Long buccal nerve block: a previously unreported complication

Marjorie Kerry Herd, MRCS, MFDRCSI,a Robert J. R. Smith, MJDF, MFDS, DPDS,b and Peter A. Brennan, MD, FRCS, FRCSI, FDSRCS,c Portsmouth, United Kingdom

DEPARTMENT OF ORAL AND MAXILLOFACIAL SURGERY, QUEEN ALEXANDRA HOSPITAL

Although local anesthetic injections are commonly used in dental practice, the complex neurovascular anatomy of the face can present the practitioner with unexpected complications. Several reports document adverse events related to inferior dental blocks (IDBs), whereas long buccal nerve blocks are usually performed without incident. We describe a previously unreported complication of a long buccal nerve block involving blanching, pain, and paresthesia specifically within the infraorbital arterial territory of the face. We had previously reported an identical event resulting from an IDB. We discuss the facial vascular relationships that might explain this complication and how to manage it. (Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;112:e1-e3)

Local anesthetics are commonly used in dental practice with few complications. Local complications include needle-induced nerve damage, resulting in paresthesia, or soft tissue effects, such as trismus from hematoma formation. Needle breakage may also occur, although this is rare.1 Systemic complications are usually related to toxicity from excessive administration, rarely to allergy.2

We have previously reported an unusual complication of profound immediate numbness and marked facial skin pallor in the distant infraorbital territory occurring after the administration of an inferior dental block (IDB)3 and postulated that this may have been due to inadvertent injection into a branch of the maxillary artery, or possibly due to a neurologic mechanism. We have recently had an almost identical complication after a long buccal nerve block for a buccal mucosal biopsy.

A 50-year-old woman attended the maxillofacial unit for surgical biopsy of a small white patch present in the right buccal mucosa. A right long buccal nerve block was administered by using a 29-gauge needle and an aspirating technique in the standard position, above the mucobuccal fold adjacent to the third molar in the occlusal plane. As the solution (1 mL 2% lidocaine with 1:80,000 adrenaline) was deposited, the patient experienced a sudden, sharp, shooting pain over the ipsilateral infraorbital region. This was immediately followed by notable skin pallor in the distribution of the infraorbital artery, extending superiorly to the lower eyelid, medially involving the nose, and inferiorly to the nasolabial fold (Fig. 1).

Examination revealed anesthesia in the same territory; intraorally the only sign was mucosal pallor local to the injection site. The biopsy was completed, and the cheek pallor and anesthesia began to resolve 30 minutes after the injection.

There have been numerous publications of unusual neurovascular complications distant to the local anesthetic injection site after IDBs4, but we are not aware of any publication relating to long buccal nerve blocks.

The most likely explanation regarding cheek pallor would be inadvertent intraarterial injection of the vasoconstrictor component of the local anesthetic solution. Although a self-aspirating syringe was used, as-

Fig. 1. Skin pallor in the anatomic distribution of the infraorbital artery after a long buccal nerve block.
pirating mechanism failure or needle movement may have occurred. Although the anatomy in this area is highly variable, it is possible that the buccal (also named the buccinator) artery, a branch of the middle third of the maxillary artery, may have been injected with adrenaline.

Established anatomy texts\(^5\),\(^6\) state that the buccal artery may anastomose with the infraorbital and facial arteries. It is therefore possible that the solution might either travel distally through an anastomosis to join the infraorbital artery after it exits its foramen or travel proximally into the maxillary artery and on via the infraorbital canal into the infraorbital artery territory. Both routes would affect the facial skin, although the latter route might additionally affect ocular adnexae (Fig. 2). This vasoconstrictive mechanism occurs via sympathetic adrenoceptor response in the arteriolar wall and smooth muscle contraction.

Pallor may also be caused by direct needle contact with an artery via sympathetic stimulation causing vasoconstriction.\(^7\) In the present case, an arterial spasm propagated via the vascular connections described above might have induced pallor over the cheek; furthermore, arterial spasm might have affected supply to local sensory nerves, provoking pain/paresthesia.

Numbness may be attributed to the action of vasoconstrictor diffusing from within the vessel and acting on the colocated infraorbital nerve trunk, possibly by constricting its vasa nervorum, explaining the numbness in the infraorbital nerve territory. Additionally, any lidocaine distributed from local vessels could act directly on the sensory infraorbital nerve.

Management of all such local anesthetic–related complications are best addressed by immediately stopping the injection, formally assessing the patient, and reassuring them of the short-lived nature of the complication. All eye problems should include a formal ophthalmic assessment, including visual acuity, eye movements, and corneal sensation, prophylactically taping lids closed as necessary.

These reactions are possibly under reported, and while they may be alarming for both patient and practitioner, reassurance is usually all that is required, because they are self-limiting with no long-term neurologic effects.

REFERENCES

Fig. 2. Maxillary artery branch anastomotic relationships and proposed direction of local anesthetic distribution.


Reprint requests:
Miss M. K. Herd
Oral and Maxillofacial Surgery Dept.
Queen Alexandra Hospital
Southwick Hill Road Cosham
Portsmouth PO6 3LY
United Kingdom
kerryherd@hotmail.com;
kerryherd1@doctors.org.uk).