

## RECTAL ANÆSTHESIA IN OBSTETRICS\*

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**B**UT a short period of time had elapsed after the discovery of the anæsthetic properties of ether, before experimenters in the realm of anæsthesia began to devote their energies to the possibilities of anæsthetizing patients, not by the inhalation method, but by the introduction of ether into the rectum and large bowel; the first series of cases, using this form of anæsthetic induction, was reported from St. Petersburg by Pirigoff<sup>1</sup> in 1847.

His technique was merely to force warm ether vapor into the rectum. The great majority of his eighty-one patients suffered post-operatively from varying degrees of intestinal irritation, and two deaths reported were due to a very severe colitis. As a result of these accidents the technique did not gain any favour in the field of anæsthesia, and was not heard of again for over fifty years.

In 1905, Cunningham, of New York, reported a series of cases in which rectal anæsthesia was used, air being employed as the vehicle for the ether, and since that time this form has become more or less popular with various surgeons and anæsthetists, being particularly used in the surgery of the mouth, throat, respiratory tract and the chest.

Some eight years later, Cunningham<sup>2</sup>, in collaboration with Sutton, evolved the "oil-ether mixture" which required a less elaborate technique, and had a shorter induction time than the previously used air ether mixture; Sutton reported a series of 100 cases with intestinal irritation in but five.<sup>3</sup> At the present time the oil-ether mixture is the one universally used, and the literature from time to time contains fairly large series of cases giving usually very gratifying results.

It was not until 1923, however, that the possibilities of this form of anæsthesia in the field of obstetrics were considered. Thaler and Huber at this time presented a report of a considerable number of deliveries where rectal

anæsthesia had been used. Their technique differed in no way from that used for surgical cases; the great drawback to their method was the fact that in the great majority of cases one administration of oil-ether was not sufficient, and the procedure had to be repeated, sometimes as many as five times.

In the same year Gwathmey, of New York, devoted a considerable portion of his time to an attempt to find the most suitable obstetrical anæsthetic that could be used per rectum. He devised what he terms "A synergistic analgesia," that is, an analgesia that is not the result of one drug, but the combined result of several drugs working in unison. His method is now being used as a routine at the New York Lying-in Hospital.<sup>4</sup>

Having had some considerable experience with this type of obstetrical anæsthesia while a junior house-surgeon at the New York lying-in hospital, and being more than satisfied with the results obtained, I have, with the consent and co-operation of Dr. R. W. Wesley and Dr. Magwood, used this form of anæsthesia as far as possible on every ward patient in the Alexandra Obstetrical wing of the Western Hospital.

The technique of giving the anæsthesia consists of two main components,—a hypodermic injection and an instillation per rectum.

The hypodermic consists of one-sixth of a grain of morphine sulphate dissolved in 2 cc. of a 50 per cent. magnesium sulphate solution. The latter is prepared by dissolving one gramme of the chemically pure magnesium sulphate in 2 cc. of distilled water, giving the desired 50 per cent. strength. This solution is then sterilized and sealed in ampoules.

The hypodermic may be given into the upper arm, thigh or buttock. It should not be injected subcutaneously, but deeply, as magnesium sulphate if given subcutaneously in strong solutions has a tendency to cause a necrosis and sloughing of tissues about the site of injection, although I, personally, have never seen this.

The part the magnesium sulphate plays in

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the synergistic analgesia is this:—The salt is known, when introduced into the body tissues, to cause a general systemic relaxation, hence its use in convulsive seizures, and its intravenous or intrathecal injection in cases of tetanus or eclampsia. More important, however, is the fact that this drug has the peculiar power of increasing very greatly the analgesic effect produced by other drugs, and that is its main purpose in this form of obstetrical anaesthesia.

The instillation to be given per rectum consists of a four ounce mixture containing twenty grains of quinine hydrobromide dissolved in two drachms of alcohol, two and a half ounces of ether, and the remainder of the four ounces, olive oil. The quinine dissolved in alcohol is placed in the mixture merely to insure continued uterine contractions, although I think this, in the great majority of cases, is unnecessary.

