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LESSONS FROM THE CÆSAREAN OPERATIONS OF
PHILADELPHIA, 1835-1889.

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THE history of Cæsarean work in Philadelphia—embracing its three different types, “old style,” “Porro,” and “Sänger, or improved”—has far more than a local or even a national interest, for it is a record of most encouraging progress in *laparo-hysterotomy*, once regarded as highly dangerous, if not certainly fatal to the woman, and attended also with considerable risk to the child; but now believed to be far less fatal than many of the capital operations of surgery, provided the subject is in a proper condition to give a fair prospect of success. For many years the fear of a fatal issue had much to do with making the issue fatal, and the surgical work, resorted to when all other expedients had failed, was made to bear a degree of responsibility that properly belonged to the prior management of the labor.

Delay in operating has long been charged with much of the fatality that followed the performance of the “old Cæsarean” operation in England and America; but this was only one of several factors that combined to cause the death of the mother, and in many instances that of the child also. Pure delay, that is, a simple waiting for nature without intermeddling, is a far less dangerous factor than futile attempts to deliver by the forceps, version or craniotomy, so often the accompaniments of delay.

Promptness in operating, where the fœtus is vigorously alive, and there have been no attempts to deliver, has been shown by careful statistical research to promise far more in our country than in Great Britain, under

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the old method. A strange and almost unaccountable fatality, amounting to seventy-five per cent., had attended the *early* performance of laparo-hysterotomy in the British Isles up to the time when the Porro and Säger methods were introduced, and antiseptic precautions were adopted. What these are to accomplish in Great Britain has still to be ascertained, as the tests have as yet been quite limited in number, and not very encouraging: seventeen Porro cases with eleven deaths, and three Säger's with two deaths, may be very much improved upon in the near future. Promptness in American operations, even when the use of the uterine suture was very exceptional, and antiseptic measures were not employed, saved, by careful calculation, seventy-five per cent. (twenty-one out of twenty-eight) of the women, and eighty per cent. of the children. The two new methods are still under trial in this country, and the later operations, as in England, have given a better promise of success for the future: we have had eleven Porro-Cæsarean cases with seven deaths, and thirty-four Säger-Cæsarean cases with eighteen deaths. Three were saved out of the last six Porro cases, and six out of the last eight Säger's. The last five Porro operations of England and Scotland were without a death, and this method may perhaps overcome the tendency to a high mortality in Great Britain better than the improved system of uterine suturing, which latter is certainly the least fatal in Germany, Austria, and America. Italy saved six Säger cases out of her first eight, and six Porro cases out of her first seventeen. This will endanger the relative status of her national method.

Promptness in the use of the knife is all-important now in securing success, and this is particularly the case where the woman is a rachitic dwarf, because of the much more rapid exhaustion of the latter as a result of labor. As long as the closure of the uterine wound was made to depend solely upon muscular contraction, there being no sutures inserted, so long was it an absolute essential of success that there should be no post-partum inertia produced by uterine fatigue, to cause a gaping of the wound, and an escape of lochia into the peritoneal cavity: hence the importance of prompt action under the old operation. Promptness now is important because long-continued uterine action has a tendency to produce tissue-changes that are antagonistic to an early healing of the wound. This early union is requisite, because if not secured the muscularis will gape open, and although the peritoneum may unite so as to prevent leakage, this will not in all cases secure the deeper cut surfaces against the danger of septic absorption. Uterine hemorrhage, shock, exhaustion, and septicæmia are all favored by delay and rendered less likely to occur by its avoidance: hence a growing disposition on the part of operators not to wait until labor has commenced, and the results of test cases, would appear to strengthen the belief that it is the better plan.

Far worse than delay is futile intermeddling in cases where the difficulty of delivering *per vias naturales* should be recognized by the touch and pelvic measurement. If four accoucheurs are to try their forceps upon a woman at her own home, and members of a hospital staff are to repeat the experiment after her admission, the latter should not look for success under a Sænger-Cæsarean operation after a labor of forty-two hours, when the patient is exhausted and has a pulse of 124. The capabilities and requirements of the operation are better understood now than they were in 1885. (See Case 9.)

Craniotomy is growing less and less in favor as the danger of death under the Cæsarean section diminishes; and accoucheurs are more than ever beginning to question the propriety of its repetition upon the same woman, or of performing it at all where the pelvis is too small for the child to be delivered alive. If the woman has gone almost to her full time it may be too late to extract alive a foetus that might have been delivered and saved at eight months. What is to be done in such a case, and particularly if the parents are determined not to submit to foetal destruction? Some appear to think that their wishes should not be considered. I am not prepared to say this, and especially since I once advised the Cæsarean section in such a case, and seventeen months later, the induction of labor at eight months, both of which were successful, the second child weighing thirty and one-half ounces less than the first. It was claimed that the first child could have been born alive naturally; but this has been disproved by the fact that the much smaller one required a labor of twenty-seven hours and a high-forceps delivery. Both children were females, and the first of average size. (See Case 13.)

In view of the almost universal adoption of uterine suturing at the present day, it appears strange to us that the method was so strenuously opposed in all countries from 1769 down to almost a century later (1867) when two women were saved by it in New Haven and New Orleans within a period of five weeks. Certain European obstetrical autocrats held a conjectural idea that it must be a fatal expedient to sew up the uterine wound, and hence by a vigorous opposition had the power for a long period of preventing its being tested, although the initial experiment of 1769 was not fatal, and a very large majority of the cases left to nature resulted in death. Even where this additional security was adopted, timidity in use is shown by the fact that in most cases only from one to four stitches were taken, and this is particularly true of the work in our own country down to 1874, when as many as ten were used by a Georgia operator, whose example was lost to science in the fact that he did not report the case for eleven years, or until he had had a second operation, which, unlike the first, proved fatal.

