



# A NOVEL TECHNIQUE FOR SAFE PERCUTANEOUS BIOPSY OF A PETROUS APEX LESION

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# DECLARATION

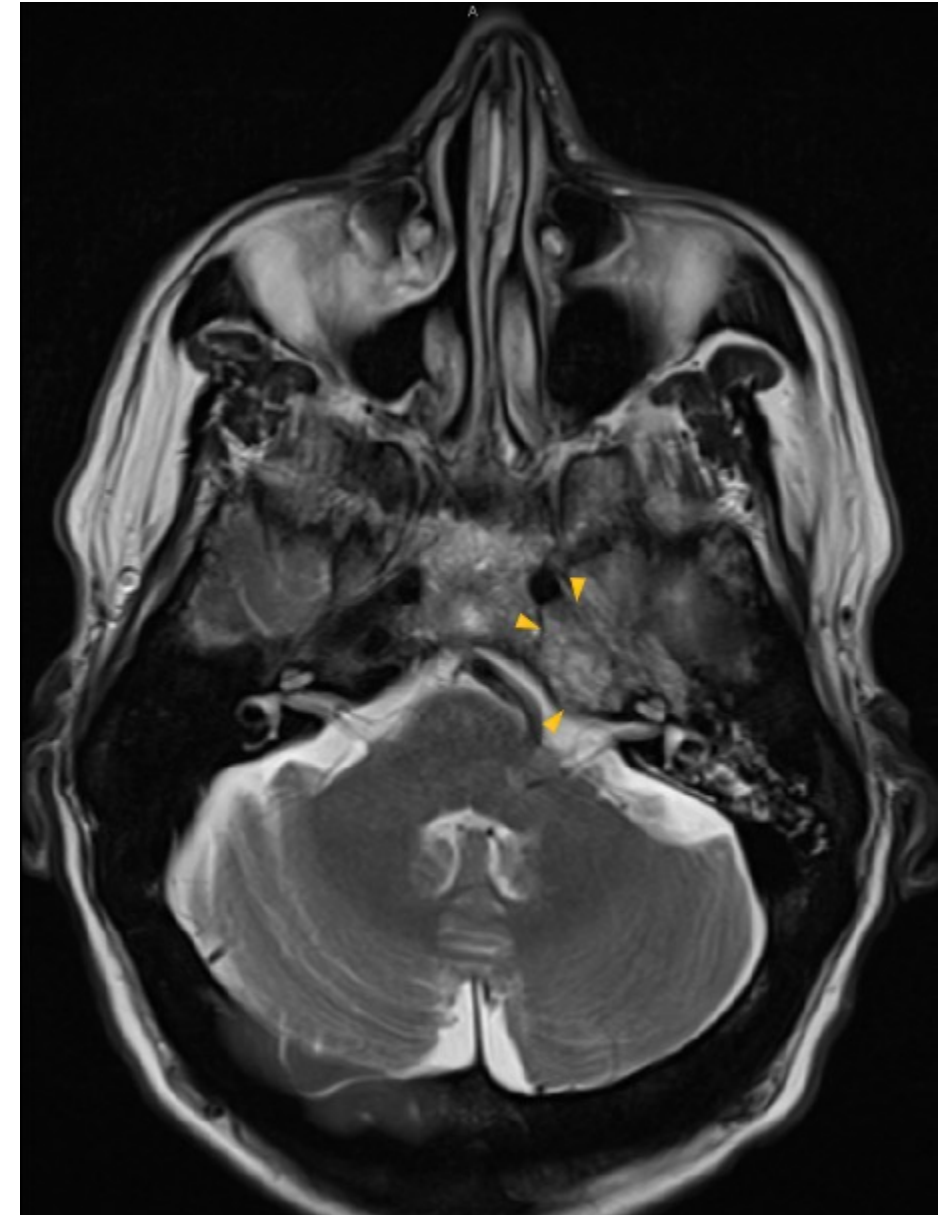
- Authors have nothing to declare

# BACKGROUND

- Lesions of the skull base are often the most challenging targets for percutaneous biopsy.
- Petrous apex lesions are among the **most dangerous** targets for a percutaneous biopsy within the skull base as the **internal carotid artery** resides within the anterior portion of the petrous apex.
- We describe a novel percutaneous CT-guided approach for biopsying a petrous apex lesion that has not been reported and can be safely employed with thorough planning.

