

“Double Quarter Turn of the Head and Plumb Bob from the Corner”: A Novel Landmark-Based Approach for Pterygopalatine Fossa Block (PPFB).

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Introduction

Pterygopalatine fossa block (PPFB) is used across wide range of procedures involving V2-innervated structures, management of primary vascular headaches and post-dural puncture headaches and less frequently, for ophthalmic procedures and as part of scalp blocks for craniotomy.

Multiple landmark-based and ultrasound-guided (USG) approaches to PPFB have been described. However, the optimal technique remains undetermined. During a series of USG PPFBs, we identified recurring technical patterns and came up with a simplified, reproducible landmark-based method.

A Novel Technique

The block is performed with the patient supine after induction of general anesthesia.

1. The head is rotated laterally, away from the injection side, so that the sagittal plane is angled approximately 25° relative to the OR table.
2. The cephalad portion of the table is then elevated by an additional 25° relative to the floor.
3. After palpating the frontozygomatic (FZ) angle, the needle is introduced approximately 5 mm posterior and 5 mm cephalad to the bony counters.
4. The needle is advanced vertically toward the floor — the “plumb-bob” trajectory.

With the patient’s head positioned as described, this straight-down trajectory produces approximately 25° of posterior and 25° of caudad angulation relative to the cranial planes, replicating the US-derived ideal trajectory. Advancement of 4–5 cm (depending on age, sex, and BMI) positions the needle tip near the sphenopalatine fossa.

The Big Idea

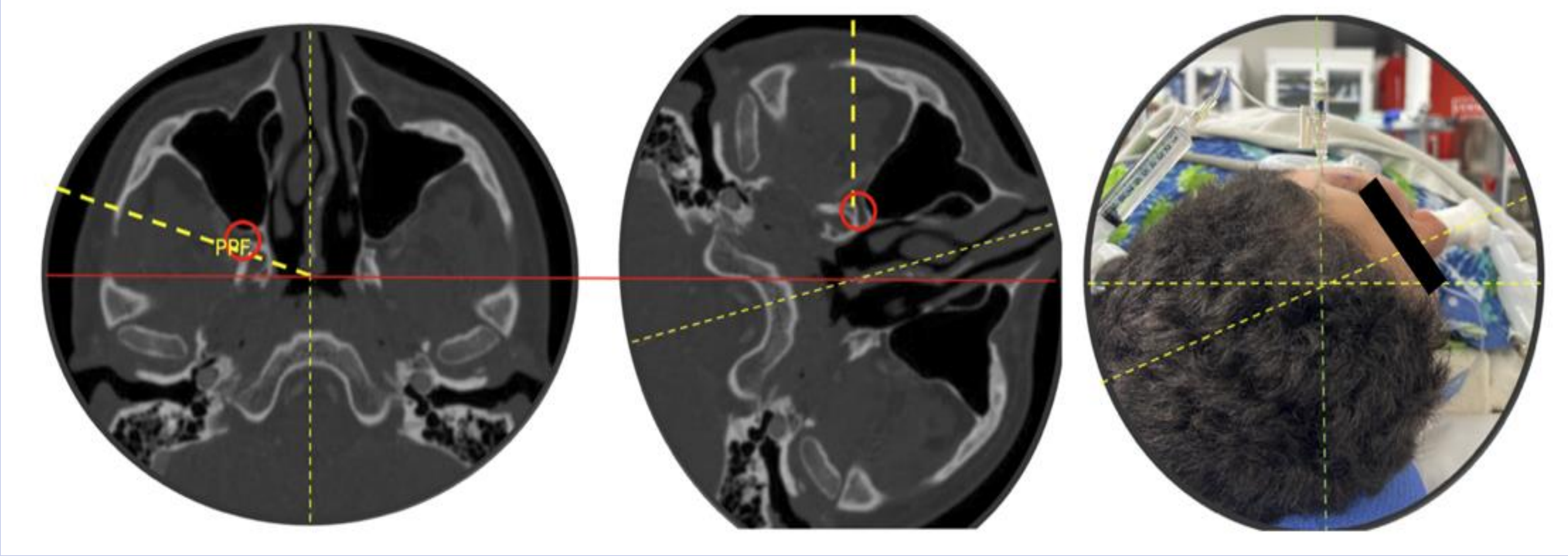


Fig 1. On the left: trajectory from the FZ angle to the PPF (yellow thick dashed line) on axial head CT images, showing approximately 75 degrees relative to the sagittal plane (thin yellow dashed line). On the right: image is rotated. The same trajectory is recreated with a plumb-bob approach when the head is “rotated laterally” so the sagittal plane is angled about 25 degrees relative to the floor. Without head rotation (left image), it is difficult to set the correct angle when relying only on the facial surface—here the trajectory appears perpendicular to the skin surface (green line) but is actually 75 degrees relative to the sagittal plane due to head shape variations. The PPF is outlined by a red circle.

