Further observations on the Caesarean section / by Thomas Radford.

FURTHER OBSERVATIONS

ON THE

CAESAREAN SECTION

BY

THOMAS RADFORD, M.D., F.R.C.P.Ed.,

HONORARY CONSULTING-PHYSICIAN TO ST. MARY'S HOSPITAL, MANCHESTER; ETC.

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FURTHER OBSERVATIONS ON THE CÆSAREAN SECTION.

In the present communication, it has been my object to register all cases of Cæsarean section, published and unpublished, which (as far as I have been able) have occurred in Great Britain and Ireland since the publication of my former observations (British Medical Journal, 1865, vol. i, p. 211), to which I beg to refer my readers, as it is quite impossible, and indeed unnecessary to enter, at the present time, upon all those subjects which are legitimately concerned in the consideration of this operation, as one of election, or even as one of necessity. The concentration of, or reference to, all cases of this important operation, especially as it is not universally adopted, or even recognised, is most valuable to those members of the profession who are desirous to analyse and compute the risk and dangers of it, in comparison with the results of those alternative operations which are recommended to supersede its performance, and thereby to satisfy themselves whether the unfortunate results of this (the Cæsarean section) are really attributable to it, or to other factors of mischief not necessarily belonging to it.

The annexed tables are very limited when compared with those from which they have been extracted, and which embrace the following points; the number and kind of previous labours; the mode of delivery; the tangible state of the os uteri; the situation of the placenta; the line of the incision; the previous and present constitutional state; the administration of chloroform; the application of ether-spray; the reputed cause of death; and the results of the *post mortem* examination. I have enumerated the above points, which head the columns in the said tables, in order that the reader may understand upon what plan I have based my deductions.

I take this opportunity of returning my sincere thanks to Dr. Frederic Bird and to Dr. J. Braxton Hicks, for their great kindness and liberality in furnishing me notes of three unpublished cases of Cæsarean section; and also to Dr. Greenhalgh, Dr. Eastlake, Dr. Pirrie, and

Dr. John Taylor, for having supplied me with additional and important particulars relative to their published cases.

There are nineteen cases tabulated, of which number seventeen have occurred in England, one in Scotland, and one in Ireland. I may again remark, that it is a remarkable fact that there is no case recorded from Wales. The causes which have rendered the operation necessary in these nineteen cases are as follows. In two the pelvis was distorted from mollities ossium; in four it was caused by rickets; in one the pelvic bones were undeveloped, and the apertures diminished—characteristically partaking of the oblique shape described by Naegelé, only differing in having both sides, although not equally, affected; in four cases the obstacle was caused by pelvic distortion, but the character of the deformity is not mentioned; in one a large exostosis, springing from the upper portion of the sacrum, caused the difficulty; in one it was produced by a large fibrous tumour impacted in, and blocking up, the pelvic cavity; in four cases carcinomatous degeneration of the cervix and os uteri, and in one case of the rectum, rendered the operation necessary; in one case the operation was performed on account of a large hydatid cyst, which had passed from the abdomen into the pelvis, and was placed before, and compressed by, the advancing head of the infant; it was so hard as to be mistaken for a bony growth. Although the diminution of the pelvic apertures has been deemed sufficient in these cases to prevent the delivery *per vias naturales*, yet it must ever be borne in mind that the cause of mischief in most of them is not stationary, but progressive, so that ultimately the pelvis might be as nearly as possible completely blocked up. In one case (79) the error of diagnosis which was made, was proved by the *post mortem* examination. It might have been obviated by an earlier examination, before the cyst had been so firmly compressed. Puncture of it at an early stage of labour would doubtless have removed the cause of obstruction. In some of the cases the os uteri could not be felt; whilst in others it could only be reached with great difficulty. There is ample evidence in all (but one) of these cases to prove the necessity of the Cæsarean section. The mechanical obstruction which existed is sufficient to demand its performance; but the unsuccessful attempts made in some of them, by some of our most experienced obstetricans, to deliver by craniotomy, embryotomy, etc., afford further corroborative evidence that this operation cannot be eliminated, but it must stand at least as one of necessity, which neither craniotomy, cephalotripsy, the induction of premature labour, or of abortion, can supersede.

Statistics.—The results of the Cæsarean section in reference to

the mothers are very unfavourable; of the 19 women whose cases are tabulated 15 died, or 78.94 per cent.; four, or 21.05 per cent., were saved. In one of these cases, the report extends only to 48 hours after the operation. Further information I have not received, although I sought for it. From the 19 women the same number of infants were extracted, of which number 13, or 72.22 per cent. were saved.* Two of this number afterwards died, one being very small and feeble; the other premature, being only six months and a-half. These two infants were the offspring of women suffering under cancerous degeneration of the cervix and os uteri. Of the entire number, five, or 26.31 per cent., were dead when extracted.

