

## AN ILLUSTRATED HISTORY OF THE LOW OR CERVICAL CESAREAN SECTIONS\*

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**T**HE history of the cervical cesarean section teaches that the principles of the low incision were established at the very beginning, and that the present perfection of the operation is the result of the development of our knowledge of the local anatomy, plus, of course, the improvement in surgical technic and anesthesia. It will, therefore, be very helpful to the understanding of the different operations if the regional anatomy is studied.

Particular notice is to be taken of the extreme mobility possessed by the peritoneum over the bladder and lower uterine segment, and how this portion of the uterus is almost denuded of the serous membrane, becoming largely extraperitoneal. The changes in location of the anterior culdesac may be compared to those produced by a cervical subserous fibroid, developing to the size of a fetal head.

Mythology abounds with instances of cesarean section on the dead mother. The removal of the child after the death of its mother was the *Lex Regia* of Numa Pompilius, 700 B.C. References to section on the living woman are only of recent date, mainly since 1420, but we have strong reasons for believing that it was practiced long before Christ. One would not expect anatomic details of the operation to come out of antiquity, but we may well believe, from references in ancient literature, that several methods were practiced, even in those days.

It is claimed that Buddha was delivered through the flank of his mother, that Brahma appeared through the navel, and the Babylonian Jews in the *Mischnejoth* (140 B.C.) described two kinds of cesarean section, the *Kariyath Habeten*, similar to our classic operation, and the *Jotze Dofan* or flank delivery which may have been the operation of Ritgen (1821), Thomas (1870), and A. B. Davis (1924). The Jews,

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according to Preuss, did the operation on the living patient long before the first authentic case of Trautman (1610), indeed even before the present era, as is evidenced by rabbinic laws regarding women who had had abdominal delivery and regarding the rights of twins delivered by section. The rabbis believed such women were sterile thereafter. (See Rigby, Macht, Schapiro.)

That there were, even before Christ, several varieties of cesarean section is certain and it may be assumed that these different modes of operating were dictated by the deadlines of the interference. Death was the usual outcome and it was due to hemorrhage or peritonitis, both the result of imperfect closure of the uterine wound. The spongy vascular uterus could not contract, nor stay contracted long enough to control bleeding, and the lochia almost always were discharged through the abdominal aperture, usually accompanied by a fatal peritonitis. Further, there was danger from the primary spill, and, in those days laparotomy technic was poor; they had no anesthetics, and the escape of bowels and omentum created serious operative complications.

The first to actually make a purposeful, scientifically thought-out attempt to circumvent all these dangers was Osiander, of Goettingen, in 1805. In my opinion, formed by reading his original descriptions of his two operations, he is entitled to the credit of being the first to blaze the way to the modern low cesarean section.

It was the nineteenth of March, 1805. The day had been a strenuous one in the hospital, there having been three unusually difficult deliveries and, before attempting the cesarean section, Osiander took a half hour's rest. During this time he revolved in his mind the disadvantages of the methods of section in vogue at the time and thought out the technic soon to be described. He argued, (1) that experience with rupture of the uterus proved that the danger was less when the tear occurred in the lower half than when it fell in the upper part, or indeed the middle,—meaning the dangers of hemorrhage and sepsis; (2) the incision in the belly and the uterus could be smaller,—a decided advantage as regards hemorrhage and infection in those non-aseptic days, and as a preventive of escape of the intestines during operation; (3) the wound being in the lower half of the uterus would sink deep down into the pelvis behind the pubis. Thus, blood and liquor amnii would not get into the general peritoneal cavity, the lochia would be provided ready escape, and at the same time gut and omentum would not so easily find their way into the uterine aperture and prevent healing. Resolution followed these deliberations and he put his plan of operation into effect. The patient, who bore her suffering stoically,—not even having her hands tied down,—died of per-

itonitis, as did another woman operated on according to the same method, a year thereafter.

At both operations, Osiander found these true obstetric principles vindicated, and although success failed him we can partly agree with the original and intrepid operator that the bad result was not due to the method but to the poor subjects he had,—both half-starved human flotsam, covered with vermin and pustular eruptions.

Before enumerating the cervical operations, it may be well to remind the reader that the knowledge of the anatomy of the uterus and cervix possessed by those older accouchers was meager, and that the distinctions (late in labor) between vagina, cervix, lower uterine segment, and uterine body were not as carefully drawn as is possible today. Since all their operations were done during very advanced labor, when the cervix and lower uterine segment were one canal and dilated and stretched to the utmost, we may conclude, with a high degree of certainty, that their incisions were made as often in the cervix as the vagina, and most often in that portion of the parturient canal we call the lower uterine segment, or isthmus. This fact was appreciated by Osiander in 1812 (l. c., vol. iii, 75).

In performing his operation Osiander pushed the head up against the lower abdominal wall with one hand in the vagina, and, with the other, he cut down on the bulging prominence making his incision alongside the pyramidalis muscle. The head popped out through the opening, responding to the pressure from behind, and the body then quickly emerged; soon thereafter the placenta followed, whereupon the uterus sank into the pelvis carrying the wound so far down that it disappeared from view. There can be no doubt from his description but that this was a true laparotrachelotomy. (Fig. 1.)

Joerg, of Leipzig, in 1806, basing his recommendations on the clinical observation reported by Boër, that rupture of the vagina (and probably the lower uterine segment) allowed the exit of the child into the peritoneal cavity from which it could be easily removed, suggested that at cesarean section, instead of opening the middle of the uterus, the incision be made in the vagina and, if there is not room enough, the mouth of the uterus also, thus providing an opening for the extraction of the child. Fig. 2. Or in Joerg's own words:

“Könnte nicht vielleicht auch beym Kaiserschnitte die Mutterscheide, und wäre dies allein nicht hinreichend, der Muttermund zugleich mitgeöffnet und das Kind durch diese Oeffnung aus der Gebärmutterhöhle geschafft werden? Vermuthlich würde durch diese Veränderung des Einschnittes diese Operation weniger gefährlich werden, als sie ist, wenn die Gebärmutter in der Mitte geöffnet wird.—Ich bin erst seit kurzer Zeit auf diese Idee gekommen, und habe daher noch keine Gelegenheit gehabt, Versuche anzustellen; ich bitte aber Geburtshelfer, die Gelegenheit haben, im letzten Monate der Schwangerschaft verstorbene Schwangere zu seciren, recht sehr, auf die Beantwortung meiner Frage mit Rücksicht zu nehmen.”

