Bulletin of the Lying-in Hospital of the City of New York

Vol. IX. JUNE, 1914. No. 4.

# THE TECHNIQUE OF EXTRAPERITONEAL CESAREAN SECTION.

By BARTON COOKE HIRST, M.D.
Philadelphia, Pa.

Read before the Alumni Society of the Lying-In Hospital of New York City, February, 1914.

In accepting the kind and flattering invitation of the Society to address the members on this subject, I am embarrssed in a two-fold manner: first, by the appearance of a paper by Dr. Wm. R. Nicholson, in a recent number of "Surgery, Gynecology and Obstetrics," which leaves nothing to be said on the subject in general, and second, by the comparative paucity of my material, comprising sixteen operations, which in contrast with some of the German statistics, looks very small indeed. But it happens that in consequence of an apparent prejudice against the operation here, no other American operator has had as many of these operations, I believe, and therefore it may be justifiable for a single individual to describe his personal experience with a procedure that is certain to find an acknowledged position in this country as it has in other parts of the world.

My first operation I performed after reading Bumm's description of his method, before seeing any one else do it. Shortly afterward I had the opportunity of seeing several German operators perform it, notably Sellheim in Tübingen and on my return to America, performed a series by this surgeon's technique: a long Pfannenstiel incision, a transverse transperitoneal incision with suture of the flaps and a longitudinal uterine incision. But while the patients did well and the principle of the operation seemed unassailable, I was not satisfied with the method. It was slow, awkward and necessitated a kind of abdominal incision difficult to keep from infection. In thinking the matter over, I determined to try a technique which seemed to preserve the advantages of the extraperitoneal operation and to escape the disadvantages of the long transverse incision of Sellheim's operation and the intraperitoneal operation of Bumm, without knowing at the time that Veit and Fromme had

devised practically the same technique with a minor difference to which reference will be made in a moment.

This operation consists in a longitudinal incision through the abdominal wall beginning below the umbilicus and extending down to the symphysis, only long enough to allow the emergence of the infant; a longitudinal incision through the visceral peritoneum of the lower uterine segment where it is detachable, a junction of the two peritoneal flaps by sutures, and then with the peritoneal cavity shut off, the longitudinal incision of the lower uterine segment and the extraction of the fetal head by forceps.

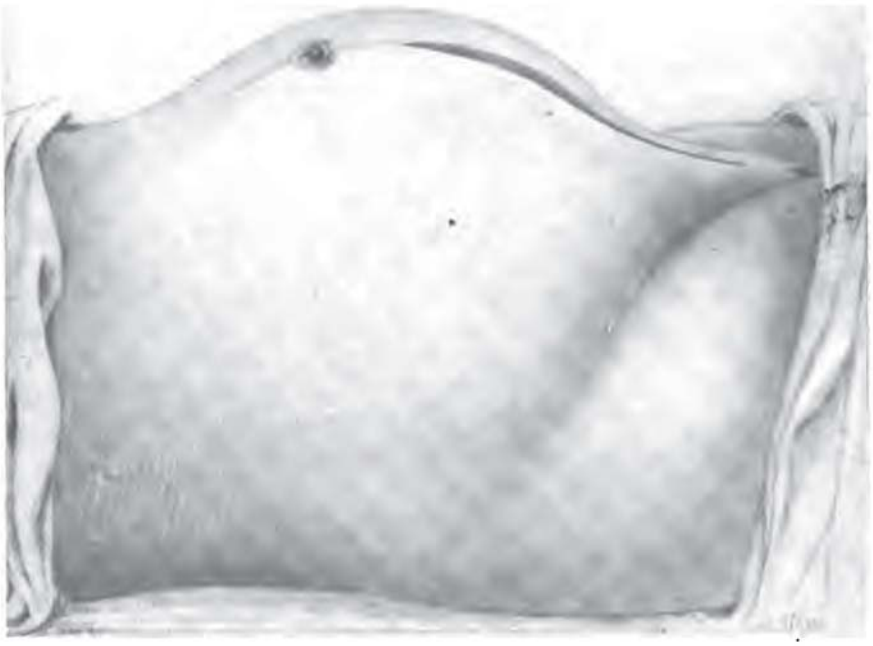

Fig. 1.—The length and situation of the incision.

Veit and Fromme clamp the peritoneal flaps and unite them by sutures after the evacuation of the uterus, thus making, not the operation, but the convalescence, extraperitoneal. In this respect only does their operation differ from mine. Their reason for this procedure, is the fear that the peritoneal flaps will tear during the extraction of the child and this has happened in some of my earlier cases, but I found that if a retractor is inserted in the upper angle of the uterine wound, and if the sutures in the peritoneal flaps are interrupted and not continuous, this accident could be avoided.

After the extraction of the child and the placenta ,which I find had better be delivered through the wound, although this is contrary to the

advice of some of the German operators, the uterine wall is united with a two tier suture of chromic gut, number two, and then the joined peritoneal flaps are brought together in the middle line by two or three interrupted sutures.

The ideal case for this extraperitoneal Cesarean section is such a one as I last operated on: a woman 24 hours in labor, 12 hours in the second stage, futile attempts throughout a night to deliver with forceps

Fig. 2.—Incising the parietal peritoneum.

by two physicians in a poor house with imperfect aseptic technique, distended lower uterine segment, head unengaged above the superior strait. The operation was a success for both mother and child, the former making an afebrile recovery. No one, I think could deny that in a series of such cases, the extraperitoneal operation must give the best results. There are, however, conditions which make the classical operation preferable, such as placenta previa, and premature separation of the normally situated

placenta, or any condition demanding the speediest and least bloody operation. It is a question open for discussion whether the extraperitoneal operation is not preferable in the majority of instances, even in a clean case before labor on account of the extraperitoneal situation of the uterine wound during puerperal convalescence. That I for one have thought so, is shown by the fact that out of my last 21 operations, 15 have been

Fig. 3.—Incising the visceral peritoneum over the lower uterine segment where it is loose and detachable.

extraperitoneal. While the number is small, the choice of operation has been justified by a favorable result for both mother and child in every instance, contrasted with a total mortality in my 155 Cesarean sections of 6, or 3.87 per cent.

*Brief Records of Personal Cases.*

CASE I. This patient was a primipara and had been in labor for twenty-four hours. Her membranes were ruptured when first seen.