The first case of deep and superficial multiple uterine suturing in Philadelphia was that of Dr. Thomas M. Drysdale, in 1884: see Case

8 in table. This was the twelfth in chronological order in the world, and the third in the United States: it was also the sixth to prove fatal, and the third for our country: the German record up to that time having shown eight cases with two deaths. The fatality of two of the American cases was due to conditions existing at the time of the operation; and that of the other to the addition of the existence of erysipelas in the hospital.

The early trials of the Snger method and its simplifications in the United States were far from encouraging in their results, although the operators had the wisdom to see that prior conditions rather than the surgery were at fault in their misfortune. The progress of improvement may be shown in a few words: there were three saved out of the first ten; five out of the second ten; and six out of the third ten.

The Porro-Cæsarean operation was first performed in Philadelphia on August 16, 1880, by Prof. D. Hayes Agnew, in the case of a woman five days in labor and only six months pregnant: she died in sixty-four hours, of vomiting and exhaustion. The fœtus not having been of viable age the case belongs to the second classification of Godson, and does not appear in my chief tabular record. Excluding this premature case we have a record of eleven Porro cases in the United States, three of which were in Philadelphia. Case 2 (of Philadelphia) and cases 8, 9, and 10 of our country recovered, and seven of the eleven children were saved. Our American Porro record is one of the worst in the world, and is only exceeded by that of Scotland, which has lost four out of five cases. Progress is shown, however, by the fact that three of the last four operations in our country were successful. This is not due to an increase of skill, but to the fact that the cases were in a more favorable condition for the operation. The progress of improvement throughout the world is still more remarkable, as there were, as far as has been ascertained, only four deaths out of twenty-eight cases in the year 1888, or one in seven. There were twenty-two lost out of the last one hundred.

The Snger-Cæsarean work of Philadelphia has done credit to its operators in all the cases where the prior condition of the subjects gave any reasonable hope of success, and it is much to be regretted that all had not an equal opportunity of manifesting their ability to save life, for in this event there should not have been a single death. Personal acquaintance with the cases enables me to speak confidently on this point, and to express my sympathy for those who deserved success but failed in its attainment. There are two conditions which in general terms determine an unfavorable result; one is the state of health of the woman prior to labor, as in the cases of cancer, abscess, spinal caries, etc.; and the other is that produced by dangerous delay and intermeddling after the labor has commenced: one is unavoidable, and the other in most instances unpardonable. Fortunately for the cause of science and humanity,

obstetricians, especially in our large cities, are learning the requirements of the improved Cæsarean operation, and that an important one is, a fair condition of the subject. If the old adage, "meddlesome midwifery is bad," ever had a proper application, it was to cases in which Cæsarean delivery might possibly become a requisite measure. With those who have most carefully considered all the requisites for success it is becoming, nay, has become with some, a question of vital moment whether or not a woman whose condition is known to demand a Cæsarean section shall be allowed to get into labor before the knife is used. In cases of cancer of the cervix, and of intra-pelvic tumors obstructing the delivery, I believe that success will be more certain, and convalescence more uninterrupted, if the woman is operated upon a few days before gestation is complete, and the same view may in time be made to apply to all elective operations. It is a mistake to suppose that a uterus not in actual labor will fail to contract properly and rapidly when the fœtus is removed: tests practically made in this city show us that there need be no fear on this point.

Hemorrhage from the uterine wound is generally most active while the knife is being used and the steps are taken for the removal of the fœtus. If the placenta is under the line of incision the loss of blood is as a rule greater than where it is located at the back of the uterus; but there are exceptions to this and directly the opposite may be the case. As the blood-loss favors septic absorption and an attack of crural phlebitis as well as the prolongation of convalescence, it ought to be prevented by cervical compression, either manually applied by a strong assistant or by the use of the elastic tubing of Esmarch. Tubing compression has a tendency to paralyze the uterus and should not be continued after the organ is well contracted. In exceptional cases, where there is an unusual tendency to hemorrhage, it may be necessary to continue the use of the tubing until all of the deep-seated uterine sutures shall have been tied. In anæmic cases and dwarfs special care should be taken in preventing the loss of blood, as such subjects are long debilitated by hemorrhage, even when not excessive, and their convalescence is slow and tedious.

The experience of Philadelphia operators is in favor of opening the uterus *in situ*; and bringing it out of the abdominal cavity after it has been emptied, for greater facility in using the sutures. The whole operation, to the tying of the last abdominal stitch, may be performed in twenty-five minutes; but, to do this, the operator should not thread a needle. Rapidity in operating depends mainly on the economy of time practised in sewing up the uterus and abdomen; and is of advantage to the patient in shortening the period of anæsthesia. The abdomen and uterus may be opened and the child delivered in less than two minutes, and is said to have been done in one; but to close the uterine wound properly, requires much more time—*i. e.*, five or six times as long. The uterus should be sutured in two rows, deep-seated

and superficial or peritoneal, as recommended by Dr. Max Sänger, of Leipzig, and the stitches should all be interrupted. For the peritoneal row, the intestinal suture of Lembert gives the best security against leakage and promotes an early union. The uninterrupted or continuous suture has a tendency to slacken when the wound shortens under uterine contraction. The experience of this city favors the use of carbolyzed Chinese silk as a suture material; and the general opinion is, that there should be four or five stitches to the inch, about one-half of them being superficial. All animal sutures have a tendency to stretch and to become untied; the best is the chromic-acid catgut. Where this is used, the knots may be secured by passing through them a fine silk thread, and tying it.

