

generally be effected without any particular difficulty. Dr. Kidd, of Dublin,¹ who strongly advocated this operation, recommended that an ordinary male elastic catheter, strongly curved and mounted on a firm stilet, or, still better, on a uterine sound, should be passed round the neck. Previous to introduction a cord should be passed through the eye of the catheter, which is left round the neck when it is withdrawn. By means of this cord a strong piece of whipcord, or the wire of an écraseur, can easily be drawn round the neck and used for dividing it. The former, to protect the maternal structures, may be worked through a speculum, and by a series of lateral movements the neck is easily severed. The écraseur, however, offers special advantage, since it entirely does away with any risk of injuring the mother.

Withdrawal of the Body and Delivery of the Head.—After the neck is divided the remainder of the operation is easy. The body is withdrawn without difficulty by the arm, and we then proceed to deliver the head. By abdominal pressure, this, in most cases, can be pushed down into the pelvis, so as to come easily within reach of the cephalotribe, which is by far the best instrument for extraction. Preliminary perforation is not necessary, since the brain can escape through the severed vertebral canal. The secret of doing this easily is to fix and press down the head sufficiently from above, otherwise it would slip away from the grasp of the instrument. The perforator and craniotomy forceps may be used, if the cephalotribe be not at hand. Perforation is, however, by no means always easy, on account of the mobility of the head. After it is accomplished, one blade of the craniotomy forceps is passed within the skull, the other externally, and the head slowly drawn down.

Evisceration.—The alternative operation of evisceration is a much more troublesome and tedious procedure, and should only be used when the neck is inaccessible. The first step is to perforate the thorax at its most depending part, and to make as wide an opening into it as possible, in order to gain access to its contents. Through this the thoracic viscera are removed piecemeal, being first broken up as much as possible by the perforator, and then, the diaphragm being penetrated, those in the abdomen. The object is to allow the body to collapse and the pelvic extremities to descend, as in spontaneous evolution. This can be much facilitated by dividing the spinal column with a strong pair of scissors introduced into the opening made in the thorax, so that the body may be doubled up as on a hinge. Here the crotchet may find a useful application, for it can be passed through the abdominal cavity and fixed on some point in the interior of the child's pelvis, and thus strong traction can be made without any risk of injury to the mother. It can be readily understood that this process is so lengthy and difficult as to render it probably the most trying of obstetric operations; it is certainly inferior in every respect to decapitation, and is only to be resorted to when that is impracticable.²

¹ Dublin Quart. Journ. of Med. Science, 1871, vol. II, p. 383.

² In nine cases of impaction of the fœtus in a transverse position, in the United States, the Cæsarean operation has been performed, owing to great difficulty in accomplishing either decapitation or evisceration, and six of the women were saved. The three deaths were from exhaustion.—Harris's note to third American edition.

CHAPTER VI.

THE CÆSAREAN SECTION—PORRO-CÆSAREAN OPERATION.

History of the Cæsarean Section.—The Cæsarean section has perhaps given rise to more discussion than any other subject connected with midwifery, and there is yet much difference of opinion as to the limits of, and indications for, the operation. The period at which the Cæsarean section was first resorted to is not known with accuracy. It seems to have been practised by the Greeks, after the death of the mother; and Pliny mentions that Scipio Africanus and Manlius were born in this way. The name of Cæsar is said to have been given to children so extracted, and afterward to have been assumed as a family patronymic. These children were dedicated to Apollo, whence arose the practice of things sacred to that god being taken under the special protection of the family of the Cæsars. Many celebrities have been supposed to owe their lives to the operation, among the rest Æsculapius, Julius Cæsar, and Edward VI. of England. Regarding the two latter, there is conclusive proof that the tradition is without foundation. There is no doubt that the operation was constantly practised on women who had died at an advanced period of pregnancy, and indeed it has, at various times, been enforced by law. Thus, among the Romans it was decreed by Numa that no pregnant woman should be buried until the fœtus had been removed by abdominal section. The Italian laws also made it necessary, and the operation has always received the strong support of the Roman Church. So lately as the middle of the eighteenth century, the King of Sicily sentenced to death a physician who had neglected to practise it. The first authentic case in which the operation was performed on a living woman occurred in 1491. It was afterward practised by Nufer in 1500^[1]; and in 1581 Rousset published a work on the subject in which a number of successful cases were related. In English works of that time it is not alluded to, although it was undoubtedly performed on the Continent, and to such an extent that its abuse became almost proverbial. We have evidence in Shakespeare, however, that the operation was familiarly known in Great Britain, since he tells us that—

Macduff was from his mother's womb
Untimely ripped.

[This is much more likely to refer to a horn-rip, as the original expression, "ripped out," would indicate. Fourteen such operations under the horn-thrusts of the bull, ox, cow, bison, and buffalo have been recorded, and ten women with seven children escaped death. Mrs.

[1 1498.—Ed.]

Macdull was probably operated upon by a cow.—Ed.] Paré and Guillemeau, amongst the writers of the period, were noted for their hostility to the operation, while others equally strongly upheld it.

In England it has, until recently, scarcely ever been performed in a manner which offers even the faintest hope of success. It has been looked upon as almost necessarily fatal to the mother, and it has, therefore, been delayed until the patient has arrived at the utmost stage of exhaustion. For example, in looking over the records of British cases, it is no uncommon thing to find that the Cæsarean section was resorted to, two, three, or even six days after labor had begun, and when the patient was almost moribund. With rare exceptions [up to] within the last few years, the operation has been performed [in England] in what may be called a hap-hazard way. In many cases long and fruitless attempts at delivery by craniotomy had already been made, so that the passages had been subjected to much contusion and violence. Little or no attempt has been made to obviate the well-known risks of abdominal operations; no care has been taken to prevent blood and other fluids finding their way into the peritoneal cavity, and no means have been adopted subsequently to remove them. It is, therefore, not so much a matter of surprise that the mortality has been so great, but rather that any cases have recovered.