Examination showed a conjugata vera of 8 cm. and the head of the child was large. Forceps were applied twice before sending her to the hospital. In the first attempt the application was made with due regard to asepsis, but, failing to engage the head, the family physician attempted to deliver by the use of his forceps, which he applied without any sterilization. In this case the Bumm technique was employed. The peritoneum

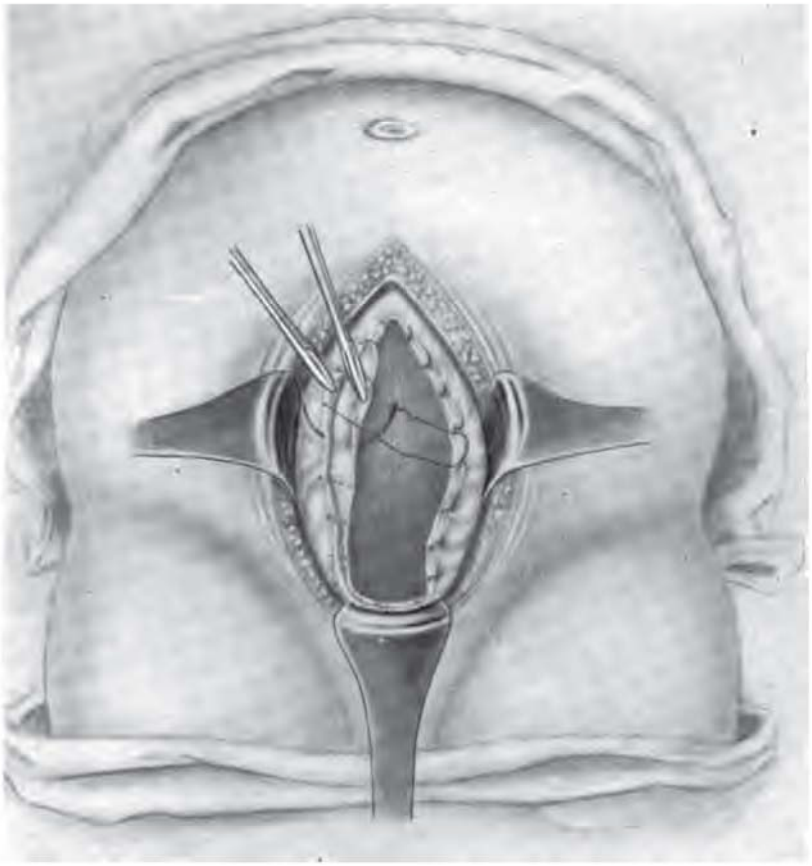

Fig. 4.—Uniting the parietal and visceral flaps, thus closing the peritoneal cavity, before incising the lower uterine segment.

was inadvertently opened but immediately closed, and the mother and child made a good recovery.

CASE. II. Had a history of one miscarriage and one child delivered by high forceps at the seventh month. A rachitic dwarf with a conjugata vera of 9.25 cm. Several examinations had beeen made upon her outside of the hospital by the students. Temperature on admission was 99° and her pulse was 112. Had been in labor for 36 hours without engage-

ment and was delivered by Sellheim's first method. Mother and child discharged in good condition.

CASE III. Primipara with a true conjugate of 8.75 cm. In labor for 36 hours before admission; no engagement; was delivered by Sellheim's second method. Had a slight febrile reaction for a few days. Mother and child discharged in good condition.

CASE IV. Multipara. All three of her previous labors had been very difficult. Conjugata vera 8 cm. She was a house case and had

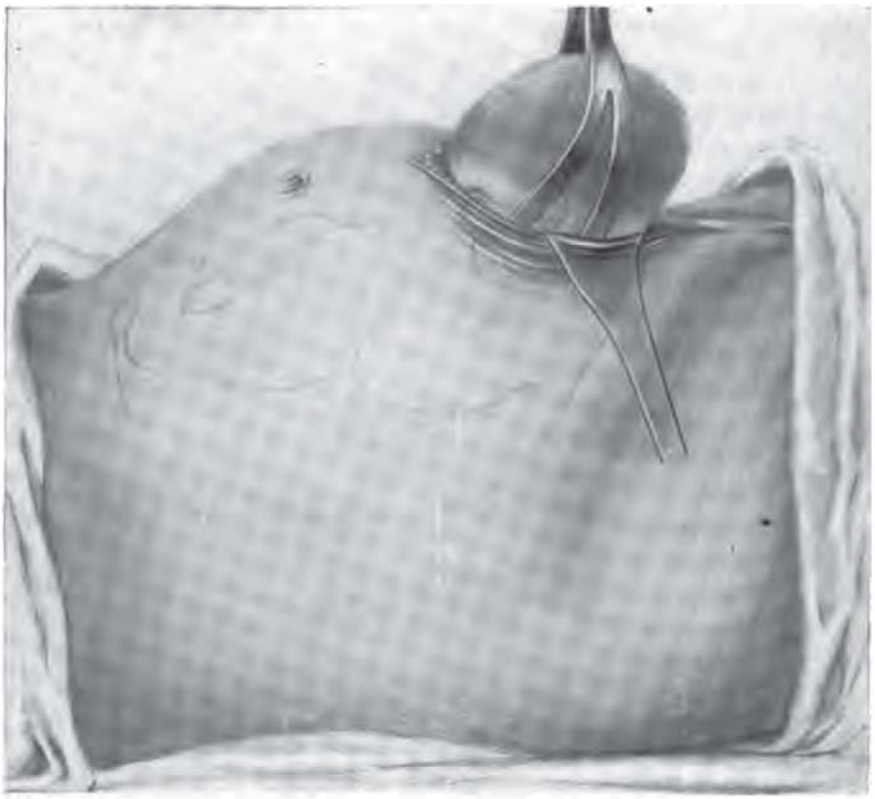

Fig. 8.—The extraction of the fetus with forceps.

been in labor for 16 hours, without engagement, at the time of the first pelvic examination. An examination made at this time resulted in rupture of the membranes and prolapse of the cord. She had hard and regular pains. Delivered by Sellheim's second method. Had a badly infected wound giving rise to fever from the second to the ninth day. Both patients discharged in good condition.

CASE V. Multipara. Conjugata vera 8.25 cm. Was a house case and at time of operation the membranes were still intact and the pain

had not been severe. Had been in labor about 24 hours. Was delivered by Sellheim's second method and had a moderate infection of the wound with consequent temperature from the second to the ninth day. Both mother and child recovered.

CASE VI. Primipara. Had been in labor four or five days. The membranes were not ruptured and there was no engagement. Had a justo-minor pelvis of the fetal type, and marked outlet contraction in both the transverse and the posterior sagittal diameters. Was operated by the Sellheim second method and the bladder was injured, but the rent was immediately closed and no trouble resulted. Badly infected wound. Both patients discharged in good condition.

