When Anatomy Meets Endocrinology: Hematoma After Posterior Superior Alveolar Nerve Block in a Hypothyroid Dwarfism Patient a Case Report

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ABSTRACT

The Posterior Superior Alveolar (PSA) nerve block is a routine local anesthesia technique used for maxillary molar procedures. Despite its safety, inadvertent vascular injury may result in hematoma formation—a rare but distressing complication. This case report presents a hematoma occurring after PSA nerve block in a 55-year-old female patient with hypothyroidism and dwarfism, highlighting the importance of understanding how systemic and craniofacial anatomical variations influence anesthetic complications.

Keywords- Posterior superior alveolar nerve block, hematoma, hypothyroidism, dwarfism, local anesthesia complication, maxillary anesthesia.

INTRODUCTION

The Posterior Superior Alveolar (PSA) nerve block is an essential technique to anesthetize the maxillary molars and associated tissues. Although usually safe, complications such as hematoma, pain, transient diplopia, or trismus may occur due to inadvertent vascular trauma [1]. A hematoma develops when the pterygoid venous plexus or posterior superior alveolar vessels are punctured, causing extravasation of blood into soft tissues [2]. Anatomical variations and systemic conditions can significantly alter the risk and severity of such complications. This report presents a rare case of hematoma formation following PSA block in a female patient with hypothyroidism and dwarfism, conditions that may alter tissue resilience, vascular structure, and craniofacial proportions, increasing susceptibility to injury.

Case Report

A 55-year-old female reported to the Department of Oral and Maxillofacial Surgery for extraction of the right maxillary second molar with chronic periapical infection.

- Medical history: Known case of hypothyroidism for 10 years, managed with levothyroxine, and proportionate dwarfism.
- No history of bleeding disorders, hypertension, or anticoagulant use.
- Physical examination: Revealed short stature (height: 125 cm), small craniofacial dimensions, and shallow buccal vestibule in the posterior maxilla.

After informed consent, a posterior superior alveolar nerve block was administered using 2% lignocaine with 1:80,000 adrenaline and a 27-gauge short needle. During needle withdrawal, the patient reported mild discomfort and fullness in the infrazygomatic region.

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Within a few minutes, diffuse swelling developed over the right infraorbital and buccal region, extending toward the lower eyelid—clinically consistent with a hematoma.

Immediate Management

- The injection was immediately stopped.
- Cold compression was applied over the swelling for 15 minutes.
- The patient was reassured and monitored; no airway obstruction or visual disturbance occurred.
- Prescribed analgesics and instructed cold compresses for 24 hours, followed by warm compresses after 48 hours.

By the fifth day, the swelling reduced significantly, and by day seven, it completely resolved without fibrosis or discoloration.

Fig 1: after 24 hours diffuse swelling developed over the right buccal region

Fig 2: after 24 hours hematoma can be see at right buccal region

DISCUSSION

Pathophysiology

Hematoma after PSA nerve block results from accidental penetration of the posterior superior alveolar artery or pterygoid venous plexus [3]. The plexus lies in close proximity to the needle path; thus, even minor over-penetration can rupture a vessel.

Anatomical Considerations in Dwarfism

In individuals with dwarfism, craniofacial anatomy is often altered—featuring smaller maxillary dimensions, shorter zygomatic processes, and reduced distance between the maxillary tuberosity and pterygoid plexus [4,5]. This reduced anatomical space increases the risk of vascular injury during PSA block, even with standard insertion depths.

Influence of Hypothyroidism

Hypothyroidism is associated with:

- Increased mucopolysaccharide deposition in tissues, leading to fragility and edema,

- Delayed capillary response, and
- Prolonged tissue healing [6,7].
- These changes make soft tissues more susceptible to trauma and slower to recover from vascular injury.

Moreover, reduced metabolic rate and vascular tone in hypothyroidism may influence hemostasis and prolong hematoma resolution [8].

Clinical Presentation

Typical hematomas appear immediately or within minutes of injection, presenting as soft, diffuse, non-tender swellings extending toward the infraorbital or periorbital regions. Ecchymosis may develop within 24 hours and resolves over 1–2 weeks [9].

Management

Most PSA block-related hematomas are self-limiting and managed conservatively [10]:

- Apply pressure and ice packs immediately to restrict bleeding.
- After 48 hours, use warm compresses to promote blood resorption.
- Analgesics for discomfort; antibiotics only if secondary infection occurs.
- Avoid needle aspiration or surgical intervention, as they may aggravate bleeding.

6. Preventive Measures

- Use a short needle (≤16 mm insertion depth) [11].
- Aspirate in two planes before injection.
- Inject slowly and avoid over-penetration, especially in patients with small craniofacial anatomy.
- Consider systemic conditions (e.g., hypothyroidism, bleeding disorders) before anesthesia administration.

CONCLUSION

Although rare, hematoma following PSA nerve block can be distressing. This case emphasizes that systemic factors (hypothyroidism) and craniofacial variation (dwarfism) may enhance susceptibility to anesthetic complications. Careful evaluation of anatomy, slow injection technique, and immediate conservative management ensure patient safety and rapid recovery.

Clinical Significance

Dental professionals should consider systemic and skeletal variations before local anesthesia. Tailoring injection technique based on anatomical dimensions and systemic health minimizes the risk of complications like hematoma.

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