

Facilitating Good Local Anaesthesia

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Abstract

Introduction: The dental syringe, since its introduction in 1921, has been very popular in operations performed under local anaesthetics (LA). It can, however, be quite cumbersome to handle for people with petite hands. Therefore, the aim of this study is to introduce a technique of utilizing its sealed lignospan cartridges in a simpler way by using hypodermic syringe and needle to achieve effective local anaesthesia.

Method: A 21-gauge hypodermic needle is fitted onto 2.5 mls syringe after aspiration of 1 ml of air and then, needle inserted into lignospan cartridge. The sheath of the needle is used to push the diaphragm of lignospan cartridge to transfer the solution into the syringe. Towards the end, the air from the syringe is expelled back into the cartridge, which in turn helps to empty the remaining content into the syringe on repeating the previous motion.

Result: This technique of using lignospan cartridges with hypodermic syringe has, thus, proven to be very beneficial for local anaesthesia for different hand sizes, especially petite hands.

Conclusion: This technique of LA infiltration is simple, convenient and efficacious. Hence, we would advocate all clinicians to incorporate this method of local infiltration into their armoury of techniques.

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Keywords: Local anaesthesia; anaesthesia; syringe; surgery; lidocaine Word Count 615

I. Introduction

Local anaesthesia (LA) is defined as the loss of sensation in any part of the body due to reversible suppression of neuronal signal conduction or excitation¹ and the agents used for this purpose are called local anaesthetics². Since its discovery in the sixteenth century in Spain via coca leaves, local anaesthetics have revolutionized both medical and dental practice³. The dental syringe is one of the most popular devices for local infiltration since its introduction in 1921⁴. It consists of a breech-loading syringe into which a sealed cartridge of local anaesthetic solution is inserted. It is commonly used in LA cases performed by surgeons. Despite the convenience of changing sealed cartridges containing lignospan (2.2 mls of 2% lidocaine with adrenaline 1:80,000) and a very fine needle, the dental syringe is not the perfect tool for every clinician. People with small hands, specifically a limited distance between the fully abducted, extended thumb and the rest of the hand, find it cumbersome to use because of its length with the plunger fully drawn out. When compared to a 2.5 mls hypodermic syringe, the dental syringe features a significantly longer length by 51 percent. This results not only in uncontrolled subcutaneous infiltration of lignospan whilst holding the dental syringe but also, in difficulty changing the orientation of the needle without withdrawing it from the subcutis layer. We have therefore devised a technique to use the same cartridges of lignospan in a simpler way by using a 2.5 mls hypodermic syringe and needle such that all clinicians, irrespective of hand size, can infiltrate local anaesthesia in an accurate and effective manner.

II. Method

A 21-gauge hypodermic needle is fitted onto the end of a 2.5 mls hypodermic syringe. The plastic sheath is removed from the needle and 1ml air aspirated into the syringe, positioning the top of the plunger i.e., that within the barrel, at 1ml. The needle is inserted 2cm through the rubber bung at the end of a lignospan cartridge so that it can rest in this position without a supporting hand. The needle sheath is then used to push down on the rubber diaphragm at the opposing end of the cartridge, thus transferring the contents of the cartridge into the syringe. The reason for this method is that drawing out the solution from a sealed lignospan cartridge by aspirating on the syringe alone is very difficult. When the sheath cannot be pushed any further down the cartridge due to its relative short length, the air within the syringe is expelled back the other way into the cartridge. This pushes the diaphragm back up the cartridge allowing the subsequent repeat downwards

motion of the sheath in order to transfer all of the solution into the syringe. The needle is then withdrawn from the bung and changed to an appropriate gauge (ideally 27G, 1 1/2 inch needle) for infiltration.

III. Discussion

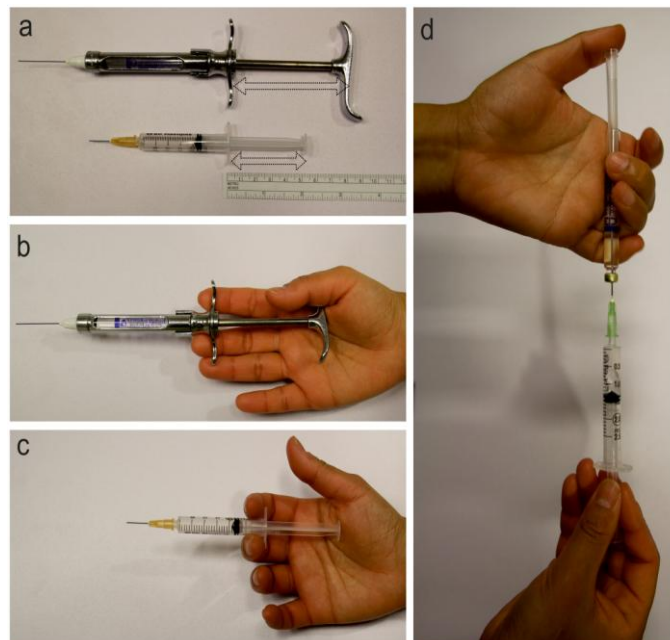
The described technique of local anaesthetic infiltration enables the clinician to use sealed lignospan cartridges with a hypodermic syringe and needle in a more convenient and universal manner, irrespective of hand size. The study by Wiener et al.⁵ showed that dental students wearing small or extra small gloves preferred petite syringes over conventional ones so as to provide a better sense of control whilst injecting local anaesthetics. The hypodermic syringe and needle is one of the most commonly used devices in medicine and is familiar and easily handled by all doctors⁶. An additional benefit is that a change in orientation of the needle is much more easily achieved. We would advocate all clinicians to incorporate this easy and effective method of local anaesthesia infiltration into their armoury of techniques.

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- [7]. Statements Contributorship
- [8]. There has been equal amount of contribution from all the authors in creating this useful piece of work. b. Funding
- [9]. This research received no specific funding.
- [10]. c. Competing interests
- [11]. There are no competing interests.

Figure legends

a. The dental syringe (7.4 cm) has a 51% longer plunger length compared to hypodermic syringe (4.9 cm) when filled with 2.2mls of local anaesthesia



In smaller hands, tips of fingers just reach the bar of the dental syringe

(b) compared to the hypodermic syringe

(c) d. Technique of filling hypodermic syringe with local anaesthesia from lignospan cartridge