To draw up any routine plan of procedure regarding the time of giving these two parts of the treatment, is a matter of no little difficulty, mainly because patients are admitted to the hospital in such varying degrees of labour. With one it is a matter of minutes until the delivery is completed; with the next, probably hours before the third stage is over. The method we follow, as far as possible, is this:—The hypodermic is given when the patient is in active labour; that is, contractions with definite pain occurring every four to six minutes and lasting about sixty seconds, and when vaginal examination shows a dilation of the cervical os of about two or three fingers.

Every case is a law unto itself as regards the period of time which should elapse after the hypodermic before the instillation is given. Should the patient show a response to the hypodermic medication by a decrease in the amount of pain, then the instillation may be withheld for a period of an hour or an hour and a half. However, if there is no appreciable sedative result to the patient, then the instillation may be given in twenty minutes, or half-an-hour.

The necessary apparatus for giving the anaesthetic is very simple, consisting of an ordinary granite or glass funnel, a foot of rubber tubing, a two-inch glass connecting rod and a large sized rubber catheter with several additional openings nicked in it to promote a little faster flow of the oil-ether mixture.

The technique followed in giving the instil-

lation is as follows:—The patient should have had the lower bowel thoroughly emptied by an enema a short time previous to giving the anaesthetic. She is then placed on her left side in a modified Sim's position, with the right limb flexed at hip and knee. About an ounce of warm sweet olive oil precedes and follows the giving of the instillation proper. The presence of the oil serves two purposes. First, ether may irritate and cause a burning sensation if the rectal mucosa is hypersensitive, or if hæmorrhoids are present. If present, this burning will be but momentary, being almost instantly allayed by the soothing action of the warmed oil; and secondly, the instillation being over 50 per cent. ether is very volatile and runs very easily and quickly, but being sandwiched in between two layers of oil this tendency is greatly overcome. The funnel and tubing are then filled with the warm oil, and all air bubbles excluded before the introduction of the catheter, as any air in the rectum will cause distension and a bearing down sensation to the patient, which is, of course, to be avoided.

The catheter is then introduced into the rectum for a distance of between four and six inches. Should the foetal head be low down, it is imperative that the tubing be placed above the level of the oncoming head, for then the head will act as a ball valve,—the harder the pains the more completely the head will press on and collapse the rectum, and will more surely tend to materially aid the retention of the oil-ether mixture.

The fluid is run in by gravity alone, usually taking about four or five minutes. If the pains are severe during this period of time, the tube may be temporarily clamped by the fingers during the height of the contractions. As soon as all the fluid has entered the rectum, the tubing is carefully withdrawn between pains, and then either the attendant or a nurse should sit by the patient and with a folded towel press the buttocks together, and pressure should be exerted upwards with the towel during the next few pains. The patient should be left as quiet as possible, all unnecessary noises about her eliminated, and any conversation carried on in low tones. The lights should be dimmed, and possibly an eye-shade of gauze placed over the patient's eyes.

Most patients will for a minute or two follow

ing the instillation have the desire to empty the lower bowel. I think, personally, that the success of the treatment depends very greatly on the obstetrician obtaining the full co-operation of the patient before the anæsthetic is introduced into the rectum. She should be told why she is being given the treatment; that the injection is to be retained; that if she does retain it she will go to sleep, have no more pain and wake up when everything is over. Understanding this, and co-operating as fully as possible, patients will not have the slightest difficulty in retaining the instillation.

The effects are noticeable in an extremely short time, because the absorptive area of the large bowel is so great that the ether is absorbed at an even rate and becomes systemic about twice as quickly as in the inhalation method. So, very often the ether will be tasted before the injection is completed; the odor will be on the breath in four or five minutes, and by fifteen minutes at the outside, usually ten, the patient is either very stuporous or fast asleep. Labour is not prolonged. The obstetrician may sit by the side of his sleeping patient, and may feel the uterine contractions going on just as regularly, just as frequently and just as forcibly as before, and the strength and frequency will increase proportionately as the second stage progresses.

