An In-plane Technique for the Suprazygomatic Maxillary Nerve Block

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Introduction

- To manage postoperative pain, suprazygomatic maxillary nerve block (SZMN blocks) are widely used in pediatric patients undergoing cleft palate surgery and adenotonsillectomy.
- The suprazygomatic approach offers reduced risk by angling away from the base of the skull. However, the out-of-plane technique presents challenges in visualizing the needle tip and precise localization of local anesthesia delivery.
- While there have been case reports of complications such as paresthesia, ocular involvement, hematoma formation, and seizure associated with an infrazygomatic technique, there is a lack of reports regarding complications in the suprazygomatic approach.
- Despite the advantages, our institution has encountered a series of complications with the increasing adoption of this block technique.
- Notably, we present case reports detailing rare complications of SZMN block, including facial nerve paralysis and ocular palsy, in pediatric patients.
- To address these concerns, we propose adopting an in-plane approach for placing the SZMN blocks to enhance needle guidance and improve visualization of local anesthesia placement.

Objectives

1) Demonstrate the in-plane technique for administering the suprazygomatic maxillary nerve block.
2) Emphasize complications associated with the out-of-plane approach to administering the suprazygomatic maxillary nerve block.

Case Report 1

- A 2-year-old girl had bilateral SZMN blocks during adenotonsillectomy.
- Each side received 1 mg/kg of 0.5% Ropivacaine.
- Initial hydrodissection shallow; needle repositioned before injection.
- Post-surgery, the patient experienced mild right-sided smile asymmetry.
- Examination revealed facial nerve paralysis in a buccal branch.
- Recovery was otherwise normal; eating and drinking were unaffected.
- Paralysis improved within 5 hours and returned to baseline by the next day, matching ropivacaine's efficacy timeline.

Case Report 2

- A 5-year-old girl presented for adenotonsillectomy due to severe obstructive sleep apnea.
- Nerve block placement, following Sola et al.'s method, was uneventful.
- Ultrasound confirmed local anesthesia placement via tissue motion on injection. The procedure utilized Ropivacaine 0.5% (1 mg/kg on each side) with an adjunct of dexmedetomidine 1 mcg/ml (total of 10 mcg).
- The patient woke up in the recovery unit with agitation; ptosis was observed upon calm examination.
- Eye symptoms were resolved entirely by a follow-up call on POD 1.

Images

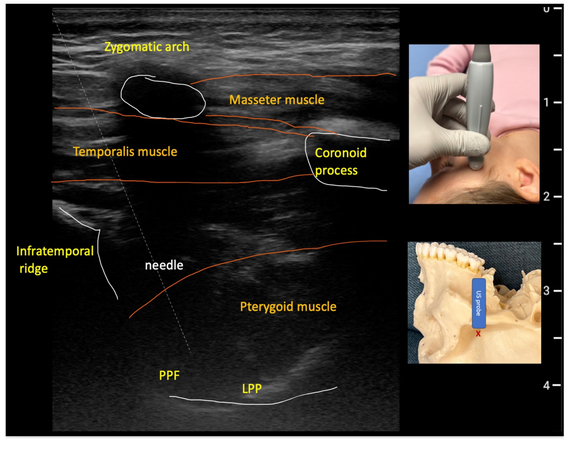


Figure 1. Suprazygomatic maxillary nerve (SZMN) block in-plane approach

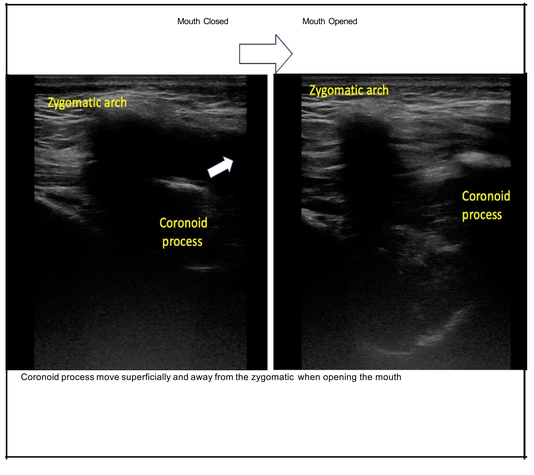


Figure 2. Suprazygomatic maxillary nerve (SZMN) block in-plane approach optimization with mouth opening

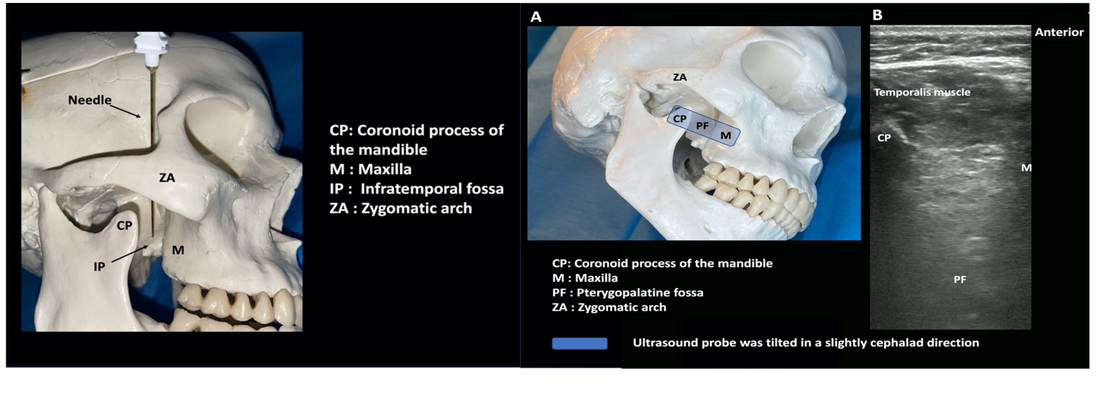


Figure 3. Suprazygomatic Maxillary Nerve (SZMN) Block traditional out of plane approach

In-Plane Ultrasound

- The in-plane technique of the SMN approach involves the following steps:
  - Inserting the needle above the zygomatic arch in a plane parallel to the probe positioned over the zygomatic arch.
  - Opening the patient's mouth improves the acoustic window by causing the coronoid process to move superficially and away from the zygomatic arch.
- This approach has been clinically and successfully employed for young children and adults.
- Needle visualization: the in-plane technique allows the entire needle and more precise needle tip placement.
- Local Anesthesia visualization. the in-plane technique allows the visualization of the local anesthesia deposition instead of imprecise tissue displacement.
- Fewer needle redirections: the in-plane technique requires fewer needle redirections, reducing the risk of unintended tissue injury and improving patient comfort.
- Simultaneous image acquisition: avoid vascular structures and reduce the risk of unintended tissue injury.

Limitations

- Small sample size from case studies.
- Suprazygomatic maxillary nerve block has low rate of complications.
- Prospective randomized study are needed.

Discussion

- The case reports highlight rare complications of SZMN block in a pediatric patient, with symptoms resolving 24 hours after local anesthetic injection.
- The current out-of-plane approach relies on imprecise tissue displacement.
- Consider using an in-plane technique for ultrasound-guided suprazygomatic maxillary nerve block to locate the needle tip and local anesthetic deposition more accurately.

References

- Scan the QR code for references.