CASE VII. Multipara. Conjugata vera 7.5 cm. Head large and high, overlapping the symphysis markedly. Previous history of difficult labors. Was not in labor. In this instance the Veit-Fromme technique was employed with the greatest satisfaction. The lower segment was markedly dilated, due to the high position of the head, and there was ample room to work. Afebrile convalescence with primary wound healing. Child discharged in good condition.

CASE VIII. E. B., III para. Previous labors difficult. Two attempts at forceps, before entering hospital. Second stage had lasted all night; rachitic pelvis; conjugata vera 8.5 cm. Good recovery, normal temperature except for a part of one day: primary union. Child lived.

CASE IX. J. C., III para. First labor Cesarean; second forceps 3 weeks before term; rachitic pelvis, conjugata vera 8 cm. Labor not yet begun. Fever from 5th to 12th day. Child died on 4th day. Good recovery; primary union.

CASE X. A. C., I para. Patient came in hospital in active labor; os dilated; rachitic pelvis; conjugata vera 9 cm. Head could not be engaged, fever 4th and 5th day, primary union. Mother and child discharged in fourteen days.

CASE XI. L. R., aet. 23; II para, conjugata vera 5.75 cm. Labor not yet begun. Uncomplicated convalescence for mother and child.

CASE XII. R. B., I para, conjugata vera 8.25 cm. Operation before labor; slight rise of temperature on 4th day. Good union. Mother and child discharged in good condition.

CASE XIII. A. F., VI para, placenta previa; had been bleeding four days; operation satisfactory; no hemorrhage of any moment but extremely stormy convalescence; sinus in abdominal wound. Ultimate recovery of mother. Child lived. This case and case No. XV would prevent my performing an extraperitoneal Cesarean section again for placenta praevia.

CASE XIV. N. G. Kyphoscoliotic pelvis of rachitic type; conjugata vera 8.5 with 3 cm. difference between diagonals (asymmetry); operation before labor had begun. Afebrile convalescence: baby in good condition.

CASE XV. A. G., xiii para: placenta previa; brought into hospital having considerable hemorrhage. After making and uniting peritoneal flaps opening lower uterine segment, delivering child and placenta there was a furious post-partum hemorrhage, most difficult to control; the uterus was packed through the wound before it could be sutured; intravenous injection on the table. Patient made a good recovery, but had a narrow escape from death during the operation. Child lived.

CASE XVI. J. E., curious family history. Mother delivered 12 times at 7 months; only 4 children survived the first week, one sister delivered at 16 years of age with difficulty at 7 months. Justo-minor pelvis: Circumference, 84 cm., external conjugate 17.5 cm., height of symphysis, 5 cm., tr. outlet 8 cm. Operation before labor. Uncomplicated recovery; child lived.

From Case 7 to case 16 inclusive the Veit-Fromme technique modified by the writer was employed. Since writing the paper one more case it will be noted, has been added.

## DISCUSSION

DR. JAMES W. MARKOE: "I am sure we are all delighted to have Dr. Hirst come to us and explain this operation, which he has introduced into this country. Dr. Hirst has always been a pioneer. He has been a pioneer in more ways than one and we are greatly honored by his coming here and talking to us of the Lying-In Hospital. After reading Dr. Hirst's first article on extraperitoneal Cesarean section, I thought I should like to perform the operation. So when a patient came in to my wards who was suffering from a severe form of toxemia of pregnancy, I decided that this was a good opportunity to try the operation as described by Dr. Hirst.

"I had no idea of the technique save what I learned from reading his article and, as a rule, I think it is difficult to grasp the detailed technic in that way. On opening the abdomen from below the umbilicus down to the symphysis I found that peritoneum was loose over the lower part of the uterus, which I divided down to uterine muscle and then pushed it back by blunt dissection on either side without trouble. It happened in that particular case that the omentum came down from above and as I had started to sew the parietal and visceral peritoneum together from the bladder end up, I found it difficult to keep the omentum out of my way when I came to close the upper angle of the peritoneal layers. In the two cases I have operated upon since then I have started my sutures at the upper part of the incision and had no further trouble. In the first case the child, as I remember it, gasped once or twice and died. The woman died and our pathologist found hemorrhages in the liver, and without doubt they were also in the brain, so that I feel it was the proper procedure although the woman died in coma immediately after the operation."

" The next case was one in which the woman had a contracted pelvis. On admission her history showed that she had been handled by an outside physician for some eighteen or twenty hours and looked as though she might be septic. I performed the same operation, that is I incised the parietal peritoneum, and then went through and incised the peritoneum covering the uterus and reflected this on either side. I began in this case by sewing from above the two layers of peritoneum and without any difficulty brought the peritoneum covering the uterus into apposition with that of the parietal peritoneum. Then I incised the uterus and delivered the child by grapsing a foot. The woman recovered without a rise of temperature and was discharged well with her child."

" The third case occurred this last week. The patient had been in labor three days when she came in. She had been in the hands of a midwife who had examined her seven or eight times. This also seemed to me a suitable case for extraperitoneal Cesarean, so I performed the Hirst operation. On admission she had a temperature of 102°F, and a distended abdomen so that we felt rather uncertain as to the outcome but I had no trouble in doing the operation and delivered a living child. In all these cases I did not use the forceps as suggested by Dr. Hirst, but grasped a leg and did an easy version. There was no tearing of the uterus in any of the three cases and all the children were born without any trouble. Now the reason I did a version is because I believe it is better, as in these cases there is always considerable blood and liquor amnii flowing from the uterine wound, and to be able to use the forceps in that flow is not altogether an easy thing. On the other hand it is easy enough to put your hand in the uterus in the dark, grasp the leg and pull it out, but it is not always easy to put the forceps on where the blood is flowing out and where everything is obscured."

"In the first case the child and mother died, but the other two children are alive. In the second case the mother is well. In the third the woman's abdomen immediately became distended, her temperature went up and she developed general peritonitis and died. After this experience I made up my mind that there are cases of intense infection where even this extraperitoneal Cesarean section will not help, as in cases where a midwife or some person whose surgical cleanliness is not known has first handled the case."

" There is therefore a grave question in all these cases. How much has a woman been infected before she comes to you. When you realize that a man with infected fingers can infect a woman through a mere scratch in the vagina so that she will die, and that another man who does not happen to have the same virulent infection on his hands and has given the best treatment possible will not infect his case, how are we going to decide in which case to do an extraperitoneal Cesarean, and in which case are we going to do a craniotomy? I have delivered two living children by this operation, but among these three cases one woman

lived and two died. I was perfectly honest in my belief that they all had a very good chance if the operation could be performed extraperitoneally."