From what we know of the history of ovariectomy, its early fatality, and the extreme and even apparently exaggerated precautions which are essential to its success, it is fair to conclude that, if the Cæsarean section were performed, as it is to be hoped it always will be in future, with the same careful attention to minute details as ovariectomy, the results would not be so disastrous. Making every allowance for these facts, it must be admitted that the Cæsarean section, as hitherto performed, has been necessarily almost a forlorn hope; although happily recent statistics show that this need no longer be considered the case. In making these observations I have no intention of contesting the well-established rule of British practice that it is not admissible as an operation of election, and must only be resorted to when delivery *per vias naturales* is impossible.

Statistical Returns are not Reliable.—The mortality, as given in statistical returns from various sources, differs so greatly as to make them but little reliable. Radford has tabulated the operations performed in England up to 1879, and the list has been completed by Harris up to 1889. The cases amount to 154 in all, of which 32 were successful. Michaelis and Kayser [1833 and 1841] found that out of 258 cases and 338 operations, 54 and 64 per cent. respectively were fatal. These include operations performed under all sorts of conditions, even when the patient was almost moribund; and until we are in possession of a sufficient number of cases performed under conditions showing that the result is certainly due to the operation—in which it was undertaken at an early period of labor and performed with a reasonable amount of care—it is obviously impossible to arrive at any reliable conclusions as to the mortality of the operation. That it is necessarily hopeless is certainly not the case, and we know that on the Continent, where it is resorted to much oftener and earlier in labor than in Eng-

land, there are authentic cases in which it has been performed twice, thrice, and even, in one instance, four times on the same patient. Kayser [1841] thought that a second operation on the same patient afforded a better prognosis than a first, probably because peritoneal adhesions, resulting from the first operation, have shut off the general abdominal cavity from the uterine wound; and he believed that in second operations the mortality is not more than 29 per cent.

The Cæsarean Section in America.—The Cæsarean section [thus far] has been more successful in America than in Great Britain. Dr. Harris, of Philadelphia, who has paid much attention to the subject, has collected 234 cases occurring in the United States, of which 105, or over 44 per cent., were successful as regards the mother.^[1] These favorable results he refers partly to the fact that none of the American cases were the subjects of mollities ossium, rachitic patients forming one-half of the entire number. He also gives some interesting facts showing how remarkably the mortality of the operation was lessened under the old method, when performed soon, and the patient was not exhausted by long and fruitless labor. Out of 28 selected cases of this kind, 21, or 75 per cent., were successful. The latest European statistics show that the modifications of the operation now universally adopted upon the Continent of Europe are followed by the most gratifying results. [Of 54 women operated upon in Leipzig, 51 recovered; 34 were saved out of 38 in Dresden; 16 were delivered under the section in the Krankenhaus of Vienna, in order, without a death, and Dr. Murdoch Cameron, of Glasgow, has only lost 3 out of 30. Here we have a record of 138 cases with 128 recoveries, a mortality of 7½ per cent., showing the possibilities of this method of delivery in well-appointed maternities, and under competent operators. In view of these facts, we are inclined in our country to estimate the danger of the operation according thereto.—Ed.]

Results to the Child.—The mortality of the children likewise cannot be ascertained from statistical returns, since, in the large majority of cases in which dead children were extracted, the result had nothing to do with the operation. Indeed, there is nothing in the operation itself which can reasonably be supposed to affect the child. If, therefore, the child be alive when the operation is commenced, there is every probability of its being extracted alive; and Radford's conclusion, that "the risks to infants in Cæsarean births is not much greater than that which is contingent on natural labor, provided correct principles of practice are adopted," probably very nearly represents the truth.

Causes Requiring the Operation.—The Cæsarean section is required when there is such defective proportion between the child and the maternal passages that even a mutilated foetus cannot be extracted. This in by far the greatest number of cases is due to deformity of the pelvis arising from rickets or mollities ossium. The latter may occur in a patient who has been previously healthy, and who has given birth to living children. It is a more common cause of the extreme varieties

^[1] By the old method, 146, with 90 deaths—and by the new, 79, with 29 deaths. 2 died out of the last 20.—Ed.]

of deformity than rickets; and out of 132 British cases tabulated by Radford, in 56 the deformity was produced by osteomalacia, and in 31 by rickets.^[1] In certain cases the pelvis itself may be of normal size, but has its cavity obstructed by a solid tumor of the ovary, of the uterus itself, or one growing from the pelvic wall. The obstruction may also depend on morbid conditions of the maternal soft parts, of which the most common is advanced malignant disease of the cervix. Other conditions may, however, render the operation essential. Thus Dr. Newman² recorded a case in which he performed it for insurmountable resistance and obstruction of the cervix, which was believed at the time to be caused by malignant disease. The patient recovered, and was subsequently delivered naturally, and without anything abnormal being made out. This renders it probable that the disease was not malignant, and it may possibly have been an extensive inflammatory exudation into the tissues of the cervix, subsequently absorbed. I myself was present at a Cæsarean section performed in Calcutta in the year 1857, when the pelvis was so uniformly blocked up with exudation, probably due to extensive pelvic cellulitis or hæmatocele, that the operation was essential.

