THE HISTORY OF ANESTHESIA IN OBSTETRICS

BY

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I

ANCIENT HISTORY OF OBSTETRICAL ANESTHESIA

Little mention is made in ancient literature of the use of substances to allay the pain incident to childbirth. From Greek writers, however, it is learned that attempts were made, and that at times these efforts led to punishment.

In the trials of the sixteenth century, witches were punished for their attempts to lessen the pain of labor. The methods used were unique if not effective.

For practical purposes, obstetrical anesthesia did not exist before the work of Sir James Y. Simpson. The pain of labor had always been the plight of woman and no one had concerned himself about it.

II

THE ROLE OF SIR JAMES Y. SIMPSON IN OBSTETRICAL ANESTHESIA

A. Sir James Y. Simpson.

James Y. Simpson was born of poor parents in Bathgate, Scotland in 1811. He was the youngest of seven children and evidently the most promising, for family resources were pooled so that he might obtain an education. His education began in the local school, which he attended from the age of four until he was fourteen. At this age he entered the Faculty of Arts at the University of Edinburgh. However, he did not complete the arts course, for after two years he began the study of medicine. While still less than twenty years of age he passed the final examinations for a medical degree. Following this he attended classes in midwifery at the University as well as assisted the professor of pathology. He also assisted a local physician and traveled extensively.

He began his professional work as a general practitioner, but soon he was attracted to obstetrical work. He started a lecture course in this branch of medicine. When he was twenty eight years of age the chair of midwifery at the University of Edinburgh was vacated. Simpson was determined to secure this position. Competition for the post was keen but Simpson finally was elected by a majority of one. When he learned that his bachelorhood was being used as an argument against him, he acquired a wife.

Simpson's contributions to branches of medicine other than obstetrics are overshadowed by his outstanding work in this field. He is also regarded as one of the founders of modern gynecology. It has been said that if he had done nothing for obstetrics, his name would have lived in connection

with gynecology.

Simpson read widely and was well informed on many subjects. This in addition to an excellent knowledge of the Bible aided him greatly in his fight for anesthesia in obstetrics.

B. Events Preceding Simpson's Early Work in Obstetrical Anesthesia.

This section deals with the discovery of general anesthesia, which of course preceded Simpson's early efforts. The controversy that arose in this connection is well known to students of medical history.

Crawford W. Long (1815-1878), Horace Wells (1815-1848) and William T. G. Morton (1819-1868) are credited more or less with the discovery of surgical anesthesia.

According to Leake, Long first used ether for a surgical operation on March 30, 1842. He did not publish his discovery until many years later.

Wells, a Connecticut dentist, used nitrous oxide on December 11, 1844, for the extraction of a tooth.

Morton used ether anesthesia on animals and on himself. On October 16, 1846 he successfully demonstrated its use before the surgeons of the Massachusetts General Hospital.

All are not agreed with the relative merits of these three men, but any further discussion is beyond the scope of this article.

C. Simpson's Early Work.

In January 1847 Simpson was appointed one of the Queen's Physicians

for Scotland. He wrote that, although this was no small honor, he was far more interested in having delivered a woman without pain using ether.

When the news of Morton's successful demonstration on October 16, 1846 had reached Edinburgh, Simpson at once thought of its possibilities in obstetrics. His problem was two-fold. In the first place, he wanted to know if anesthesia could be continued sufficiently long, and secondly if it would interfere with uterine contractions.

He first used anesthesia in obstetrics on a patient with a contracted pelvis in which a version and extraction was necessary. In this case it was of little moment whether uterine comtractions were interfered with or not. On January 19, 1847 he performed the operation successfully and painlessly. He noted that uterine contractions were unimpaired. This first case was soon followed by many normal deliveries with the patients under the influence of ether anesthesia.

On February 10, 1847 he read an account of his discovery before the Edinburgh Obstetrical Society. Soon the use of ether in obstetrics was tried in England, Germany and finally in America. The innovation was, however, not accepted without many bitter controversies. It was in meeting these objections that Simpson laid further claim to versatility.

D. Simpson on Chloroform.

On November 10, 1847 Simpson communicated his discovery on the anesthetic effects of chloroform to the Medico-Chirurgical Society of Edinburgh. In this paper he stated that he had tried various agents on himself and others in an attempt to find one that would be less disagreeable, less irritant, and more economical to use than ether. In

chloroform he had found a substance which he believed possessed the advantages of ether but lacked its disadvantages.

