The Choice of Methods in Abdominal Delivery. By Robert P. Harris, A.M., M.D., of Philadelphia.

The "old," or as it is sometimes erroneously called the "classic" Cæsarean operation, is very rarely performed at the present day, according to its original type. The abdominal and uterine incisions are usually made in the median line as of old, but after the fœtus has been removed, the whole character of the remaining process is changed. The abdominal cavity is now cleansed, and antiseptics are used in it and the uterus; and the same are employed in the external dressings. The uterine wound is rarely left to the closure effected by muscular contraction, but is now secured by sutures of different materials, and inserted after different methods, some of which are very ingenious. Drainage of the abdomen and uterus is by some thought imperative, and antiseptic irrigations of the abdominal cavity advisable by others, where puriform discharges are forming. Every imaginary scheme for preventing death by peritonitis and septicæmia is employed, and still the mortality is on the increase in the United States. Why is this? Because improved plans of dressing, antisepsis, drainage, and the uterine suture can never be made to overcome (what is evident in almost every case) the unfavorable prognostic condition in which the operator, who is rarely the original attendant, finds the woman, when at last the accoucheur, after vainly trying a variety of expedients, has become convinced that the knife can alone deliver his long-suffering patient.

The introduction of the uterine suture was certainly a valuable aid to the old method, in securing the wound against gaping, and allowing the escape of fluids into the abdominal cavity. It has, no doubt, enabled the operator to save patients *in extremis*, who must otherwise have been lost, but it cannot be made to work miracles in cases where the knife should

have been used hours or days earlier. That it has become a popular improvement in our country is shown by its general introduction; and much greater expectations have been formed from it than have been realized in practice. Still the impression is that it has not had a fair opportunity to show what its true capabilities are in cases not rendered almost hopeless by delay and futile attempts at delivery. When will the accoucheurs of the United States realize the fact that the high rate of mortality lies at their door rather than at that of the operator?

Before 1867 the uterine suture had been used in our country but thrice, *i. e.*, in 1828, 1851, and 1852. In the next twenty operations after the advance of 1867, sutures were used in seven; in the succeeding twenty, in eight; and in the closing twenty-four, in eighteen: only in three cases out of the last nineteen were they not employed. There was certainly very little to encourage their use in the results of the cases in which they were used; but still the operators were convinced that the fault was not in the sutures, or their want of skill. We are sorry to draw such a picture as must be shown by the results of the last decade; but the truth is, that of the 38 Cæsarean operations performed in the United States since January 1, 1875, 29 were fatal to the women, and 21 to the children. Of 17 children delivered alive, one was premature and died in four hours, another had a fractured skull and lived one day, and two others survived respectively two days, and thirteen were diseased from their birth. Thus then we may say, that the operation saved in this period $23\frac{4}{19}$ per cent. of the women, and $33\frac{10}{19}$ per cent. of the children. Where more than three-fourths of the women, and nearly two-thirds of their children were lost, there must have been a great deal of bad management of the cases prior to the operation. As 21 children were dead before delivery, we have a very presumptive proof of want of skill in management. 28 of the women were in labor from one day to two weeks, of which 15 were in labor more than three days, and 7 of these again were 4 days and upwards. This record of delay explains our frightful retrogradation as compared with earlier reports.

We next come to the consideration of a more encouraging record of cases, mostly European, in which the chief element of success was a new method of suturing the uterine wound, devised by Dr. Sänger of Leipzig, in 1881, and more recently simplified by other operators. This method, although having very decided merit, cannot overcome the evil influence of delay, and the table I have prepared will show at a glance the importance of having the patient in a favorable condition for the operation at the time it is entered upon. It will be noticed that three of the cases occurred in this country, all fatal, and that but one child was saved, while one German operator, Dr. Leopold, saved 4 women and 5 children by 5 operations; the difference of result being very largely due to the difference of condition in the women at the time of the operation. Case 3, for

