Achieving mandibular pulpal anesthesia

Adapted from Reader, Al. Taking the pain out of restorative dentistry and endodontics: current thoughts and treatment options to help patients achieve profound anesthesia. 2009.

Hargreaves, Ken. Oral lecture UCSF, Winter 2009.

Intro

Everyone has had difficulty achieving profound local anesthesia in the mandible.

For irreversible pulpitis, IAN blocks work between 20-56%

Why don't blocks work?

Lowered pH lessens the effectiveness of LA (when abscessed).

Inflamed pulps have lowered resting potentials and excitability thresholds

Some sodium channels are resistant to LA (tetrotoxin resistant TTXr).

Inflamed pulps have increased expression of sodium channels

Patients in pain are apprehensive which in turn lowers the pain threshold.

How can we improve our LA success? True or False?

1. Lip numbness indicates that the teeth are numb. FALSE. Lip numbness means the lip is numb, not the teeth.
2. Lack of accurate injection is the reason for anesthesia failure. FALSE. Studies show that even when the needle is in the right spot, pulpal anesthesia is not guaranteed.
3. Once lip numbness is obtained, pulpal anesthesia is not far behind. FALSE. Lip numbness occurs after 5-10 minutes. Pulpal anesthesia may take up to 15 minutes, and in 8% of patients it takes up to 30 minutes!
4. Patients who have had difficulty getting numb in the past have higher failure rates in the future? TRUE. Also, patients who have chonic pain have a lowered pain threshold and are more difficult to anesthetize.
5. The bevel of the needle influences success of IAN block. FALSE. No difference.
6. Incisors are harder to numb than the molars. TRUE. Anesthesia fails 17% of first molars and 32% of lateral incisors. Molar nerves are on the outside of the nerve sheath; incisor nerves in the middle.
7. Accessory innervations is the main reason for failure. FALSE. Anesthetizing the mylohyoid does not increase anesthesia. TABLE 2.

8. Two cartridges of anesthetic are better than one. FALSE. See table 3. Also, increasing the concentration of epi does not influence success.
9. Articaine is better than lidocaine? FALSE. No difference.
10. Infiltrating with 4% articaine increases success. TRUE. Infiltrating with Articaine will increase the success rate up to 88% (Still not 100%)!
11. The speed of the injection influences pulpal anesthesia. TRUE. Injecting over 60sec greatly increases anesthesia. COMFORT CONTROL SYRINGE.
12. If patients have a numb lip and they feel pain during treatment, giving another IAN block will help. FALSE. If you see this clinically, it is most likely due to a slower onset of the first injection.
13. Cross innervation is the reason that incisors do not get numb. FALSE. Although there is cross innervations, it is the failure of the IAN block that causes failure.
14. 3% mepivacaine plain is just as good as lido with epi for IAN block. TRUE.
15. Articaine should not be used for a block due to its higher incidence of paraesthesia. FALSE. Parasthesias were found 35% from lido and 30% from articaine. The difference is not statistically significant.
16. Use an intraosseous injection to increase success. TRUE. Get up to 90% success. PDL injections are not as successful as intraosseus due to the decreased volume of anesthetic delivered. TABLE 7.

Other factors

Red headed people are more difficult to anesthetize. They have a mutation that makes them more difficult to anesthetize.

When inflammation is present, the sodium channels become phosphorylated, making them resistant to Na channel blockers. Give 800mg IB in Gel Cap an hour before working on pt. De-phosphorylates the channels.

Summary:

Have pts take IB prior to appt.

Give a slow IAN block.

Give anesthetic long enough time to take effect.

Infiltrate with Articaine

Give an intraosseus injection

Use an intrapulpal if necessary.