Limits of Obstruction Justifying the Operation.—Different accoucheurs have fixed on various limits for the operation. Most British authorities are of opinion that it need not be resorted to if the smallest diameter of the pelvis exceed one and a half inches.³ This question has already been considered in discussing craniotomy, and it has been shown that a mutilated fœtus may be drawn through a pelvis of one and a half inches antero-posterior diameter, provided there be a space of three inches in the transverse diameter. If sufficient space for using the necessary instruments does not exist, the Cæsarean section may be required, even when there is a larger antero-posterior diameter than one and a half inches. This is especially likely to occur when we have to do with deformity arising from mollities ossium, in which the obstruction is in the sides and outlet of the pelvis, the true conjugate being sometimes even elongated. On the Continent the Cæsarean section is constantly practised as an operation of election when the smallest diameter measures from two to two and a half inches; and when the child is known to be alive, some foreign authors recommend it when there is as much as three inches in the antero-posterior diameter. In Great Britain, where the life of the child is most properly considered of secondary importance to the safety of the mother, we cannot fix one limit for the operation when the child is living, and another when it is dead. Nor, I think, can we admit the desire of the mother to run the risk, rather than sacrifice the child, as a justification of the operation, although this is laid down as an indication by Schroeder.⁴ Great as are the dangers attending craniotomy in extreme deformity, there can be no doubt that we must perform it whenever it is prac-

[1] Observations on the Cæsarean Section, etc., 2d edition, 1880.—Ed.]

² Obst. Trans., 1866, vol. vii. p. 343.

³ In Dr. Parry's table of 70 craniotomies, there are 34 cases of two to two and a half inches conjugate. [British authorities are changing their views very materially in regard to the applicability of the Cæsarean section to cases formerly delivered by craniotomy.—Ed.]

⁴ Manual of Midwifery, p. 202.

ticable, and only resort to the Cæsarean section when no other means of delivery are possible.^[1]

For this reason I think it unnecessary to discuss the question whether we are justified in destroying the fœtus in several successive pregnancies, when the mother knows that it is impossible for her to give birth to a living child. Denman was the first to question the advisability of repeating craniotomy on the same patient. Amongst modern authors Radford took the most decided view on this point, and distinctly taught that even when delivery by craniotomy is possible, it "can be justified on no principle, and is only sanctioned by the dogma of the schools, or by usage," and that, therefore, the Cæsarean section should be performed with the view of saving the child. Doubtless much can be said from this point of view; but, nevertheless, he would be a bold man who would deliberately elect to perform the Cæsarean section on such grounds.² It is to be hoped, however, that in these days the induction of premature labor or abortion would always spare us the necessity of deciding so delicate a point.

[One of the vital questions of the day is, "Shall the Cæsarean operation be performed in cases under *relative indications*?" That is, Is it proper to elect to perform the operation where the indications for it are not absolute and positive? If by fetal destruction the mother can in all probability be saved, is it a justifiable act to run a greater risk in order to save the child? Are the wishes of the parents for a living child to be considered in deciding as to the method of delivery? In view of the fact that a premature delivery cannot save the child in a given case, and the mother has already lost one or more fetuses by craniotomy, is it proper to save the child by an operation in which from 6 to 10 per cent. of women die? We think it is, and should be performed.—Ed.]

Post-mortem Cæsarean Operation.—The Cæsarean section may also be required in cases in which death has occurred during pregnancy or labor. This was the indication for which it was first employed, and it has constantly been performed when a pregnant woman has died at an advanced period of utero-gestation. There is no doubt that a prompt extraction of the child under these circumstances has frequently been the means of saving its life, but by no means so often as is generally supposed. Thus, Schwarz³ showed that out of 107 cases not one living child was extracted. Duer⁴ has written an interesting paper on this subject, in which he has tabulated 55 cases of post-mortem Cæsarean sections. In 40 a *living* child was extracted, the time elapsing after the death of the mother being as follows: "Between one and five minutes, including 'immediately' and 'in a few minutes,' there were 21 cases; between five and ten minutes, none; between ten and fifteen minutes, 13 cases; between fifteen and twenty-three minutes, 2 cases;

[1] This opinion is not held in our country.—Ed.]

² This was done twice successfully by Prof. William Gibson in the case of Mrs. Reybold, of Philadelphia, in 1835 and 1837, after she had twice been delivered by craniotomy under Prof. Charles D. Meigs, who declined destroying any more children for her.—Harris's note to third American edition.

³ Monats. f. Geburt., suppl., 1862, Bd. xviii. S. 112

⁴ "Post-mortem Delivery," Amer. Journ. of Obst., 1870, vol. xii. pp. 1 and 374.

after one hour, 2 cases; and after two hours, 2 cases." In those extracted, however, after the lapse of an hour, the children did not ultimately survive, and the cases themselves seem open to some doubt.

Want of Success in Post-mortem Operation.—The reason that the want of success has been so great is doubtless the delay that must necessarily occur before the operation is resorted to; for, independently of the fact that the practitioner is seldom at hand at the moment of death, the very time necessary to assure ourselves that life is actually extinct will generally be sufficient to cause the death of the fetus. Considering the intimate relations between the mother and child, we can scarcely expect vitality to remain in the latter more than a quarter or, at the outside, half an hour after it has ceased in the former. The recorded instances in which a living child was extracted ten, twelve, and even forty hours after death, were most probably cases in which the mother fell into a prolonged trance or swoon, during the continuance of which the child must have been removed. A few authentic cases, however, are known in which there can be no reasonable doubt that the operation was performed successfully several hours after the mother was actually dead.

Since, then, there is a chance, however slight, of saving the child's life, we are bound to perform the operation, even when so much time has elapsed as to render the chances of success extremely small. It might be considered almost superfluous to insist on the necessity of assuring ourselves of the mother's death before commencing the necessary incisions; but, unfortunately, numerous instances are known in which mistakes in diagnosis have been made, and in which the first steps of the operation have shown that the mother was still alive. The operation should, therefore, always be performed with the same care and caution as if the mother were living. If death has occurred during labor, some have advised version as a preferable alternative. This can only be resorted to, with any hope of success, if the passages be in a condition to admit of delivery with rapidity; otherwise the delay occasioned by dilatation, even when forcibly accomplished, and the drawing of the child through the pelvis, will be almost necessarily fatal. The only argument in favor of version is that it is less painful to the friends; and if they manifest a decided objection to the Cæsarean section, there can be no reason why an attempt to save the child in this way should not be made.