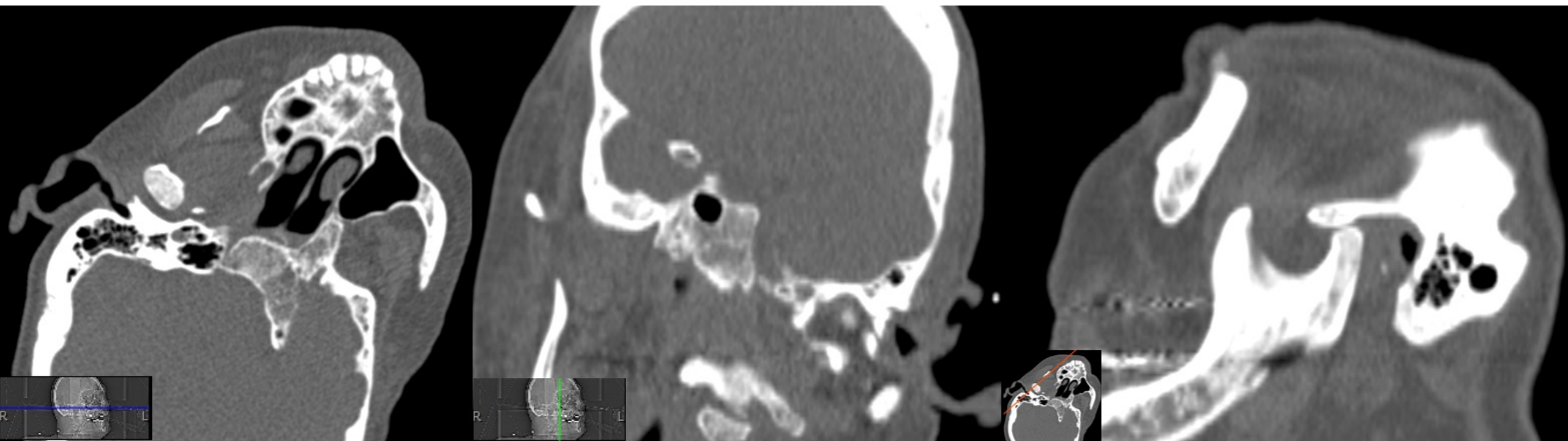
# CASE ILLUSTRATION

- A 55-year-old, acute onset of left facial weakness.
- **Bell's palsy??** 14-day steroids (failed to improve symptoms)
- MRI of the brain showed an enhancing **left petrous apex lesion** abutting the dura and extending to the facial hiatus.
- The bone marrow at that time showed **11-15% blasts** (Leukemic involvement of the petrous apex??)
- Neurosurgery was consulted (Invasive endonasal, endoscopic transclival bx with a clinical background of a hematological disorder)
- Neuroradiology was consulted to determine the feasibility of a minimally invasive CT guided percutaneous biopsy.



# TECHNIQUE

- An **imaging review**, including multiplanar and 3D reconstructions, was performed to search for a safe approach to the left petrous apex.
- Advancing the biopsy device along the contralateral right subzygomatic infratemporal fossa mandibular notch and drilling across the clivus to reach the left petrous apex posterior to the ICA was **the safest and technically feasible**.



