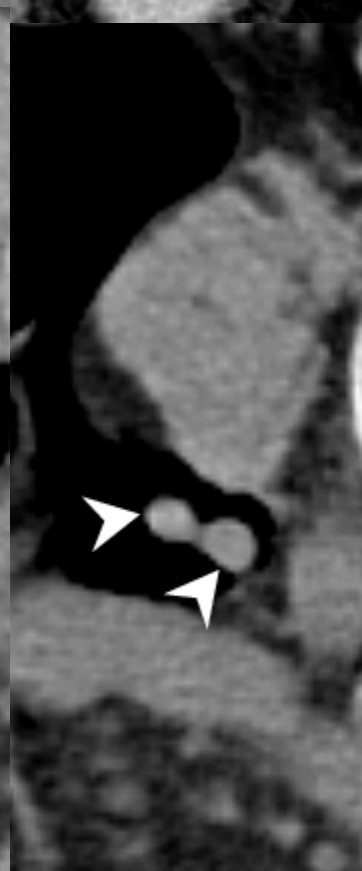
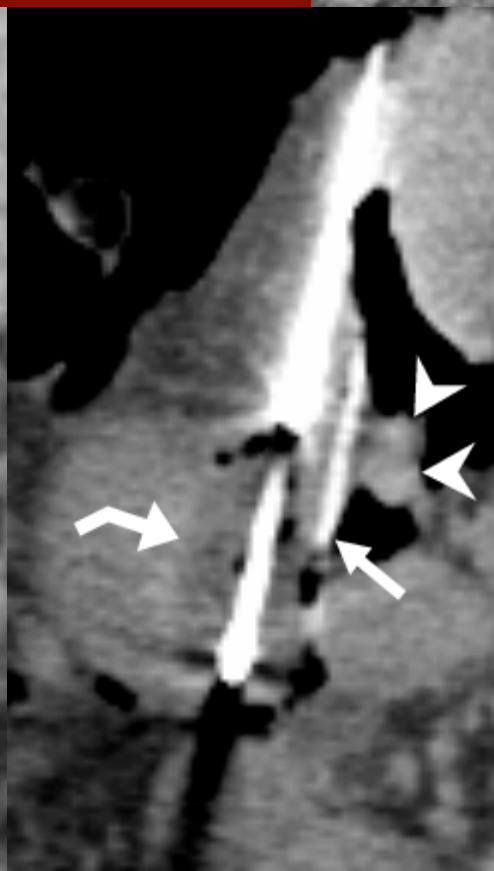
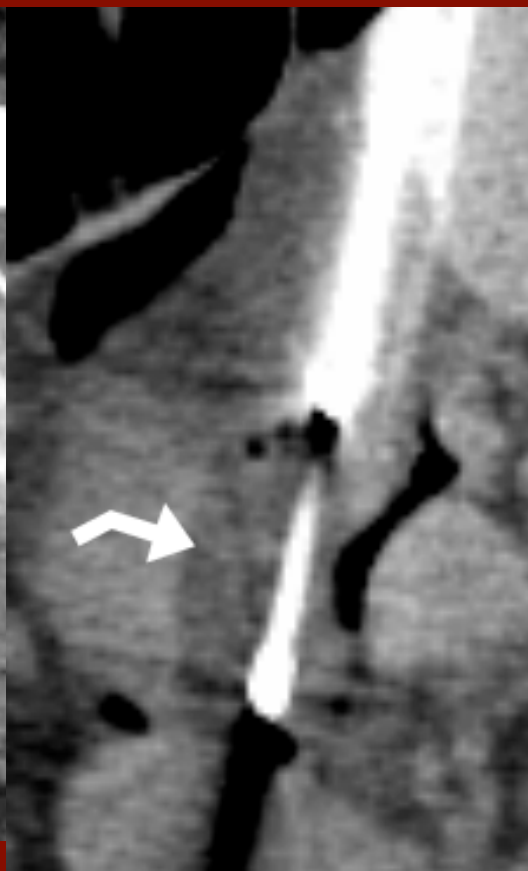