It is in the last of his "Aphorisms," in a tiny unimportant booklet on sundry obstetric subjects, that Joerg expresses his belief in the possibility of such an operation and requests surgeons to try it out on women dead in late pregnancy. Very lukewarm himself regarding its advantages over the classic cesarean, he did not perform the operation on the living, but, in the 1820 edition of his textbook, mentions having done it once on a dead parturient. He did not urge it upon the profession as Osiander did,—indeed, the latter said it should replace the classic section entirely, so deeply was he convinced of the superiority of the low operation.

Osiander antedated Joerg by one year and possibly Joerg got his

idea from Osiander. Osiander preserved the torso of his first patient and demonstrated it regularly in his obstetric lectures. Leipzig is 125 miles from Goettingen.

In those days of universal infection there was a great clamor from many sides against opening the serous cavities. It was believed that laparotomy was almost invariably followed by peritonitis. This was contested by a few, even then, and now we have learned that the peritoneum can care for much infection. Abernethy, in 1796, ligated the internal iliac artery extraperitoneally and, by the surgeons, this method of approach to abdominal organs was adopted wherever feasible.

Ritgen, of Giessen, in 1821, following this line of reasoning, tried to reach the vagina by an incision parallel to Poupart's ligament, operating subperitoneally, thus to empty the parturient uterus. He failed through lack of anatomic knowledge, which caused profuse hemorrhage. (Fig. 3.)

In 1823, Baudelocque, the younger, devised, independently, a new method of abdominal delivery. Whereas his uncle, in 1790, had expressly warned against incising the neck of the uterus and had insisted on the opening being made at least 2 inches above the internal os,—the idea being to make the aperture in the uterus to correspond to that in the abdomen and thus provide for the free exit of the lochia,—the nephew devised two low operations for removing the child abdominally. One was similar to Ritgen's, the other the same in all respects but that the approach to the vagina was made through the peritoneal cavity. Both his patients died, one from hemorrhage, one from peritonitis. He named these operations gastroelytrotomy and twenty years later wrote a paper denouncing them.

In 1824, Physick, of Philadelphia, through the agency of a letter written by Dr. W. A. Horner, recommended to Dewees a true extra-peritoneal cesarean section. Neither performed it. One should make a cross cut through the abdominal wall just above the pubis down to the peritoneum; the serosa is then to be elevated off the bladder by dissection; one thus gains access to the cervix and another cross cut here enables the delivery to be accomplished. (Fig. 4.)

With the exception of a case of combined Ritgen and Joerg operations reported by Testa as having been performed by Cianflone in Italy, oblivion was the fate of these recommendations and attempts to make cesarean section safe. Looking backward, one would expect nothing else. Success had to wait on more knowledge. Antisepsis and asepsis had to come; pelvic anatomy had to be learned; anesthesia had to render deliberate operating possible; and surgical technic had to be developed.

In 1870, T. Gaillard Thomas, of New York, revived Ritgen's gastroelytrotomy and in spite of the crudity of the technic and the imperfect asepsis of the times, of eight operations performed up to 1878, four women lived,—Thomas 1, Skene 2, Gillette 1. This mortality, 50 per cent, was certainly as good as that of the classic cesarean section, indeed better, since in those days 40 to 80 per cent of the women died, and in some countries not one woman survived the operation in a half century. In the meantime, however, 1876, Porro, of Pavia, invented his operation which did away, almost, with the dangers of both hemorrhage and sepsis, wherefore Thomas's revival of laparoelytrotomy did not last long.

In 1881, Kehrer modified the classic section by making the incision

at the junction of the cervix with the body of the uterus and transversely. He also insisted on an accurate suture. Not enough attention was paid to this real advance in technic. Saenger's improvement of the classic cesarean, in 1882, consisted mainly of a firm uterine closure, combined with a rigid asepsis and thus the cesarean operation was freed of most of its dangers. It sprang into favor and soon became standard all over the world. The mortality sank from 65 per cent to 30 per cent, to 20, 10, 5,—indeed series of 100 or more cases without maternal death were published. Nevertheless, the general mortality could not be reduced low enough, and it remained at nearly the old time figure in just those cases which were most common and where abnormal delivery was most needed, i.e., the neglected labor with the suspicion of infection. Furthermore, even with a low mortality, there was always a large and worrisome peritoneal morbidity.

Therefore, Fritz Frank, of Cologne, struck a responsive chord, particularly in Germany, when, in 1906, he presented to the profession an improved Osiander-Joerg-Physick operation. He made a cross cut above the pubis, through the whole thickness of the abdominal wall (Bardenheuer's incision) to the peritoneum; then he incised the peritoneum transversely across the top of the bladder and made a corresponding cross cut through the serosa over the distended lower uterine segment but near the bladder reflection; after stripping up the peritoneum from the lower uterine segment he united the upper flap of the visceral to the upper flap of the parietal peritoneum, thus shutting the general cavity off from the region above the bladder; in fact, he made a new and elevated anterior culdesac; then he opened the uterus transversely and delivered the child. The sutured edges of the peritoneum were left united and the abdomen closed with drainage. He first tried, but failed, to hold a purely subperitoneal course. In several cases he did succeed in operating extraperitoneally. Frank reported 13 operations without a death, and at once the Germans began experimenting with the new procedure. To the German operators must be given credit for having contributed the most in the development of our modern cesarean section. (Fig. 5.)

Veit and Fromme, in Halle, 1908, at first used Frank's method but took out the peritoneal suture and reunited the peritoneum as it originally was. Later, they substituted the longitudinal for the transverse abdominal and uterine incision, uniting the edges of the parietal to the edges of the undermined uterine peritoneum with clamps before opening the lower uterine segment. The peritoneal flaps were restored anatomically in the closure. Hirst, of Philadelphia, independently worked out an identical operation using sutures at first and later clamps for the temporary closure. The sutured peritoneum was not reopened but the four edges were brought together in the median line.

Hofmeier used a continuous suture to unite the peritoneal flaps, did not reopen them but drained the wound. The main object of all these methods is to keep the spill out of the general peritoneal cavity; secondarily, to prevent the leakage of lochia into it. (Fig. 6.)

