CURRENT COMMENT AND CASE REPORTS

CURRENT COMMENT is a section in ANESTHESIOLOGY in which will appear invited and unsolicited professional and scientific correspondence, abbreviated reports of interesting cases, material of interest to anesthesiologists reprinted from varied sources, brief descriptions of apparatus and appliances, technical suggestions, and short citations of experiences with drugs and methods in anesthesiology. Contributions are urgently solicited. Editorial discretion is reserved in selecting and preparing those published. The author's name or initials will appear with all items included.

A CART DESIGNED FOR STORING CONTINUOUS SPINAL MATTRESS

Transportation and storage of the cumbersome continuous spinal mattress has been greatly facilitated in our operating suite by the use of a cart designed for the purpose.

The "chariot" illustrated (fig. 1) is made of plyboard mounted on casters and provides space for the mattress, straps, sandbags, and the special shoulder braces and arm boards used with this mattress. The cart stands 4 inches from the floor, is 20 inches wide, 13 inches deep and 29½ inches high.

After the mattress is placed on the chariot, one of the belts is strapped around the sideboards to secure it in place. A sheet over the top prevents the collection of dust.

While the continuous mattress is in use, the ordinary mattress from the operating table rests on the chariot outside the operating room and is convenient for replacement when the continuous mattress is removed.

On a busy service where continuous spinal technic is used frequently, such a device has proved very useful.

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PROCAINE RESISTANCE. REPORT OF A CASE

When an anesthetic agent injected intraspinally fails to produce anesthesia, many possibilities are considered. Among these are failure of technic, deterioration of material used, failure to obtain the proper concentration of the agent intraspinally and, finally and perhaps too infrequently, the possibility that the patient may be one of the rare individuals who is resistant to the drug. The following case,

after study, was classified as one in which relative resistance to procaine probably was the basis for the failure.

A man 29 years old was admitted to the hospital on December 21, 1946, with a chief complaint of "piles." He appeared to be well developed and well nourished. Physical examination revealed submandibular and cervical lymphadenopathy; slight suprapubic tenderness and large, tender, red, external and internal hemorrhoids which were prolapsed and hard to reduce. Laboratory studies on the blood and urine were negative except for a slight trace of albumin. A diagnosis was made of "mixed hemorrhoids, prolapsed." Operation was performed December 26, 1946. At that time the temperature was 98.6, pulse 84 and respirations 20. Premedication with nembutal, 1½ grains, was given at 10:30 a.m., the effect of which seemed satisfactory upon his arrival in the operating room at 11:15 a.m. After the usual preparation, and with the patient in the right lateral position, a lumbar puncture was made between the fourth and fifth lumbar vertebrae. A free flow of clear spinal fluid was obtained. Procaine hydrochloride, 50 mg., was dissolved in 1.0 cc. of spinal fluid and injected at 11:25 a.m. He was then put in slight Fowler's position. Twenty minutes later no anesthesia had resulted and the surgeon decided to proceed under local anesthesia. Approximately 120 cc. of 1 per cent procaine without epinephrine was infiltrated locally, with no more analgesic effect than would be expected from tissue distention with saline solution. He complained of pain throughout the operation which began at 11:53 a.m. and was completed at 12:35 p.m.

Because the local anesthesia was also inadequate, it was thought that this patient might be a procaine resistant type, and he was studied further. On three different dates intracutaneous injections of various agents were made on the volar surfaces of the forearms, and he was then tested for pin-prick anesthesia in these areas (table 1). Procaine, 1 per cent, pontocaine, 0.1 per cent, and physiologic saline solution produced no anesthesia, while procaine, 2 per cent, metycaine, 1 per cent, and intracaine, 1 per cent, gave complete anesthesia.

A consideration of the chemistry of local anesthetic drugs makes these results plausible. Procaine and pontocaine are derived from para-amino benzoic acid and are very closely related. Metycaine is a benzoic acid ester, and intracaine is derived from para-ethoxy benzoic acid (1). The chemical structure of these drugs may well explain this patient's relative resistance to procaine and pontocaine.

McCullough and Llewellyn (2) reported a case in which no anesthesia resulted from three injections of procaine subdurally, procaine locally, or pontocaine subdurally. Ether by inhalation was finally given for repair of his hernia. Sebrechts (3) classified resistant patients as "sympathicotonic," and sensitive patients as "hypervagotonic." He believed procaine tolerance to be familial and reported 5 such cases in one family. He also suggested that resistance is more common in the Anglo-Saxon race. Black and Walters (4) re-

TABLE 1

Agent	12/26/46	12/27/46	1/31/47
Physiologic saline solution	No anesthesia	No anesthesia	No anesthesia
Procaine 1%	No anesthesia	—	No anesthesia
Procaine 2%	—	—	Complete anesthesia
Pontocaine 0.10%	—	—	No anesthesia
Metycaine 1%	—	Complete anesthesia	Complete anesthesia
Intracaine 1%	—	—	Complete anesthesia

ported 2 patients who were resistant to cocaine derivatives in a group of 600 cases, and called them "rachiresistant." Our own incidence in 1773 consecutive anesthesias with cocaine derivatives by various methods has yielded only the case reported.

It is logical to assume that since some patients are sensitive to the cocaine derivatives, others may be resistant. More careful study and follow-up of spinal anesthetic failures might reveal that such resistance, rather than the more commonly considered causes, is responsible for at least a small percentage of the failures.

SUMMARY

Procaine resistance is suggested as a cause of spinal anesthesia failure.

A case of relative procaine resistance is presented.

REFERENCES

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"SEMI-OPEN" ENDOTRACHEAL ANESTHESIA

A very useful manner of administering ether by a "semi-open" * system is utilized in this hospital. We claim no originality. The method employs endotracheal intubation, Leigh's valve, and the Flagg can. After induction with ether by any appropriate method, the trachea is intubated. A short length of rubber tubing of approximately ⅜ inches internal diameter is connected to the endotracheal tube and distally to the Leigh valve. Another 8 to 10 inch length of wide-bore tubing connects the Leigh valve to the Flagg can (fig. 1).

A Leigh one-way double valve is used to keep the mixture moving in one direction only—toward the patient. On inspiration, an expiratory valve closes and an inspiratory valve opens to allow the patient to inhale the ether-air vapor from the Flagg can. The patient's expiratory efforts blow out nearly all of the inspired mixture and keep the inspiratory valve closed. The Leigh valve should remain horizontal, although it will function well with the distal end lowered a little. The expiratory valve must be uppermost. The inspiratory valve *must be distal* to the expiratory valve at all times (fig. 2). The only dead space is the distance (approximately 4 inches) from the endotracheal tube to the Leigh valve. This is no more than the pharyngeal dead space eliminated by the endotracheal tube.

Oxygen can be given at all times by passing it into the Flagg can through one of the open vents on the top. The concentration of ether vapor can be increased by submerging the oxygen catheter in the liquid ether. The 1-pound ether can provides adequate vaporizing surface. It is never filled more than one-third, so as to minimize the risk of getting liquid ether into the tubing. The can is kept vertical at all times, and may be hung from the table in a cotton bag for convenience.

For infants and those with inadequate respiratory excursions, we reduce the inspiratory effort required by covering all but one or two of the vents in the Flagg can, and running a large volume of oxygen into the can above the ether. This provides a partial positive pressure oxygen-ether mixture.

A better method has been devised for using this system in such circumstances. An extra spout from an ether can is

* "Semi-open," as arbitrarily defined in the A.S.A. code manual, implies that the apparatus allows no rebreathing.