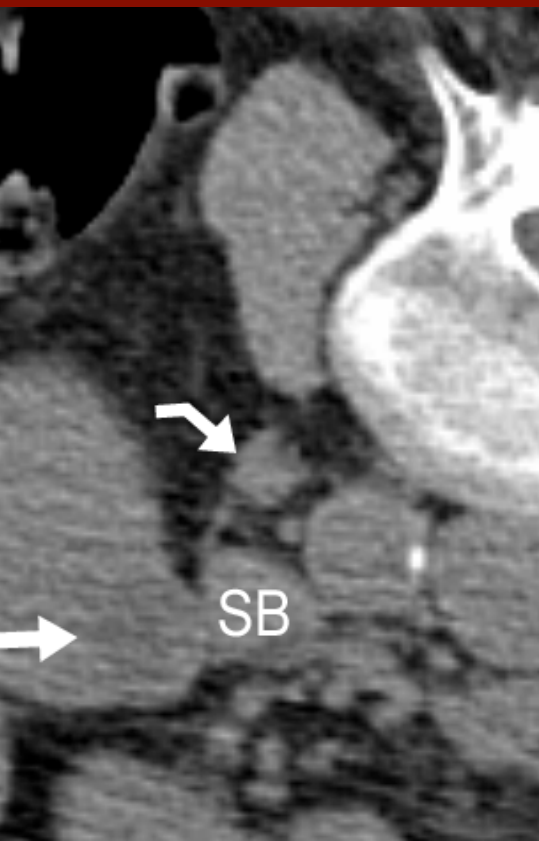
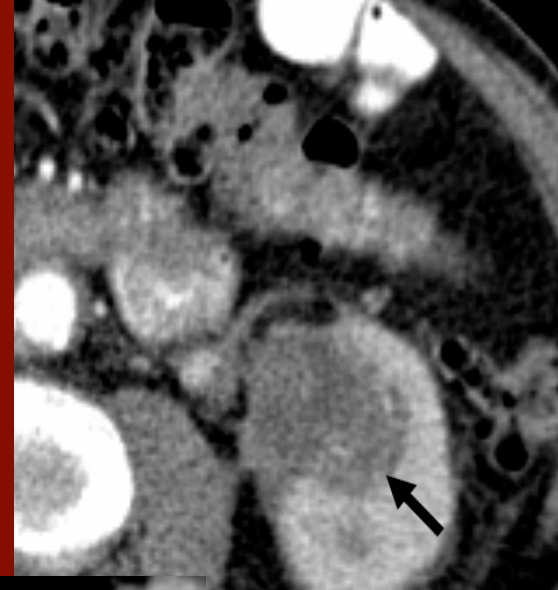