The discovery of the anesthetic effects of chloroform was not an accident. He had tried many other volatile liquids with odors more agreeable than that of ether. Chloroform had been discovered in 1831, but no one before Simpson had used it by inhalation for anesthetic purposes.

Simpson believed that chloroform was superior to ether because of its more rapid action and its more agreeable odor. He also noted that less was required to produce the desired effect, and that the preliminary stage of excitement was all but abolished.

He first used chloroform in obstetrics on a woman, who on a previous confinement had been delivered by craniotomy after a difficult three day labor. He started chloroform three and one-half hours after labor began. Twenty five minutes later the child was expelled, and when the fortunate mother awoke, Simpson had difficulty convincing her that she had a living child.

Simpson foresaw objections that were to come for he said that although obstetricians might oppose anesthesia, he believed the patients themselves would eventually demand its employment. He repeatedly stated that the mission of the physician was twofold, to alleviate pain as well as to preserve human life.

E. Simpson's Defences of Anesthesia.

The use of anesthesia in obstetrics was not accepted without a struggle. Simpson's wide knowledge enabled him to meet objections as they arose.

It was argued that pain during operations was desirable and that to prevent it was hazardous. One critic states that in the lying-in chamber pain was the mother's safety. Simpson was assailed as one who had forgotten, that in the Bible it had been ordered that woman shall bear young in pain and sorrow.

He answered that if it was wrong to relieve pain with chloroform it was also wrong to attempt to relieve pain by other methods in common use. He felt all who objected on such grounds should reject all kinds of medical assistance during labor. If God had intended labor pains were to be irrevocable, he would never have allowed man to discover a means to stop them, Simpson further stated.

Some objected to anesthesia because it was unnatural, but Simpson refuted by writing that these persons were inconsistent since they rode in couches, when the natural means of progression was walking. When a woman told Simpson she thought it was unnatural for Edinburgh physicians to abolish labor pains, he told her that it was also unnatural for a person to ride across the Irish channel in a steamboat against the side. Among the most outspoken opponents of Simpson's innovations was Professor Meigs of Philadelphia. In a letter dated in Edinburgh in August of 1848, Simpson systematically answered the objections raised by Meigs. Meigs had argued that the best guide to the proper introduction of forceps was to ask if they hurt or not. If there was no pain, the forceps were properly placed. Simpson wrote, however, that anyone attempting to employ forceps should have a far better understanding of the anatomy involved than Meigs had presupposed.

Secondly, Meigs held that pain in labor was "a physiqlogical pain"

not to be anulled, since it was present to promote the safety of the mother. Simpson stated that labor pains consisted of two elements, which were distinct.

1. Contractions of the uterus

2. The sensations of pain resulting from these contractions.

Simpson believed the second element to be non-essential.

Meigs had admitted that labor pains were absolutely undescribable and comparable to no other pain. Simpson said that the mission of a physician was not only to preserve life but also to relieve pain. He felt that a physician who did not attempt to relieve pain was foregoing an important part of his professional duty.

Lastly Meigs objected to anesthesia because the mother's life might be endangered. Simpson believed an occasional deleterious result in one patient among its use in thousands was not an argument against it. He further stated that each year hundreds of people were poisoned with opiates, yet no one advised abolition of opium for this reason. Each year, too, hundreds were drowned while bathing, yet no one felt that bathing should be stopped.

The above discussed objections are typical of those encountered by the Edinburgh physician. He and chloroform were denounced by clergymen, the laity, and even by members of the profession. Chloroform was called a decoy of Satan and Simpson was all but Satan himself. The lying-in room was compared to a scene of drunken revelry.

In April 1853 Queen Victoria accepted chloroform for the delivery of her seventh child. The professional journals had no words of approval either

for the attendants or the Royal patient herself. When the Queen again accepted chloroform in 1857, formal opposition was much reduced.

F. The Results of Simpson's Contributions.

Although in 1870 Simpson wrote that chloroform had largely replaced the use of ether, in America ether had held its rightful place. By 1890 after many accidents with chloroform, ether was being more widely used the world over.

Before Simpson there was no anesthesia available for women in labor, but before he died obstetrical anesthesia was a reality. Even though chloroform did not maintain the position to which Simpson had elevated it, he had shown the way.

Simpson died in 1870. He had lived to see his work accepted.

III

AN AMERICAN PIONEER IN OBSTETRICAL ANESTHESIA

Walter Channing of Boston was born in Rhode Island in 1786. From 1818 until 1854 he was Professor of Obstetrics and Medical Jurisprudence in the Harvard Medical School. In private practice he was primarily interested in obstetrics. He was the first dean of the Harvard Medical School.

