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Focal Epistaxis After an Infraorbital Nerve Block: A Rare Case Report and Literature Review

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ABSTRACT

The infraorbital nerve block is a widely used regional anaesthesia technique for maxillary dental procedures. Although generally safe, its proximity to the infraorbital vascular plexus and nasal cavity means that unusual complications such as epistaxis may occasionally occur. A 45-year-old female developed brief pinpoint bleeding from the left nostril immediately after administration of a left infraorbital nerve block for the extraction of tooth 25. The bleeding resolved spontaneously within a minute without intervention. The extraction proceeded. The patient was monitored postoperatively. No further symptoms were observed during the procedure and at one-week follow-up. Transient epistaxis following infraorbital nerve block, while rare, is anatomically plausible due to the thin bony boundaries of the infraorbital canal and its vascular communications with the nasal cavity. Literature examining midfacial anatomy and anaesthesia techniques documents how variations in canal morphology, vascular networks, and injection dynamics may contribute to such bleeding. These episodes are typically benign, self-limiting, and require only observation and reassurance. Clinicians should recognize that minor nasal bleeding can occur following an infraorbital nerve block. Awareness of anatomical variations and careful injection technique remain essential to minimizing risk and ensuring appropriate patient management.

Keywords: Epistaxis; infraorbital nerve block; local anaesthesia complications; maxillary anaesthesia; midfacial anatomy.

INTRODUCTION

Anatomical studies reveal that the infraorbital nerve exits the infraorbital foramen, which lies approximately 6.3 mm below the infraorbital rim and is closely related to the maxillary sinus and nasal cavity.[1]

This area also houses key vascular structures, and the thin or inconsistent bone surrounding the infraorbital canal can leave patients vulnerable to uncommon yet significant injection-related complications.[1,2] Because the bony roof over the infraorbital groove and canal offers only minimal protection, nearby vascular branches remain exposed, increasing the risk of inadvertent vascular puncture during nerve block procedures.[1,2]

The infraorbital nerve block is a commonly employed aesthetic technique for procedures involving the maxillary anterior teeth, premolars, upper lip, and

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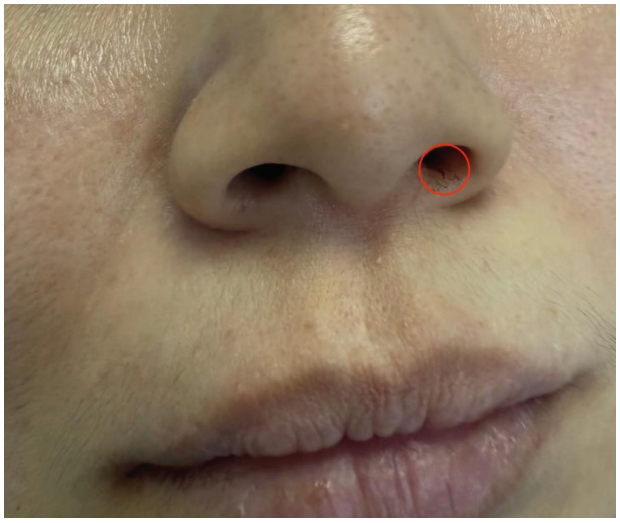
midfacial soft tissues. Its effectiveness stems from the predictable course of the infraorbital nerve and its branches as they emerge from the infraorbital foramen.[1, 2]

Typical complications include hematoma, transient paraesthesia, diplopia, and localized swelling. Epistaxis following infraorbital nerve block is rarely documented, yet its anatomical basis is sound, given the proximity of the infraorbital artery and its branches to the nasal cavity. Recognition of this rare complication is important to prevent unnecessary concern and to guide appropriate management.

This report and review describe a rare case of focal epistaxis following infraorbital nerve block and present a literature-based discussion of anatomical factors and mechanisms underlying this phenomenon.

CASE REPORT

A 45-year-old female with no systemic disease presented for the extraction of the maxillary left second premolar. A standard intraoral infraorbital nerve block was administered on the left side, directed toward the left infraorbital foramen. The needle was inserted through the mucobuccal fold in the region of the left first premolar using a 27-gauge short needle (22 mm) with a total depth of the needle penetration of less than 16 mm. No bisecting central incisor technique was employed. Needle advancement and anesthetic deposition were smooth and uneventful, with no deviation from the standard technique. 1.8 ml of 2% lidocaine with 1: 100000 adrenaline was used for both infiltration and block. Within one minute of completing the injection, the clinician noted pinpoint bleeding from the patient's left nostril. Anterior rhinoscopy done; No visible nasal mucosal tearing or injury was noticed. The bleeding was mild, lasted less than a minute, and resolved spontaneously without the need for compression, packing, or medication. The patient denied discomfort, sensory changes, visual disturbances, or airway symptoms. The patient reported a history of requiring multiple injections during a previous extraction on the right side. In the present procedure, the patient continued to experience pain despite a single local infiltration administered in the region of tooth 25; therefore, an infraorbital nerve block was subsequently performed. Additionally, the nerve block technique requires a smaller volume of local anesthetic compared with a supraperiosteal injection, which typically necessitates approximately 3 ml of solution. The extraction proceeded. The patient was monitored postoperatively, and no signs of persistent bleeding, hematoma, or nerve paraesthesia were noted. At the one-week follow-up visit, the patient reported no recurrence of nasal bleeding or other adverse events, and healing was uneventful.