"In 1912 I had two women come in to me who had no temperature, who had no history of any manipulation, in which without hesitation I did the classical Cesarean and yet they both developed a rapid septicemia and died within 48 hours. I did what I believed was a perfectly legitimate operation as there was no history of any serious complications such as Dr. Hirst has spoken of, where one or two doctors have been using forceps, but yet those cases were infected. I don't know whether Dr. Hirst has had such an experience in any of his cases. I think it is difficult to know when to do this particular operation and yet I like this extraperitoneal Cesarean in doubtfully infected cases if I only knew how far these people have been infected before coming to me; because if they have been already thoroughly infected it really does not make any difference what operation you perform. Even if you do a cranitomy a certain number are going to die. Have you ever looked up the statistics as to how many craniotomies die of septicemia? If we had statistics published on all craniotomies, and all cases where we did a version and had to do a craniotomy on the after-coming head, how would our statistics look as compared with the statistics of the Cesarean? I do not know how many Cesareans I have done, perhaps one hundred. I have had about ten deaths in that one hundred cases. Out of those ten deaths three I can lay to sepsis. They were septic when I performed the classical Cesarean and they died. Perhaps I should have done something else; perhaps if I had done a craniotomy I might have quite a clean record, for the other seven cases who died did so because they had eclampsia or toxemia or some form of disease which meant inevitable death and had nothing to do with the operation. In these I obtained living children and was satisfied. I think we have got to consider these questions very carefully for we have not reached the stage where we can say we will do this or that operation, because that particular operation may not be applicable to the particular case. There is not any operation that is applicable to every case."

"One other question which may come up and of which he has relieved my mind, was the question of the ligament formed by the bringing together of these two peritoneal surfaces, the parietal and visceral peritoneum; whether they would not make a band which would hold the uterus up and give a woman trouble even if she did not become pregnant again. I do not think it would interfere if she became pregnant, but when she was not pregnant perhaps it would hold the uterus up against the abdominal wall and cause pain. This question I have not been able to answer because I have not had enough experience, but I must say that the one woman who survived has had no pain, but this was only in October so I do not know whether she is going to develop symptoms in the future."

DR. ASA B. DAVIS: "It should be a matter of congratulation that a man of Dr. Hirst's extended experience in obstetrics, and also as a teacher, should take up this operation in order to determine its true value. Extraperitoneal Cesarean section has not been generally accepted and performed by operators in this country. Although I have not done the operation myself, I have been very much interested in the work carried on by Dr. Hirst. The procedure applies to a class of cases that certainly give us a great deal of concern, for the clean cases we can take care of by the classical Cesarean operation. Although the extraperitoneal procedure seems easy and is now being performed far more often, I think we cannot get away from the fact which Dr. Harrar brought out in his paper on the uterine scar after a classical Cesarean section. He showed from a study of such cases that we never know the strength of the scar in the uterus. There may be apparently perfect union and a woman may go through successive pregnancies but we do not know which scar under the strain and stress of labor subsequent to Cesarean section, is going to rupture. A great many of these women do not come under observation in a pregnancy following a previous Cesarean section and I have had personal experience with a case of this kind only a few months ago. The patient was a dwarf of low grade physical and mental development. I followed her very carefully through her pregnancy by having her come to the Hospital at regular intervals. She was advised to enter two weeks before the expected labor and remain under observation. She failed to do this and was left alone at home. She was in labor twelve hours before being sent to the hospital and on admission was in a condition of complete shock from a rupture of the uterus throughout the entire length of the old scar. The child and placenta were in the abdomen. The former was dead and the mother died soon after. I believe as regards the uterine scar the extraperitoneal section offers no advantage over the classical operation. Another danger after these operations is from adhesions. In some cases of classical operation we find absolutely none, whether this is done by high or low incision. In others, however, adhesions of greater or less degree may produce decided complications, including intestinal obstruction."

"While the Cesarean operation is usually safe and while the mortality has been reduced, it is by no means free from danger. I had occasion to look up our own histories a few weeks ago and found that we had performed up to December, 1913, 494 Cesarean operations with 50 deaths. This represents a little more than 10 per cent mortality during the entire period including all cases by different operators. Of course there were patients operated upon in the early days whom we would not operate upon to-day for various reasons."

The demand for Cesarean section has increased in the larger urban centers more than in the smaller towns, probably because there is a greater proportion of poorly developed women among the foreign element. Among this class there is a large proportion that have been tampered

what has been written on this subject, it seems to me that we have not by any means arrived on a definite basis as to when, or when not, this operation shall be done or omitted. I had the pleasure of witnessing two very prominent operators in Germany last summer perform this operation. I was particularly impressed by the manner in which Prof. Sellheim executed the same in a case of placenta previa in which a premature child was extracted but died before the completion of the operation. The woman had a narrow pelvis but might be regarded as a clean case. As I have already said, the operation was done in a most perfect manner and no fault could be found in the way in which Prof. Sellheim did it, but I have felt a great deal of hesitancy in any desire to imitate him. The child was small and the extraction with his special instrument was not difficult in his hands but it seemed to me that in the case of a larger child it would have been very difficult to deliver it in the way that he did, without producing a considerable amount of laceration. In this particular clinic (Tübingen) all the Cesarean operations are done by this method, not only those by Prof. Sellheim himself, but his assistants as well. Moreover, they are all done under spinal anesthesia preceded when possible by the so-called "twilight sleep" induced by scopalomine and morphine. As the material in this clinic is very large and no restrictions are interposed as to the method of operating, a great number of cases can be rapidly brought together. Therefore, I do not believe that in view of the restrictions which Dr. Hirst places on the operation, that he ought to hesitate to report the comparatively small number mentioned in his paper."

"It seems to me that the keynote in stating the conditions for this operation is the determination of the amount of infection present in the individual case. How this is to be determined no one at the present time can say. Thus far we have decided the indications from the clinical phases that present themselves in the particular case rather than by any actual method of gauging the infection which is present by bacteriological or other tests. Many of these would be ruled out because in most instances we have not sufficient time to await their performance, so that we will probably always be guided more or less by clincial symptoms, and we all know how mistaken we may be in the impression which the latter may afford us. We have found that in a great many cases which have been repeatedly examined and thus subjected to infection, that the results were good even with the transperitoneal operation, while on the other hand there are cases apparently free from infection that do very poorly after operation. In view of this uncertainty it is rather comforting to hear the conservative attitude which Dr. Hirst assumes and it is a relief to find this stated in contrast to the somewhat extravagant claims advanced by many European operators. As the individual factor in the individual case is of such great importance it must be evident that the conservative middle course defined by Dr. Hirst is the sensible one to pursue. It is only by gathering statistics along the lines that the speaker has defined this evening that we may get some true idea as to

the value of this procedure. It is not fair to condemn an operation in the early periods of its application. We must gather the statistics of a larger number of operators than have heretofore employed the procedure and must not compare the results only with those obtained in cases done by the transperitoneal route, but with all the other procedures employed to extract a living child, whether by vaginal Cesarean section, pubiotomy, symphysiotomy, or the suprasymphyseal operation."