Channing's pioneer work is a point likely to be overshadowed by Simpson, yet he did more to advance the use of anesthesia in obstetrics in this country than did anyone else. Like Simpson,he met with much opposition.

Channing's most important contribution was "A Treatise on Etherization in Childbirth". He reported the results of 581 cases delivered while using ether to prove its beneficial and safe results.

Meigs also opposed Channing's work. Interestingly Meigs objected to O. W. Holmes' theory on the contagiousness of puerperal fever.

IV

NITROUS OXIDE ANALGESIA AND ANESTHESIA IN OBSTETRICS

In 1878 Paul Bert, a Frenchman, first recommended the use of nitrous ocide in obstetrics. In 1880 Klikovitsch, a Russian, reported on twenty-five cases in which this gas was used. About 1890 American obstetricians learned of its use, but owing to the cost, impurity of the gas, and faulty technique, the method did not attain widespread popularity.

When the above named faults were corrected, nitrous oxide anesthesia was resumed. In 1910 Guedel began the routine administration of the gas as it is now known.

In 1917 C. Henry Davis wrote that within the past year (1916) he had used nitrous oxide-oxygen anesthesia in over five hundred cases in three Chicago hospitals. He stated that this method was the most satisfactory means yet available to alleviate the pains of labor.

V

TWILIGHT SLEEP

In 1897 the combined use of morphine and scopolamine was advocated to relieve the pain of surgical operations. In 1902 von Steinbuchel first suggested the use of morphine and scopolamine in obstetrics and in 1903 he reported on its use in twenty obstetrical cases.

In 1906 Gauss made his first report on "Twilight Sleep". Twilight Sleep soon attained wide popularity. The literature is full of many and varied conflicting reports on the subject. The method had a brief vogue in this country, after its use was increased by a series of articles in women's magazines in 1914. Until war time, when all things German were taboo, it was extensively employed.

Following the discovery of the method by the lay press, twilight sleep became the chief concern of physicians practicing obstetrics. Although, in general, the agitation over painless labor as advocated by lay circles was detrimental, all their efforts were not in vain. Edgar states that it stimulated research into newer and even older methods of producing painless labor. With twilight sleep the women suffered pain, but did not recall it after the ordeal was over. Many found it difficult to believe that one showing all the evidence of pain did not actually experience it.

Others believed that labor was prolonged. Frequently the babies were born deeply anesthetized. To the credit of the method, it cam be said that a large percentage were confined in a state of amnesia and subsequently they had no recollection of pain.

In 1921 there was an unsuccessful attempt to revive the use of twilight sleep. In 1929 Gauss still expressed confidence in his method, but tactfully added that experience in the technique of dosage is essential to success.

Hunt in 1935 found that few obstetricians push morphine and scopolamine to the original full twilight state as was first advocated. The widespread general popularity of the method has waned and there remains a fear of giving morphine because of the effect on the child's respiratory efforts. The poor results encountered with twilight sleep were, in general, due to giving too much morphine too late in labor. Properly applied morphine and scopolamine has been found by many to be too good a method to discard entirely.

VI

THE GWATHMEY TECHNIQUE

In 1923, ten years after the discovery of oil ether anesthesia, the method was tested both in America and in Germany, with the intention of applying it in obstetrics. In the New York Lying-In Hospitals experiments were conducted under Dr. Asa B. Davis.

The method combines a primary intramuscular injection of morphine and magnesium sulphate. Twenty minutes later another injection of magnesium sulphate is given, also by the intramuscular route. This, in turn, is followed by a retention enema containing quinine, alcohol, ether and olive oil.

Gwathmey summarized the early word using the synergestic method as follows:

1. Labor is not delayed
2. The condition of the baby is not affected
3. Colonic ether is safer than an equivalent amount of morphine on the child.

By 1926 over 20,000 cases had been reported by the original observers.

As in the case of twilight sleep lay writers arose to extoll the merits of the synergistic method. Notable among these was Constance Todd, who wrote a book in which she listed the hospitals throughout the country using the Gwathmey technique, as well as the percentage of cases in which it was used. She believed the acne of obstetrical anesthesia had at last been attained, but others far more qualified to an opinion, have not shared her optimism.

VII

MISCELLANEOUS METHODS

A. Ethylene Anesthesia.

In recent years many agents and various methods have been advocated to produce obstetrical anesthesia.