# Fiducial

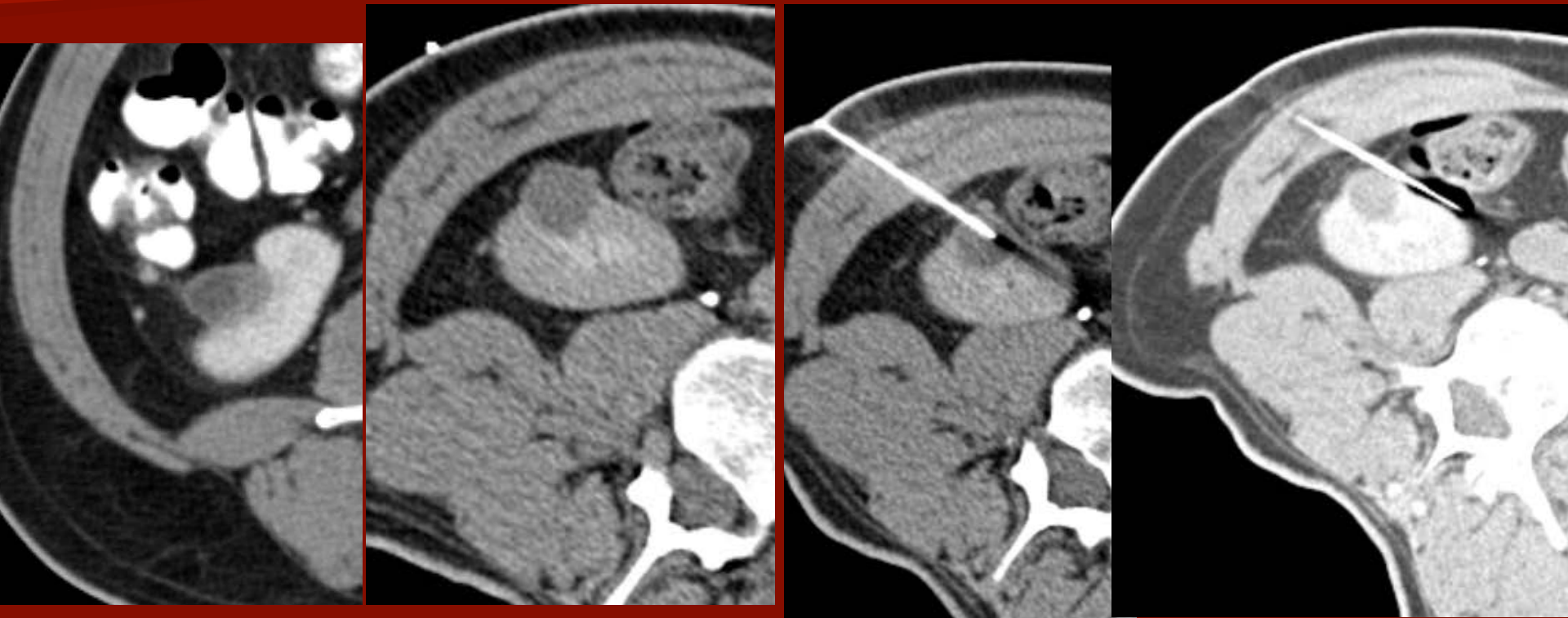


4. With thermoablation fluid or air can be used an insulator: air is better but requires more volume