DR. ROSS MCPHERSON: "I have not done any of this particular type of operation but after listening to the remarks of Dr. Hirst, which I have enjoyed very much, there occurred to me the fact that some years ago Reynolds of Boston laid down certain rules for the performance of Cesarean section with a large list of illustrative cases and statistics. It seems to me that by the observance of these rules we have pretty clear indications for the use of the kind of Cesarean section under discussion tonight. In cases where the membranes are not ruptured, where there have been no frequent examinations, with subsequent danger of infection, and where the woman is in good condition, the classical Cesarean section should bring about satisfactory results. We next have the second type of case where the woman has been in labor for a long time and the membranes are ruptured, but where she has been under competent treatment. The statistics that Reynolds published and our own experience shows us that the mortality in this class of cases is much higher than in the first and it is in such patients that it seems to me the extraperitoneal Cesarean section is a very great improvement over classical one. Lastly, we have the third type of case which has been in labor a long time, the membranes have been ruptured, examinations have been frequent by numerous persons whose technic we know nothing about, and here it would seem that either the classical or the extraperitoneal operation is very much out of place."

"The indication for the classical operation is very clear for all cases falling in class one and I can see no reason for doing the extraperitoneal operation on such patients."

"I shall be very much interested to hear what Dr. Hirst has to say about the ligament which is formed by the peritoneum subsequent to this operation."

DR. B. C. HIRST: "That question of the ligament formed by the union of the two layers of the peritoneum is important. When I first published this technique a physician wrote me that the only objection he saw to the operation was this formation of an artificial ligament of the lower uterine segment, the least desirable place to have an adhesion, between the two layers of peritoneum. He thought it would prevent involution of the uterus by pulling the lower uterine segment forward, and would have a tendency to throw the fundus backward. Now that is a legitimate criticism only to be answered by an observation of these cases after a sufficient interval. As I have been doing this operation for

almost two years, I have had an opportunity to examine one woman 18 months after the operation. I delivered one twice by the same extraperitoneal route so I had an opportunity to see in her exactly what had occurred. So far I have not seen any disadvantage from the formation of an artificial ligament, and it seems to me that one could foretell that result. If you loosen the peritoneum over the lower uterine segment and attach it to the peritoneum of the abdominal wall, the two tissues are very elastic and in the rapid involution which occurs in the lower uterine segment, this portion of the uterus is reduced to a fraction of an inch in length, so that the only result I have seen, or could imagine, is a slight shallowness of the anterior reduplication of the peritoneum. I have so far found the uterus in perfect position and perfectly mobile months after the operation. This objection to the operation therefore, which would occur to any one, can be regarded I think as negligible."

In answer to the question whether this operation should be done in clean cases in preference to the classical Cesarean, my idea is this: that we get advantages from the extraperitoneal operation even in clean cases. If the uterine wall should give way—and that might possibly happen to any of us—then it is not necessarily a fatal accident, because it gapes in the extraperitoneal space, and the discharge requiring drainage, should any occur, would be into the cervical canal. If the uterine wound should become subsequently infected, as it might even in an originally perfectly clean case, the operation would not necessarily be fatal, whereas it would be in the classical intraperitoneal operation. So to my mind, on theoretical grounds, the extraperitoneal Cesarean section has a distinct advantage even in the clean case, unless the operation is done for placenta previa, or premature detachment of the placenta and must be done quickly with least loss of blood.

In regard to what Dr. Broun said about drainage, many of the European operators do drain their cases but I have not drained any of mine yet, because it seems to me that if the necessity for drainage should develop in the course of convalescence a natural drainage would be established from the gap in the lower uterine segment through the vaginal route with as good result as if by artificial drainage above, and we would get a nice union of the abdominal wound, a quicker convalescence and a firmer abdominal scar. Finally if one may be permitted to judge by his own experience, I am confirmed in my predilection at present in favor of the extraperitoneal Cesarean section by results. So far there has been no mortality and I cannot help thinking that in the future some deaths may be averted by this technique which might occur by the older operation. It seems reasonable to expect a slightly lower mortality in the extraperitoneal section than is possible in the intraperitoneal operation, or the old classical operation, taking cases of course without selection, as they come into a hospital clinic.

# A REPORT ON FIVE CASES OF EXTRAPERITONEAL CESAREAN SECTION

By JAMES W. MARKOE, M, D.
Attending Surgeon

In view of the possible soiling of the general peritoneal cavity by infectious liquor amnii during the course of a classical Cesarean section, various attempts have been made to approach the interior of the uterus without invading the peritoneal cavity itself. This method of operating has received renewed attention during recent years and a considerable number of foreign obstetricians have devoted themselves to the development of various plans of procedure. Although the results with the classical Cesarean operation have been very greatly improved, cases will often arise in which a transperitoneal operation is less desirable than one which would permit the emptying of the uterus without the extrusion of any part of its contents into the abdominal cavity. In two recent cases in which the author performed the modern abdominal Cesarean operation, the results as regards the mothers were rapidly fatal from a virulent form of streptococcic infection, although the patients showed no evidence of such infection upon admission that could be recognized by the ordinary signs and gave no history that would lead one to suspect that they were already infected; the outcome was nevertheless unfortunate. In other cases the history is such that the probability of septic infection of the genital tract may be taken for granted and in such the grave question arises as to the proper procedure. Some might, I fear, consider it a simpler matter to allow the woman to continue in labor until all signs of life in the child have ceased and then to perform craniotomy with a fair assurance of safety of the mother, but the question whether such a procedure is justified is an old one and it may be difficult to solve the same in an individual case where we are face to face with the possibility of losing both mother and child if a Cesarean section by the transperitoneal route is decided upon. Dr. T. G. Thomas sought to overcome this by his operation of laparoelytrotomy, an operation that was much too complicated and was therefore early abandoned. Since then symphysiotomy and pubiotomy have been strongly advocated by some and employed in a restricted number of cases. Symphysiotomy has been virtually abandoned and pubiotomy may be said to grow less in favor as time goes on. The reports of Frank, Sellheim, and others upon extraperitoneal Cesarean section have been long considered by the author but it was not until Dr. B. C. Hirst published his report on the modern extraperitoneal Cesarean section, with a description of the technic for its performance, that I was induced to resort to the operation. In all five cases herewith noted I followed the method as laid down by Dr. Hirst with but two exceptions. In the first case I began the suturing of the two layers of

peritoneum at the lower angle of the wound and was considerably hampered by the omentum while closing the upper angle, therefore in the two succeeding cases I brought together the two peritoneal surfaces at the upper angle of the wound. Then again I found the extraction of the child simplified by passing the hand into the uterine cavity, grasping the foot and extracting as in the ordinary transperitoneal Cesarean section. My