After the sutures are all in and *counted*, the abdominal cavity should be cleaned out by irrigating with hot distilled water (105° to 110° Fah.), which has the additional advantage of reviving the patient from the shock of the operation. There is no occasion to insert a drainage-tube, as there should be no escape of fluid into the peritoneal cavity, if the uterus has been properly sewed up; in fact, the tube is objectionable, because it delays union and has a tendency to favor the production of hernia. If the woman has a settled cough, or continues to vomit after a week has passed, her abdominal sutures should not be removed for ten or twelve days, and then the abdomen should be supported by adhesive strips. Having seen a case where the abdominal wound was torn open by an attack of coughing and straining, I have given these precautions. It should be remembered that new tissue is very weak, and that a restored perineum has been torn open in Philadelphia by straining to pass long-retained excrement, twelve days after the operation.

The time required for convalescence varies with each case, and will depend much upon the general health of the woman. Under the old Cæsarean operation, in 1835, Mrs. Reybold's abdominal wound was not fully healed until sixty-six days had passed; but under the improved method Mrs. Schultze (Case 15) was well enough to travel 200 miles on the nineteenth day, without detriment.

Cæsarean women will sometimes nurse their children as well as those that have been delivered by the natural way. This has been the case with two old Cæsarean, one Porro-Cæsarean and two recent Sänger cases in Philadelphia, one of which last has now, at the end of six months, an unusually large and fat male child. If the woman is healthy and has no drawbacks in her convalescence, she should be able to nurse, although her milk may be late in coming—*i. e.*, not until the fifth or sixth day. If she should have an attack of peritonitis, or crural phlebitis, her milk will be likely to fail. If crural phlebitis should appear, it may confine itself to one leg, or may appear in the second, either early or much later than the first. In my experience, it is most likely to appear, when it does, during the third week, or about the

fifteenth to the seventeenth day; I have known it to appear on the thirtieth day, and as late as the sixth week. It has followed both Porro and Sanger operations in this city and New York, and was indirectly (by cardiac embolism) the cause of death in the initial American Porro case, under the late Prof. Isaac E. Taylor, of New York. From what I have seen in private and hospital cases, crural phlebitis must be a not infrequent sequel of Cæsarean delivery, although rarely a cause of death, and for this reason seldom reported.

Two questions of scientific interest are yet to be settled: 1. If a uterine suture is composed of perfectly pure silk, can it entirely disappear by absorption? 2. Is the uterus at all likely to rupture in a subsequent labor in the line of a cicatrix formed under the improved Cæsarean operation? The first query can only be determined by the microscope. It is claimed that the silk is not absorbed, but that proliferations of new tissue divide it up into its original fineness and spread it among the muscular fibres. Is it certain that these fibres of silk, so called, are not cotton? Under the old operation, the uterine cicatrix was apt to be thin and weak, and a number of cases are recorded where rupture took place subsequently; although in some instances children were born in the interval without accident. A rupture cicatrix has been known to give way as many as three times in subsequent labors, in order, and the woman recover. But the intimate union under the Sanger operation should be far safer than the imperfect one under a rupture, or where the wound was left to nature's closing, after an operation.

The existence of cancer of the cervix or vagina does not appear to influence the healing process in the uterine wound; and such cases, when not far advanced, are more likely to recover than where the subject is a small rachitic dwarf. The cancer cases in England have been much the most successful, according to Dr. Radford's tables. In cases of fibroid obstruction, on the contrary, there may be mural degeneration in the line of incision, seriously interfering with the process of union, as in the Drysdale case, No. 8. If one or more small fibroids are bisected in making the uterine incision, they should be removed by resecting a portion of the muscularis, as these small tumors are apt, when divided, to suppurate and give rise to septic infection. Cases might be cited to prove this danger, and the value of the resection. Subperitoneal fibroids should not be enucleated, as a general rule, in Cæsarean cases, as this procedure may increase the danger of sepsis, particularly in a Porro operation. Supra-vaginal exsection of the uterus and ovaries should have an atrophic effect upon cervical fibroids.

Hospital treatment, with its forced ventilation, trained nurses, and antiseptic management, is to be preferred to that usually attainable in the private houses of the class of patients requiring Cæsarean delivery. Cases among the poor, when thought hopeful, have in a number of

instances in our country been lost through exposure, errors in diet, and ignorance in nursing. Until within a few years, the hospital mortality in the United States was greater than that of the private house, especially when the latter was located in a village or upon a farm; but now the operator finds that he is more likely to succeed in the ward or single-room of a well-appointed maternity, where he can be sure of proper care and diet as directed by himself. Of the last six operations in this city, five were in four hospitals, and one in a two-story private house, with but one large chamber, open front and back, and the building set back from the street. All of these six women recovered from the operation, and all of their children were living.

The first elective Porro-Cæsarean operation of Philadelphia (Case 5) was performed at eight and a half months, and before labor, and saved both mother and child. It was the sixty-fifth case in chronological order, and the twenty-eighth success, showing a mortality of fifty-seven per cent., which we should now regard as frightfully high, for under the last sixty-five operations, as far as recorded or communicated, there were but thirteen women lost, or exactly twenty per cent.

