

series varied according to the preference of the surgeons and anesthetists. Spinocaine was used in six of the earlier operations. Pontocaine was employed in one case. The remainder were done under procaine. In the majority, 120 mg. of the latter drug was used.

"Sixteen per cent of all cases required supplemental anesthesia, either nitrous oxide and oxygen, nitrous oxide and oxygen and ether, cyclopropane, or local infiltration with procaine.

"Like the anesthetic agents, pre-anesthetic medication varied according to the policy in vogue at the particular time. There was no uniformity as to the drug used, its dose, or time of its administration. Morphine, scopolamine, atropine, and barbiturates were all used, either alone or in various combinations. No correlation between the medication before delivery and the condition of the baby could be established except that in no instance was the baby depressed, cyanosed, or in need of resuscitative measures.

"Contraindications to the use of spinal anesthesia in cesarean sections have been found in general to parallel those for other abdominal surgical procedures, namely, (1) extreme arterial tension, either high or low, (2) pathology of the spinal cord, (3) cutaneous infection at the proposed site of the puncture, (4) septicemia."

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CRAIG, P. E.: *The Use and Abuse of Spinal Anesthesia*. Clin. Med. 48: 64-69 (March) 1941.

"No other known method of anesthesia today will permit the use of such a minute dose of a drug, and yet maintain complete and prolonged analgesia. The whole organism is not subjected to the dangers of general anesthesia, with resulting strain on the heart and lungs. The early symptoms of vasomotor and respiratory depression are transitory

and, upon disappearance, leave the surgeon free to perform the operation under an ideal condition of complete muscular and visceral relaxation. Injury to the intra-abdominal organs is negligible, because the intestines are contracted, facilitating easy manipulation; and when the patient is placed in the Trendelenburg position the gut gravitates cephalad, making the use of restraining pads unnecessary. Peristalsis is augmented and the expulsion of the flatus stimulated; speed in the performance of nontraumatic surgery is greatly favored; and postoperative morbidity and mortality, in both clean and septic cases, are materially reduced. . . .

"While spinal anesthesia is applicable to the average surgical risk, it has very definite contraindications [which are:] 1. Abnormally low blood pressure. . . . 2. Cardiopathies. . . . 3. Extreme hypertension. . . . 4. A psychoneurosis. . . . 5. Active pulmonary tuberculosis, and pleural or pericardial effusions. . . . 6. Pott's disease, syphilis, generalized septicemia, and diseases of the meninges or spinal cord. . . . 7. Malformations of the spine. . . . In past years, cocaine, stovaine, Alypin, tropacocaine, apothesine and tutocain have soared to heights of popularity, and have subsequently fallen into the discard. Cocaine, however, is still used satisfactorily by many surgeons in Mexico. At present spinocaine, novocaine, nupercaine, metycaine, neocaine, and pontocaine occupy a place of prominence. . . . It is a distinct advantage for the surgeon-anesthetist to choose one suitable spinal anesthetic and, having familiarized himself with its physical properties and technic of administration, apply it in all his surgical procedures. In this manner he will come to master and, in a definite measure, standardize a heretofore uncontrollable method of anesthesia. . . .

"It is extremely important, in preparing a patient for spinal anesthesia,

not to use drugs which will depress or fatigue the medullary centers. Among those to be avoided are morphine, Avertin, nembutal, evipal, etc. Paraldehyde or scopolamine, however, may be used with relative safety. It has been my experience that large doses of depressing drugs, administered preoperatively, not only render the patient comatose and uncooperative, but lower the blood pressure to the extent of making the anesthetic dangerous to administer. . . . Circulatory depression consequent to spinal anesthesia is largely the result of paralysis of the muscles of the thoracic cage, which exerts a diminished aspirating effect upon the blood stream. Weakening or paralyzing respiration interferes with the minute volume of the circulation of the blood in the coronary arteries and the oxygen tension therein. The sudden fall in blood pressure causes a feeble heart action, which interferes with an adequate delivery of blood to the medullary centers. Respiration, therefore, becomes feebler and a greater degree of anoxemia develops. Since temporary vasomotor paralysis invariably follows the introduction of an anesthetic solution into the spinal canal, it is essential that some drug be given to counteract the sudden lowering of vascular tension. The selection of such a drug has been the subject of controversy. . . . In my opinion, ephedrine should never be used routinely, because of possible idiosyncrasy in cardiopathic patients and asthmatics, and because it increases the pulse rate and the work of the heart. . . . The average fall of blood pressure following a spinal anesthetic is from 40 to 50 points systolic (from 120 to 70 or 80). This is a physiologic reaction and can best be met by the intravenous injection of from 200 to 300 cc. of a 5 per cent solution of dextrose, to which has been added 2 or 3 minims of a 1:1,000 solution of epinephrine. The venoclysis is begun as

soon as the anesthetic is given, and is continued throughout the operation. The vasomotor palsy lasts about twenty to thirty minutes, or until the anesthetic is fixed in the nerve tissue. . . .

"The treatment of . . . complications . . . lies largely in their prevention. It is absolutely necessary for the surgeon-anesthetist to study the individual patient, determining whether or not he or she is a fit mental or physical subject for spinal anesthesia. The properties of the anesthetic drug must be completely understood. The dosage of the anesthetic solution and the desired height and length of the anesthesia must be accurately predetermined. Repeated attempts at puncture should be discouraged, for it may cause an extradural hemorrhage or nervous sequelae. If, for any reason, the anesthesia is insufficient, supplemental gas or ether should be administered at once. It is far better to give too little than too much anesthetic intraspinally. Artificial respiration, the Trendelenburg position, intramuscular injections of 2 cc. of sulphuric ether or from 2 to 5 minims of a 1 per cent solution of neosynephrin, and the use of a carbon dioxide and oxygen mixture, constitute the armamentarium of treatment when respiratory paralysis and vasomotor collapse are imminent. Ephedrine is a tricky and potentially dangerous drug and great care should be exercised in its use. . . . Spinal anesthesia is as safe as its user." 4 references.

J. C. M. C.

BELL, F. K., AND KRANTZ, J. C., JR.: *Determination of Unsaturation in Cyclopropane*. *J. Am. Pharm. A.* 30: 50-52 (Feb.) 1941.

"The quantitative determination of the amount of unsaturated hydrocarbons present in cyclopropane as impurity presents an interesting and difficult problem. In the preparation of cyclopropane the formation of some unsaturated hydrocarbons is to be ex-