

Making local anesthesia less painful: Tips and Techniques

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Abstract

Office-based surgery depends highly on local anesthesia. Though convenient, it is associated with pain of administration. This pain is attributable to factors relating to the patient, the drug and the technique. This short-lived pain is sometimes severe enough for the patient to decline or postpone the surgery. We have discussed some techniques to minimize the pain of local anesthesia.

INTRODUCTION

Local anesthesia is produced by the injection of a local anaesthetic drug into the immediate area upon which an operation is to be performed. It is widely used in medical practice in various clinical settings. Office-based surgery depends highly on local anesthesia. Though convenient, it is associated with pain of administration. This pain is attributable to factors relating to the patient, the drug and the technique. This short-lived pain is sometimes severe enough for the patient to decline or postpone the surgery. We have discussed some techniques to minimize the pain of local anesthesia.

The patient factor: The first step in any medical procedure is to explain carefully to the patient exactly what you are going to do with him. This will alleviate his anxiety and he will be better prepared psychologically for the trauma. Premedication with anxiolytics like Diazepam or Alprazolam is helpful to relieve anxiety in very anxious patients.

Distraction methods like conversation, music and concentration on breathing etc. during the procedure make the patient more comfortable. Rubbing, shaking and pinching of the skin on the site of injection also reduces the pain of the needle prick by 'Gate control mechanism', i.e. stimulating A-fibres and inhibiting C-fibres to the spinal cord.

Sedation by propofol or midazolam may be required but is not usually recommended.

Topical anesthesia prior to injection will reduce the pain of the needle prick. Various agents used to desensitize the skin

are eutectic mixture of prilocaine and xylocaine (EMLA, PRILOX cream), 4% xylocaine ointment and 10% xylocaine spray¹²³⁴ Precooling of the skin surface with ice packs and spraying ethyl chloride which acts as a surface anaesthetic agent has been found to be effective in reducing the pain⁵.

The drug factor: Lignocaine and Sensoricaine are the most commonly used local anaesthetic agents. They are weak bases with a pH of 7.7-9.5 and have limited solubility in water. They are used as salts (hydrochlorides) which are acidic and more water soluble. When they are injected, ionized and non-ionized forms appear in the tissues. The non-ionized form is responsible for penetration through the tissues and transmission across the nerve membrane. The acidic nature of the drug is responsible for the pain caused by the drug.

Warming and buffering of the local anesthetic drug raises its pH and speeds up the onset of conduction blockade by increasing the amount of the drug in non-ionized form⁶. Warming the anesthetic solution to 37 and 42 °C has shown to be beneficial⁷.

Pain and the stinging sensation is decreased by buffering the anaesthetic solution with 8.4% sodium bicarbonate (1ml to 9ml of local anaesthetic solution, irrespective of presence of adrenaline)⁸⁹¹⁰.

Technical factor: Fine needles cause less pain; 27-30 gauge needles are preferred for initial infiltration¹¹. A longer needle allows infiltration in a wider area in all dimensions and reduces the number of repeated pricks. Expansion of tissues during infiltration causes pain; therefore, delivering the drug at a slower rate causes less pain¹²¹³. The volume of

the drug delivered to the site is directly proportional to the discomfort experienced; therefore, a smaller volume of the drug should be used wherever possible. We have found that giving the first prick by insulin syringe to raise an intradermal wheal followed by subsequent injection through the anaesthetized area effectively decreases the pain experienced by the patient.

Injection through the wound edges of the lacerations or incised wounds also reduces the pain as compared to infiltration from outside the wound. Injection in tighter tissue like tip of nose and lip is very painful; therefore, injection in subdermal tissues is preferred to minimize the pain.

The most important part of a successful local anesthesia practice is reassurance and counseling. Confident, unhurried and encouraging words in a calm and comfortable atmosphere play a vital role in achieving good results.

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