The effects of this synergistic analgesia will last from two to six hours, depending on the patient's susceptibility to ether, and depending on whether or not the instillation is completely retained.

Should there be some disproportion between the size of the foetal head and the maternal pelvis, some malpresentation or a dystocia due to any cause, resulting in a prolonged labour, then it may be necessary to repeat the hypodermic, omitting the morphine sulphate; that is, if the effects of the instillation are beginning to wear off and it is thought that it may be some little time before delivery, 2, 4, or 6 cc. of the magnesium sulphate solution may be given by hypodermic. This will usually carry on the effect of the analgesia for another hour or so.

Naturally, the question arises, what dangers are there to the mother or child in this mode of anæsthesia? The anæsthesia, in my experience, is without any danger to the mother or child. Let us consider briefly the various items in the treatment.

In the *Jour. Am. Med. Ass.*, August 5th, 1921, there was reported from the Presbyterian Hospital, New York, a series of 200 cases in which as much as half an ounce of the magnesium sulphate was given subcutaneously with no disastrous effects. We would have to give 32 cc. of our solution to equal even this safe amount, and the most ever given is 8 cc. So the magnesium sulphate may be considered harmless.

One-sixth of a grain of morphine given in the later part of the first stage is, I think, without danger. As for the ether, the usual amount given to surgical patients where rectal anæsthesia is being used, varies from three to six ounces, usually four or five ounces being the amount. In the obstetrical technique only two and a half ounces are given. The latter probably accounts for the fact that we do not get marked tenesmus, or a colitis with bloody stools that sometimes occurs in the surgical cases, although in some of our cases there is a slight straining by the patient which is bothersome, coming on an hour or two after delivery and lasting for about half an hour or so.

There is usually a good bowel movement the first day after delivery, which I think is a slight advantage. An advantage of greater importance, however, is the fact that a 50 per cent. ether solution in the rectum will in ten minutes kill all colon bacilli in the lower bowel, thus minimizing the chances of a post natal infection, especially in cases where there has been a repair to the perineum.

I have personally used this treatment in the neighbourhood of one hundred and fifty cases, and have had no still-births in that series, and only three of the babies had to be resuscitated. However, there was one case in which only the hypodermic was given and a still-birth resulted, but as the case was one of version and breech extraction, complicated by both arms being above the head, I do not think the hypodermic could be blamed, and there have been no still-births in the series where the whole cycle was given.

Vomiting occurred in two mothers. In both cases the woman had eaten very heavily a short time previous to the administration of the anæsthetic, evidently looking forward to a week or ten days of semi-starvation while in the hospital. Perhaps another half-dozen have complained of a nausea that was only temporary, however.

There are practically no definite contraindica-

tions to its use. It has been given safely in pre-eclamptic cases and in cases with cardiac complications of a type that have not become decompensated. It should be withheld in cases that are likely to be delivered by Cæsarean section and are being given the so-called "test of labours," or in cases of premature delivery where it is desirable to safeguard the premature to the greatest possible extent.

Having so far dealt only with the advantages and benefits of this anæsthesia, it would be wise to dwell for a moment on the disadvantages and the drawbacks, for although greatly outweighed and outnumbered by the advantages and benefits, still they do in a small way exist.

The greatest drawback, in my mind, is that occasionally (five times in my experience) the patient becomes irrational and sometimes highly excitable under the effects of the analgesia. This may show itself only in incoherent speech and mild delusions or hallucinations, or the patient may become extremely violent and very difficult to handle. This result is not at all desirable in a private home, occurring as it does after the obstetrician has told the anxious relatives or friends what peace and calm the instillation will bring to the patient. However, wild as the patient may be, labour is not prolonged and there is present relief from pain.