# Air used to protect appendix for renal cryo



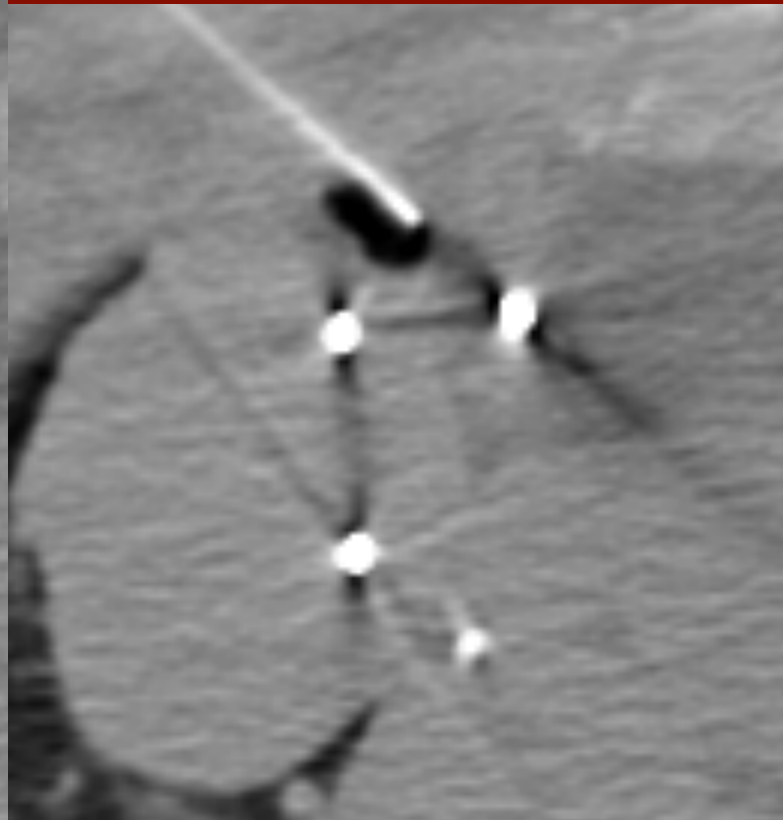
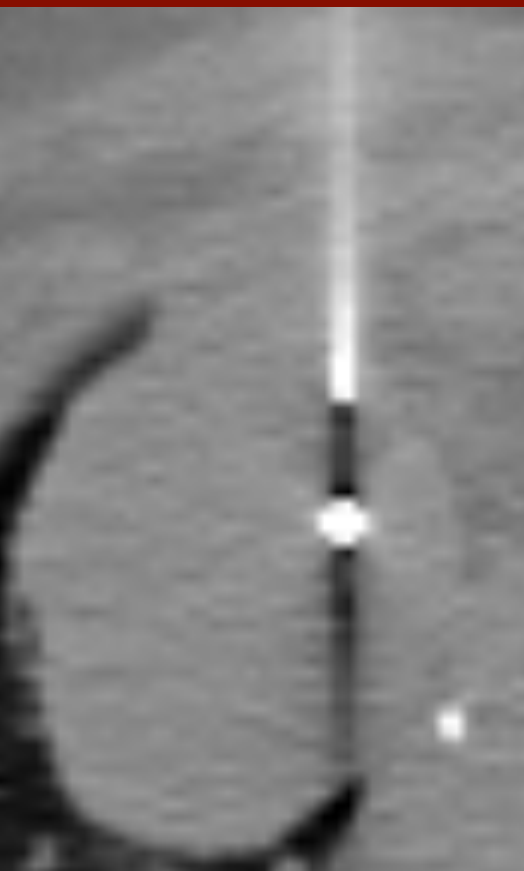