MATERNAL MORTALITY.—The maternal mortality is shown above to be very great; and it is of the highest importance to ascertain what has caused such a fatality. We find that the constitutional state of nearly all the women who underwent this operation was in a most unfavourable condition to bear it without great hazard; and in several of them the pelvic organs and tissues had suffered from pressure. Seven of these women laboured under progressive and incurable disease, with four of whom it was malignant, there being cancerous degeneration of the cervix and os uteri, and one of the rectum; one was nearly bed-ridden, and suffered from mollities ossium. Four women were rickety, and greatly exhausted; one of them was a dwarf, and had had craniotomy unsuccessfully performed after a very long labour. In one the infant presented footling, and, after fruitlessly drawing down the feet, breech, and arms, the head was perforated, and the cephalotribe unsuccessfully attempted to be used. The body was afterwards dragged away, leaving the head behind, which afterwards escaped into the abdomen through a rent of uterine tissue. One was greatly exhausted, and suffered from considerable pelvic mischief. Another suffered from great exhaustion, and had endured a long labour; the infant's arm presented; turning was attempted, and the blunt hook and cephalotribe were unsuccessfully used; the muscular tissue of the uterus was torn. Two of the women who died were not in a bad constitutional state. One of them had a large fibrous tumour, which blocked up the pelvis. In the other, pelvic deformity existed, and she had labour induced at eight months and a-half. In two cases we have no account.

EXHAUSTION.—Exhaustion is stated to be the only cause of death in eight cases; in one of which labour is stated to have existed some days—eight days after the rupture of the membranes. Several of the abdom-

* In one case (82), there is no account whether the infant was living or dead; if living, which is most likely, the number saved would stand 14, or 73.68 per cent.

inal organs were diseased; there was also a large hydatid cyst, extending from the liver into the pelvis, which was the obstructive cause of labour. In one the membranes had ruptured ten days before, and active labour had existed several hours. Several of the abdominal organs were diseased, and the os and cervix uteri were affected with cancerous degeneration. One woman, who had not commenced labour, sank on the sixth day after the operation from the exhaustive influence of a large cancerous growth. One woman was four days in labour, and was in a bad state of health when it commenced. In one, the duration of labour was, as far as can be computed, from 70 to 80 hours; the membranes had ruptured 96 hours before the operation was performed, and several unsuccessful manual and instrumental attempts had been made to deliver the woman; rupture of the uterus had taken place. Another patient was only in labour 28 hours, or thereabout, after the discharge of the liquor amnii, but craniotomy had been unsuccessfully performed, and the infant's body had been forcibly dragged away, leaving the mutilated head *in utero*, which afterwards passed into the abdomen through a rent in this organ. One woman, a dwarf, is reported to have died exhausted, who was in labour 72 hours; her infant had been unsuccessfully craniotomised. The death of one woman is assigned to exhaustion; she was in labour only 12 hours, and delivery was obstructed by a large fibrous tumour. On an attentive consideration of the circumstances of the aforesaid cases, there exists abundant evidence in all (with the exception of the last case) of what were the real causes of the failure of the vital powers.

PERITONITIS.—Peritonitis is recorded as the cause of death in six cases. In one, the duration of labour was 66 hours; the woman was likewise in a bad constitutional condition. In one, it was 112 hours. This woman was also in a bad state of health. In one case, the woman was in labour 48 hours; and at least 30 to 40 hours after the discharge of the liquor amnii. The cervix uteri was soft and dark coloured, and the os was patulous and nearly black, as if gangrenous. The internal surface of the uterus was darker and rougher than natural. In one case, labour had lasted 96 hours; and the woman was greatly exhausted at its commencement. In one case, it is stated the waters had been discharged 10 days before the operation; but active labour had only existed 3 or 4 hours. She had cancerous degeneration of the cervix uteri, and was completely anæmic from previous losses of blood, and there existed disease in the liver, spleen, and other organs. In one case there was "slight injection of the peritoneum." The operation was performed at 8½ months of pregnancy. Labour was induced by "secale". Long duration of labour stands pro-

minently forward in nearly all those cases of Cæsarean section, in which death has been recorded as having been caused either by *exhaustion* or by *peritonitis*. Protraction in labour ought at all times to be considered as a factor of danger. The mischief inflicted varies in degree in different cases, according as there may exist different relative circumstances; but it is an indisputable fact, that danger nearly always increases in proportion to the duration of labour. There are doubtless other contingent conditions which aggravate the effects thus produced; such as the early evacuation of the liquor amnii; the kind and degree of the obstacle which impedes the progress of the infant through the pelvis; or a low constitutional and local state of vital power. In most of the aforesaid fatal cases, some, if not all, of these elements of mischief existed.