Causes of Death after Cæsarean Section.—The causes of death after the Cæsarean section may, speaking generally, be classed under four principal heads: hemorrhage, peritonitis and metritis, shock, septicæmia and exhaustion from long delay. These are pretty much the same as those following ovariectomy, and the resemblance between the two operations is so great that modern experience as to the best mode of performing ovariectomy, as well as regards the after-treatment, may be taken as a guide in the management of cases of Cæsarean section.

Hemorrhage to an alarming extent is a frequent complication, though seldom the cause of death. Thus, out of eighty-eight operations, the particulars of which have been carefully noted, severe

hemorrhage occurred in fourteen, six of which terminated successfully, and in four only could the fatal result be ascribed to the loss of blood. In one of these the source of the hemorrhage is not mentioned, in another it came from the wound in the abdominal wall, and in the other two from the uterine incision being made directly over the placenta. In neither of the two latter was the loss of blood immediately fatal; for it was checked by uterine contraction, and only recurred after many hours had elapsed. The divided uterine sinuses, and the open mouths of the vessels at the placental site, are the most common sources of hemorrhage.

Much may be done to diminish the risk of bleeding, but even with every precaution it must be a source of danger. Hemorrhage from the abdominal wall may be best prevented by making the incision as nearly as possible in the line of the *linea alba*, so as not to wound the epigastric arteries, and by controlling bleeding by pressure forceps as we proceed, as is done in ovariectomy. The principal loss of blood will be met with in dividing the uterus; and this will be the greatest when the incision is near or over the placental site, where the largest vessels are met with. We are recommended to ascertain the position of the placenta by auscultation, and thus, if possible, to avoid opening the uterus near its insertion. But even if we admit the placental souffle to be a guide to its situation, if the placenta be attached to the anterior walls of the uterus, a knowledge of its position would not always enable us to avoid opening the uterus in its immediate vicinity. We must, in the event of its lying under the incision, rather hope to control the hemorrhage by removing it at once from its attachments, and rapidly emptying the uterus. When the child has been removed there may be a large escape of blood; but this will generally be stopped by the contraction of the uterus, in the same manner as after natural labor. Should contraction not take place, the uterus may be firmly grasped for the purpose of exciting it. This plan was advocated by the late Ludwig Winckel, who had a large experience in the operation; and by using free compression in this way, and making a point of not closing the wound until the uterus was firmly contracted, he had never met with any inconvenience from hemorrhage. Säger, to whose writings we owe so much in perfecting the modern Cæsarean section, relies much on frequent kneading of the uterus during the application of the sutures. Murdoch Cameron, of Glasgow,¹ who has had the largest experience of the operation amongst British operators, recommends that the cut surfaces of the uterus should be firmly pressed together.^[2] He also places a hard-rubber oval pessary on the uterus before commencing the incision, which is made within the oval, and by this means, he says, the chance of hemorrhage is lessened. If bleeding continue, styptic applications may be used, as in a case reported by Hicks, who was obliged to swab out the uterine cavity with a solution of perchloride of iron. The method first used by Litzmann, and adopted since by many operators, of placing a soft-rubber cord around the cervix, after the uterine contents have been removed,

¹ British Med. Journ., March 7, 1889.

² Up to July 7, 1893, he operated on 30 women, and saved 27 of them.—Ed.]

will tend effectually to control hemorrhage, but Cameron objects to it as likely to induce inertia after its removal.^[1]

Among the most frequent causes of death are peritonitis and metritis. Kayser attributed the fatal results to them in 77 out of 123 unsuccessful cases.

The mere division of the peritoneum will not account for the frequency of this complication, since its occurrence is considerably more frequent than after ovariectomy, in which the injury to the peritoneum is quite as great—and indeed greater, if we take into account the adhesions which have to be divided or torn in that operation.

The division of the uterus must be regarded as one source of this danger. Dr. West lays great stress on its unfavorable condition after delivery for reparative action. He believes that the process of involution or fatty degeneration which commences in the muscular fibres previous to delivery, renders them peculiarly unfitted to cicatrize; and he points out that, on post-mortem examination, the edges of the incision have been found dry, of unhealthy color, gaping, and showing no tendency to heal. On this account Hicks and others have operated ten days or more before the full period of labor, in the hope that the risk from this source might be avoided. It is by no means certain, however, that the change in the uterine fibres is the cause of the wound not healing, and involution will commence at once when the uterus is emptied, even if the full period of pregnancy have not arrived. As a point of ethics, moreover, it is questionable if we are justified in anticipating the date of so dangerous an operation, even by a few weeks, unless the benefit to be derived is very decided indeed.

One important cause of peritonitis is the escape of the lochia through the uterine incision into the cavity of the peritoneum, which there decompose and act as an unfailing source of irritation. This may be prevented, to a great extent, by seeing that the os uteri is patulous, so as to afford a channel for the escape of discharges, and by effective closing of the uterine wound by sutures. In addition, there is the danger arising from blood and liquor amnii escaping into the peritoneum, and subsequently decomposing. There is little evidence that "la toilette du péritoine," on which ovariectomists now lay so much stress, has ever been particularly attended to in Cæsarean operations.^[2]

The chief predisposing cause of these inflammations, however, must be looked for in the condition of the patient, just as asthenic inflammation in ovariectomy is most frequently met with in those whose general health is broken down by the long continuance of the disease. We are fully justified, therefore, in assuming that peritonitis and metritis will be more likely to occur after the Cæsarean section when that operation has been unnecessarily delayed, and when the patient is exhausted by a protracted labor. In proof of this we find that, in a large proportion of the cases above mentioned, peritonitis occurred when the operation was performed under unfavorable conditions.

^[1] This has so often led to secondary hemorrhage after its removal, that the practice has been generally condemned; manual compression is much safer.—Ed.]

^[2] See German and Austrian reports of operations performed within the last ten years.—Ed.]