Another application of supra-vaginal exsection of the uterus and ovaries, as recommended and initiated by Prevôt of Moscow, was tried in this city in a desperate case of ruptured uterus, by Dr. Mordecai Price, on April 12, 1889, and resulted in death in thirty minutes. In eleven years this operation, as here applied, has been performed in the world fourteen times with nine deaths, a mortality of nearly sixty-five per cent. But two trials, as far as known, have been made in the United States, the second of which, under Prof. Henry C. Coe, of New York, on September 8, 1889, saved the life of the woman. As this has been repeatedly called, in error, a Porro operation, I propose to examine its credentials as we advance, and its claims as a curative measure.

Laparotomy, with removal of the fœtus and secundines with blood and amniotic fluid, has been twice performed in Philadelphia in cases of ruptured uterus, under the late Drs. John Neill and William Byrd Page, respectively, and both women recovered, although in neither instance was the uterus sutured. Where the state of the woman will admit of it, and this will only be in exceptional cases—even then the treatment of Prevôt will not be likely to do better than to deliver by laparotomy, cleanse the abdominal cavity by irrigation, trim the ragged edges of the uterine wound, and sew it up with carbolized silk. The fact is that rupture cases are so rapidly brought to a state of collapse by shock and hemorrhage, that in only a small proportion can surgery be made to avail anything. When it can be, the treatment by uterine exsection should only be used in cases where the character of the tear and its location make its choice imperative, and particularly where there is a pelvic deformity to warrant the mutilating measure.

One of the inconveniences of an unscientific nomenclature is shown

by the frequent misapplication of the terms "*Porro*" and "*Cæsarean*," found in the reports of discussions in American and English obstetrical societies upon the proper treatment of rupture of the uterus. Supra-vaginal amputation of the uterus may or may not be a *Porro* operation, according to circumstances. If there is performed a puerperal laparo-hysterotomy, *completed by a supra-vaginal hysterectomy*, then there is a true *Porro* operation, and not without. If the abdomen and uterus *are both incised* and a foetus is removed from the latter, the operation is a true *Cæsarean*, and in no other case. If the foetus is extra-uterine, there can be no laparo-hysterotomy, or *Cæsarean* section, practised for its removal; so, likewise, if the uterus has been opened by laceration and the foetus is in the abdominal cavity, or is even delivered through the rent, the section is only a laparotomy. Supra-vaginal hysterectomy was practised years before Prof. *Porro* performed it upon a parturient woman to save her and her child; he *applied* it to diminish the danger of the old *Cæsarean* operation, and his name was given to the *application*. If we cannot call a special section "*Porro-Cæsarean*," we cannot correctly give the *Porro* name to it. If, then, a woman has ruptured her uterus and supra-vaginal hysterectomy is resorted to, after the dead foetus is removed by abdominal section, the *application* is not that of Prof. *Porro*, and it is an error to call it by his name; it has three times the mortality, and does not save a foetus. If, for convenience, it *must* have an operator's name, call it *the Prevôt method of treating uterine rupture*, after him who first applied it. We have, then, puerperal laparo-hysterotomy (*Cæsarean* section); laparo-hysterectomy as complete of the *Cæsarean* section (the *Porro* operation); laparo-cystotomy or cystectomy in ectopic pregnancy; and laparo-hysterectomy in cases of ruptured uterus (the *Prevôt* method of treatment). The question to be considered by societies is, Shall we treat rupture of the uterus by laparotomy and uterine suturing; by supra-vaginal exsection of the uterus and ovaries; or by antiseptic drainage of the uterus through the vagina? In two exceptional cases on record, the *Cæsarean* operation was performed after uterine rupture. In one, a small rupture was enlarged by the knife; and, in the other, the peritoneum was not torn, and required incision. In the latter case the child was saved. When we consider how many ruptured uteri there must have been in our chief cities during the last decade, we are surprised to find in how very few cases the abdomen has been opened in the effort to save life. Surely the successes in cases of ruptured tubal pregnancies should lead to surgical efforts to save life where the uterus has been ruptured during pregnancy or parturition. Dr. Coe is very much to be congratulated upon the success which attended his case, in which the choice of operations was made of necessity after the character of laceration was fully determined by laparotomy. Had the tear been a favorable one, he could have saved the uterus by careful multiple suturing, as in the *Sänger-Cæsarean* closure.