# Air protect appendix continued



Fiducial Markers for Cyberknife  
“gold seeds implanted to guide  
computer modulated radiation  
therapy”

# Fiducial Placement simplified by using single site and cannula for multiple placements

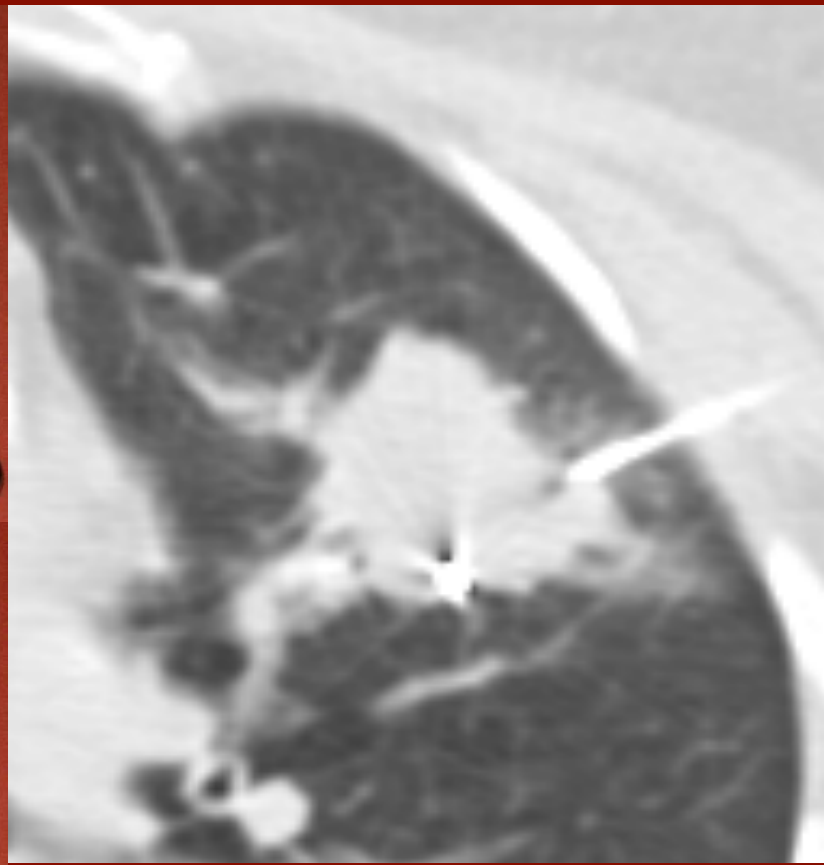
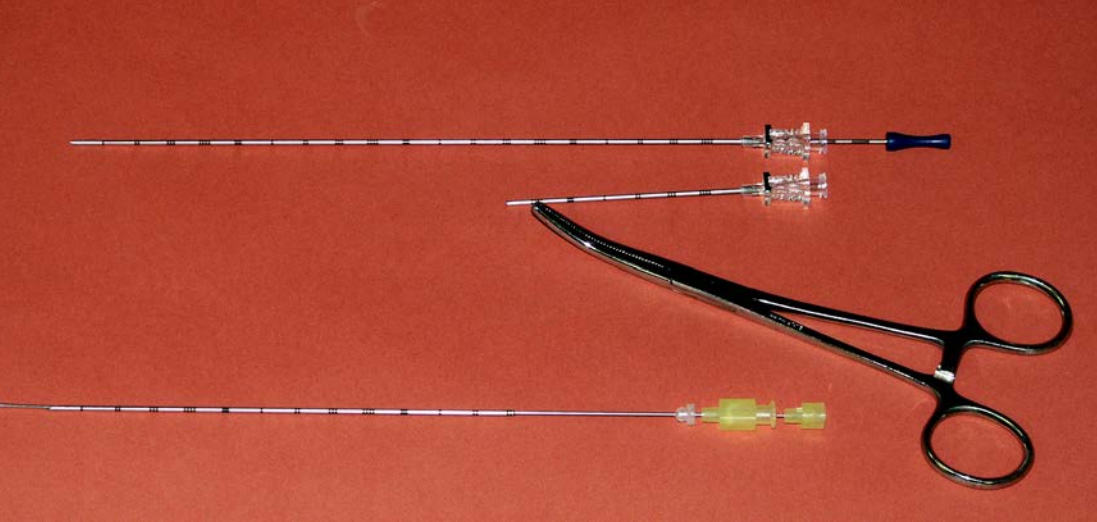
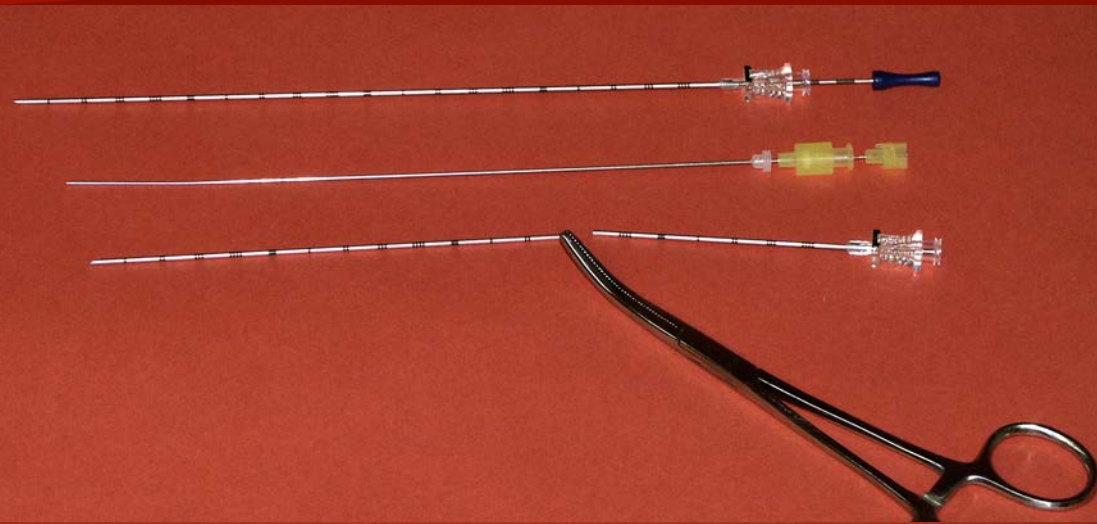


