CONTINUOUS CAUDAL ANESTHESIA*

PRELIMINARY REPORT OF A NEWLY MODIFIED TECHNIC

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THE authors wish to describe a newly modified technic for the administration of continuous caudal anesthesia in obstetrics, as originally reported by Hingson and Edwards.[1]

We have observed three marked disadvantages to the original method: The most important objection is that the physician must administer the anesthetic agent (procaine) to the parturient at regular intervals of thirty to forty minutes. For a busy obstetrician, this technic is impractical, as he can thus care for only a single patient in labor at one time. Second, special apparatus would be needed to make painless labor available to a large portion of the public; this is not feasible in these times. Third, the continual handling of the apparatus each time the medication is injected increases the likelihood of contamination.

By a simple modification of technic which ensures continuous rather than repeated fractional dosage, we believe that we have eliminated these three disadvantages and at the same time made the method safer.

TECHNIC

For the original injection, we follow the method and observe the precautions described by Edwards and Hingson.[1] However, we vary the volume of 2 per cent procaine from 30 to 50 cc. In the early first stage, 30 cc. are sufficient, but during the second stage, 50 cc. are required. An initial injection of more than 50 cc. may result in procaine excitement.

We prefer an ordinary large spinal tap needle to the malleable type. As in the original technic, the skin and subcutaneous tissues are first infiltrated. The skin is pierced about one inch caudad to the sacral hiatus. The spinal needle is allowed to run in the subcutaneous tissue until the point reaches the level of the sacral hiatus. The hillock of the needle is then raised, with resultant lowering of the point. The sacrococcygeal membrane is pierced and the sacral canal entered. The operator next depresses the needle so that it returns to its original direction, almost parallel to the skin, after which he inserts it two inches up the sacral canal. The needle is, therefore, buried up to the hillock, if possible; it is thus anchored and protected.

After insertion, the needle is connected by means of ordinary infusion tubing to a small Kelly flask or similar container. Fifteen minutes after the initial injection, a slow, continuous drip infusion of eight to ten drops (0.5 to 0.6 cc.) of 2 per cent procaine per minute is begun. The patient, therefore, receives the equivalent of "20 cc. every thirty to forty minutes," as recommended by Hingson and Edwards.[1] This dosage may be varied according to the needs of the patient. We have found a dosage of twelve to fourteen drops per minute more satisfactory.

Infusion tubing is readily obtainable in any hospital and the container for the procaine is easily improvised. A small Kelly flask may be employed. For our first case we used the barrel of the syringe employed to fill a Voorhees' bag. We now have an old cylinder, opened at the bottom, originally used thirty years ago, when salvarsan was given by infusion. This cylinder, which is graduated at 10 cc. intervals, allows a

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check on the rate of infusion during short intervals of time.

The use of the Lemmon mattress, though not essential, allows the patient greater freedom of motion.

REMARKS

We believe that the modified technic here presented eliminates the three objections to the original method which were stated above. Several patients may now be attended at a single time and watched by any attendant, not necessarily a physician. The apparatus, which is readily improvised, does not necessitate the manufacture of new material. After the apparatus has been set up, it is automatic and does not require frequent handling, with possible contamination.

We also believe this method of administration to be safer than the original. After the initial injection, procaine is slowly replaced at the rate at which it is metabolized. The nerves which are blocked are, therefore, continuously bathed by a constant amount of procaine. Since infusion takes place at such a slow rate, any toxic symptoms will develop so gradually that their development may be checked in the early stages by slowing or stopping the infusion. On the other hand, with the injection of large amounts at intervals and corresponding sharp increases in the rate of absorption, any toxicity occurring after an injection will be sudden and more severe. It is recalled, of course, that the antidotes for procaine are the barbiturates.

At this writing, we have performed during the past four months more than 100 caudal blocks, including single injections and the continuous type. With the technic just described, our type of service at Harlem Hospital should make available about two or three continuous caudal anesthesias a day. We are now preparing a detailed analysis of our results, which we expect to publish in the near future. We are publishing this preliminary report on technic only so that painless labor may be used sooner by more obstetricians and its advantages thus made available at an earlier date to a greater number of expectant mothers.

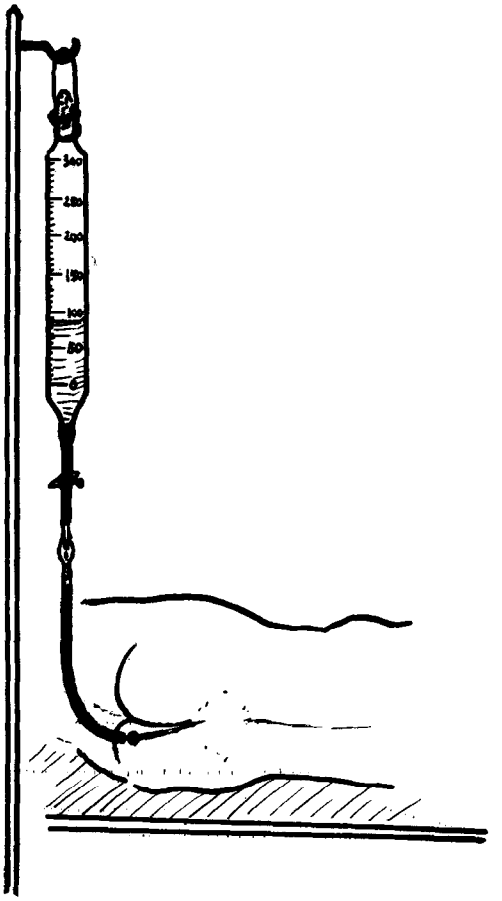

Fig. 1. The graduated container (Salvarsan Tube Vitax No. 4010) hangs from a stand, and is connected by means of ordinary infusion tubing to an ordinary spinal tap needle (B-D Yale-19G-3″) placed in the caudal canal. About fifteen minutes after the initial caudal injection has been effective, the infusion is begun at about twelve drops per minute (45 cc. per hour). The rate of flow is regulated by opening or closing the stop cock on the infusion tubing or varying the height of the container of procaine.

SUMMARY

A modification of the original fractional technic of administering caudal anesthesia, first described by Edwards and Hingson,[1] is reported. After the initial injection, a continuous slow drip infusion is established and continued throughout labor.

This method the authors believe to be safer than the original. By eliminating three disadvantages, namely, frequent injections of the anesthetic, the necessity of special apparatus, and repeated handling of the apparatus, the modified technic becomes more practical and available to a greater portion of the parturient population.

REFERENCE

1. Edwards and Hingson. *Am. J. Surg.*, 37: 459–464, 1942; *J. A. M. A.*, 121: 225–229, 1943.

Versions consist of a turning of the uterus as a whole (flexion being disregarded) about an imaginary axis situated in the upper third of the cervix. Any type of version may be associated with any type of flexion.