

tion in doing major operations with a local anesthetic, but after a short time one learns to know what structures give pain, and also how those may be made analgesic. You have all seen cases where a general anesthetic seemed contraindicated, and also many cases where unexpected complications have arisen, such as bronchitis and pneumonia, which are attributable almost directly to the general anesthetic. At first much too strong solutions were used for injection into the tissues, and as a result many cases of poisoning were reported. Now, however, with very weak solutions one seldom sees an unfavorable symptom which may be attributed to cocaine. Undoubtedly in many cases it is much pleasanter to work when the patient is unconscious. There are many cases, however, where a general anesthetic adds a not inconsiderable quota of danger. Take, for instance, a patient with obstruction of the bowel, where fecal vomiting has already begun. An operation under such conditions is a serious matter. In one case I saw with Dr. Mullock, in Binbrook, the patient was extremely reduced, with a rapid, irregular pulse and subnormal temperature. We first washed the fecal matter out of the stomach, and then did an enterostomy with cocaine infiltration. The patient had neither pain nor shock. She said that the lavage was infinitely worse than the operation itself.

The first great advance made in this form of anesthesia was the manner of injection of the liquid, viz., the intradermal instead of the hypodermic method. The physical condition thus brought about aids materially in producing the desired result.

It was found that very weak solutions of cocaine produced quite as efficient anesthesia as strong solutions. Another important point in the preparation of the fluid for injection was to have it isotonic, that is, its specific gravity and freezing point must be the same as that of the tissues. Plain distilled water when infiltrated into the living tissues will cause pain, while normal saline solution will give practically no sensation of discomfort unless injected too rapidly and with too much force.

On account of the frequency of poisoning with cocaine, other drugs were sought for which were less toxic. It was found that B. eucaïne had analgesic properties, almost, if not quite, as pronounced as cocaine and with a decided advantage of being much less toxic; unfortunately the analgesia was found by many to pass off too quickly for a prolonged operation. With the addition of a small quantity of adrenalin chloride the small vessels become contracted and the eucaïne or cocaine is retained much longer in the infiltrated area, and the anesthesia