The anatomic studies of Sellheim of the pelvic viscera in the non-pregnant and pregnant states served to clear up many questions regarding all possible methods of approach to the cervix by the abdominal route. Sellheim first tried to follow Physick's recommendation, i.e., to go over the top of the bladder subperitoneally, but he soon found that too often he opened the peritoneal cavity or injured the bladder,—or had to make a little hole in the serosa so that he could look in to see what he was doing. Then he adopted Frank's method

of splitting both the parietal and visceral peritoneum transversely and uniting them before he delivered the child. But Sellheim used the Pfannenstiel incision instead of Bardenheuer's, which was a decided improvement, and he cut the uterus medially instead of transversely. (Fig. 7.) Further experience teaching him that in septic cases all danger of peritonitis was not removed, he sewed both the parietal and the visceral peritoneum to the edges of the skin, then after delivering the child he united the gaping ring of the cervix to the sides of the abdominal incision, leaving the wound open until all danger was past. This he called the "utero-abdominal fistula," and it reminds one of the attempts of Pillore and Lestocquoy of France, 1854 and 1857. (Fig. 8.) Pillore after doing the classic section sewed the uterine edges to the abdominal wound to provide easy escape of the lochia, which measure should avoid contaminating the free peritoneal cavity. Lestocquoy sewed the

uterus to the abdominal wall before delivering the child, hoping thus to obviate both the primary spill and the dangers of lochial discharge. A similar operation was advised by Olshausen, E. Martin, in 1890, and Foster, in 1924, but the abdomen was to be closed. The idea proposed was to make future cesareans extraperitoneal.

Rubeska, in 1908, made a low median incision in the abdominal wall, united the parietal to the uterine peritoneum all the way around and then delivered the child. The whole wound was left open. (Fig. 9.)

In 1910, Sellheim simplified the low cesarean by opening the abdomen longitudinally and omitting the peritoneal suture, packing the free peritoneal cavity off with pads instead, thus making the operation purely intraperitoneal. He made a transverse cut through the vesico-

vaginal plica and a longitudinal one in the cervix, thus laying a complete foundation for the low, cervical, intra-, trans- or per-peritoneal cesarean section, or the laparotrachelotomy as it is done today. Franz, Opitz, Henkel, Krönig, Polak, Beck, all performed this operation, making slight inconsequential modifications.

Opitz incises the uterine peritoneum near its bladder attachment, and pushes up a flap to the gray seam. In suspect cases he places a drain under the bladder leading down into vagina. Beck and I incise the loose peritoneum midway between the bladder reflection and the gray seam, making two flaps, an upper and a lower, which are later overlaid in the suturing. Several operators, in the final closure, after uniting the uterine peritoneal edges, secure the union with an additional row of Lembert sutures.



Meanwhile other experimenters were trying to perfect the Ritgen-Physick-Thomas-Sellheim true extraperitoneal approach to the cervix. After Sellheim, Küstner, Latzko, Kermauner and Doederlein must be mentioned as having carried on the work. (Fig. 11.)

The inguinal incision was first of all discarded as being technically too difficult, and as being complicated by the dangers of hemorrhage, and of injury to bladder and ureter, besides as not procuring sufficient room for the extraction of the fetus. Küstner makes a rectus incision, Doederlein and Latzko the usual median laparotomy. The peritoneal cavity is not opened, and it is not found difficult to peel the serosa itself gently upward from *off the side of the bladder and the lower uterine segment*, the former being pushed to the right side and held

there with a smooth retractor. A longitudinal median incision is now made in the lower uterine segment for the delivery of the child,—forceps being used.

It will bear repeating that the practicability of this operation depends upon the bladder and the peritoneum being raised up out of the pelvis and the latter being drawn upward over the lower uterine segment *by the prolonged action of the uterus during labor*, and that the ease and safety of the performance of the technic will vary with the degree to which the lower uterine segment has been stripped of its peritoneum, i.e., has become extraperitoneal. This method, therefore, is most useful in cases where uterine action has been strong and operative for many hours.

For the sake of completion, the Solms-Duehrssen operation must be mentioned and, as a matter of interest, the revival by Dr. A. B. Davis, of New York, in 1923, of the old Ritgen-Baudelocque-Thomas gastro-

elytrotomy. Solms combines Duehrssen's vaginal cesarean section with the inguinal incision advocated by Ritgen, delivering the child suprapubically, a very complicated procedure which has not gained any recognition. Davis reports 28 cases of gastroelytrotomy with two deaths, a good showing, but the operation is uninviting and has been superseded by the Latzko method, which is much simpler and founded on better anatomic and surgical principles. It has been learned by bitter experience that the further one advances from the middle line the greater grow the dangers of hemorrhage and the more technically difficult each step of the operation becomes.

All the published modifications of these operations have not been described nor even mentioned here. They are too numerous and in-

consequential. Those presented signify principles or progressive steps in the technic.

Much confusion regarding the low, cervical operation has been due to the introduction of numerous nondescriptive terms, such as intra-, extra-, trans-, per- peritoneal, etc., and also by the inventors attaching their names to a procedure which is distinguished from another only by the method of abdominal incision or other technicality.

We formerly classified all these varieties under three heads,—first, those in which the peritoneal sac was not opened at all, the attempt being made to lift it off the anterior portion of the inlet, the bladder and the lower uterine segment and, thus, to gain access to the child. These are, and should be called, extraperitoneal or subperitoneal sections.

The next group consisted of those in which the peritoneal cavity was opened but closed again, either by clamps or suture, after the lower uterine segment, i.e., the area of the uterus in which the incision was to be made, had been properly exposed. By closing the peritoneal sac before delivery, the spill was kept out of it. Some operators left the new-formed anterior culdesac and newly isolated peritoneal region to act as a barrier against seepage of the lochia and to render subsequent cesareans truly extraperitoneal. Some removed the sutures and restored the previous anatomic conditions. These operations were intended to be temporarily extraperitoneal, but experience has shown that the suture line often tore during delivery and even if it apparently held and remained water-tight, it was not bacteria-tight. Therefore, these operations were really intraperitoneal and fell into the third class where the technic comprehended the delivery of the child through the lower peritoneal cavity, trusting to packing off the operative area and the healing powers of the serosa to care for both the spill and the delimitation of the infection as well as the seepage of lochia.

In other words, an operation is extraperitoneal or intraperitoneal,—all variants should be put in either of these two classes.

The operation to which the author gave the name laparotrachelotomy is essentially the fourth one devised by Sellheim and consists of the following steps: a median abdominal incision just above the pubis, using the old American "trap door" method; a transverse visceral peritoneal cut one inch from the firm attachment to the uterus; dissection downward of the bladder flap; dissection upward of the uterine flap; a longitudinal incision in the lower uterine segment; delivery; repair of the uterus in two layers; special suture of the fascia; overlapping of the peritoneal flaps in suspect cases only; closure without drainage.