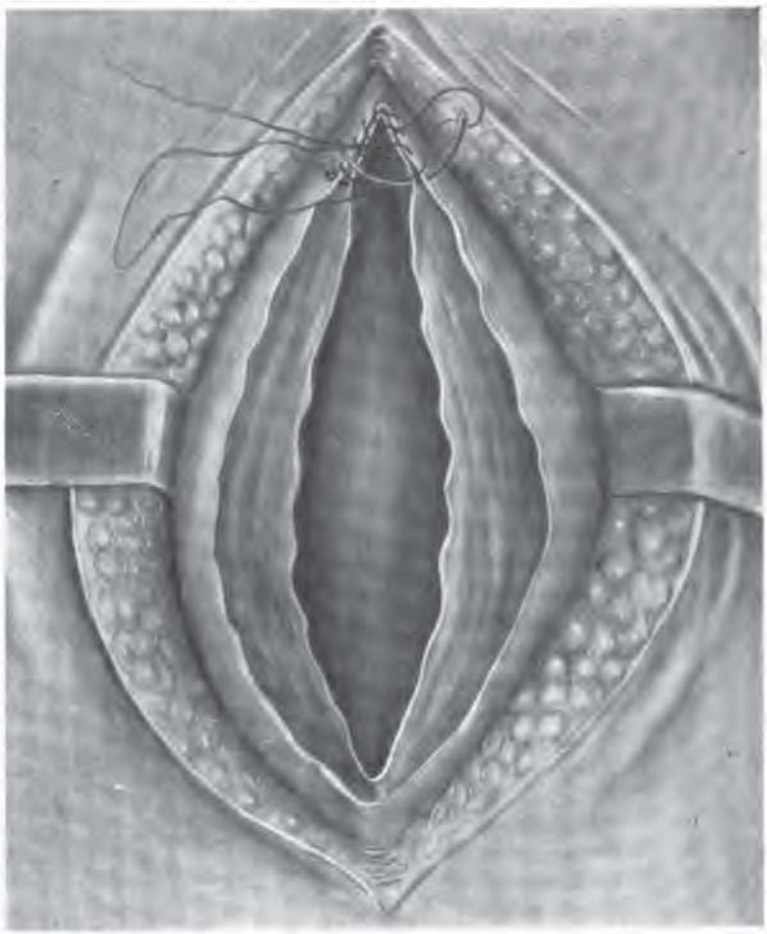

Fig. 1.—Showing suture of visceral and parietal layers of peritoneum from above downward.

results in these five cases are not encouraging but a reference to the detailed histories herewith presented will partially account for the same.

The first case did not at the time of operation lead one to suspect that it was such a hopeless toxemia of pregnancy as the autopsy later proved. In the third case there was not sufficient time to secure the report of the pathologist as to the virulent character of the infection and

even if it had been known, I do not believe that any other operation, even a craniotomy, would have changed the result.

The following are the histories of the four cases operated upon by me according to the extraperitoneal method.

CASE I, (Mrs. A. G.), age 22; para I; admitted October 23rd, 1913, with the following history: At 5 A. M. on day of admission, patient, then in

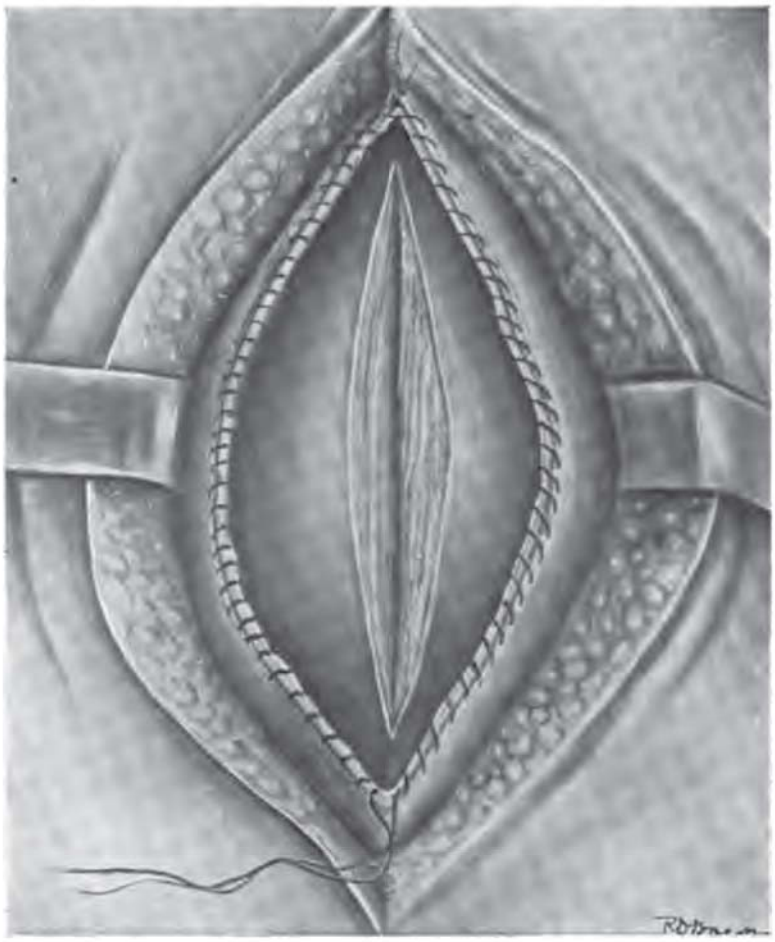

Fig. 2.—Showing suture completed and uterus incised.

her ninth month of gestation complained of severe headache. At 7 A. M. she vomited a number of times, and immediately following had a convulsion. A midwife and later two physicians were called who examined her and then sent her to this Hospital stating that she had had two convulsions. After admission she had eight more convulsions before she could be delivered. Temperature on admission was 101° F., pulse 120 and her

urine boiled almost solid; specific gravity 1017, with hyaline and granular casts. The indication for Cesarean was eclampsia in a primipara and for the transperitoneal operation, the fact that the patient had been in the hands of a midwife and two unknown physicians.