Ethylene was first used as an anesthetic agent in 1923 and soon it was tried in obstetrics. In 1924 Heaney reported a series of two hundred fifteen cases in which the agent was used with excellent results. He believed that ethylene had superior relaxing qualities as compared to nitrous oxide. In this early report, however, two explosions were encountered. The explosibility of ethylene oxygen mixtures has greatly restricted its general employment. For practical purposes, ethylene may be regarded as similar to nitrous oxide except for the very real use of danger of explosion met with in its use.

B. Spinal Anesthesia.

Kreis is credited with having made the first application of subarachnoid anesthesia in obstetrics in 1900. It was early recognized that uterine contractions became more energetic after the agent was administered and that the uterus remains in a condition of tension for a variable period between the contractions.

As with other innovations in the field of obstetrical anesthesia, the spinal method has gone through periods of skepticism and injudicious use.

Cosgrove, in many publications, has repeatedly advocated spinal anesthesia in obstetrics. He feels that because of soft tissue relaxation obtained the incidence of episiotomies is materially reduced. He believes

it to be of decided value in obstetrical laparotmies because of the complete anesthesia obtained, the thorough muscular relaxation, the relatively minimal bleeding, the reduced postoperative discomfort, and smooth postoperative course. He further adds that it may be used for any condition contraindicating general narcosis.

Pitkin takes care not to advocate the method as one of choice, but finds it efficacious when inhalation anesthesia is contraindicated. The same author mentions tuberculous bronchitis, decompensated cardiac disease, the toxemias of pregnancy, acidosis, nephritis, diabetes, toxic goiters, anemias of pregnancy, and Bandl's ring contractions as conditions in which the method is useful. He states that postpartum hemorrhage is less frequent because the uterus contracts firmly when it is emptied.

Babcock writes that by no means is spinal anesthesia fool-proof,or even safe when it is used carelessly or indiscriminately. Pitkin and Mc Cormack in 1928 reported that the troublesome postoperative anesthetic after effects are not encountered as with inhalation narcoses. They state that the primary mortality with this method is less and that the secondary mortality is practically nil.

Sise and others have reported, however, that the type of anesthesia has little effect on the production of postoperative pulmonary complications and that the type of operation is the main factor in their occurrence.

In discussing the disadvantages of the method, Greenhill writes that there is a definite mortality with the procedure. Other complications encountered are pronounced falls in blood pressure, and failure of the uterus to relax. He believes that labor is prolonged in over half the

cases and that operative intervention is frequently necessary. He calls attention to the fact that the procedure is irrevocable and that it requires special knowledge for proper usage. Some have found that post partum hemorrhage to be definitely more likely to occur in spite of earlier reports to the contrary.

In general it would seem that the disadvantages of the method outweigh the advantages and that its general employment is out of the question.

C. Barbituric Acid Derivatives.

Some of the early work on the use of barbiturates in labor was done in as early as 1923. Cleisz gave a drug called somnifene intravenously and obtained good results. Others repeated this work but concluded that the child was narcotized too much when the drug was used. It is interesting to note that the women were very restless when udner the influence of the drug. Barbituric acid derivatives were used to a limited extent in obstetrics in the United States by 1929, but they had been widely used in Europe.

In 1929 Robbins and his co-workers reported on the use of sodium amytal in labor. They concluded that the most serious objection was difficulty in controlling patients who became very restless. They believed that there was no danger to the mother or child and that labor was not delayed.

In reviewing the literature of today, one is impressed by the number of articles on the use of barbituric acid derivatives in labor. The volume of material written is indicative of the fact that the ideal one has not been discovered.

One could not discuss all of the drugs advocated, so only a few will

be mentioned. Hardly an issue of an obstetrical journal appears without a report on one of the barbiturates.

Pernocton, one of the series, was first investigated in Germany in 1927 by Bumm of Berlin. There were many reports on the use of this drug in labor in European journals, but none appeared in the United States before Brown et al reported their series in 1931. They believed there was no tendency to prolong labor, and that the amnesia produced was the most notable effects. They noticed the tendency to produce excitation.

Barbiturates have been given by oral, intravenous and rectal routes. They have been used both alone as well as in combination with practically every known method of attempting to produce painless labor.

Ruth in 1929 reported a series of cases in which he combined intravenous sodium amytal with nitrous oxide-oxygen anesthesia.