A discussion of the comparative virtues of the different operations was not intended for this paper. Küstner and Doederlein still believe that greater safety against peritonitis and general sepsis is obtained by adherence to the purely extraperitoneal method of Latzko, but the large majority of both German and other accouchers have decided that in that particular regard there is no choice. Since the intraperitoneal methods are simpler of performance and equally safe, these are given the preference.

Whereas, at first, after Frank and Sellheim published their results, the new operations were hailed with joy as a good way out in infected cases and a means of lifting the opprobrium of craniotomy on the living child, more recent experience is demonstrating that Küstner is going too far in recommending the suprapubic delivery even in infected cases. Bumm, one of the most vociferous proponents of this

view, reversed his position just before he died. This means, not that the low operations have failed, but that we must not expect too much of them. I believe they should replace the classic section in all cases where it has heretofore been indicated and that they permit us to extend the indication for abdominal delivery to cases where, up to now, the classic method is too dangerous.

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# THE AMERICAN GYNECOLOGICAL SOCIETY

## FIFTIETH ANNUAL MEETING

WASHINGTON, D. C., MAY 4, 5, AND 6, 1925

(Continued from September)

DR. JOSEPH B. DELEE, Chicago, Ill., presented a series of lantern slides, illustrating the **History of the Low or Cervical Cesarean Section, Including Laparotrachelotomy.** (For original article see page 503.)

### DISCUSSION

DR. ALFRED C. BECK, BROOKLYN, N. Y.—I want to tell Dr. DeLee that this is not the Beck operation. I looked up the Opitz reference and I found that what I described as a modification of the Krönig technic was described by Opitz in 1911 and 1914. I wish, therefore, to acknowledge his priority. What I did was a very simple thing and possibly should not be spoken of so highly in connection with my name. The literature before the time of Frank is quite unknown to me. Dr. Dewees, however, apparently thought very little of the suggestion of Physick of Philadelphia, because in most of the latter editions of his work he omitted the footnote in which Dr. Physick's suggestion was mentioned. I think the greatest credit possibly in connection with the low cesarean section belongs to Frank because he again directed attention to the lower segment and better peritonealization of the wound.

I think that, instead of looking upon the subject in a chronologic way, we may better understand its history if we divide the men who have worked along this line into two groups. The first group includes those who were very much afraid of the amniotic spill and attempted to do an extraperitoneal operation. The second group feared the spill less and did the procedure by a transperitoneal technic which led to a more perfect peritonealization of the wound in the lower segment.

Frank, in his first operation, did exactly what Physick suggested. He found, however that in some instances it was impossible to peel the peritoneum off the bladder and consequently recommended that the transperitoneal route be followed. Sellheim immediately modified Frank's idea as Dr. DeLee has shown us. Veit, Fromme, and Hirst devised the technic which is known in this country as the Hirst operation. Latzko, however, clung to the original extraperitoneal idea and gave us the technic which is now followed by the adherents of the first group. All of these men in the first group who were so fearful of the spill, did broad dissections in the cellular tissue and apparently were less fearful of infection in this region than they were of infection of the peritoneal cavity from the spill.

The second group, those who cared less about the spill, approached the lower segment through the peritoneal cavity and relied upon the measures usually employed in abdominal surgery to protect the peritoneum from contamination. They depended more upon the extraperitoneal closure to protect the peritoneal cavity from infection should an infected uterine wound break down. The chief mem-

bers of this group are Krönig, whose operation is known to all of us, and Opitz whose technic is essentially that described by Dr. DeLee and myself.

Dr. DeLee omitted Doederlein in his discussion, whose name is frequently mentioned in connection with the low operation. He independently did the Latzko procedure but later acknowledged Latzko's priority.

**DR. GEORGE W. KOSMAK, NEW YORK CITY.**—One statement made by Dr. DeLee is of special interest, namely, that one of the indications for low cesarean section is the observation made by an earlier operator, that rupture of the uterus in the lower uterine segment is much less dangerous than in the upper segment. I think that statement should be accepted with some question. In my own experience I know that the cases of rupture of the uterus that took place during labor were much more dangerous when the rupture took place in the lower uterine segment and involved in that region the larger vessels. I have seen cases where the rupture took place in the upper segment, with practically no shock to the patient.

**DR. DELEE (closing).**—Regarding Opitz, I would say that I consulted his original paper and found he is not entitled to the credit for that operation. The development of this part of the operation was done at the Chicago Lying-in Hospital but I thought the credit should be given to Dr. Beck because he first published and emphasized it. Opitz cut the peritoneum at the edge of the bladder and did not overlap in suturing. The overlapping of the two flaps, we developed at the Lying-in Hospital. We fell into it naturally, by our mistakes. We found if the incision in the peritoneum was made too low, we did not have enough room and we made an upper flap too, but we have given up overlapping except in infected cases because when we do a second and third operation on clean cases we found we had used up the peritoneum of the anterior culdesac.

Doederlein is mentioned in my paper. The distinction between those that are afraid of the primary spill and those that feared the lochia is also made in the paper. We divide them into the extra—and intraperitonealists and war was waged among the Germans, who are great believers in this operation, as to which method is better. The favor seems to be on the side of the intraperitonealists, although Küstner and Doederlein stick to the old extraperitoneal operation.

The indications for this low operation are restricted and limited. Whereas at first we regarded it with great enthusiasm, thinking that at last we could get rid of the craniotomies on living children, still it did not eliminate all the dangers of peritonitis.

As to Dr. Kosmak's point that a rupture in the upper part of the uterus is not more dangerous than in the lower,—that depends on the time of occurrence. In the olden times a rupture in the upper part of the uterus was always fatal because the belly had to be opened and that was necessarily fatal. If it occurred in the lower part of the uterus craniotomy could be done and still the baby could be got out below. In those days a fundal rupture was feared most. Nowadays we fear them also because they occur during pregnancy when the woman is far from help.

