A review article on regional anaesthesia needles (types, design styles, peripheral needle choice, their relevance, costs and updates).

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Abstract

As far as standards of patient care concerned, quality service and patient satisfaction take the great priority. From a medical point of view, we anesthetists typically rely on a subjective evaluation of possible abnormal resistance to injection while performing a peripheral nerve block. For example, a greater force required to perform the injection is believed to be associated with intramural injection, so why to take extra risk. In order to establish blockade of a peripheral nerve, local anesthetic solution must be placed as close as possible to the nerve but not in the nerve. It is therefore imperative if you wish to perform peripheral nerve blocks that you know the relevant anatomy for each block you wish to perform with appropriate needle to perform.

Keywords: Anesthesia, peripheral needles, regional blocks.

Introduction

Special insulated needles are required when performing a peripheral nerve block with a peripheral nerve stimulator. They have a special insulating coating along the length of the needle except for the needle tip, so that current only passes to the tip. Therefore, a muscle contraction resulting from stimulation of the nerve means that the needle tip is very near to the nerve. This type of needle is also often used during ultrasound /being available in our setup/ guided peripheral nerve blocks because it has a separate injection port which will allow our assistant to inject local anesthetic without disturbing the needle position [1].

Discussion

The safe and successful application of regional anesthesia in patients requires specialized training and equipment availability this discussion will focus on types, design styles, peripheral needle choice, their relevance, latest news and also a final note about costs. In 2005, guidelines for regional anesthesia fellowship training were published in the journal Regional Anesthesia and Pain Medicine. An important part of this journal is the categorization of regional anesthetic procedures into basic, intermediate, and advanced techniques. And each of these categories requires different needle designs/ styles to prevent complications [2].

Needles

A variety of quality regional anesthesia stimulating needles are available on the market today. Qualities of a good regional anesthesia needle include the following.

- Stimulating needles should be insulated along the shaft, with only the tip exposed for stimulation.
- A comfortable finger grip should be attached to the proximal end of the needle.
- The wire attaching the needle to the stimulator should be soldered to the needle's shaft and have an appropriate connector for the nerve stimulator [3].
- Long, clear extension tubing must also be integral to the needle shaft to facilitate injection of local anesthetic and allow for early detection of blood through frequent, gentle aspirations.
- Stimulating needles are typically beveled at 45° rather than at 17°, as are more traditional needles, to enhance the tactile sensation of the needle passing through tissue planes and to reduce the possibility of neural trauma.
- Finally, markings on the needle shaft in centimeters are extremely helpful in determining needle depth from the skin. Centimeter markings on the needle shaft are particularly important now that ultrasound technology can provide accurate measurements of skin to nerve distances [4].

Needle choice for peripheral nerve blocks

There are three 3 ways that they can inject the medicine, a one-time needle shot, connecting a tube to the nerve block site to deliver medicine during certain times, and the third is connecting a tube to the nerve block site to deliver medicine all the time [5].

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Pro bloc Single Injection Regional Block Needles

Peripheral Nerve Block Needles

Life-Tech's insulated nerve block needles are available in three styles and three tip designs. Each style and tip design is available in several gauges and lengths to meet the requirements of a wide variety of nerve block procedures. Medical grade insulation on all needles localizes the stimulating current to the needle tip.

Laser-Stripping Technology

This specification provides clean insulation removal with sharp, defect-free boundary, creates limited conductive area on lumen side of needle tip to localize stimulation to the anesthetic's exit point, and also produces consistent conductive areas in different size needles insuring repeatable stimulation characteristics from procedure to procedure [6].

Needle tip designs

Block Bevel with Sleeve Insulation which provides maximum uninsulated tip exposure.

Block Bevel Laser-Stripped Tip

This design meets requirements of anesthetists who prefer a blunter needle tip to minimize nerve trauma more over the design provides precise stimulation pattern for tip placement [7].

Chiba Tip with Ground Conductive Area

This design is preferred as it has a sharper needle to minimize tissue trauma and maximize needle control.

Transparent, Ergonomically Designed Hub

Has molded arrow provides both visual and tactile indication of bevel orientation for easy to hold and manipulate. Enables easy observation of aspirated blood without contaminating the injection tubing set 1.

Pro Bloc TM Single Injection Needles-Available in Three Configurations

HN1 Style-Needle Only, **HN2 Style**-Needle with Injection Tube Attached,

And **HN3 Style**-Injection Tube and Stimulating Cable Attached.

Pro Bloc SC Design

Their 25

Peripheral Nerve Block Support Tray (CPNB-1)

This is a support tray that contains the components necessary to perform a peripheral nerve block and while it has a "C" for continuous, it can also be used for single injection blocks. It is CE marked and contains no latex. It does not include the needle or needle/catheter set. The importance's are: small size reduces storage requirements, contains only components needed for PNB, "Combine a needle" reduces purchasing and stocking requirements for each gauge and length iteration. A larger caliber blunt needle (e.g. 18G Tuohy cf. 22G short bevel) reduces the potential for significant complications for three main reasons [9].

I. Reduced risk of intraneural needle placement, and in particular intra-fascicular injection-a well-recognized predictor of prolonged neurological deficit following peripheral nerve blocks.

II. Reduced risk of inadvertent subarachnoid needle placement (total spinal anesthesia and possibly devastating spinal cord syrinx formation).

III. Reduced risk of inadvertent intravascular injection (systemic LA toxicity–central nervous system and cardiac) [10].

Latest News

ContiStim

ContiStim stimulating catheters with flat profile Stingray connector is a major advancement in ease of use and patient comfort.

Continuous peripheral nerve block tray

Convenient tray contains components to perform a peripheral nerve block also for single injection blocks [11].

A final note about cost

In some markets, cost may be a prohibitive factor to using a large caliber insulated Tuohy needle. The Contiplex needle kit has a retail price of approx. $US40 (720 Eth birr) (compared to approx. $US15 (240 Eth birr) for a standard stimuplex needle. Echogenic needles are even more expensive, while non-insulated non-echogenic epidural Tuohy needles remain inexpensive [12].

Conclusion

Peripheral nerve block is a special way to manage pain. It will help control the pain for a long time-from a couple hours up to a couple days. Alternative location for nerve block placement will prevent unnecessary operating room delays, allow additional time for long-acting local anesthetics to "set up" and allow the provider to assess the quality of the nerve block prior to surgery. Other advantages of a regional anesthesia area include reduced anesthesia turnover times and improved patient-anesthetist relationships. Additionally, the regional anesthesia area greatly enhances the MSc education by providing an instructional environment free from the pressures and distractions of a busy operating room.

As mentioned in the discussion different designs and support tray assembly are available in the market which contains the components necessary to perform a peripheral nerve block. Theoretical disadvantages are of doubtful clinical significance as reported in reviews. Therefore, in my opinion, the benefits of using a larger caliber Tuohy needle (a 22G short bevel) for nerve blocks far outweigh the theoretical problems. As so what advocated is using an 18G Tuohy needle for most adult blocks (continuous and single shot), with the exception of perhaps distal upper limb blocks and the ankle block.

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