instance, was admirably conducted by Dr. Garrigues of New York, and the woman had been but a few hours in labor; still he lost his patient, because of her condition produced by an ante-partum hemorrhage. Case 9 might have been regarded as almost hopeless at the time of the operation, from the effects of existing disease, long delay, and hemorrhage. It had been thought by the accoucheur to be one of extra-uterine pregnancy, with the fœtal head in the Douglas cul-de-sac. The operation established the fact that the peritoneal part of the uterine wound, when the serous surfaces are secured in contact, may unite as early as 26 hours after the operation. Case 5 belongs to a class which has been much the least fatal in Great Britain, after the old Cæsarean method, and should have escaped death, had her surroundings in hospital and her physical strength been more encouraging. This makes the seventh gastro-hysterotomy in our hospitals, all of which have proved fatal. In this case it will be noticed that the entire uterine wound had healed during the survival of 45 hours.

The method of Dr. Sänger is based upon the facts, that the serous surfaces of the peritoneum may be made to unite rapidly by a circumscribed adhesive peritonitis of a salutary character, if they are sutured in contact; and that welting this membrane into the uterine wound, by numerous superficial sutures, somewhat after the stomach and intestinal closure of Gély, will secure the wound against leakage and its resulting dangers. The full process of Sänger is quite complex, and it has been found in practice that both the dissecting up of the peritoneal coat, and cutting away a wedge-shaped slice of the muscular, were not absolutely essential to success. After the uterus contracts, its greatly diminished size so loosens its outer coat that it may be readily slid over the edge of the wound and turned in, as was done in Cases 3, 5, 9, and 12. Where the uterus is thickened and solidified by fibroid degeneration, as in Case 9, the membrane does not so readily slide, as where the uterine contraction is normal and more complete. The separation of the peritoneum by the knife makes a deeper welt, and the resection of the muscular coat one still deeper, but this loss of substance must weaken the ultimate cicatrix, and certainly can be avoided if the operation is performed in good season. In August, 1884, Dr. Leopold reported that his three patients were all living and in good health, and that the children were also well, the latter being then aged respectively 4 years and 3 months, 10 months, and 5 months. He stated at that time that he intended in future operations to avoid the resection and separation, as not essential to success. In Cases 11 and 12 will be noticed his more simple modifications and their results. Dr. Garrigues's and Dr. Jewett's cases proved under autopsy that entire union from peritoneum to mucosa could be effected without the separation or resection; the operation of Dr. Garrigues antedating all of Dr. Leopold's, except his first.

In Dr. Sänger's last monograph, which he was kind enough to send me, and to which I am indebted for the German cases in my table, are several designs for suturing the uterine wound, some of which are complex, but certainly very ingenious. I introduce here the two which have the most practical character, particularly the first, in which the deep and superficial sutures are tied separately. A third figure shows the superficial stitch used by Dr. Drysdale in his operation, the tightening of which draws the peritoneum into a welt, as seen in the lower illustration.

Fig. 1.

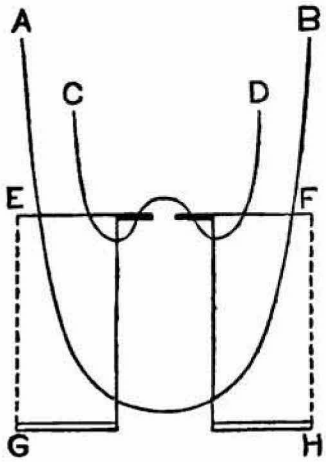

Fig. 2.

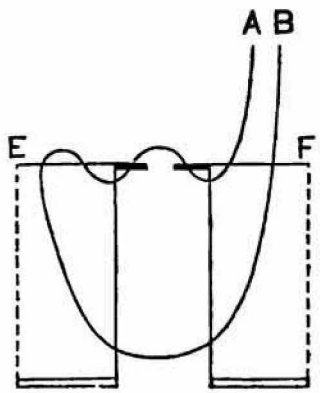

Fig. 1, A. B. represents the line of the deep-seated suture, which is carried down nearly to the mucous membrane; C. D. shows the direction of the superficial suture, the tightening of which will turn in the peritoneum, and draw the serous surfaces in contact.