# Reloading In Place cannula



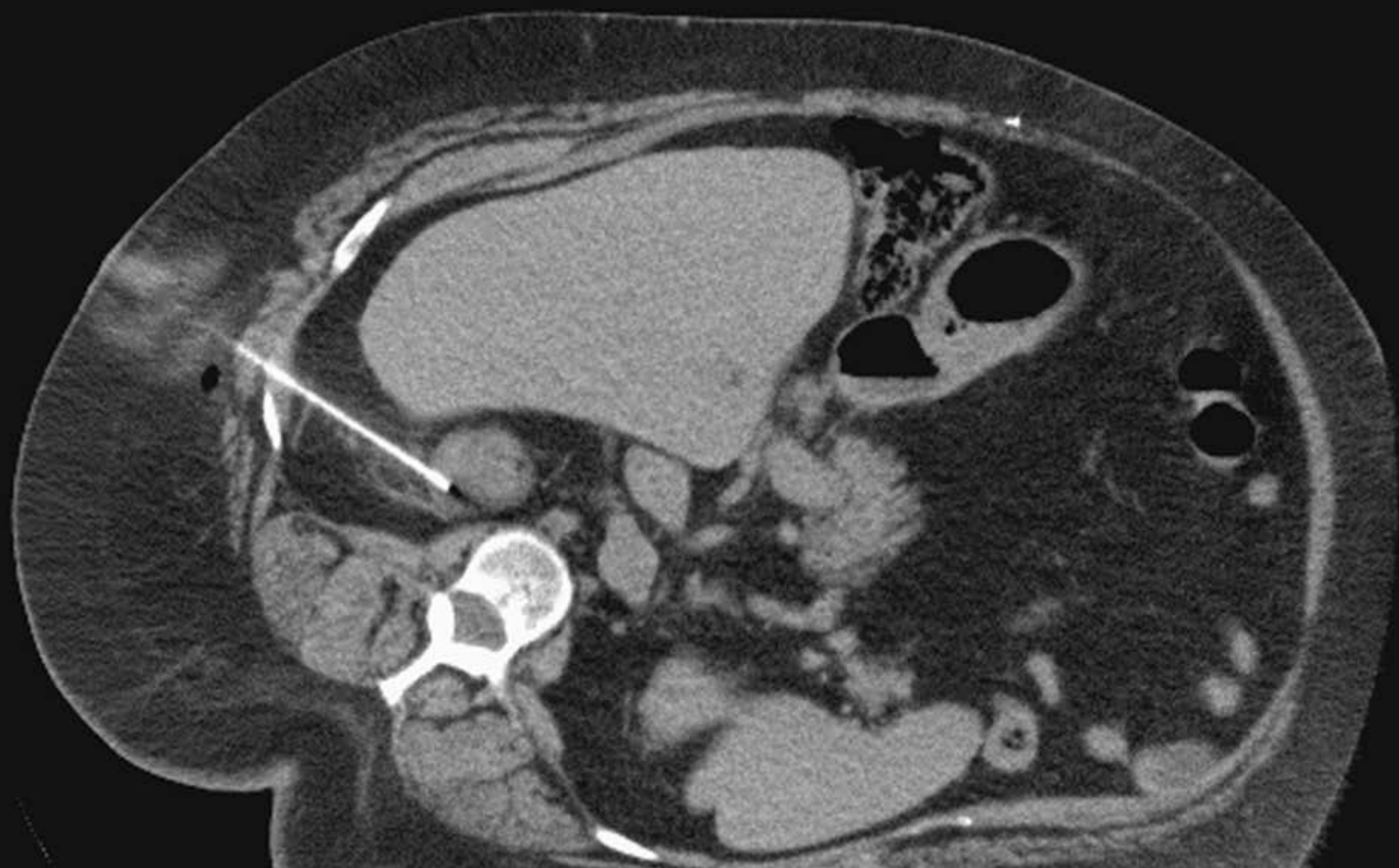


If biopsy is also necessary can use fiducial cannula for guidance. Break off brittle needle, and insert needle



# Adrenal Gland biopsy

- Exclude patients with functional tumors
- Anatomic approaches: transcrural decubitus approach most effective.
- Avoid transpleural, transhepatic, transpancreatic, etc.

















# Renal nerve block, placement of RF





