

## SPINAL ANESTHESIA WITH A PROCAINE-PONTOCAINE SOLUTION: ONE HUNDRED CASES

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THE advantage of using a spinal anesthetic solution which combines the desirable properties of rapid induction and prolonged effect for the more lengthy surgical procedures is well recognized (1, 2).

Because no single anesthetic agent satisfied both of those requirements, a solution containing 100 mg. of procaine hydrochloride and 10 mg. of pontocaine in each 2 cc. ampule\* was employed in this analysis of 100 attempted spinal anesthetics. This preparation of procaine, 5 per cent and pontocaine, 0.5 per cent has a specific gravity of 1.0113, which is definitely hyperbaric. It may be weighted further by the addition of an equal amount of 10 per cent glucose to the selected volume of anesthetic solution. A corresponding volume of spinal fluid, 0.5 to 3.0 cc., was added to the procaine-pontocaine or procaine-pontocaine-glucose mixture before injection.

### COMPUTATION OF SPINAL ANESTHETIC DOSE

In computing the dose of anesthetic solution required to produce the desired height of analgesia, it is necessary to consider the length of the patient's spinal cord as well as his weight and height. The surgical problem and the time necessary for its completion together with the ability and speed of the surgeon are the dominating factors in determining the height of the anesthesia. In general, it was found that in taller individuals, a larger volume of anesthetic solution was necessary than in shorter individuals to achieve a corresponding level of analgesia.

### PREOPERATIVE SEDATION

Late in the afternoon before operation a soapsuds enema is given to the patient. Fluids as required and a light supper are permitted. To insure a "good night's rest" for the patient, a barbiturate is administered at 10 p.m. No breakfast is permitted and no enema is given on the morning of the operation. Ninety minutes preceding operation a sedative is given by mouth to allay apprehension, and followed in forty-five minutes by a hypodermic injection of pantopon and

\* Supplied by Winthrop Chemical Company, Inc.

atropine. The dosage of these drugs is carefully calculated in each case.

#### TECHNIC OF SPINAL INJECTION

The patient is placed in the lateral position on a level table. The area chosen for spinal injection is prepared by scrubbing with a detergent, followed by an ether wash and painting with zephiran tinted tincture, 1:1000. After draping the field, the site of injection (usually the second or third lumbar interspace) is anesthetized with 3 cc. of 1 per cent procaine solution to which has been added 50 mg. of ephedrine (unless this vasoconstrictor is contraindicated). The Sise introducer is inserted, and through this a 22-gauge gold needle with stilet is directed into the subarachnoid space. Removal of the stilet permits a free flow of spinal fluid. The syringe containing the selected dose of anesthetic solution with or without glucose is attached to the spinal needle, 1 cc. of spinal fluid is withdrawn, and then the contents of the syringe are injected slowly. At the completion of the injection, the Sise introducer and needle are withdrawn and the skin puncture is sealed with collodion. At this point the patient is turned on his back. His head is sharply flexed on a pillow and the table is adjusted to a slight shock position, permitting the anesthetic agent to flow cephalad. When the desired level of anesthesia is obtained, as determined by constant testing of the skin of the abdomen, the table is returned to a slight Fowler's position with the head remaining flexed to prevent any further progress cephalad of the anesthetic solution.

#### INDIRECT RESULTS OF ANESTHESIA

Careful observation of the patient should be made for development of any untoward symptoms. Nausea, difficulty in breathing or speaking, and sudden circulatory collapse may arise usually within five to ten minutes following injection. Proper methods of combating such respiratory and circulatory embarrassment should be instituted immediately. In this series, however, no disturbing complications occurred other than nausea in a few cases, which was quickly relieved by proper use of oxygen inhalations.

#### OBSERVATIONS (TABLE 1)

In 89 cases, satisfactory analgesia was obtained, lasting from one hour and thirty minutes to five hours without supplementary anesthesia. The average duration of anesthesia was approximately two hours and thirty minutes. In 10 cases, it was necessary to prolong anesthesia by means of pentothal given intravenously, and in one additional case, morphine and scopolamine were administered. The clinical material employed in this study consisted of 100 cases, about equally distributed between the sexes. Ages ranged from 18 to 79 years, and weights

TABLE 1  
LENGTH OF ANESTHESIA

Hours	Minutes	Cases	
1	30	2	
2		22	
2	10	2	
2	15	5	
2	30	29	
2	35	1	
2	45	1	
3		21	
3	10	1	
3	15	4	
3	20	1	Youngest patient—18 yrs.
3	30	8	Oldest patient—79 yrs.
4		1	
5		1	
?		1	
		100	

Results of anesthesia:

Satisfactory 99 (1 case:—action delayed 20-30 min.)  
Unsatisfactory 1

Supplementary anesthetic—10 cases pentothal  
1 case morphine and scopolamine

varied from 102 pounds to 226 pounds. The degree of operative risk was not considered in choosing these candidates for surgery.

### CONCLUSIONS

The use of this prepared solution of procaine, 5 per cent and pontocaine, 0.5 per cent, of known concentration facilitated the computation of the individual dose of spinal anesthetic agent.

Clinical observation of its use for spinal anesthesia in patients who varied widely in age, weight, height and degree of operative risk demonstrated to us the safety and efficiency of this preparation.

### REFERENCES

1. Newell, Cecil E.: Spinal Anesthesia with Special Reference to the Use of a Procaine-"Pontocaine" Mixture, *South. M. J.* **39**: 542-549 (July) 1946.
2. Schuhmacher, Lawrence F., Jr., and Eversole, Urban H.: The Technics of Spinal Anesthesia, *Anesthesiology* **3**: 630-643 (Nov.) 1942.