Fig. 2 shows how the deep-seated suture of Fig. 1 may be made also to supply the place of the superficial one C. D. It is a much better plan to have two sutures, and let the greater strain come upon the deep-seated one. It is of advantage to have a large number, as there is less individual tension, and less danger of gaping.

Fig. 3.

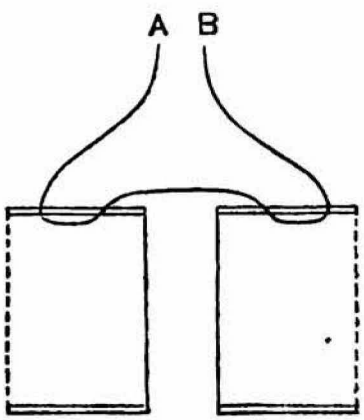

Fig. 4.

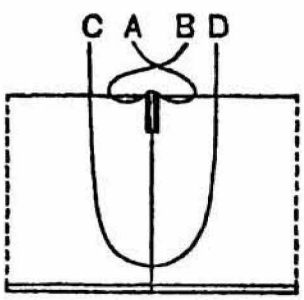

Fig. 3 shows a modification of the intestinal suture of Gély. When the superficial stitch is drawn upon, the peritoneal edges are to be turned in by the handle of a scalpel or other flat, blunt instrument. In cases where the serous coat is not loosely attached, it will be of advantage to dissect it up around the wound, as recommended and practiced by Sänger.

A third choice in the mode of abdominal delivery is that of Laparo-Elytrotomy, which it will be seen by my tabular record has been performed the same number of times, and with the same degree of success as regards the mothers, as Sänger's improved Cæsarean operation. It has this advantage, however, over all other methods, in the fact that the uterus is not cut open, which is an element of very great danger in gastro-hysterotomy, where the muscular activity of the organ has been long kept up. The abdominal surgery of the last decade has certainly established the fact that the opening of the peritoneal cavity is one of the least of the risks to be incurred. And I am satisfied from my own researches that long delay in operating vastly increases the risk of opening the uterus. The application of this method of Professor Thomas is limited, however; and in many of the cases in my record of 138 old Cæsarean operations of the United States, delivery under it would have been quite impracticable, the obstacle having been in the lower segment of the uterus itself. Where the risk in operating has been largely increased by delay and attempts at delivery, it becomes important that wounding of the uterus should be avoided, and as delay is the rule in our country in cases of impracticable pelvic delivery, Laparo-Elytrotomy deserves to be much more thoroughly tested than by a dozen examples in fifteen years. Like all of the methods here enumerated, promptness of action and avoidance of futile intermeddling add materially to the prospect of success. Where there is a putrid fœtus in utero, the choice will lie between uterine exsection after the plan of Porro and Müller, and Laparo-Elytrotomy as successfully performed by Dr. Walter R. Gillette, and shown in Case 8. It would appear to be safer, however, in such cases, to select the Müller operation and get rid of the risk of septic absorption, by the removal of the uterus and its offensive contents at once, as was done with success, after six days of labor, by Dr. Ramello, of Turin, in July, 1880. In Great Britain, where 75 per cent. of *early* Cæsarean operations have been fatal to the mothers, although quite a large proportion of the children have been saved, Laparo-Elytrotomy should be fairly and perseveringly tested in the same class of cases. If women are repeatedly lost, even when but a short time in labor, because of sequelæ traceable directly or indirectly to the uterine wound, then such subjects should be delivered by a method in which this highly sensitive organ is not incised. Cases 6 and 7 of the Laparo-Elytrotomy table were very unfortunately selected for this new form of delivery, and because they were fatal no one appears inclined to make another test in England.