The sources of septicæmia are abundantly evident; not the least, probably, being absorption by the open vessels in the uterine incision.

The last great danger is general shock to the nervous system. In Kayser's 123 cases, 30 of the deaths are referred to this cause. In the large majority of these the patient was profoundly exhausted before the operation was begun. It is in predisposing to these nervous complications that we should, *à priori*, expect that vacillation and delay would be most hurtful; and in operating when the patient's strength is still unimpaired, we afford her the best chance of bearing the inevitable shock of an operation of such magnitude.

In addition, a few cases have been lost from accidental complications, which are liable to occur after any serious operation, and which do not necessarily depend on the nature of the procedure.

There is only one source of danger special to the child which is worthy of attention. As the infant is being removed from the cavity of the uterus, the muscular parietes sometimes contract with great rapidity and force, so as to seize and retain some part of its body. This occurred in two of Dr. Radford's cases, and in one of them it is stated that "the child was vigorously alive when first taken hold of, but, from the length of time occupied in extracting the head, it became so enfeebled as to show only slight signs of life," and subsequently all attempts at resuscitation failed. I have myself seen the head caught in this way, and so forcibly retained that a second incision was required to release it. In Dr. Radford's cases the placenta happened to be immediately under the incision, and he attributes the inordinate and rapid contraction of the uterus to its premature separation. It is difficult to believe that this was more than a coincidence, because the contraction does not take place until the greater part of the child's body has been withdrawn, and because numerous cases are recorded in which the uterus was opened directly over the placenta, or in which it was lying loose and detached, in none of which this accident occurred. The true explanation may, I think, be found in the varying irritability of the uterus in different cases.

Irrespective of the risk of portions of the child being caught and detained, rapid contraction is a distinct advantage, since the danger of hemorrhage is thereby thus diminished. Serious consequences may be best avoided by removing, when practicable, the head and shoulders of the child first, or by employing both hands in extraction, one being placed near the head, the other seizing the feet. Either of these methods is preferable to the common practice of laying hold of the part that may chance to lie most conveniently near the line of incision. If this point were properly attended to, although the detention of the lower extremities might occasionally occur, the life of the child would not be imperilled.^[1]

The Patient should be Prepared for the Operation.—The preparation of the patient for the operation should seriously occupy the attention of the practitioner, and this is the more essential since almost all patients requiring the Cæsarean section are in a wretchedly

^[1] Under the *old* operation the fetus was, as a rule, extracted by the feet. Cameron and some others now recommend to deliver by the head.—Ed.]

debilitated condition. If the patient be not seen until she is actually in labor, of course this is out of the question. But this will rarely be the case, since the deformed condition of the patient must generally have attracted attention. Every possible means should be taken, therefore, when practicable, to improve the general health by abundance of simple and nourishing diet, plenty of fresh air, and suitable tonics (amongst which preparations of iron should occupy a prominent place), while the state of the secretions, the bowels, skin, and kidneys, should be specially attended to. Whenever it is possible a large, airy apartment should be selected for the operation, which should never be done in a hospital, if other arrangements be practicable.^[1] These details may seem trivial and unnecessary; but to insure success in so hazardous an undertaking no care can be considered superfluous, and probably the want of attention to such points has had much to do with increasing the mortality.

The question arises whether we should operate before labor has commenced. By selecting our own time, as some have advised, we certainly have the advantage of operating under the most favorable conditions, instead of possibly hurriedly. There are, however, numerous advantages in waiting until spontaneous uterine action has commenced, which seem to me to more than counterbalance the advantages of choosing our own time. Prominent among these is the partial opening of the os uteri, so as to afford a channel for the escape of the lochia, and the certainty of active contraction of the uterus, to arrest hemorrhage. Barnes recommends that premature labor should be first induced, and then the operation performed. This seems to me to introduce a needless element of complexity; and besides, in cases of great deformity it is by no means always easy to reach the cervix with the view of bringing on labor. All needful arrangements should be made, so as to avoid hurry and excitement when the operation is commenced, and we may then wait patiently until labor has fairly set in.

The Administration of Anæsthetics.—The operation itself is simple. The patient should be placed on a table, in a good light, and with the temperature of the room raised to about 65°. Chloroform has so frequently been followed by severe vomiting, that it is probably better not to administer it. For the same reason Sir Spencer Wells has long given up using it in ovariectomy, and finds that chloro-methyl answers admirably; ether also is devoid of the disadvantages of chloroform. In one or two cases local anæsthesia has been used by means of two spray-producers acting simultaneously; and this plan, if the patient have sufficient fortitude to dispense with general anæsthesia, has the further advantage of stimulating the uterus to powerful contraction.

To insure as great a measure of success as possible, the operation should be performed with all the minute precautions used in ovariectomy.

Description of the Operation.—The incision should be made as much as possible in the line of the linea alba. On account of the deformity, the configuration of the abdomen is often much altered, and some have

^[1] Modern operators prefer hospital advantages, and the revolution in saving life has been mainly effected in well-ordered maternities.—Ed.]