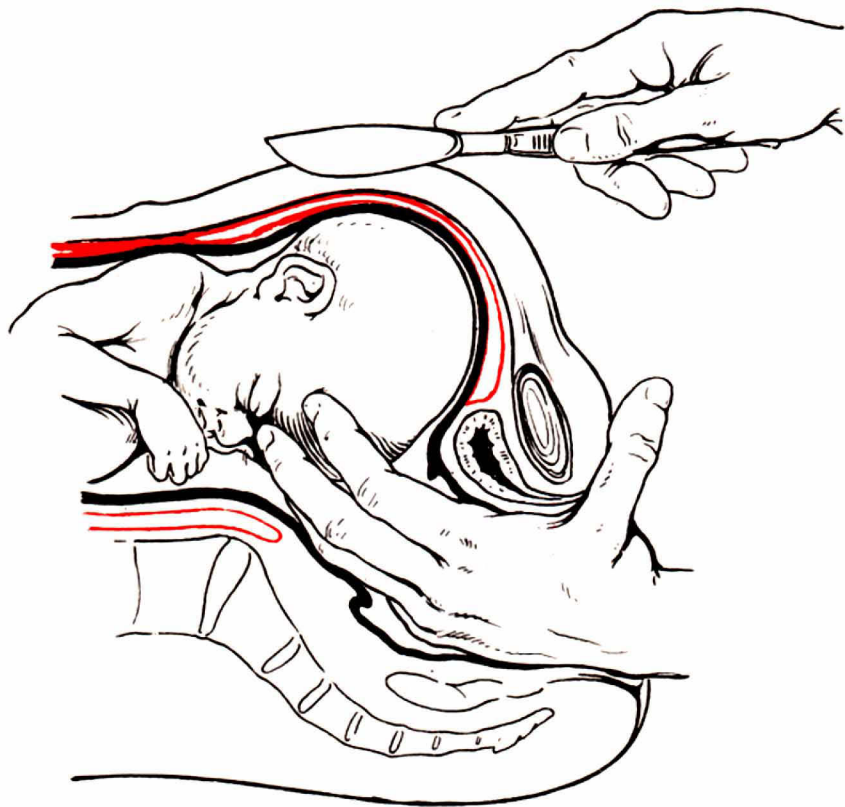


Fig. 1.—Osiander's operation, 1805. (In this and the following cuts, the peritoneum is shown in red.)

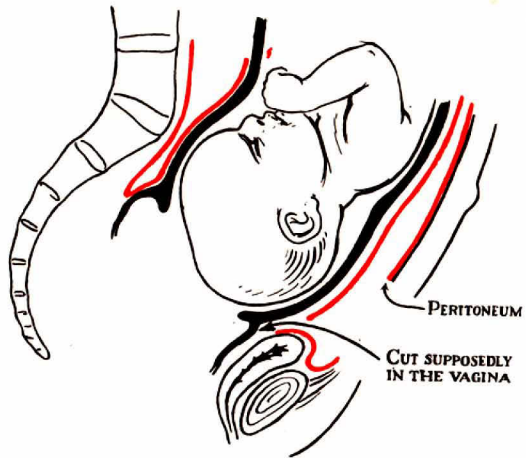
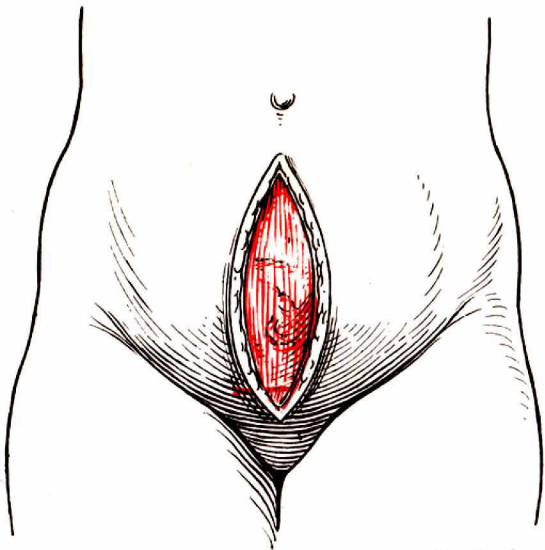


Fig. 2.—Joerg's operation, 1806.



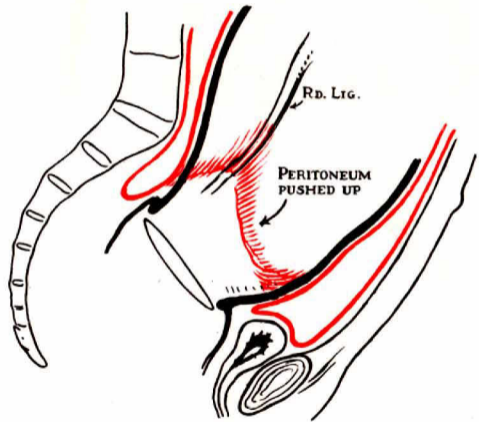
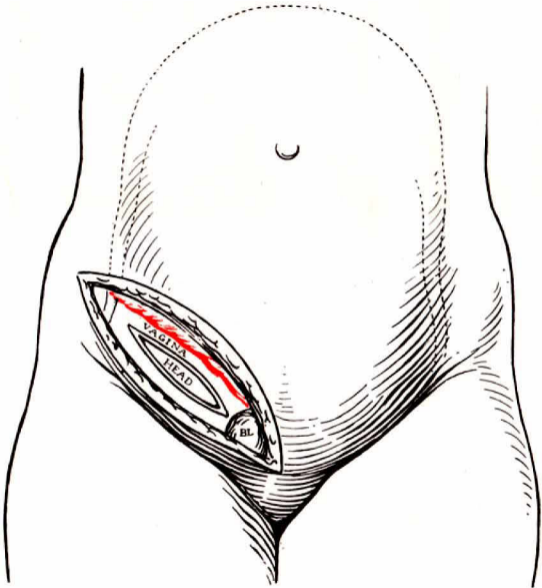


Fig. 3.—Ritgen's operation, 1821.