In 1933 Van Ess and Olsen wrote that pernocton had been used in over 200,000 cases in this country and abroad. They found that the tendency to produce excitation was the only unsatisfactory finding.

Hunt in 1935 made a survey of the methods of analgesia used in labor in the United States. He contacted eighty representative American obstetricians. The wide use of barbiturates was indicated by the fact that sixty-two out of seventy-eight men answering used barbiturates of some kind or in some combination. The majority preferred pentobarbital sodium. Sodium amytal was the next drug of choice. A few used Barb-eth-oil, a combination of barbiturates with rectal ether. The chief objection voiced was undue excitement and restlessness.

Hunt concluded that the tendency at the time was definitely away from the use of morphine and toward the wider use of barbiturates in labor. Intravenous administration seemed to be becoming less popular than the oral or rectal routes.

New preparations are continually being sought in the hope that among them one will be found which will overcome the excitement so frequently reported with other barbiturates.

D. Hypnotism.

This means of producing painless labor has repeatedly been advocated, but it has attained no degree of success.

Von Wolff in 1927 traced the historical development of the subject. He reported that although the method had been known for years few had used it. The following brief summary is condensed from von Wolff's article.

In the sixteenth century Mesmer made the first attempt to use hypnotism on a scientific basis. In 1843 Braid attempted to withdraw the subject from the realm of mysticism.

In 1888 Werth stated that the entire procedure, with reference to its use in labor, placed the obstetrician using it in a very doubtful light. He felt it was applicable only in mentally healthy individuals.

The tendency to associate hypnotism with all sorts of mysticism had hindered its advance. The majority of physicians have always had little faith in the procedure. Von Wolff reported on its use in Berlin. He believed that it was successful in numerous cases. He felt that it was less successful in nervous patients.

E. Parasacral Anesthesia.

Sacral block, as well as other means of producing local anesthesia, has been suggested for the production of obstetrical anesthesia. These methods are difficult to carry out, and probably will not attain general usage.

F. Avertin in Obstetrics.

The anesthetic properties of avertin (tribromethyl) were demonstrated by Eichholtz in 1927. It was widely used in Europe before its introduction in America. The drug is given by rectum and is rapidly absorbed. Obstetricians became interested in the method as a means of anesthesia for patients in whom inhalation narcosis was contraindicated.

Reed in 1930 reported a small series of cases, but made no conclusions on the efficacy of the method.

Standar in 1931 made a series of studies and stated that it seemed especially indicated in patients unable to take inhalation anesthesia. Newell in 1932 wrote that he believed the method had distinct advantages over other forms of anesthesia now in use. He believed that it was more readily retained in the rectum tham ether-oil mixtures.

Bemes in 1933 was less optimistic. He listed excitement of the patients, the frequent failure to produce adequate analgesia, and the relatively short duration of action as decided disadvantages. Post partum atony of the uterus with abnormal blood loss has also been reported as a not unusual complication.

VIII

SUMMARY OF THE DEVELOPMENT OF ANESTHESIA IN OBSTETRICS

To conclude, the following dates which are of importance in the history of obstetrical anesthesia are listed in chronological order:

1786 Birth of Walter Channing

1811 Birth of Sir James Y. Simpson.

1842 Crawford W. Long first used ether for a surgical operation

1844 Horace Wells used nitrous oxide for the extraction of a tooth

1846 William Morton successfully demonstrated the use of ether

1847 January 19, Simpson first used ether anesthesia in obstetrics

1847 February 10, Simpson reported an account of his discovery before the Edinburgh Obstetrical Society.

1847 November 10, Simpson reported on the anesthetic effects of chloroform.

1847-1868 Rapid development of chloroform anesthesia.

1853 Queen Victoria accepted chloroform for her seventh confinement.

1857 Queen Victoria again accepted chloroform.

1870 Death of Sir James Y.Simpson.

1878 Paul Bert recommended the use of nitrous oxide in obstetrics

1880 Klekowitsch reported twenty-five cases of labor in which nitrous oxide was employed.

1902 von Steimbuchel first suggested the use of morphine and scopolamine in obstetrics.

1903 von Steinbuchel reported the use of twilight sleep in twenty cases.

1906 Gauss made his report on twilight sleep.

1914 Series of articles on the advantages of twilight sleep appeared in a popular woman's magazine.

1923 Gwathmey technique used in obstetrics

1923 Barbituric acid derivatives advocated for obstetrical use

1924 Heaney reported on the use of ethylene in obstetrics.

1927 Anesthetic properties of avertin demonstrated.

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