advised that the incision should be made oblique or transverse, and on the most prominent part of the abdomen.^[1] The risk of hemorrhage being thus much increased, the practice is not to be recommended. The incision, commencing a little above the umbilicus, is carried down for about three inches below it. The skin and muscular fibres are carefully divided, layer by layer, until the shining surface of the peritoneum is reached, and any bleeding vessels should be secured with pressure forceps as we proceed. A small opening is now made in the peritoneum, which should be laid open along the whole length of the incision, upon two fingers of the left hand introduced as a guide. A few silk sutures, three or four, should now be passed through the upper end of the incision. The object of these is to temporarily close the abdominal parietes after the uterus is opened, so as to prevent the escape of the intestines, or the entrance of blood, etc., into the peritoneal cavity. Before incising the uterus an assistant should carefully support it in a proper position, and push it forward by the hands placed on either side of the incision, so as to bring its surface into apposition with the external wound, and prevent the escape of the intestines, and a large flat sponge should be placed on either side, between the uterus and the abdominal parietes, to prevent blood and liquor amnii entering the abdomen. If we have reason to believe that the placenta is situated anteriorly, we may incise the uterus on one or other side; otherwise the line of incision should be as nearly as possible central. The substance of the uterus is next divided until the membranes are reached; these are punctured and divided in the same way as the peritoneum. It is important not to puncture these until the uterine incision is completed, and we are ready to remove the child. The uterine incision should be of the same length as that in the abdomen, and it should not be made too near the fundus; for not only is that part more vascular than the body of the uterus, but wounds in that situation are more apt to gape, and do not cicatrize so favorably. After the uterus is opened, Dr. Ludwig Winckel has recommended that the fingers of an assistant should be placed in the two terminal angles of the wound, so that the ends of the incision may be hooked up and brought into close apposition with the abdominal opening. By this means he prevented not only the escape of blood and liquor amnii into the cavity of the peritoneum, but also the protrusion of the abdominal viscera.

Removal of the Child.—We now divide the membranes and carefully remove the child, the head and shoulders being taken out (if possible) first; the placenta and membranes are afterward extracted. Should the placenta be unfortunately found immediately under the incision, a considerable loss of blood is likely to take place, which can only be checked by removing it from its attachments and concluding the operation as rapidly as possible.

Eversion of the Uterus.—As soon as the child is removed, the uterus should be turned out of the abdominal cavity, which is temporarily closed by the sutures already introduced, and further protected by placing a large flat sponge behind the uterus. At the same time,

^[1] This was a very old recommendation; no one prefers it now.—Ed.]

hemorrhage is controlled by a rubber cord tied round the cervix.^[1] This gives time thoroughly to attend to the suturing of the uterine incision, a point of great importance. The uterus should now be surrounded by soft napkins wrung out of warm 1:2000 perchloride of mercury solution. After the placenta has been removed and the hemorrhage arrested we should see that the os uteri is open, so that any fluid in the uterine cavity may drain into the vagina. The cavity should also be dusted with iodoform.^[2]

Importance of Securing Uterine Contraction.—As soon as the child and the secundines have been extracted, the sooner the uterus contracts the better. It will usually do so of itself, but should it remain lax and flabby, it should be pressed and stimulated by the hand. We are specially warned against handling the uterus by Ramsbotham and others; but there seems no valid reason why we should not restrain hemorrhage in this way, as after a natural labor. The intervention of the abdominal parietes, in their lax condition after delivery, can make very little difference between the two cases. Ergotine administered hypodermically will also be useful in promoting efficient contraction.

Ligature of the Fallopian Tubes.—In some recent cases the Fallopian tubes have been ligatured and divided at the time of the operation, with the view of preventing future impregnation. This does not sensibly increase its risk, and seems to be a judicious precaution in any case in which the pelvis is much deformed.

Closure of the Uterine Wound.—Much of the recent success in this operation is due to the careful closing of the uterine incision by sutures. Säger, who has paid great attention to this point, used formerly to strip off the peritoneum for about five millimetres on each side of the incision, and then resect the muscular wall for about two millimetres; this, however, he has now given up. He inserts eight to ten deep sutures of silk through the peritoneum and muscle, but not through the mucosa, taking care to turn in the peritoneal edges so as to bring them into accurate contact, with the view of securing rapid adhesion. The reason for not passing the sutures into the uterine cavity is to prevent the possibility of septic material finding its way along the track of the sutures into the peritoneum. Finally he passes twenty to twenty-five fine silk sutures through the inverted edges of the peritoneum. Cameron uses only seven to twelve deep stitches of silk, and reserves superficial sutures, for which he uses gut, for any points where it might be thought advisable to insert them.

A point of great importance, and not sufficiently insisted on, is the advisability of not closing the abdominal wound until we are thoroughly satisfied that hemorrhage is completely stopped, since any escape of blood into the peritoneum would very materially lessen the chances of recovery. In a successful case reported by Dr. Newman,³ the wound was not closed for nearly an hour.^[4] Before doing so, all

^[1] Recent experience prefers manual compression, as much safer.—Ed.]
^[2] This treatment has been largely done away with. If the child is living, no internal application to the uterus is thought advisable by Cameron and other operators.—Ed.]
^[3] *Obst. Trans.*, 1867, vol. viii. p. 343.
^[4] Under the new operation, the arrest of hemorrhage is usually effected by the suturing of the uterine wound. Twenty-five years ago the uterus was very rarely sewed up; hence the precaution of Newman.—Ed.]

blood and discharges should be carefully removed from the peritoneal cavity by clean soft sponges dipped in warm water. The abdominal wound should be closed from above downward by silk sutures, which should be inserted at a distance of an inch from each other and passed entirely through the abdominal walls and the peritoneum, at some little distance from the edges of the incision, so as to bring the two surfaces of the peritoneum into contact. By this means we insure the closure of the peritoneal cavity, the opposed surfaces adhering with great rapidity. If, as should be the case, the operation is performed with full antiseptic precautions, the wound should now be dressed precisely as after ovariectomy.

Subsequent Management.—Into the subsequent treatment it is unnecessary to enter at any length, since it must be regulated by general principles, each symptom being met as it arises. It has been customary to administer opiates freely after the operation; but they seem to have a tendency to produce sickness and vomiting, and ought not to be exhibited unless pain or peritonitis indicates that they are required. In fact, the treatment should in no way differ from that usual after ovariectomy, and the principles that should guide us will be best shown by the following quotation from Sir Spencer Wells' description of that operation: "The principles of after-treatment are—to obtain extreme quiet, comfortable warmth, and apply perfectly clean linen to the patient; to relieve pain by warm applications to the abdomen, and by opiate enemata; to give stimulants when they are called for by failing pulse or other signs of exhaustion; to relieve sickness by ice, or iced drinks; and to allow plain, simple, but nourishing food. The catheter must be used every six or eight hours, until the patient can move without pain. The sutures are removed on the third day,^[1] unless tympanic distention of the stomach or intestines endangers reopening of the wound. In such circumstances they may be left for some days longer. The superficial sutures may remain until union seems quite firm."