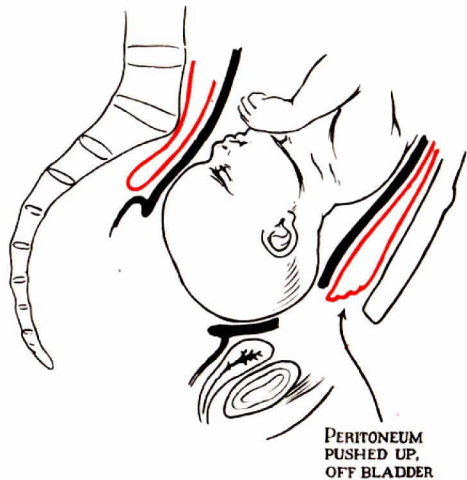
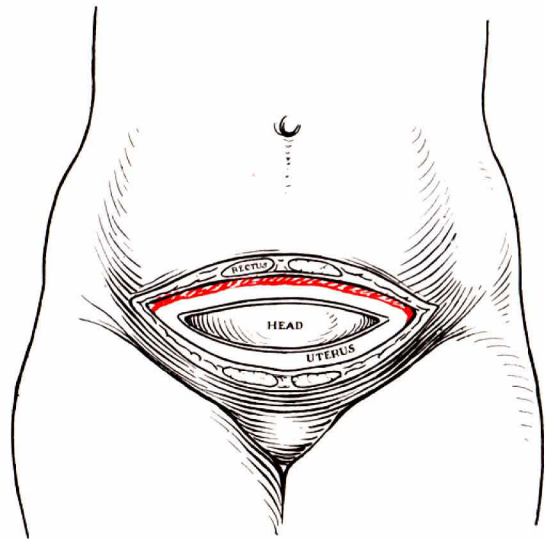


Fig. 4.—Physick's operation, 1824. Sellheim's first operation similar to this.

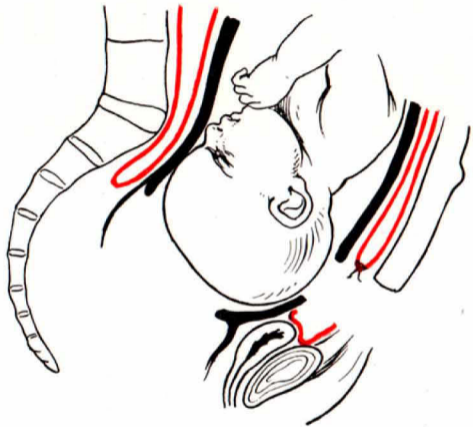
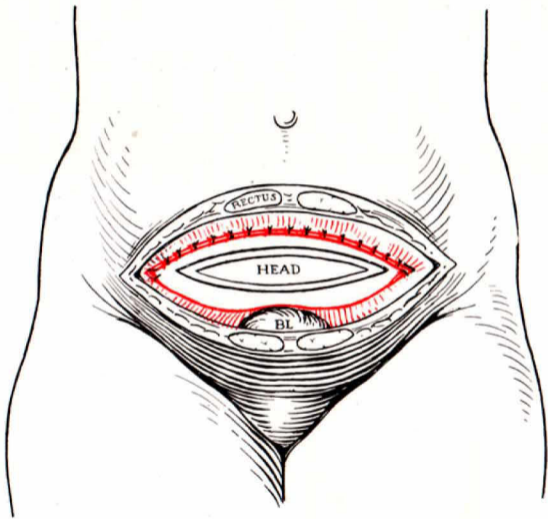


Fig. 5.—Frank's operation, 1906.

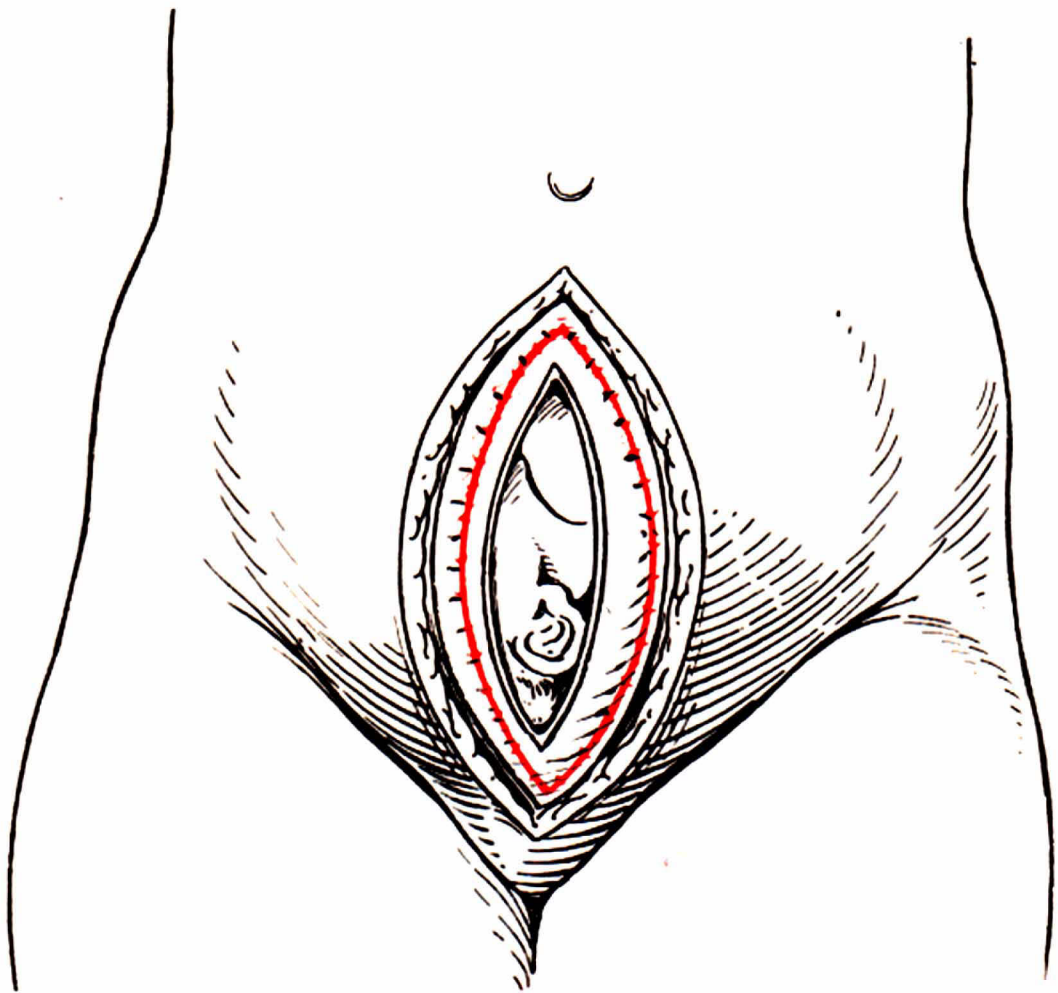


Fig. 6.—Veit-Fromme operation, 1908.