Once the patient has become anæsthetized, she should be watched fairly carefully, especially if she should be a multipara, for labour may advance and terminate very quickly while the patient is fast asleep. For this reason a nurse who is experienced in obstetrics should always be present when the case is being conducted in a private residence.

These two facts constitute the only real drawbacks to this form of obstetrical anæsthesia.

Like the New York routine, we attempt to grade our cases in accordance with the success of the treatment in relief of pain to the mother, the ease of delivery and the condition of the baby. I regret that we have not a larger series of cases to report from the hospital here, but owing to temporary quarters, clinical material has been scarcer than we would have wished for, and we have been unfortunate lately in that the majority of patients when admitted have been too far advanced in labour, making the use of the anæsthetic unwise.

However, in a series of twenty-seven cases,

consisting of nine primiparæ, eighteen multiparæ, the complete cycle was given in twenty cases, the hypodermic only in seven. Of the twenty receiving the whole treatment, nine were graded "A" results; seven "B" results, and four "C" results; that is, 80 per cent. were "A" or "B", which means a successful result. In about 150 personal cases in New York and Toronto, between eighty or ninety per cent. were "A" or "B" results; of the four class "C" results, that is, poor results, two were cases of false labour; one was a mental case, and in the last the treatment was given too late in labour and no appreciable result was noticed.

I would like to briefly summarize two of our "A" results, to give you some idea of what results can be obtained from the use of this anæsthesia.

*Case No. 1.*—Age eighteen, para. 1. Admitted 2.15 p.m.—2½ F. dilated; very strong pains occurring every three minutes. Patient restless and shrieking. Hypodermic given on admission. Noticeably sedative effect. Instillation one hour later, 3.30 p.m., nearly 4 F. dilated. Patient tasted ether in two minutes, ether odor on breath in three minutes; asleep in eight minutes. Slept for two and a half hours; could not be aroused. Caput showing with pains at 5.45—delivery 6.20 p.m. No additional anæsthesia. Nine pound eight ounce baby, perfectly normal.

*Case No. 2.*—Age forty-two, para. 6. Admitted 7.20 a.m., active labour. Hypodermic at 9.00 p.m. 3 F. dilated. Instillation 9.30 a.m.—4 F. dilated. At this time pains every two minutes and patient making considerable noise. Although instillation partly expelled, effect very noticeable in ten minutes. Patient quiet and stuporous. Labor progressing rapidly. Delivery completed fifty minutes after instillation. During that fifty minutes patient would open eyes when spoken to, but needed no additional anæsthetic at actual time of delivery, and was not restless during any part of the labour.

Both these patients, twenty-four hours later, remembered nothing after they received the instillation.

Such results are, unfortunately, not obtainable in all cases, and it may be necessary to administer a few drops of ether by mouth as the head is sweeping over the perineum, and additional anæsthetic is practically always necessary when extensive repair work has to be done, or when the labour is terminated by operative measures. Such cases as these, where the benefits are quite marked, but additional anæsthetic at actual times of labour is necessary, are graded in our classification as "B" results.

But to be able to give to a woman in the throes of mental agony and physical pain, relief by a safe analgesia that will carry her from the later part of the first stage to the termination of her

labour free from pain and in a quiet slumber, is to my mind a godsend to her, to her relatives and even to her obstetrician, and is the greatest recommendation that can be given to this form of treatment.

Let me sum up the following conclusions:—

1.—This method is of a simple nature, easily given, and produces no deleterious effects in either mother or babe.

2.—It produces an analgesia throughout the greater part of the second stage in all cases,—in some even to the termination of labour.

3.—It can be used in private practice, but is more suited for hospital cases.

4.—It practically never tends to produce any nausea or vomiting, or intestinal irritation.

5.—In 80 per cent to 90 per cent. of patients the results obtained are satisfactory. However, in a few patients (about 3 per cent.) the effect is unpleasant due to the patient becoming irrational or violent.

#### REFERENCES

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