# TECHNIQUE

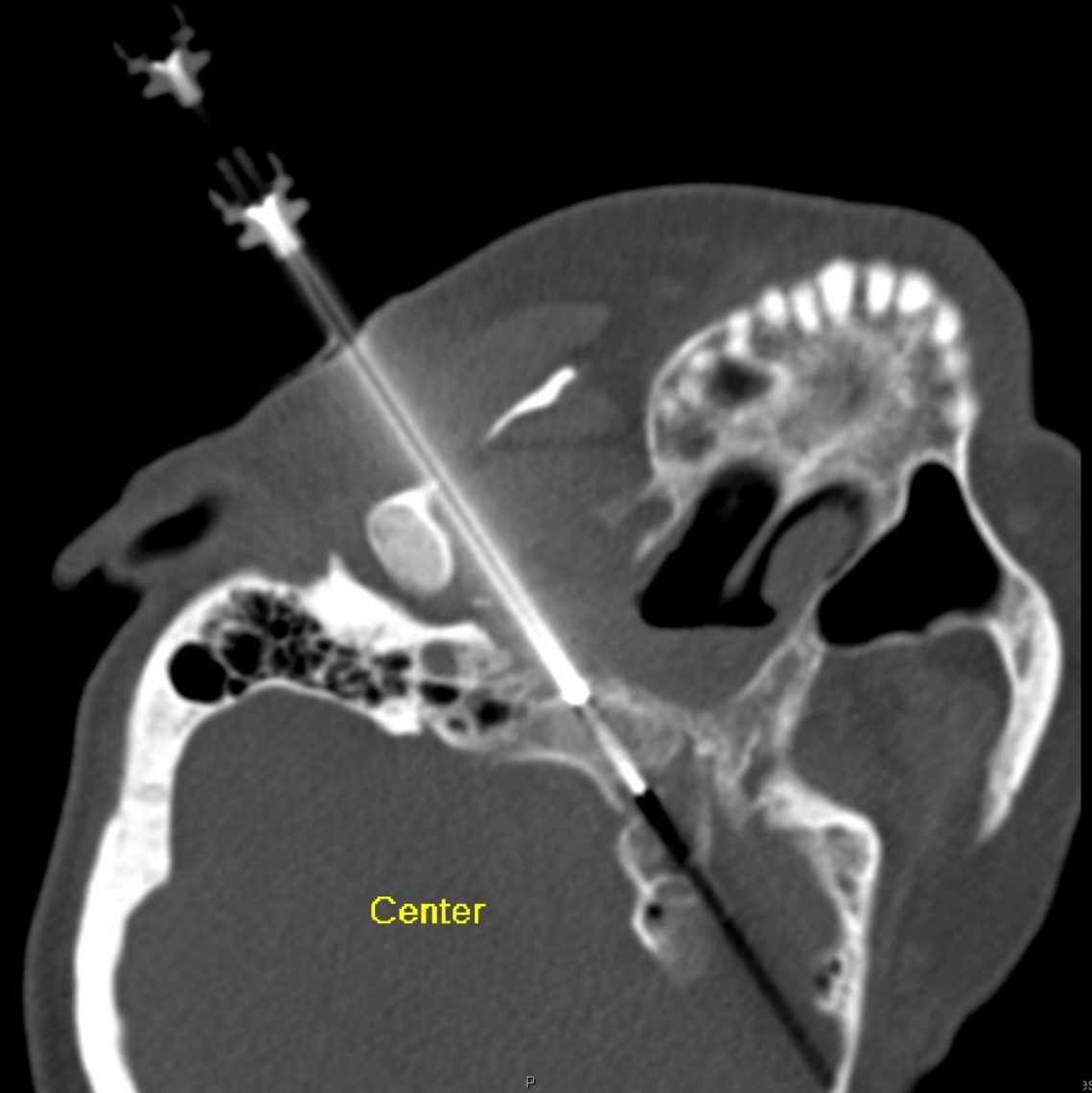
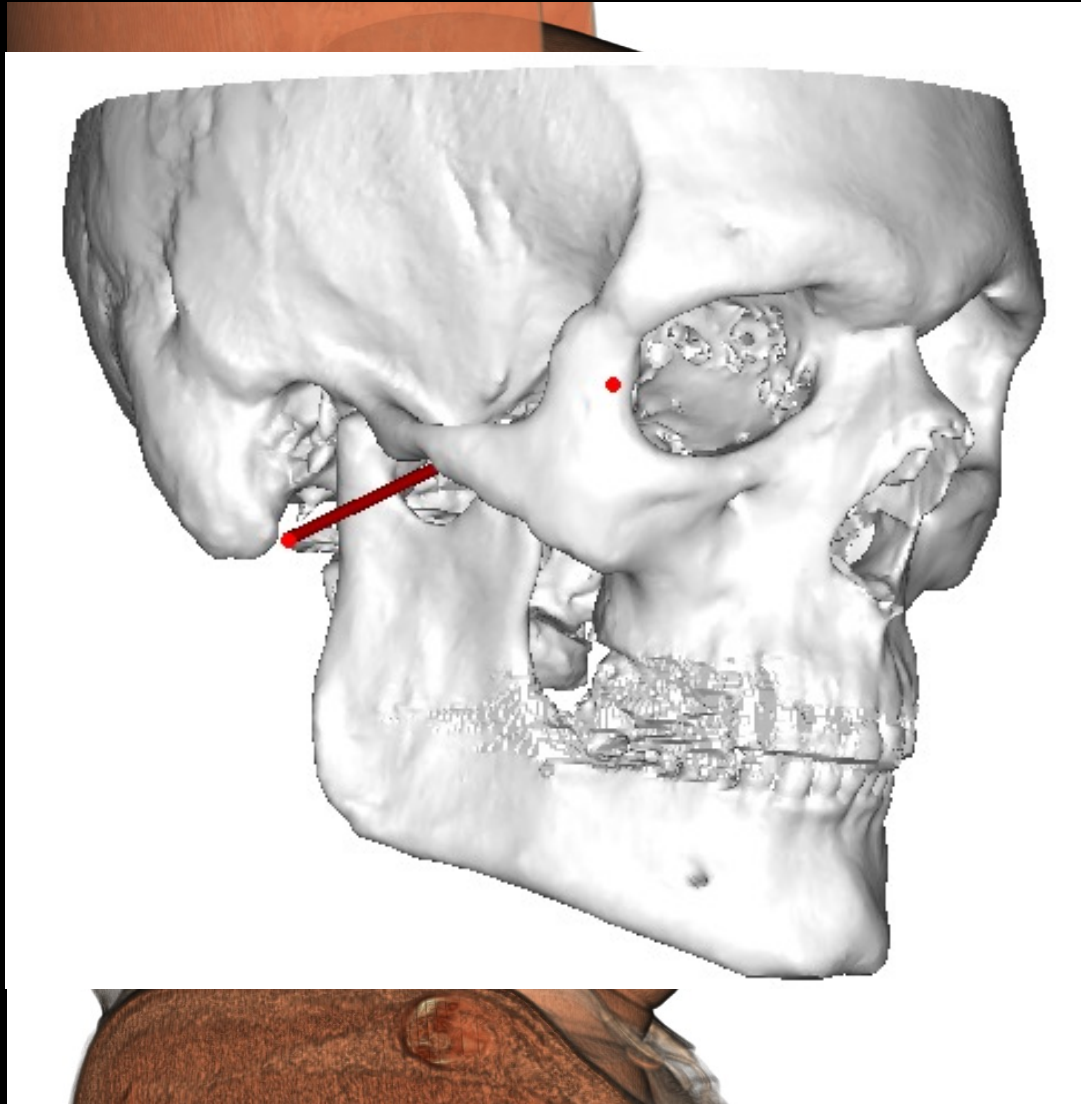
- A commercially available biopsy device (Arrow OnControl Powered Bone Lesion Biopsy System™) was selected for the procedure. *An 11-gauge, 10 cm access device and a 13-gauge, 14 cm biopsy device, each with a diamond tip stylet, were included in the kit. The inner sharp diamond tip stylet was exchanged with a blunt tip mandril from 18-gauge/15 cm long Hawkins-Akins blunt needle*
- **Intermittent CT fluoroscopy** with every instance of the access needle manipulation was used to confirm the **safe placement posterior to the left ICA.**
- A limited **postprocedure dynamic arterial and delayed venous brain** was performed to examine the integrity of the ICA as extravasation was normal