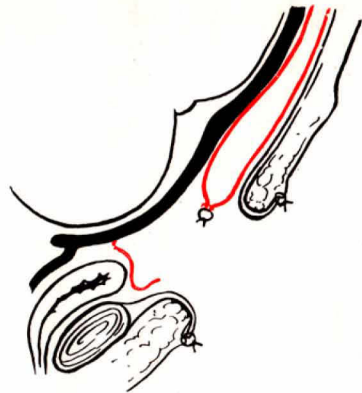
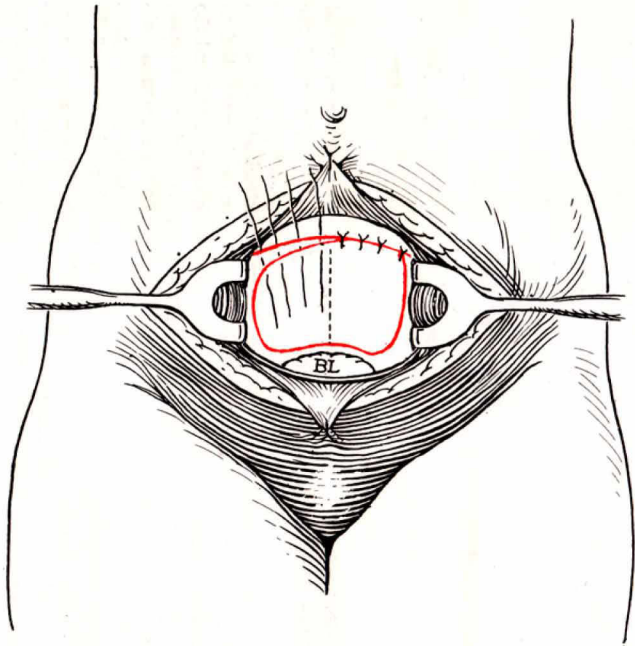


Fig. 7.—Sellheim's third method, 1908.

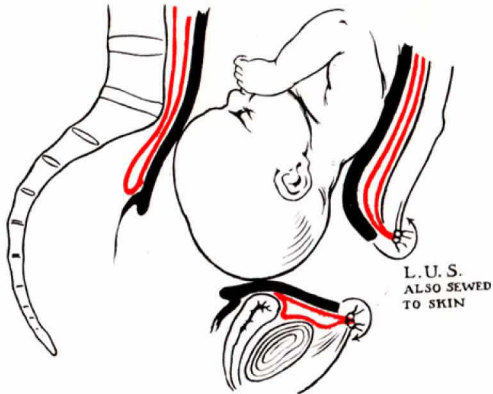
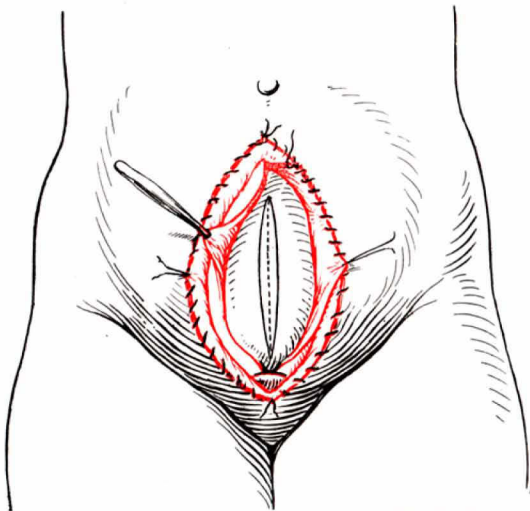


Fig. 8.—Sellheim's uteroabdominal fistula.

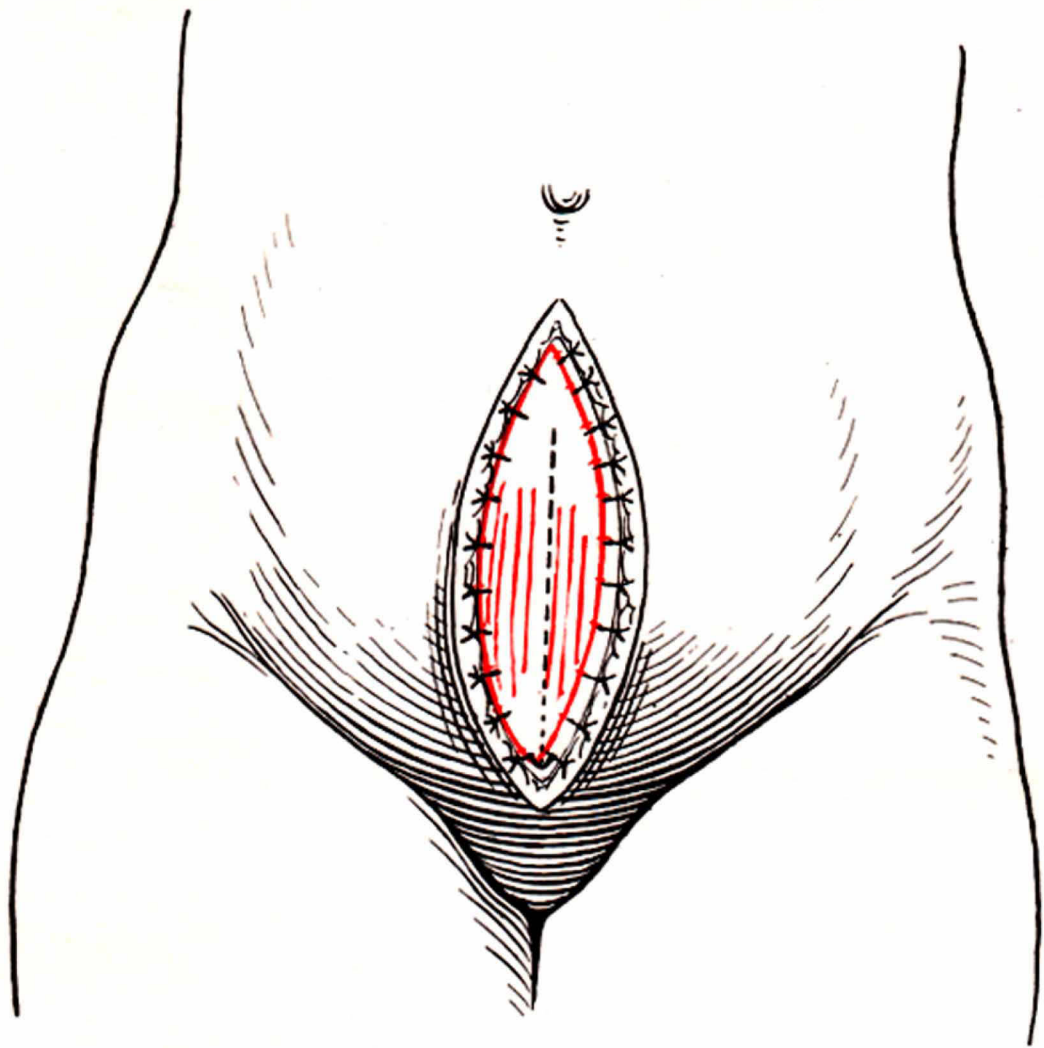


Fig. 9.—Rubeska's operation.

