CORRESPONDENCE

416 Golf St.
Bathurst, N.B.
February 5, 1959

Editor

Canadian Anaesthetists' Society Journal

DEAR SIR:

The short-needle technique in brachial plexus block as outlined by Dr. Fortin and Dr. Tremblay (this JOURNAL, vol. 6, no. 1, January, 1959, pp. 32-39), appears to have several advantages over orthodox methods practised today.

However may I be allowed to bring up the following points:

(1) Test aspiration for blood through such small needles is in my opinion unreliable and the injection of the entire volume of solution in one spot increases the danger of intravascular injection. On the other hand, to insist on obtaining paraesthesias and "freezing" the needle in position as soon as these are obtained would seem to protect against this.

(2) As emphasized by Sir Robert Macintosh in his book *Physics for the Anaesthetist*, much pressure is needed to force solutions through small gauge needles. This makes a smaller Lock syringe with finger rings mandatory. Re-loading the syringe twice will tend to disturb the position of the needle.

(3) Of course, the authors do not mean that the concentration of epinephrine in the average volume of 24.5 cc. is 1:2,000. Otherwise how do they keep the top of the patient's head from blowing right off.

Yours respectfully,

J. CARON, M.D.

Notre Dame Hospital
Montreal, P.Q.
March 11, 1959

Editor

Canadian Anaesthetists' Society Journal

DEAR DR. GORDON:

Thank you for the copy of Dr. Caron's letter. This provides us with a wonderful opportunity to give additional information on the "Short Needle Technique in Brachial Plexus Block" (this JOURNAL, vol. 6, no. 1, January 1959, pp. 32-39).

In answer to Dr. Caron's first question, we have had no difficulty in drawing blood experimentally from arteries and veins with a $\frac{1}{2}$ in 26-gauge needle. Test aspiration with longer small gauge needles is less reliable.

The possibility of transfixing a blood vessel is always present, in which event tissue displacement or needle movement may cause the needle point to slip back into the lumen of the vessel. Frequent test aspirations during the injection of the

entire volume of solution in one spot will guard against massive intravascular injection.

Dr. Caron's second objection with regard to reloading the syringe is quite legitimate. Indeed, applying Pascal's principle of the hydraulic press in reverse, the smaller the needle gauge and the larger the cross-sectional surface area of the syringe barrel, the smaller the mechanical advantage and, therefore, the greater the force required to inject. We have found that a 10 cc. syringe is the largest syringe which will allow a free flow through a 25-gauge $\frac{1}{2}$ in. needle without applying too much force. Unfortunately, this necessitates reloading the syringe and care must be taken not to displace the needle during this manoeuvre. A specially designed needle shank fitted with extensions to firmly hold the needle between the fingers would help.

We are particularly grateful to Dr. Caron for calling our attention to the concentration of epinephrine in the anaesthetic solution. On page 35, in the third paragraph of the article, the concentration of epinephrine in the Xylocaine® solution is stated as 1:2,000. *This should have read 1:200,000.*

The recommended 1.5 per cent Xylocaine® solution with an epinephrine concentration of 1:200,000 to our knowledge is not commercially available. This is obtained by mixing equal parts of a 1 per cent solution and a 2 per cent solution, one containing epinephrine 1:100,000, the other without epinephrine.

Since the article was published, we have witnessed one incident of needle breakage. Although the needle was recovered without difficulty, this type of complication could have caused an embarrassing situation to say the least. In this particular case, a 26-gauge $\frac{1}{2}$ in. needle was used for the block procedure instead of a 25-gauge needle as recommended. Furthermore the needle had already sustained a bending stress and was not discarded. Unless one has thoroughly mastered the technique of needle manipulation, it may be an added precaution to recommend the use of a 24-gauge $\frac{1}{2}$ in. needle.

Sincerely,

GUY FORTIN, M.D.

LIONEL TREMBLAY, M.D.

611 North Arden Dr.

Beverly Hills, Calif.

January 27, 1959

Editor

Canadian Anaesthetists' Society Journal

DEAR DR. GORDON:

In the January, 1959 (vol. 6, no. 1) issue of the *Canadian Anaesthetists' Society Journal*, I culled the following information from page 79 of the paper on "Cardiac Resuscitation" by Dodds and Ashmore. "The ventricles are shocked by placing the electrodes across the septum and a single shock of 170-220 v. at 1.5 amp. for 0.2 sec. is used." Beattie *et al.* (Ann. Surg. 137: 504) in 1953 reported

the resistance of the human heart to be approximately 50 ohms. According to Ohms Law, $I = E/R$ or Amperes = Volts/Ohms, it is impossible to have a voltage of 170–220 v. with a resistance of 50 ohms and obtain an amperage of 1.5 amp. If you substitute the above underlined values in the formula the following values are obtained: $170/50 = 3.4$ amp., $220/50 = 4.4$ amp. Therefore, would you please ask Drs. Dodds and Ashmore what they recommend.

Very truly yours,

BENJAMIN I. SCHNEIDERMAN, M.D.

*The Vancouver General Hospital
Vancouver 9, B.C.
February 27, 1959*

Editor

Canadian Anaesthetists' Society Journal

DEAR DR. GORDON:

In answer to the letter received from Dr. Schneiderman, Beverley Hills, I would say that the article by Beattie and Blades relating to the resistance of the human heart indicates that this measurement is very difficult to make. The figure of 50 ohms was arrived at by an indirect method by comparing the resistance in the live and dead dog's heart to that in the dead human heart. Also, it is believed, that any amperage below 1.0 is a fibrillating, rather than a defibrillating current. Since defibrillation is often required for large hearts due to dilatation or hypertrophy, it has been found that 170 to 220 v. is a range which will deliver over 1 amp. in any human heart that we have yet encountered.

Electrical resistance in the human subject is difficult to gauge clinically and for purposes of cardiac defibrillation the resistance must be assumed to be greater perhaps than it is, so that adequate current will be delivered. I hope this will clear up Dr. Schneiderman's difficulty.

Yours sincerely,

W. A. DODDS, M.D.