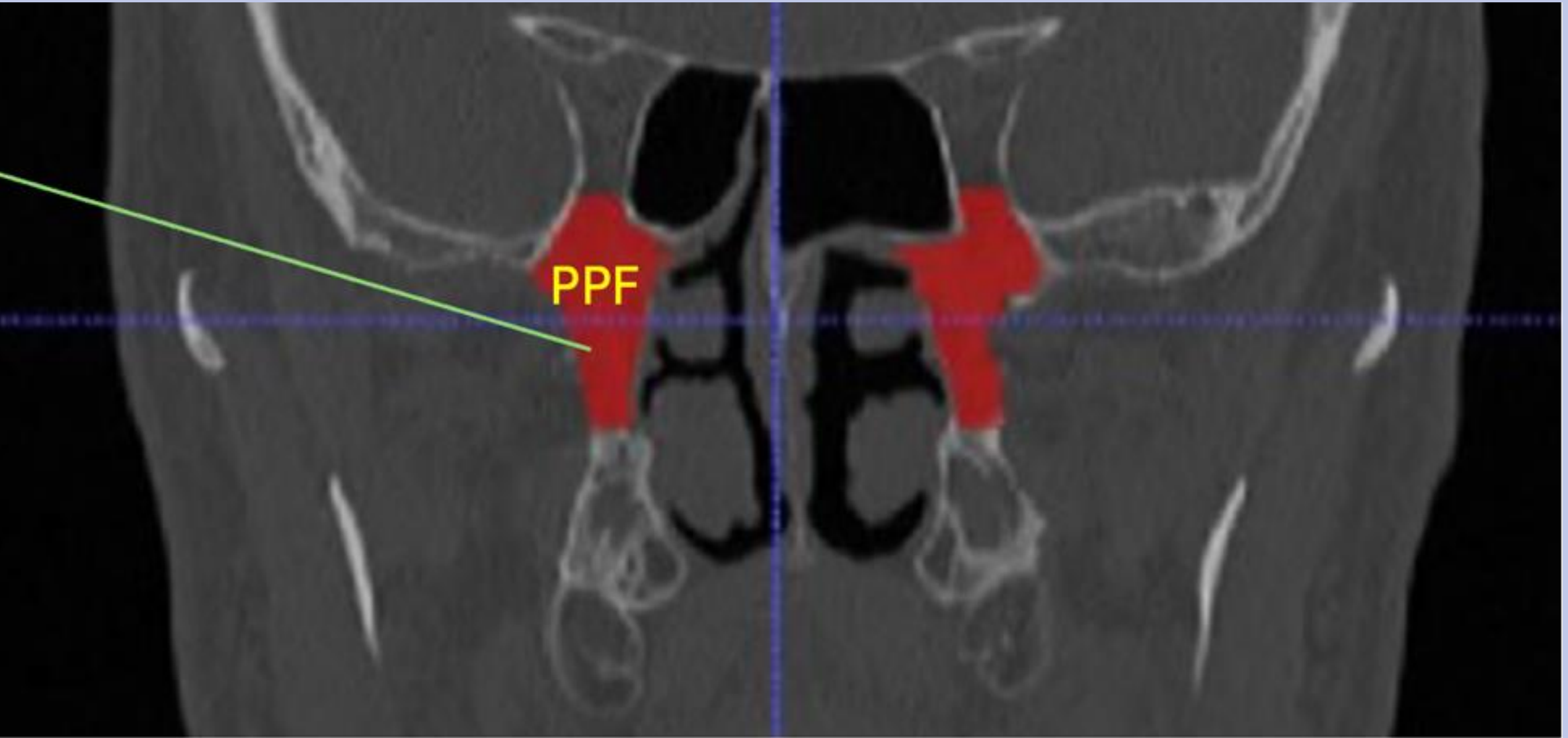


Fig 2. Coronal head CT scan showing approximately 25 degrees of caudad angulation from the FZ angle toward the pterygopalatine fossa (PPF) that is shaded red.

A 9 years-old male with history of recurrent streptococcal tonsillitis presented to outpatient surgical center for scheduled adenotonsillectomy. The patient was evaluated preoperatively, and a nerve block was offered for perioperative analgesia. After induction of general anesthesia, PPFBs were performed bilaterally with the described technique and 4 ml of 0.5% Ropivacaine was injected. An ultrasound was used to confirm injectate spread at the sphenopalatine fossa. Patient underwent surgery with no acute issues. On evaluation postoperatively, patient was comfortable with no reported pain. The patient was discharged home once all requirements were met with nerve block still in effect. On follow-up telephone call, patient’s mother reported that the patient was very comfortable postoperatively, and the patient did not require any oral analgesics.

Discussion

In comparison to previously described approaches for PPFB, this method offers several advantages. The “double 25°” head positioning is intuitive and easy to remember. The plumb-bob trajectory simplifies needle control and minimizes reliance on variable external facial landmarks. Importantly, this trajectory also reduces the risk of unintended orbital penetration — a complication reported with several suprazygomatic anatomical techniques that require anterior (philtrum) needle advancement.

To further evaluate this technique's precision, safety, and potential limitations, we plan to accumulate additional clinical experience and perform an anatomical study evaluating our proposed trajectory on 100 head CT scans (across varying ages, sexes, and BMIs).

References:

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