TABLE I.—*Cæsarean Operations by the new*

No.	Date.	Operator.	Locality.	No. of pregnancies	Age	Conj. vera.	Cause of difficulty.	Condition of woman at time of operation.
1	May 25, 1880.	Dr. G. Leopold,	Leipzig,	2-para.	29	2¾ in.	Generally contracted rachitic pelvis: sup. str't cordiform.	Favorable.
2	Sept. 11, 1882.	Dr. O. Beumer,	Greifswald,	6-para.	41	Nor'l.	Retro cervical fibro-myoma.	Unfavorable; high fever.
3	Oct. 6, 1882.	Dr. H. J. Garrigues	New York,	Primipara.	30	5 3/16	Lumbo-dorsal and pelvic kyphosis.	Pulse 124; exhausted by ant. part-hemorrhage
4	Oct. 4, 1883.	Dr. G. Leopold,	Dresden,	Primipara.	23	2¾	Generally contracted flat rachitic pelvis.	Favorable; weak and anæmic.
5	Dec. 26, 1883.	Dr. Chas. Jewett,	Brooklyn,	11-para.	46	Nor'l.	Cancer of cervix uteri.	Pulse 94 to 108.
6	Mar 13, 1884.	Dr. G. Leopold,	Dresden,	2-para.	28	2¾	Generally contracted pelvis.	Favorable.
7	July 17, 1884.	Dr. Oberg,	Hamburg,	Primipara.	37	2¾	Contracted pelvis.	Favorable.
8	Sept. 29, 1884.	Dr. Ehrendorfer,	Vienna,	4-para.	29	Nor'l.	Abdominal fibroma.	Unfavorable.
9	Nov. 12, 1884.	Dr. T. M. Drysdale,	Philadelphia	Primipara.	37	Nor'l.	Immovable fibroid of posterior wall of cervix.	Very unfavorable; anæmic; pulse 124.
10	Nov. 16, 1884.	Dr. M. Sänger,	Leipzig,	Primipara.	21	2¾–2¾	Generally contracted and flattened rachitic pelvis.	Favorable.
11	Nov. 28, 1884.	Dr. G. Leopold,	Dresden,	2-para.	26	2¾	Rachitic pelvis.	Unfavorable: pulse 120; feverish.
12	Dec. 5, 1884.	Dr. G. Leopold,	Dresden,	Primipara.	23	?	Great deformity of the pelvis.	Favorable.

Women saved 6, or 50 per cent. Children saved 10, or 83⅓ per cent.

Fatal results have repeatedly followed the Cæsarean operation in Great Britain, where the skill of the operator and the timeliness of the delivery would make us very hopeful if in this country. If then the fatality of the old operation in New York has been the inducing cause of a vital change in the process of delivery, with such a marked improvement in the results,

Sänger Method and its simplifications.