The technic of the operation was as follows: Twelve centimeter incision in median line from symphysis upward; vertical incision low down

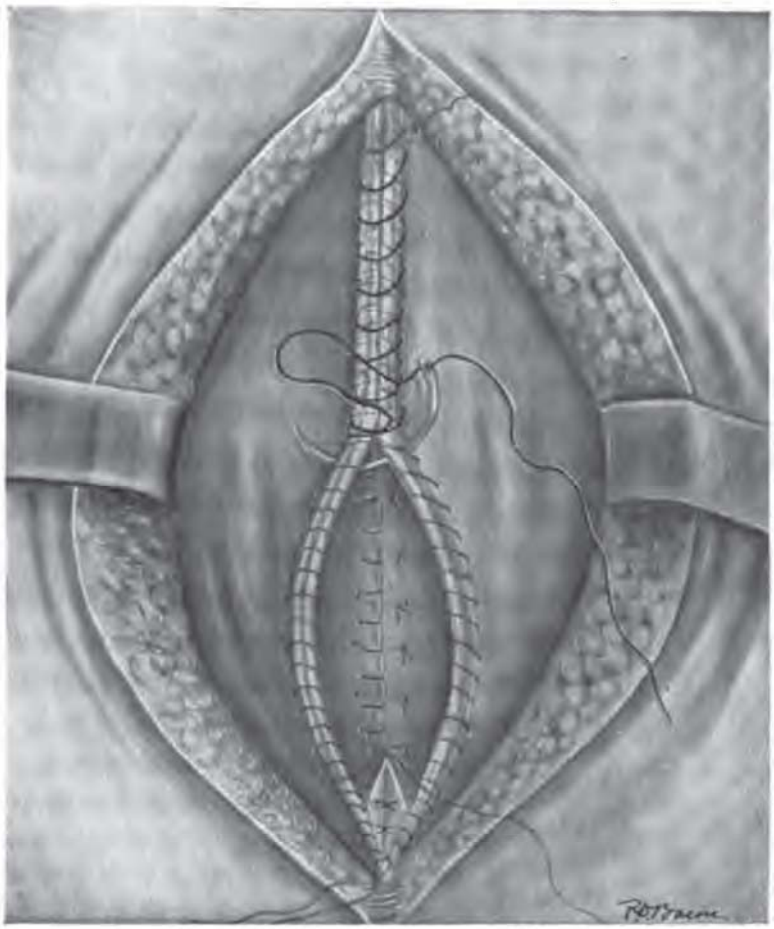

Fig. 3.—Showing sutures in uterus and closure of peritoneal wound.

on uterus through peritoneum only, flaps of which were dissected back for four cm. on either side and these were sutured to the peritoneum of the anterior abdominal wall with continuous No. 2 plain catgut suture, thus rendering the field of operation extraperitoneal; uterus then opened and child delivered by breech extraction; uterus closed with two layers of No. 3 chromic gut, the first layer uniting the deeper muscular tissues

and the second layer the superficial. The layers of the peritoneum were then brought together, the two layers, uterine and abdominal, being united as one. The fascia was closed with interrupted No. 2 chromic catgut, the skin with silkworm gut retention sutures and Michel's clips. Unhappily the child was still-born and the patient only lived about one and one-half hours after the operation. A postmortem examination revealed in the liver and kidneys numerous petechial hemorrhages over entire surface of liver, with cloudy swelling microscopically: the kidney was enlarged and the capsule adherent in several areas; microscopically capsule was thickened with connective tissue proliferation beneath; glomeruli were swollen, with proliferation of their endothelial cells; epithelium lining the tubules showed granular degeneration and sloughing; medullary portion of the kidney showed considerable edema in its interstitial tissue. Diagnosis: acute parenchymatous hepatitis, chronic interstitial nephritis with an acute diffuse nephritis.

CASE II, (Mrs. A. Y.), age 28; para II, her first pregnancy resulted in an abortion the year before. On November 22nd, 1913, she was sent to the Hospital by an outside physician who had made several attempts at delivery. She has been in labor 18 to 20 hours; temperature 99° F., pulse 98. The patient was extremely fat with a pendulous abdomen. Her cervix on admission was two and a half fingers dilated and the fetal heart was 168; vertex presenting with a tight contraction ring of Bandl about child's neck; pelvis justo-minor with narrow transverse diameter at the outlet. The diagonal conjugate was not recorded. External measurements: between spines 23.5 cm., between crests 29, ext. conjugate 19.5, obliques, R: 23, L: 22.5 cm., circumference of pelvis 97 cm. Culture taken from vagina showed colon bacilli. Indication for Cesarean section was a contracted pelvis with a living child, evidently too large to come through by the maternal forces while the indication for the transperitoneal operation was the probability of infection during the 18 to 20 hours of labor previous to her admission to the hospital and a history of attempted delivery by an outside physician. Upon admission and after a careful examination the cervix was packed with iodoform gauze as a precautionary measure.

The technic of the operation was similar to that in case I with one exception: the suture of the two layers of the peritoneum was begun at the top of the wound instead of the bottom, it being found in the first case that when begun at the bottom prolapse of intestines and omentum was apt to make trouble. It was thought wise to drain the fat so a piece of gutta percha drain was inserted into the lower angle of the wound. Child was living and weighed 4.6 kilos.

Following the operation the patient had but little discomfort. On the first day bowels were moved with enema and her stomach washed. Temperature did not go above 100° F. until the fourth day when it reached 101°. On the fifth day clips were removed. The next day the lower angle of the wound was found to be discharging and was dressed. Culture

three days later showed staphylococcus albus. Following this discharge temperature fell to under 100 in two days. Retention sutures removed on the eighth day. On the twelfth day temperature again went over 100°. The lower angle was opened for two and a half inches under gas and packed with argyrol gauze. Thereafter temperature soon became normal and remained so. Urine analysis two days after operation showed albumen present with hyaline and granular casts.

Blood count three days after operation showed, —red blood cells 3,840,000, hemoglobin 76%, white cells, 6800, polynuclears 75, lymphocytes 25. Patient was up on the 20th day and home on the 26th with granulating wound which healed without further trouble. Baby discharged with mother in good condition.