CÆSAREAN OPERATIONS, "OLD STYLE," "PORRO," AND

No.	Date.	Operator.	Form of operation.	Age.	Color and nativity	Height	Conjugate diameter.	Number of pregnancy.	Hospital or private practice	Cause of obstruction to labor.
1	Mar. 25, 1835.	William Gibson,	Old: Uterus not sutured.	26	White, Irish.	4 ft. 8	13 $\frac{1}{4}$ in.	Third, 2 embryotomies.	P.	Rachitic deformity of pelvis.
2	Nov. 5, 1837.	William Gibson,	Old: Uterus adherent to abdominal wall.	28	White, Irish.	4 ft. 8	13 $\frac{1}{4}$	Fourth, same case as No. 1.	P.	Rachitic deformity of pelvis.
3	Sept. 17, 1869.	Walter F. Atlee,	Old: Uterus not sutured.	31	White, Irish.	?	2	Third,	P.	Rachitic deformity of pelvis.
4	Feb. 27, 1878.	R. G. Curtin,	Old: Uterus closed by five cat-gut sutures.	20	Black, U. S.	4 ft. 3	2	First,	H.	Rachitic deformity of pelvis.
5	Sept. 22, 1880.	E. Richardson,	Porro: Stump held out by two crossed pins.	25	White, U. S.	3 ft. 10	2	First,	P.	Rachitic deformity of pelvis.
6	Mar. 5, 1883.	Anna E. Broomall,	Old: Uterus sutured with silver wire and silk.	22	Black, U. S.	5 ft.	23 $\frac{1}{8}$	First,	H.	Rachitic deformity of pelvis.
7	June 30, 1883.	Wm. H. Parish,	Porro: Müller method, as in Case 5.	40	White, U. S.	4 ft. 3	3	First,	H.	Rachitic deformity of pelvis.
8	Nov. 12, 1884.	Thos. H. Drysdale	Sänger: 11 deep and 11 Lembert sutures of silk in uterus.	35	White, German	.....	.....	First,	P.	Uterine fibroid blocking up the pelvis; mistaken for an extra-uterine foetal head.
9	Sept. 20, 1885.	Wm. H. Parish,	Sänger: 11 deep and 4 superficial silk sutures in uterus.	35	White, German	.....	.....	Third,	H.	Three fibroids blocking up the lower segment of the uterus.
10	July 15, 1886.	E. Richardson,	Old: Uterus closed with silk sutures.	30	?	.....	.....	?	H.	Dying of cerebral apoplexy with foetus alive.
11	Mar. 21, 1887.	Chas. M. Seltzer,	Porro: With enucleation of sub-peritoneal fibroid of cervix.	41	White, U. S.	5 ft. 7	.....	First,	P.	Tumor filling lower pelvis; os out of reach; growth size of large foetal head.
12	April 17, 1888.	Howard A. Kelly,	Sänger: 12 deep and 12 Lembert silk sutures in uterus	25	White, U. S.	4 ft. 6	2 $\frac{1}{4}$	Fifth, 4 miscarriages.	P.	Infantile pelvis; no traces of rickets; hands and feet very small.
13	May 30, 1888.	Howard A. Kelly,	Sänger: 12 deep and 17 Lembert silk sutures in uterus.	26	White, Irish.	4 ft. 8	23 $\frac{1}{4}$	Third, one very small lived.	H.	Generally contracted pelvis; relative indications; parents oppose craniotomy.
14	Mar. 13, 1889.	William Goodell,	Sänger: 14 deep and 17 Lembert silk sutures in uterus.	32	White, U. S.	.....	.....	Thirtieth, 4 miscarriages.	H.	Cancer of cervix uteri involving bladder and rectum.
15	May 10, 1889.	Howard A. Kelly,	Sänger: 8 deep and 13 superficial silk sutures in uterus.	34	White, German	.....	Space 3 $\frac{1}{4}$ in.	Fifth, 4 dead.	H.	Sacral tumor of seven or eight years' growth, filling the pelvis.
16	May 12, 1889.	Anna E. Broomall,	Sänger: 6 deep silver-wire sutures and 14 Lembert of silk in uterus.	27	Black, U. S.	4 ft. 10	31 $\frac{1}{8}$ inf'r strait contracted	Eighth, 7 dead.	H.	Generally contracted pelvis, especially marked at inferior strait.
17	Oct. 8, 1889.	Chas. M. Wilson,	Sänger: Many deep and superficial uterine sutures of silk	28	White, U. S.	.....	.....	Fifth, 4 died in infancy.	H.	Abcess in posterior wall of vagina, probably syphilitic.

CLASS 2.—UTERO-OVARIAN AMPUTATION BEFORE

No.	Date.	Operator.	Form of operation.	Age.	Color and nativity	Height.	Conjugate diameter.	Number of pregnancy.	Hospital or private practice.	Cause of difficulty.
18	Aug. 10, 1880.	D. Hayes Agnew,	Porro	44	White.	.....	.....	.....	P.	Fibro-myoma of uterus blocking up the pelvis.

"SANGER OR IMPROVED," PERFORMED IN PHILADELPHIA.