# RESULTS

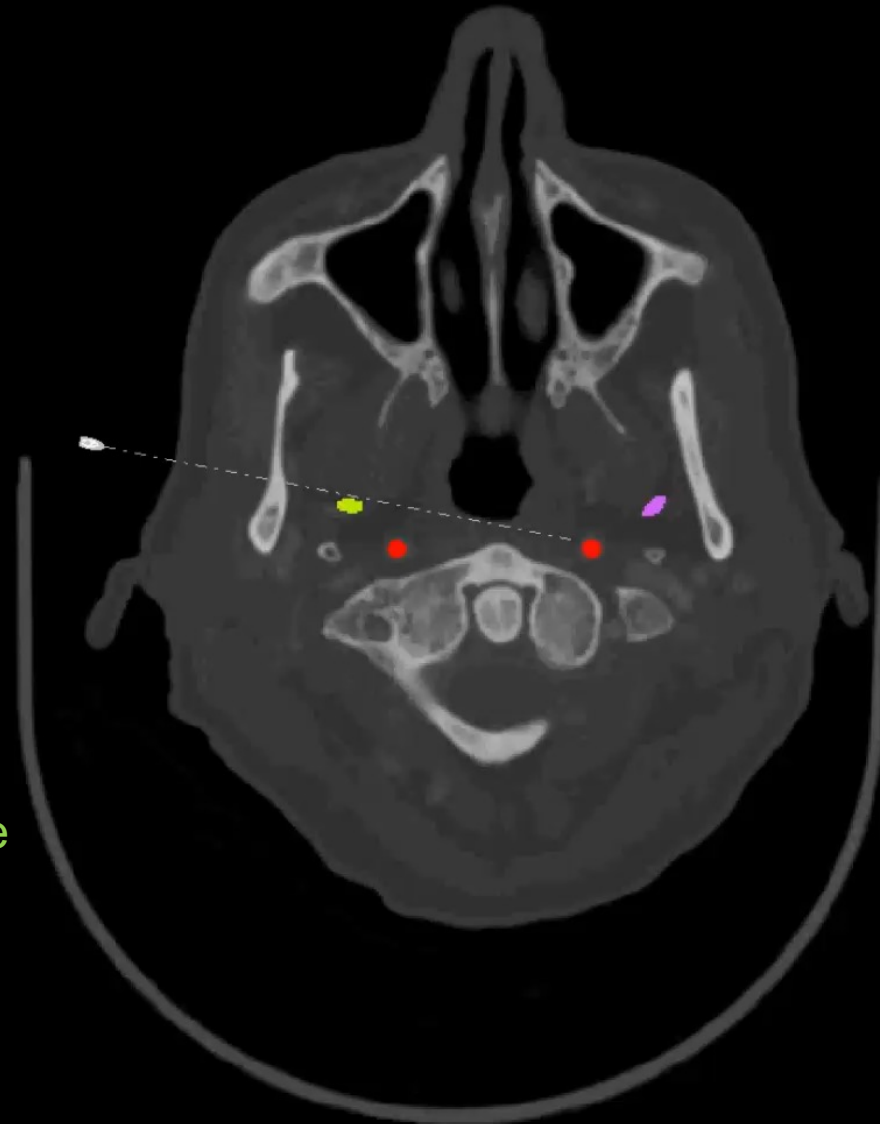
- The patient tolerated the procedure well **without any immediate or long-term complications**, including Eustachian tube dysfunction.
- Pathology revealed a metastatic **poorly differentiated squamous cell carcinoma**.

# NEEDLE PLACEMENT





# NEEDLE INSERTION SIMULATION



Red: Both ICAs

Lime green: RT Mandibular nerve

Purple: Eustachian tube

# CONCLUSION

- **Meticulous planning** aided by a thorough understanding of skull-base anatomy allows for safe percutaneous access to the petrous apex via a contralateral infratemporal fossa mandibular notch approach.
- Maintaining the needle trajectory **parallel and posterior** to the **ICA ipsilateral** to the target petrous apex ensures protection of the ICA.