Porro-Cæsarean Operation.—Within the last few years an important modification of the Cæsarean section has been adopted, which is generally known as Porro's operation, from Professor Porro, of Pavia, who was the first European surgeon who practised it. In this operation, after the uterus is emptied, the entire organ is drawn out of the abdominal wound and excised, its neck being first constricted so as to suppress hemorrhage, the stump being fixed externally in the manner of the pedicle in ovariectomy. The idea is by no means new. It appears to have been first suggested by an Italian—Dr. Cavallini—in 1768. In 1823 the late Dr. Blundell made the same proposal, and fortified it by experiments on pregnant rabbits, in the course of which he found that he lost all by the Cæsarean section, but saved three out of four in which he ligatured and amputated the uterus. The suggestion was not, however, carried into actual practice until Dr. Storer, of Boston, in 1869, removed the uterus in a case of fibroid tumor obstructing the pelvis and impeding delivery.

^[1] Sutures after Cæsarean section should remain from seven to ten days; even after eight days the abdominal wound has been reopened by coughing, and death has followed.—Ed.]

Since Porro's first case, the operation has been frequently performed on the Continent, with results which are, on the whole, encouraging. The cases have been carefully tabulated by Dr. Harris, of Philadelphia, who had collected up to the end of 1891, 442 cases occurring in the previous sixteen years, with 167 deaths of women and 99 of children.^[1] This is an improvement on the former figures, when the mortality was 50.6 per cent.² [This record reduces it below 40 per cent.—Ed.] The obvious advantage of this plan is, that instead of leaving the incised uterus, with its possibly gaping wound and all the attendant risk of septic mischief, in the abdominal cavity, it is fixed externally, and in a position where it can be readily dressed.

The objection is that it entirely unsexes the patient; but in the class of women requiring the Cæsarean section from pelvic deformity, it is questionable whether this can be fairly considered as a drawback. It is perhaps not justifiable to attempt as yet any positive decision as to the indications for this plan. It certainly seemed at first to be less dangerous than the Cæsarean section, but the improved results recently obtained in the latter operation have shown how it affords the patient as good, if not a better chance, without permanent mutilation, and Porro's operation probably requires for its skilful performance a more extensive experience in abdominal surgery. "It seems probable, therefore, that in future the Porro operation will be chiefly adopted when for some reason, such as the existence of fibro-myomata, the ablation of the uterus is specially indicated."

The operation in the successful cases has been performed with full antiseptic precautions, and the neck of the uterus, after the organ is emptied, carefully secured by ligatures before its body is amputated. Some operators have encircled the neck of the uterus with a chain or wire éraseur before removing it, and by this means completely controlled hemorrhage. The late Dr. Elliot Richardson³ transfixed the neck of the uterus with two large pins crossing each other, before removing the wire of the éraseur, and encircled them with stout carbonized cord. Müller, of Berne, has recommended that the entire uterus should be turned out of the abdominal cavity through a long incision, before it is emptied, so as to avoid the risk of its fluid contents entering the abdomen; but this manœuvre has not always proved feasible. The pedicle has generally been fixed in the lower angle of the abdominal wound and dressed antiseptically. In most cases one or more drainage-tubes have been used, either through Douglas's space or in the abdominal wound.

Frank⁴ recommends a modification of this operation, in which the uterus is amputated through the vagina. After incising the uterus and removing the child, he inverts the uterus and applies an elastic ligature round it and the ovaries outside the vagina. He now closes the abdominal wound, as in ovariectomy, and subsequently amputates the uterus below the ligature, separating and sewing the peritoneum over

^[1] The mortality under the last 100 recorded was 14.—Ed.]

² See Godson on Porro's Operation, Brit. Med. Journ., 1884, and note to 7th ed., vol. ii. p. 243.

³ Amer. Journ. of Med. Sciences, 1881.

⁴ Arch. f. Gynäk., Bd. xl. S. 117.

the stump. The operation is said to be very simple, and seven out of the eight cases he has thus operated on recovered.¹

[The Cæsarean Section of 1893.—It may be of interest to go back fifty or sixty years and quote the opinions then held, and estimates of mortality then made; but it will be much more profitable to consider what has been done in the last decade, and what is being done now.

One of the great obstacles to success in the operation has been a fear to perform it, because of its fatality; and this dread of the issue has been a chief factor in determining the measure of its danger. British opinion has, until quite recently, had much to do with moulding that of our own obstetric surgeons; but thanks to recent successes in America and Continental Europe, we are beginning to think more independently, and to look upon this form of delivery with far less anxiety and fear than formerly.

Even Great Britain, through her younger accoucheurs, has recently shown signs of a change of base, under the influence of the already quoted successes of Murdock Cameron, which will be much more potent than the still better results in Leipzig, Dresden, and Vienna, because accomplished at home.

In our own country we are slowly doing better, and the work of the last three years (August, 1890, to August, 1893) shows a record of 28 cases, with four women and four children lost. These women died after labors respectively of twelve days, seven days, three days; and one fetus was stillborn; one was delivered in a dying state; a third was of six months' gestation, but alive; and the fourth lived two days. Three of these infants were the offspring of mothers who were also lost.