No.	Manner of treating the uterine wound.	Time in labor.	Result to woman.	Result to child.	Cause of death in woman.	Remarks.
1	Serous coat separated; muscular coat resected, 8 deep silver and 12 superficial silk sutures inserted.	About 12 h'rs.	Recovered.	Living.	.....	Child and mother alive in summer of 1884.
2	Same treatment as above; 7 deep sutures and 4 superficial of English fishing gut.	8 or 10 hours.	Died in 40 h'rs.	Living.	Double pyelonephritis.	
3	No resection of muscular coat; 12 deep and 12 superficial silk sutures, with peritoneum turned in.	6 h'rs.	Died in 50 h'rs.	Dead.	Shock and previous loss of blood.	Uterine wound found to have entirely united.
4	Treatment of wound as in cases 1 and 2; 7 deep silver and 14 deep and superficial silk sutures used.	8 h'rs.	Recovered.	Living.	.....	Woman and child alive and well in summer of 1884.
5	No separation of peritoneal or resection of muscular coat; 20 deep and superficial sutures of sublimated silk, with peritoneum turned in.	9 h'rs.	Died in 45 h'rs.	Living.	Peritonitis; erysipelas appeared in the hospital.	Child lived about a year, was not well cared for; uterine wound healed through its entire thickness.
6	Same treatment as in cases 1 and 4; 5 deep silver and 15 deep and superficial silk sutures.	30 h'rs.	Recovered.	Living.	.....	Both alive and well several months later.
7	Serous coat separated; muscular resected; 10 deep sutures of coarse and 17 superficial of finer silk inserted.	?	Recovered.	Twins; one living; one 13½ in. dead.	.....	Slight peritonitis; left phlegmasia dolens of leg; pleuritic effusion; finally reported perfectly well.
8	6 or 7 deep uterine sutures of silk, and between, a large number of superficial ones.	About 2 days.	Died on the 6th day.	Living.	Sanio-purulent peritonitis.	Uterine wound of fundus not united between the sutures; edges breaking down by sloughing.
	Peritoneum drawn over edges of uterine wound and secured by 11 deep and 11 superficial silk sutures.	2 w'ks.	Died in 26 h'rs.	Dead and putrid.	Septicæmia.	Peritoneum united; muscular coat gaping: uterine walls thickened by fibroid degeneration.
10	Serous coat separated; muscular resected; 8 deep silver and 20 superficial silk sutures used.	Some hours.	Recovered.	Living.		
11	Serous coat separated; muscular not resected; deep and superficial sutures of silk used, and the peritoneum turned in.	22 h'rs	Died on 6th day.	Living.	Septic peritonitis.	
12	Serous coat *not* separated, or muscular resected, as in his 1st, 2d, and 3d operations; 6 deep silver, 6 deep silk, and 10 superficial silk sutures, with serous surfaces brought in contact.	16 h'rs.	Recovered.	Living.	.....	In the convalescence a fistula formed, through which in 5 mos. were removed 6 of the uterine wire sutures and 6 silk; the woman entirely recovered her health.

why may not the same be hoped for in London? In New York city and Brooklyn, 9 women and 9 children were lost under 11 Cæsarean operations, and in the balance of the State 7 women and 5 children under 8 operations; a loss in the whole State of $84\frac{4}{19}$ per cent. of the women, and $73\frac{3}{19}$ per cent. of the children, which is greater than the fatality in England.

TABLE II.—*Table of Laparo-*

No	Date.	Operator.	Locality.	Native of	Age	C. V.	Height.	Cause of difficulty.
1	March, 1870.	Prof. T. G. Thomas,	New York.	Ireland.	40	Nor'l.	.....	Pneumonia for 10 days.
2	Mar. 22, 1874.	Prof. Alex. J. C. Skene,	Brooklyn.	U. States.	?	2¼	.....	Rachitic pelvis.
3	Oct. 29, 1875.	Prof. Alex. J. C. Skene,	Brooklyn.	England.	31	2¼	.....	Rachitic pelvis.
4	June 23, 1877.	Prof. Alex. J. C. Skene,	Brooklyn.	Bohemia.	37	1½	.....	Lordosis and double coxalgic anchylosis.
5	Dec. 3, 1877.	Prof. T. G. Thomas,	New York.	Ireland.	20	2¼	.....	Coxalgic deformity of pelves.
6	July 14, 1878.	Dr. Thomas W. Hime,	Sheffield, E.	England.	37	Nor'l.	.....	Cancer of recto-vag. septum.
7	Nov. 23, 1878.	Dr. Arthur W. Edis,	London, E.	Ireland.	20	2¼	.....	Small pelvis; anchylosis of right hip-joint.
8	Nov. 9, 1879.	Dr. Walter R. Gillette,	New York.	Scotland.	23	1¾	4 ft. 4 in.	Deformed pelvis.
9	May 17, 1883.	Drs. Dandridge & Taylor	Cincinnati.	U. States.	32	Bis. soc. 2¼	4 ft. 7 in.	Deformed pelvis.
10	Sept. 1, 1883.	Prof Chas. Jewett,	Brooklyn.	Ireland.	40	Bis. soc. 2¾	.....	Deformed pelvis
11	Oct. 4, 1884.	Prof. Alex. J. C. Skene,	Brooklyn.	Scotland.	21	2	.....	Rachitic pelvis.
12	Jan. 26, 1885.	Prof. Chas. Jewett,	Brooklyn.	U. States.	24	?	.....	Lumbar lordosis and dorsal kyphosis.