Time in labor before operation.	Condition of woman at time of operation.	Result to woman.	Result to child.	Time of survival and cause of death in woman.	Time of survival of child.	References.
12 hours.	<i>Favorable.</i>	<i>Recovered.</i>	Lived, female.	Lived to 76; died August 15, 1885; autopsy same day; pelvic measurements confirmed.	Living in 1889; has borne 8 children; is now 54	Am. Jour. Med. Sci., vol. xvi. p. 343, 1835.
10 hours.	<i>Favorable.</i> Excited, pulse 112; fell to 8 after operation.	<i>Recovered.</i>	Lived, male.	Outlived 13 doctors who saw one or both operations.	Died of phthisis, Oct. 4, 1881, aged 43, leaving 2 grown daughters, now married.	Am. Jour. Med. Sci., xxii. 13, 1838. <i>Autopsy</i> : op. cit., p. 422, 1885 (writer present).
Several hours.	<i>Favorable.</i>	Died.	Lived, female.	Died in six days from obstruction of bowels; was not re-opened for relief, as is now done.	Living in 1889.	Am. Jour. Med. Sci., p. 393, April, 1870.
24 hours. Dr. C. called after 18 hrs.; sent to hosp. Not in labor; 8½ months pregnant.	<i>Unfavorable</i> , by reason of delay in calling in the operator. <i>Favorable.</i>	Died.	Lived, male, 7½ lbs.	Died on seventh day; slight peritonitis; fibrinous heart-clot; wounds both gaped open.	Died in summer of 1879 of diarrhoea; was over 18 months old.	Am. Jour. of Obstet., p. 613, 1878.
		<i>Recovered.</i>	Lived, male.	Died February 24, 1883, Bright's disease and cirrhosis of liver; was exhibited in a travelling circus.	Living in 1883; well formed and healthy.	Am. Jour. Med. Sci., p. 36, Jan. 1881. <i>Autopsy</i> : Am. Jour. Obstet., vol. xvi. p. 534, 1883 (writer present at operat'n).
36 hours.	<i>Very unfavorable</i> ; pulse 180; temp. 102°. Forceps used before admission.	Died.	Living, male.	Died in 35 hours of septic peritonitis; uterine wound found united.	Died in 32 hrs.; right parietal bone fractured by use of forceps.	Communicated by the operator.
Not in labor; 8½ months pregnant.	<i>Unfavorable</i> ; urine quite albuminous, showing tube-casts.	Died.	Living, male.	Died in 42 hours of exhaustion and nephritis; kidneys affected with Bright's disease.	Died in 19 days of inanition.	Am. Jour. of Obstet., vol. xvi. p. 1197, 1883 (writer present at oper'n and autopsy).
8 days irregularly; labor on Nov. 4, 5, 8, 9, 10, 11, and 12.	<i>Almost hopeless</i> ; pulse 124; antepartum hemorrhage.	Died.	Dead, and macerated.	Died in 26 hours of septicaemia; uterine peritoneum united; muscularis not.	.....	Medical News, p. 631, Nov. 26, 1887 (writer present at operation).
42 hrs.; forceps tried by four men before entering the hospital.	<i>Very unfavorable</i> ; pulse 124; much exhausted by efforts to deliver.	Died.	Dead, and putrid.	Died in 12 hours of exhaustion and septicaemia.	.....	Trans. Am. Gynecol. Soc., p. 424, 1886.
Not in labor; fetus 7 mos.	<i>Hopeless</i> ; undertaken in interest of fetus.	Died.	Living.	Died in 15 hours of the apoplexy.	Was very feeble, and died in four days.	Communicated by the operator, July 19, 1886.
Slight pains occasionally for 18 hours.	<i>Worn out and anxious</i> , otherwise general physical condition good.	Died.	Dead, and macerated; male.	Lived 4 days; "heart failure; possibly some septicaemia; little pus found on autopsy."	.....	Communicated by operator, June 13, 1887.
2 weeks; waters broken 4 days.	<i>Very unfavorable</i> ; pulse 142; exhausted; had been no attempts to deliver.	<i>Recovered.</i>	Living, male. 5 lb. 15 oz.	Alive and well in June 1889; posterior lip of cervix sloughed away; crural phlebitis; stenosis of cervix.	Died in 7 days of jaundice; it was barely alive when delivered, and was hand fed.	Trans. Am. Gynecol. Soc., vol. xiii. p. 130, 1888 (writer present at operation).
Not at full term; labor induced.	<i>Favorable</i> ; pulse 96.	<i>Recovered.</i>	Lived, female. 6 lb. 15 oz.	Living and well in Nov. 1889; nursed only a few days; had sore nipples and crural phlebitis.	Died Aug. 15, 1889, of pneumonia, aged 14½ months.	Trans. Am. Gynecol. Soc., vol. xiii. p. 132, 1887 (writer present at operation).
Not in labor.	<i>Favorable</i> ; anæmic from hemorrhages; hopeful.	<i>Recovered</i> from oper'n	Lived, male, about 6 lb.	Died of hemorrhage from the cancer on April 7, 1889; was able to nurse about two weeks.	Died a little over 2 months old, soon after going to a home for children.	Med. News, p. 337, March 30, 1889. <i>Autopsy</i> (writer present at operation).
Not in labor.	<i>Favorable</i> ; general health good; spirits likewise	<i>Recovered.</i>	Lived, male, 7 lb.	Able to nurse; up in two weeks; went home 200 miles on the 19th day; doing well at 6 months	Living and well when heard from 6 months after he was taken to Yagerstown, Pa.	Communicated by the operator (writer present at operat'n)
Labor just begun; had been in hospital two weeks 2 days.	<i>Favorable.</i>	<i>Recovered.</i>	Lived, male, 5½ lb.	Convalescence uninterrupted; nursed from 6th day; less trouble than is usual after a natural labor.	Living and doing well at six months; very large and fat.	Communicated by the operator, May 27, 1889 (writer saw patient in her convalescence).
	<i>Very unfavorable</i> ; woman in very delicate health.	<i>Recovered.</i>	Lived, male, 4½ lb. 8 mos.	Convalescence very tedious, and condition at times critical, from prior disease	Lived until 44th day; was very delicate, and grew but little.	Communicated by the operator (writer saw patient repeatedly during 7 w'ks).

THE FÆTUS WAS VIABLE, PERFORMED IN PHILADELPHIA.