Clinical image showing focal nasal bleeding

DISCUSSION

Epistaxis following infraorbital nerve block is rarely documented, but a review of the regional anatomy and literature supports several mechanisms that may contribute to this occurrence. The infraorbital nerve travels with the infraorbital artery and vein through the infraorbital canal, a narrow bony passage that varies considerably in length, diameter, curvature, and bone thickness.[2,3] In some individuals, the canal's bony walls are extremely thin or partially dehiscent, reducing the protection of vessels adjacent to the nasal cavity.

The infraorbital artery forms an anastomotic network with branches of the facial artery, anterior superior alveolar artery, and external nasal arteries.[4] These vessels supply the lateral nasal wall and nasal mucosa. Even subtle mechanical irritation from needle contact or pressure transmitted during anesthetic deposition may disturb these fragile vascular branches. Given their proximity, minor trauma or injection-induced pressure may manifest as focal ipsilateral epistaxis, as seen in this case.

Direct trauma to the nasal mucosa is unlikely in this case, as the needle was advanced toward the infraorbital foramen from a point directly above the first premolar—an anatomical location remote from the nostril. Furthermore, there was no visible perforation of the nasal mucosa, and no portion of the needle was observed within the nasal cavity.

Anatomical variations further reinforce this possibility. Studies have demonstrated accessory infraorbital foramina, asymmetrical canal patterns, and variable emergence points of neurovascular bundles, all of which may increase susceptibility to inadvertent vascular involvement during regional anesthesia.[5]

Although specific case reports of epistaxis from infraorbital block are scarce, multiple publications describe related bleeding complications after maxillary or midfacial injections. Meyer et al. documented periorbital ecchymosis and localized bleeding associated with maxillary anaesthesia, attributing these events to rupture of small superficial vessels.[6] DeSantis and Liebow also reported facial hematomas resulting from regional injections, emphasizing the vulnerability of midfacial vasculature.[7] Educational texts and regional anaesthesia reviews note that facial blocks—especially in anatomically variable areas—may rarely produce nasal bleeding due to involvement of small communicating arteries.[7,8]

The clinical behaviour of the bleeding in this case—minimal, short-lived, and self-resolving—is consistent with the literature, which suggests that these events rarely represent significant vascular injury. Instead, they reflect a temporary disruption of superficial mucosal vessels. Appropriate management consists of calm observation, patient reassurance, and continued monitoring, with no need for intervention unless bleeding becomes persistent or bilateral.

This case reinforces the importance of anatomical awareness and a gentle injection technique during an infraorbital nerve block. Aspiration before injection, avoiding excessive pressure, and maintaining proper needle angulation reduce the risk of inadvertent vascular compromise. Patients should also be informed that minor nasal bleeding is a rare but benign possibility.

While epistaxis without direct nasal mucosal trauma is unquestionably uncommon, indirect mechanisms such as transient hydrostatic pressure transmission, rupture of anatomically variant superficial vessels, or disruption of the nasal venous plexus may account for rare, self-limiting pinpoint nasal bleeding. Such mechanisms would be expected to occur infrequently, which is consistent with the rarity of these clinical presentations. A key limitation of the present case report and review of literature is the inability to definitively identify the exact pathophysiological source of bleeding, owing to the lack of direct visualization or vascular imaging. Consequently, future research—particularly studies incorporating detailed anatomical assessment, imaging correlation, or larger case series—may be

necessary to better elucidate the precise mechanisms responsible for this rare complication.

SUMMARY

Transient, focal epistaxis may occur as an uncommon complication of infraorbital nerve block. Although unexpected, such bleeding is typically mild and self-limiting and does not indicate a serious vascular injury. Knowledge of the anatomical relationships within the infraorbital region and adherence to careful injection technique allow clinicians to manage these events confidently and safely. Clear communication and patient reassurance are essential components of care when such rare complications arise.

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CONFLICT OF INTEREST: None.

REFERENCES

1. Aggarwal A, et al. Anatomical study of the infraorbital foramen: a basis for successful infraorbital nerve block. Clinical anatomy. 2015 Sep;28(6):753-60. [DOI | PubMed | Google Scholar]
2. Nam Y, Bahk S, Eo S. Anatomical study of the infraorbital nerve and surrounding structures for the surgery of orbital floor fractures. Journal of Craniofacial Surgery. 2017 Jun 1;28(4):1099-104. [DOI | PubMed | Google Scholar]
3. Kazkayasi M, Ergin A, Ersoy M, Tekdemir I, Elhan A. Microscopic anatomy of the infraorbital canal, nerve, and artery. J Craniofac Surg. 2003;14(5):692–695. [DOI | PubMed | Google Scholar]
4. Bernardi S, et al. Anatomy of maxillary sinus: Focus on vascularization and underwood septa via 3D imaging. Tomography. 2024 Mar 24;10(4):444-58. [DOI | PubMed | Google Scholar]
5. Nanayakkara D, Peiris R, Mannapperuma N, Vadysinghe A. Morphometric analysis of the infraorbital foramen: the clinical relevance. Anatomy research international. 2016;2016(1):7917343. [DOI | PubMed | Google Scholar]
6. Malamed SF. Handbook of Local Anesthesia. 6th ed. St. Louis: Mosby; 2013. [Google Scholar]
7. Biocic J, Brajdic D, Peric B, Đanic P, Salaric I, Macan D. A large cheek hematoma as a complication of local anesthesia: case report. Acta Stomatologica Croatica. 2018 Jun;52(2):156. [DOI | PubMed | Google Scholar]
8. Mesa J, Lalonde D, Vasconez LO. Local and regional anesthesia in plastic surgery: safety considerations and management of adverse events. In Complications of Regional Anesthesia: Principles of Safe Practice in Local and Regional Anesthesia 2017 May 4 (pp. 399-409). [DOI | LINK | Google Scholar]