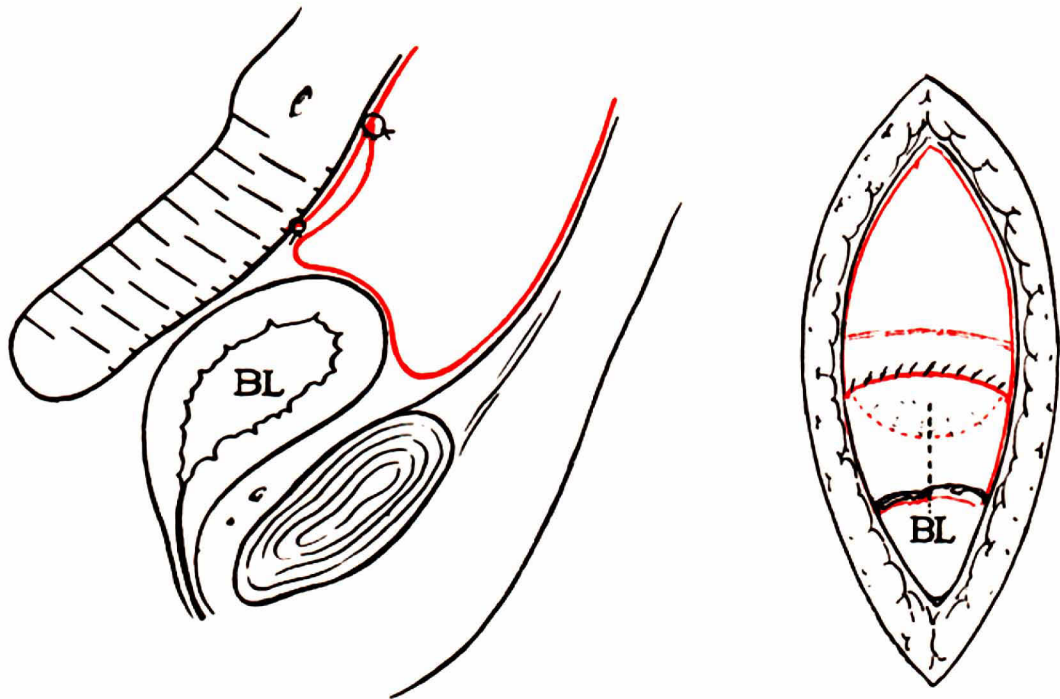


Fig. 10.—Operation of Beck and De Lee.



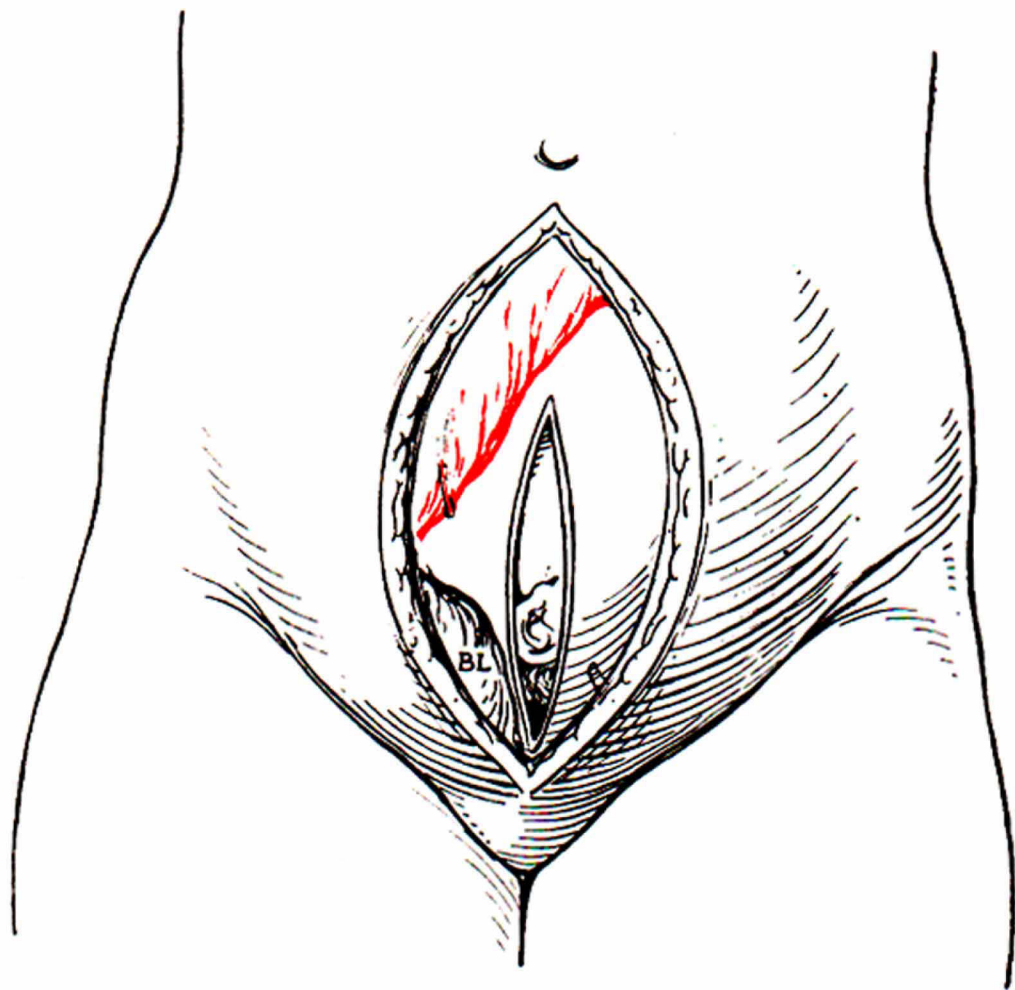


Fig. 11.—Latzko's operation, 1908.