Time in labor.	Condition of woman at time of operation.	Result to woman.	Result to child.	Time of survival and cause of death in woman.	Period of gestation.	Reference.
5 days.	Much exhausted.	Died.	Stillborn and putrid.	64 hours; vomiting and exhaustion.	Six months.	Communicated by Dr. Ellwood Wilson, Accoucheur, 1883

Special Remarks upon the Cases.—The record of Mrs. Reybold, the subject of operations 1 and 2, is of historical interest. She was born in Ireland, in 1809; became rachitic in very early childhood; married in Philadelphia at twenty-one; was delivered by craniotomy at twenty-two, after the fœtus was dead, and softened by putrefaction, its cranium being picked away; and again, after fœtal destruction, at twenty-four; was delivered under Cæsarean section at twenty-six, and again at twenty-eight, and died of old age at seventy-six. She had declined in her second pregnancy to have premature labor induced, and again, when in labor, to submit to the Cæsarean operation. In her third labor the fœtus was found to present by the breech, in which position embryulcia would probably have proved fatal, as it nearly did in her first labor. She nursed both of her Cæsarean children, and her milk came on the third day. As far as can be ascertained, Mrs. Reybold's first Cæsarean section was the thirteenth in the United States, and the ninth that ended in recovery. It was performed three years before the first of New York City, which was also a success to the mother, the child being deformed. In the early years of American Cæsarean work, the mortality was much less than at a later period, there having been twelve women saved out of the first twenty, or sixty per cent.

Case 3 was operated on after an interval of thirty-two years, and should have been a success, as the woman, who was a patient of the late Dr. Hooper, was in good condition, had been in labor only a few hours (I believe six), and did well for four days. A few uterine stitches, as in the cases of Drs. Townsend, of New Haven, and Brickell, of New Orleans, two years before, would probably have saved her. Such cases at the present day are reopened and the intestinal adhesions broken up. It is possible that a loop of intestine may have become strangulated in the uterine wound, as such an accident has been known to occur. In these days of progress in abdominal surgery, cures of strangulation are not confined to cases of hernia.

Case 4, 1878, was the first in Philadelphia in which the uterine wound was sutured, and, unfortunately, it was done with catgut, the knots of which became untied, as had repeatedly happened in Europe. The experience of American operators with carbolized catgut in the last ten years has not been such as to recommend it for general use; it has too often been followed by a gaping uterine wound, as demonstrated on autopsy. For a dwarf of four feet three inches, a labor of twenty-four hours was too long to give a hope of success under the old operation, with only seven uterine sutures, and these of catgut.

Case 5 did great credit to the late Dr. Richardson, as it was the second Porro operation in America, and the first to recover. By operating prior to labor, he saved all the strength of the little woman, and thus secured a successful result. She was subsequently exhibited as a

dwarf-mother in a travelling menagerie, and contracted a hernia by repeatedly lifting her boy in the show.

Case 6 was the first Cæsarean operation performed by a female physician in America, and might have been a success but for the almost hopeless condition of the woman when admitted into the Woman's Hospital, due to long labor and futile attempts to deliver by the forceps. With a pulse of 180 and a temperature of 102° , the death of the woman was to have been expected. We know of no earlier Cæsarean operation having been performed by a female graduate of medicine: several cases prior to it are on record where midwives operated with success, and where women delivered themselves by abdominal incision, with a similar result. In *Case 16* Professor Broomall met with entire success.

Case 9 will probably not be repeated in this city, as accoucheurs are not so timid with regard to the Cæsarean operation now as they were four years ago. This case has already been referred to as an instance of repeated and futile attempts on the part of many private and hospital physicians to deliver by the forceps so as to avoid the greater risk. An early recognition of the nature and extent of the obstruction might have given the operator a fair chance of success.

Case 12 was a very unfavorable one, from the size of the woman, time in labor, and frequency of pulse; but, fortunately, there had been no attempts to deliver, as the os was undilated. The result in recovery shows the capability of the improved Cæsarean operation, backed by careful after-treatment, in saving life. The posterior lip of the cervix was taken away in four days, in a soft offensive state, by the fingers. The healing of the cervix produced a stenosis of the canal, and a temporary utero-abdominal fistula at the menstrual epochs. This latter no longer exists, and the woman is now fat and well.

Case 13. The operator was in two instances condemned before medical societies, once before he had reported a line upon the case, for not having delivered the woman *per vias naturales*. The reasons for the operation were these: 1. The woman had a conjugate of two and three-quarters inches, did not come under the observation of Dr. Kelly and the writer until gestation was nearly complete. 2. It was true that she had once been delivered of a living child, after a severe labor of fourteen hours, without instruments; but the fœtus was *very small and feeble*, and its predecessor of larger growth had been lost, after a labor of nineteen hours, with the aid of instruments. 3. The patient and her husband were strongly opposed to fœtal destruction, and preferred the Cæsarean operation for three reasons: 1. They had known of a recovery after the Cæsarean section in their vicinity. 2. They had received a severe shock in the sudden death of a sister of the former, nine months before, after version and decapitation, with the head still *in utero*. 3. They had religious objections, and had been advised against craniotomy by

their priest. Under all these circumstances, I advised the husband to take his wife to the Kensington Hospital for Women, and have her delivered by abdominal section, in a belief that she ought to recover under the Säger method.

The child delivered under the knife was a female of six pounds and fifteen ounces, and not *very small*, as claimed by a condemner. The woman, as I know from frequent personal observations, never had any special time of danger in her convalescence, and the child, for one hand-fed and in hot weather, did well. Both were under the special care of Dr. Noble, who is of the same opinion.

In a fourth pregnancy I recommended the woman to have labor induced at eight months, which was done, and delivery accomplished with much difficulty under the high-forceps operation, after a labor of twenty-seven and a half hours, and the last six hours very severe, under the care of Dr. Charles P. Noble. The child was also a female, and weighed five pounds and one-half ounce, or thirty and one-half ounces less than the one delivered under the knife. Thus was established the fact, that the alternative in the third labor was craniotomy or the Cæsarean section after the improved method, and that delivery by the forceps of a living foetus of the weight given was impracticable.