Women saved 5, or 59 per cent. Children saved 7, or 58⅓ per cent.

Now mark the contrast: Laparo-Elytrotomy has been performed 9 times in New York and Brooklyn, saving 6 women and 5 children. Four of the six women saved were in labor, respectively, 8, 11, 16, and 22 hours, and the other two, 4 days and a week. Of the eleven Cæsarean patients, 6 were operated upon on the first day of labor, and but one was saved: the prognosis was "unfavorable" in ten of the eleven. In the Laparo-Elytrotomies, four were "favorable" and five "unfavorable" for the operation; all of the favorable cases recovered.

One other form of operation still presents itself for consideration. The Porro-Cæsarean section has its advocates in many lands, and has resulted very differently in different countries. It has been very successful in Austria, and quite the reverse in Germany. As a hospital expedient it stands unrivalled, having completely revolutionized the results in the Maternities of Milan and Vienna. Where the patient has been under treatment in hospital, and is operated upon early, the proportion saved has been very encouraging; but, like the old Cæsarean operation, success greatly depends upon the condition of the patient to be operated upon at the time when the section is commenced. If the woman is exhausted and

Elytrotomies, covering 15 years.

No.	Condition of woman.	Side of incision	Time in labor.	Result to woman.	Result to child.	Injury to bladder.	Remarks.
1	Moribund.	Right.	Not in labor.	Died.	Alive 1 hour.	No.	Operation in interest of child. Woman and child lived an hour.
2	Pulse 130, feeble.	Right.	48 h'rs.	Died.	Dead.	No.	Craniotomy attempted. Woman died of shock and exhaustion in seven hours.
3	Favorable	Right.	11 h'rs.	Recovered.	Lived.	Laceration.	
4	Unfavorable.	Right	4 days.	Recovered.	Lived.	Laceration.	Child died for want of food and care.
5	Favorable.	Right.	16 h'rs.	Recovered.	Lived 18 days.	Laceration.	
6	Very unfavorable.	Left.	24 h'rs.	Died.	Lived.	No.	Woman a drunkard. 11 weeks in bed; died violently delirious in two hours.
7	Unfavorable, lower extremities œdematous.	Right.	17 h'rs.	Died.	Lived.	Laceration.	Woman died exhausted in 40 hours; no signs of peritonitis.
8	Unfavorable.	Right.	A week.	Recovered.	Dead and putrid.	No.	Forceps, version, perforation, cephalotribe, and craniociast, all tried.
9	Unfavorable.	Left.	4 days.	Died.	Dead.	No.	Woman died in 44 hours. No evidences of peritonitis found on autopsy.
10	Unfavorable.	Right.	A week.	Died.	Dead.	No.	Woman died in 70 hours of septicæmia.
11	Favorable.	Right.	8 h'rs.	Recovered.	Lived.	Cut by scissors.	Scissor-wound, soon closed spontaneously.
12	Favorable.	Right.	22 h'rs.	Recovered.	Lived.	Laceration.	

feverish, the prognosis will be unfavorable, and still more so if the fœtus has died or been destroyed during the labor. It should always be remembered that the case of a dwarf specially requires an early attention. A careful examination of the valuable tables of Dr. Clement Godson will show the intimate connection that exists between the physical condition of the woman and the final result of her case.