One thing we can be certain of, *i. e.*, that but few women will die in this country as a result of the Cæsarean operation under good hands, where there is good ground upon which to base a favorable prognosis. In the cases of eight women where I made this estimate, there was not one that terminated fatally. In one, labor had just begun; in another it had lasted a few hours, with slight pains; in two, it was induced; and in four, it had not commenced. We have operators in New York, Philadelphia, and Baltimore who are convinced that the operation, performed a few days prior to the time for labor to set in, has decided advantages over that where the hour is determined by the commencement of parturition. The fear that the cervix may not be sufficiently patulous for drainage, or that the uterus will not properly contract, appears to be groundless. It must be a very ex-

¹ It may interest the reader to learn the views of my American editor, Dr. Harris, of Philadelphia, on this subject. It is well known that Dr. Harris has devoted an immense amount of time and labor to the study of these operations, on which he may be taken to be one of our most reliable authorities. He says: "We believe that the Porro operation will, in all probability, meet with better success than 'the conservative,' in Great Britain, from the fact that the last five cases in order have recovered. Holding the views there generally advocated, the section will only be made in badly deformed rachitic dwarfs and in the subjects of malacosteon, which are much more frequently thus delivered than the former. These will probably do better under the exsective method, which besides has the advantage that it sometimes cures malacosteon, as shown by the results in Continental Europe."—Harris, note to seventh American edition.

[The remarkable successes (1888-1893) of Dr. Murdock Cameron, of Glasgow, have set this opinion aside. The Porro operation should be elected in cases of osteomalacia, as the disease has been arrested by it in a number of instances.—Ed.]

ceptional case where this organ is not excited to action by incising its wall. We have only to look at the effect of Cæsarean horn-rips, to determine the action of the uterus when it is opened before labor.

What is wanted in England, and especially in London, is more hopefulness in the operation, and this can only be begotten by a careful examination of the record of the past decade. Let someone collect the cases, and present the causes of success and failure; and it will soon be learned how death is to be avoided. The death-rate in London is placed conjecturally at 50 per cent.; but it should be known what it is positively. If it is as much as one-half, it can certainly be reduced. Recently a rachitic primipara from Yorkshire, of four feet six inches, was operated upon in Philadelphia, and is now rapidly recovering. We expected to save her and her child, and are not surprised at the result. If this can be attained here, upon an English woman, why not in London? It should be borne in mind that a very short labor is often the key-note to a recovery and a saved foetus.

Sänger, of Leipzig, and his followers in Germany, Austria, and America, have shown the capabilities of Cæsarean surgery where the cases are treated antiseptically and the uterine wound closed by multiple suturing of silk. Ovarian exsection has largely removed the old fear of celiotomy; and we know now that if the mother and child are in a hopeful condition, skill and care will usually avail to save both. There need be no fear that the uterine wound will not readily heal, for it has been found well closed, in a case that died in twenty-six hours, in Philadelphia, from conditions existing prior to the operation. There is nothing in the idea that the process of involution in the uterus is antagonistic to that of union by the first intention. When the uterine wound was not closed, or when it was sutured with catgut, gaping often took place, but it does not do this now, where the individual tension is made light by being divided among many sutures of carbolized silk. It is not required to use fifty stitches, as has been done in a few instances, but a dozen each of deep and superficial will make a good average. A dozen or even less of deep stitches alone have answered in the Cameron cases; but we prefer the example of Leipzig and Dresden, where the maternal loss has been $7\frac{1}{2}$ per cent. It should be remembered that a uterus heals the most readily whose muscular fibres have not been overtaxed and injured by long-continued and fruitless action, and it should be borne in mind that anæmia from hemorrhage, a dead foetus *in utero*, and the exhaustion of long labor, favor the production of sepsis, septic peritonitis, and fatal shock. Where the uterus contains a decomposing foetus, the Porro exsection should be performed as the only hope of avoiding death by septic absorption; cures have been secured in this way under very desperate conditions.—ED.]

CHAPTER VII.

CÆLIO-ELYTROTOMY [†] AND SYMPHYSEOTOMY.

BEARING in mind the great mortality attending the Cæsarean section, it is not surprising that obstetricians should have anxiously considered the possibility of devising substitutes which should afford the mother a better chance of recovery. Two proposals of this kind have been suggested, and from both great results were anticipated.

Cælio-elytrotomy.—One of these is the operation of cælio-elytrotomy as perfected by Thomas, of New York, in 1870. For some years subsequent to that date it attracted considerable attention and was frequently performed. The results were on the whole promising: out of fourteen cases, seven mothers recovered and nine children were born alive; and there was good reason to expect a still higher success as the technique of the operation was perfected and greater experience was acquired in its performance. The improved Cæsarean section and Porro's operation have, however, of late years shown such good results that cælio-elytrotomy has fallen into disfavor. It does not appear to have been performed since 1887, and as it is a complex and difficult procedure it is not likely again to be adopted; nor, with the lessened mortality of the Cæsarean section, is there any reason why it should be. I, however, retain the account of it as a matter of obstetric interest.

History.—The earliest suggestion of a procedure of this character seems to have been made by Joerg in the year 1806, who proposed a modified Cæsarean section without incision of the uterus, by the division of the linea alba and of the upper part of the vagina, the foetus being extracted through the cervix. This suggestion was never carried into practice, and it is obvious that it misses the one chief advantage of cælio-elytrotomy, the leaving of the peritoneum intact. In 1820 Ritgen proposed and actually attempted an operation much resembling Thomas's, in which section of the peritoneum was avoided. He failed, however, to complete it, and was eventually compelled to deliver his patient by the Cæsarean section. In 1823, Baudelocque the younger, independently conceived the same idea, and actually carried it into practice, although without success. Lastly, in 1837, Sir Charles Bell suggested a similar operation, clearly perceiving its advantages. Hence it appears that previous to Thomas's recent work in the matter, the operation was independently invented no less than three times. It fell, however, entirely into oblivion, and was only occasionally mentioned in systematic works as a matter of curious obstetric history, no one apparently appreciating the promising character of the procedure.

[† From *collio*, the abdomen; *elytron*, the vagina, and *tomos*, to cut.—ED.]