Case 14. This woman was operated upon in the amphitheatre of the University Hospital, before perhaps five hundred students and physicians, and made a good recovery from the operation, as shown by the appearance of the uterus on autopsy. But for the hemorrhage from the cancer, this woman should have lived several months longer. Although only thirty-two years old, she had been married eighteen years and had been pregnant thirteen times.

Case 16. I believe this to have been the first successful Säger-Cæsarean operation in the world, under a female M.D. The woman recovered rapidly, and is in robust health now, as is also her boy, who is unusually large and fat. Her convalescence was better than that of the average of women after a natural labor. She has a very much contracted inferior strait, and, it is believed, cannot give birth to a living foetus under induced labor even at seven months.

Case 17 is yet to be reported by the operator. It was one of unusual interest for a long time, because of the difficulties that attended her recovery from preëxisting conditions due to syphilis, and revealed by copper-colored spots on her arms and legs. She had a severe cough, profuse expectoration, vomiting, purulent discharges from the rectum and vagina, and later, a diarrhoea, with a range of temperature from 96° to 103°, and a pulse up to 140. Repeated visits during several weeks have satisfied me of the greatly diminished danger *per se* of the improved Cæsarean operation, as shown by the recovery of this woman. With a widely open abdominal wound, torn open by coughing and

vomiting after primary union and the removal of the sutures, her uterus does not appear to have been involved in any serious lesion.

Directions for operating.—The instruments, sponges, cloths, and ligatures to be used should all be thoroughly cleaned and rendered aseptic. The hands and forearms, half way to the elbow, of the operator and two assistants, should be likewise treated. It is usual to shave the pubes, as the hairs are the seat of bacteria which washing does not dislodge; but it is not the custom, as it should be, to shave likewise the abdomen, which is covered with minute hairs, and which are capable of giving exquisite torture to the woman when adhesive strips are being removed. The shaving of the abdomen should be done with a very sharp razor, and should extend over all the parts likely to be pulled by the plaster. In setting the strips, those that support the wound should be longer than those that secure the dressing, and the latter should be applied over the former. In removing the upper row, hold the ends of the lower strips and pull from them, so as to avoid pulling directly upon the skin.

The abdominal surface should be washed as for an ovariectomy, and the incision should follow the color-line for about five and a half inches, which will be long enough to admit the passage of an average foetus, which should be withdrawn by the feet.

Cæsarean-delivered babes have sometimes weighed as high as fourteen pounds; but this is a very exceptional size, as from five to eight pounds is the usual weight. The last six in Philadelphia averaged only six pounds each. The size of the foetus will depend very much upon the size and condition of the mother and the weight of the father. A rachitic dwarf impregnated by a large man has been known to bear an overgrown foetus: in one instance in the United States, a woman of forty inches was delivered under the knife of a child of twenty inches that lived.

The spraying process, at one time thought so important in abdominal surgery, is not now used in this city, and those who longest retained it have given it up as dangerous and not required. Washing out the abdomen with weak antiseptic solutions is rarely done, and never should be in a Cæsarean section. Irrigation with blood-warm water, recently distilled, will answer all the purposes of ablution. It should be gently poured in, and not from a height, and may be aided by the use of a fine sponge in a long-stem holder. Hot water may be employed in cases of exhaustion, or where there has been much blood-loss, as a revivant.

There seems to be but little danger of infecting a patient from the air of a clean, well-ventilated room; but much from instruments, hands, sponges, etc., unless previously rendered aseptic. In a cancer case, the woman should not be allowed to get into labor, and the diseased cervix should not be explored during the operation, either from within or *per*

vaginam, as this will seriously endanger the subsequent use of the index finger. There is some temptation to test the perviousness of the cervical canal in a case where there has been no labor, but a little reflection will show its impropriety. The canal will generally be found open, as cancer of the cervix chiefly exists in multiparæ and in those that have had a laceration: should the canal be found closed, after the dressing, it may be gently dilated for drainage.

It is of interest, in connection with this work of Philadelphia, to state what is being accomplished throughout the world in general, as thus far ascertained, under the Porro and Sænger methods. It is very unfair to either method, to calculate its prospective results by the percentage of deaths standing against it. The fatality of an operation should be considered in reference to the surgery *per se*, and to the fitness of the patient to endure the trial under the knife. In the year 1888, there were 71 Sænger-Cæsarean operations, with 15 deaths, and 28 Porro-Cæsarean operations, with 4 deaths. This would make it appear that the Porro method is the less dangerous of the two; but is it so? In Germany, but 13 women died out of 98 under the Sænger method, and of the 13 some must have been regarded as almost beyond hope, when operated upon. I believe that the possibility of success may be increased to ninety per cent. Two single rachitic girls of seventeen and eighteen years of age were operated upon this year in the same hospital at Melbourne, Australia, under two surgeons, each being alternately operator and assistant. One woman recovered and made an excellent convalescence, while the other died; why? Because one was in good condition after a short labor, and the other in a very bad one after a long labor. Take a hundred cases like the first, and we ought to expect ninety to recover under favorable surroundings. The greater the proportion of cases like the second the greater must be the mortality in each hundred. Thus far, the Porro cases in fifteen countries number 272, with 150 deaths; and the Sænger operations 212, in thirteen countries, with 50 deaths. There have probably been nearly 300 Porro operations to this date, and about 260 under the Sænger or improved Cæsarean method; by 1891, they should be about equal in the number of cases.

329 SOUTH TWELFTH STREET, PHILADELPHIA.
December 20, 1889.