Painless palatal local anesthetic injection: A low-cost, effective technique

Sir,

We read with interest the recently published original article by Gazal et al.[1] The authors observe that palatal injections are much more painful than buccal infiltrations. An existing method of overcoming discomfort is to anesthetize the keratinized, tightly-bound palatal mucosal epithelium with a topical anesthetic preparatory to the injection. While options ranging from 2% lignocaine gel, 5% ointment, to 10%–15% topical anesthetic sprays are available for topical use, the operator’s limited ability to simultaneously reduce the rate of injection while maneuvering the needle has been cited as a cause for patient discomfort during palatal injections.[2‑4]

The use of computer-controlled injection devices to slow the rate of flow of local anesthetic solution into the tissues is effective in reducing pain on injection. The pump driven extremely slow rate of flow allows for a very comfortable injection experience. Cost of equipment would be a limiting factor in developing economies, especially in modestly equipped outreach centers and satellite clinics. Hence, an alternative is suggested to provide patients at these centers with a less painful injection experience.

Conventionally, a disposable syringe with a volume of 2–2.5 mL is often used for injection following aspiration. We tried an insulin syringe instead. The narrow diameter of the insulin syringe implies a marked increase in piston travel to inject the same 1 mL of solution. This is since the volume of a cylinder ($\pi r^2 h$) is proportional to the square of radius ($r$) and its height ($h$). Hence, to maintain volume constant, a small decrease in radius of a syringe must be compensated for by a large increase in its length. A law of hydraulics states that hydraulic piston travel speed (which is constant for the given operator pushing with his/her thumb) equals the ratio of flow rate to piston area. Since the insulin syringe has a narrow diameter and therefore a smaller piston cross-sectional area, flow rate of the local anesthetic solution also reduces for piston travel speed that is quite constant for a particular clinician.

We used a narrow, commonly available 1 mL disposable insulin syringe for palatal injections and received favorable feedback from patients about the choice. Although the needle is a narrower gauge, positive aspiration can be demonstrated. Further, the narrow piston diameter reduces the amount of force needed to inject. This allows for more precise control by the operator with the obvious advantage of permitting extremely slow rates of initial injection.[5] This idea has also found favor with clinicians who find that the insulin injection for anterior palatal injections requires less manual effort. While not claiming that this technique is a substitute for a computer-controlled electronic injection device, our method permits almost painless injections, costs very little, is quick to set up, and is appreciated by patients who had palatal injections previously administered with a conventional larger syringe. We recommend this low-cost improvised injection technique in palatal injections to provide the benefit of painless injections at clinics not equipped with computer-controlled injection devices.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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Sir,

Ultrasound imaging has opened a Pandora's box of possibilities as now the anesthetist can visualize and identify nerves and blood vessels as well as the needle during its passage through the tissues.

In addition, direct visualization of the spread of local anesthetic decreases the risk of intravascular injection, potential local anesthetic toxicity, pneumothorax, and a failed blockade.

Here, we discuss a successful management of a patient of head injury with cervical fracture stabilized in a halo brace posted for humerus fixation. This case represents only the first case of ultrasound-guided interscalene block in a patient of halo brace in literature even though supraclavicular block has been reported earlier.

The patient in this case, aged 45 years, was a roadside accident victim having sustained head injury with open humeral shaft fractures. Computed tomography head revealed frontal brain contusion and further revealed an unstable fracture of second cervical vertebra [Figure 1]. Her C2 fracture was stabilized in a halo brace by the neurosurgeon under local anesthesia. She was subsequently posted in emergency room for open reduction and internal fixation of humerus with plate and screw. Preanesthetic evaluation revealed a heavily built 85 kg female with Glasgow coma scale 15/15. She had associated type 2 diabetes mellitus and hypertension which were controlled on medical management. Airway could not be assessed properly due to the halo brace, and her mouth opening was only one finger breadth. Routine biochemistry investigations were within normal limits. The main aim of management of this particular case was to provide safe anesthesia with minimal interference of the cervical fixation. The choice of anesthesia in this scenario was discussed with the patient and ultrasound-guided regional block was offered to her for which she consented. Due to the nonavailability of fiberoptic bronchoscope at our institute, she was accepted for regional block in the American Society of Anesthesiologists grade 2 as the patient refused to go to a higher center.

The procedure was explained to the patient and an informed consent was obtained. The difficult intubation trolley was kept on standby in case of any adverse outcome or incomplete block. On arrival to operation theater, standard monitoring 5-lead electrocardiography, noninvasive blood pressure, and $\text{SpO}_2$ was attached along with starting of peripheral intravenous (I.V.) line with normal saline in contralateral hand. Baseline pulse rate, blood pressure, respiratory rate, and $\text{SpO}_2$ were noted. The patient was positioned head up with the brace with the arm to be operated placed by the side. Ultrasound-guided interscalene block was planned, however the access and manipulation of the neck was severely hindered due to the brace. The neck area was cleaned with 2% chlorhexidine and draped. The ultrasound probe (SonoSite MicroMaxx) of frequency 8–12 Hz was positioned under sterile conditions lateral to the level of cricoid cartilage. The probe had to be manipulated with great difficulty to locate the brachial plexus [Figure 2]. The cervical roots (traffic light sign) could be visualized lateral to the carotid artery and internal jugular vein sandwiched between anterior and middle scaleni. The patient received