CASE III, (Mrs. T. G.), age 26; para II. She stated that the first pregnancy resulted in a four months' miscarriage. She was admitted February 2nd, 1914. Labor began three days before admission but pains did not become severe until 36 hours before admission, at which time the membranes ruptured. Patient stated that she had been under the care of a midwife. On admission her temperature was 99, pulse 110, and she showed a marked degree of exhaustion in consequence of the long labor. Pelvic measurements: diagonal conjugate 10; depth of symphysis 4.5; pubic arch transverse and antero posterior diameter of outlet narrow; external conjugate 20; inter-spinous 22; intercristal 26; right oblique, 21; left oblique, 19; circumference of pelvis, 102.

The indication for the Cesarean section was the contracted pelvis and living child, and for the transperitoneal operation, the long labor with a history of examinations outside while under care of a midwife.

Technic of operation similar to that of case II; a living child delivered. The mucosa of the uterus, when it was opened, appeared gangrenous and had a very offensive odor. Histological examination of a section of the endometrium removed showed that there was an acute exudative inflammatory process going on at the time of operation.

Very shortly following the operation the patient's abdomen became distended and remained so despite all efforts to relieve it, although there was little tenderness or complaint of pain. Temperature ranged between 100° and 102°F.; pulse gradually rose to 150; and on the third day the patient died. Postmortem inspection showed the wound completely broken down with general peritonitis, culture from which showed hemolytic streptococcus and colon bacillus. The child lived until the 14th day when it died of malnutrition.

CASE IV, (Mrs. P. G.), age 23; para II. The first labor two years before was very difficult, lasting over four days and resulting in the spontaneous delivery of a still born child said to be full term. Patient was admitted to the Lying-in Hospital March 7th, 1914. Her pains she stated began three days before admission about 10 A. M., at first weak and every twenty minutes. Her physician examined her at intervals. After two days and a half of ineffectual labor with no strong pains, he gave her

a hypodermic of 1. c.c. of pituitrin, following which her pains became strong and the membranes ruptured during an examination. On admission she was having strong pains; cervix was about four fingers dilated, head floating with apparent hopeless disproportion to size of pelvis. Temperature was 98° and pulse 90. Fetal heart 128 and good quality. Patient seemed very tired. Pelvic measurements were: depth of symphysis 5 cm.; diagonal conjugate 9; true conjugate 7; pubic arch, transverse diameter of outlet and antero-posterior diameter of outlet, medium; intraspinous 25; intercristal 26; external conjugate 17.5; external oblique, right 21, left 20.5; circumference of pelvis 91. Culture made from cervix showed staphylococcus albus. Between admission and operation she received ⅜ gr. morphine in 2 doses, the last, two hours before operation.

Indication for Cesarean section, contracted pelvis and living child, for the transperitoneal operation, long labor with numerous examinations on the outside. Technic of operation was similar to that of cases II and III. Patient bled very profusely at time of operation, the uterus failing to contract although half a hypo of Ergotol was given. Her condition became desperate and at the time an infusion was given on the table. The baby remained blue, breathed only once in five minutes, dying at end of two hours. It seemed perfectly healthy weighing 4100 grams. Autopsy not allowed. Following operation patient made a very satisfactory and comfortable convalesence. On the second day temperature reached 102.4° F., but thereafter fell reaching the normal on the 7th day where it remained. On the 6th day skin clips were removed, the wound having healed by primary union. Urine analysis after operation showed nothing notable, blood count on 10th day showed 2,890,000 red cells, hemoglobin 37%; leukocytes 10,500, polynuclears 70%, small lymphocytes 24%, large lymphocytes 6%. She was out of bed on the 11th day and discharged on the 12th. Uterus at this time was central in position, movable and nonsensitive. General condition excellent.

CASE V, Mrs. P. T., para VIII. Age 38. Admitted March 29th, 1914. Of her seven previous pregnancies, six were said to be full term children, the seventh and last a seven months' premature labor. Of the six full term labors, four were spontaneous, and two, the 3d and 4th were instrumental, resulting in stillbirths. Of the four living babies, one survived a week and three between 16 and 18 months. The last full term labor was four years ago. Present labor set in about 7 p.m., March 28th. The membranes were ruptured three hours later by a midwife in attendance. After this the pains became strong. A physician was summoned later who proposed putting on forceps. Before this was tried, however, the patient was sent to the hospital arriving about 6:30 A.M., March 29th, 12 hours after the onset of labor. Examination revealed a flattened pelvis, full dilatation of a lacerated edematous cervix with head floating in L. O. A. position and apparently too large to come through. Fetal heart 160. Pains strong every 3 minutes. Mother's pulse 80; temperature 98.6° F. Pelvic measurements:

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|---|---|
| Diagonal conjugate | 10.25 cm. |
| True conjugate | 8.5 cm. |
| Interspinous | 25 cm. |
| Intercrystal | 26.5 cm. |
| External conjugate | 20 cm. |
| External obliques: | |
| Right | 21.5 cm. |
| Left | 22.5 cm. |
| Circumference of pelvis | 105. cm. |

Patient was given about four hours further trial to engage the head and although pains continued strong she was unable to make any progress. The indication for Cesarean section then was a living child and contracted pelvis with apparently hopeless disproportion between the pelvis and the head. Version was contraindicated by the torn condition of the cervix which made a deep uterine tear probable. The indication for the transperitoneal operation was a midwife case with membranes ruptured about 12 hours.

The technic of operation varied from that of former transperitoneal operations in the following particulars:

1. Difficulty was experienced in separating the uterine peritoneal flap so that the parietal peritoneum was sutured directly to the uterus around the upper half of the incision; below, the visceral peritoneum was easily separated and redundant and so the two flaps of visceral and parietal peritoneum were sutured together as formerly. This method gave a much more secure passageway than the former technique as the peritoneal flaps alone sutured together are easily torn in the upper half.

2. The incision being rather low, the child's head presented directly in the wound and it was delivered by the hand of the operator without trouble.

There was great edema in the subperitoneal tissue at the lower end of the wound which was a source of annoyance and increased the risk of infection. Cultures taken from a small amount of fluid in the abdominal cavity and from the interior of the uterus were sterile. The child was in good condition and weighed 3, 450 gms.

Post-operative course was uneventful. Clips removed on sixth day and retention sutures on eighth. Wound healed by primary union. Mother and child in good condition.

In this list of five extraperitoneal Cesarean sections the results are not brilliant but they were all cases with a history of interference by doubtful midwives or physicians and the results would not have been different unless perhaps craniotomy had been done. Two mothers died and three survived, three children survived, one baby for 14 days. No deductions can be made from so few cases but they are instructive and may be of value to those who contemplate performing the same operation in similar cases.