HÆMORRHAGE.—Hæmorrhage during labour is an accident which is generally attended with great peril to the mother, and claims the gravest consideration and attention of the obstetrician. Every case, however slight it may appear, claims his anxiety and care. There is, however, one consolation: he has the means, if he exercise judgment, to arrest the danger of some of the most appalling cases. But it may be reasonably supposed that hæmorrhage is a more serious factor of danger in Cæsarean cases than in labours in general. The sources whence blood is discharged, during and after the operation, are from the incised edges of the abdominal and uterine wounds; and when the placenta is located under the line of the incision, it may be cut, and the blood issues from its divided structure; or, if this organ be torn, it then flows from its disruptured tissue. So, also, if the placenta be detached from the uterus, when atonic, then blood is poured out from the sinuous openings. It is a remarkable fact, that there has been very little blood lost in the great majority of the (19) recorded cases of Cæsarean section. In eight of these cases the placenta adhered to the anterior part of the uterus; in four of which there was very little bleeding. The placenta was not cut during the operation, but it was very cautiously and only partially detached, so as just to admit the hand of the operator. But in the other four of these cases (placenta anteriorly placed), the bleeding which proceeded from the edges of the uterine wound was profuse; in two of them the placenta was cut into, and in the other two cases this organ was completely separated and removed by the operator before he passed his hand into the uterus to extract the infant. In eight of the entire number, the placenta was situated on the posterior part of the uterus; in two of the cases, there was a considerable loss of blood; in five, there was very little lost; and in one there was no bleeding. Chloroform was administered in ten cases; in five of which, there was only a little blood lost; in

four, the bleeding was very great. Ether-spray was used in four cases, in which there was very little blood lost. The factors of hæmorrhage in Cæsarean cases are the same as those which operate in all kinds of labour, with an additional one, the incised edges of the abdominal and uterine wounds. Whatever diminishes the contractile power of the uterus, nearly always produces this accident. It has already been mentioned that there is no cause which is more influential in weakening the vital energy of the uterus, than protracted labour. We find that those who lost the most blood were in labour for a considerable length of time. One was from 70 to 80 hours; one 112 hours; one 66 hours; and in one the membranes had been ruptured ten days, and active labour had existed several hours. This woman suffered under cancerous degeneration of the cervix uteri, and her general health was very much impaired by loss of blood and other discharges which she had during her pregnancy.

Successful Cases.—The tabulated record contains four cases of recovery after the Cæsarean section. In one case, enumerated as one of success, I can only state what has been given to the profession. It is registered (91) in the tables; and the report made by the operator only extends to forty-eight hours after the operation, when it is stated that she was doing well. Further information I have been unable to obtain. In Case 89, the cause of impediment to the passage of the infant through the pelvis was epithelioma of the cervix uteri. Dr. Greenhalgh operated before labour had commenced, and before the membranes had ruptured; and doubtless we are indebted to this gentleman for its success by adopting an early operation, and for its judicious treatment afterwards. The case merits attentive perusal and deep consideration. Ether-spray was used. In Case 88, the impediment to labour arose, again, from extensive epithelioma of the cervix and lower part of the body of the uterus. The labour in this case had commenced prematurely at six months and a half. Ether-spray was used. Mr. Newman's judicious and firm treatment of the case merits the approbation of the profession. The recoveries of these two women, labouring under malignant disease, and having undergone such serious operations, are truly wonderful, and afford the strongest evidence of the conservative powers of nature. These cases ought to teach us to have more confidence as to the result of this operation; and they afford contradictory proof against the assertion of those practitioners who despair of success, and look upon the reductive changes of the puerperal uterus as antagonistic to recovery. The other case of recovery (96) is most interesting and satisfactory. The pelvic obstruction was caused by exostosis springing from the sacrum. (See Table.) The patient was in good health; and the

operation was early and judiciously performed by Mr. I. B. Brown, with the concurrence and assistance of Dr. John Taylor, whose patient she was, before the constitutional and local vital powers had suffered from pressure, etc. The membranes had not ruptured. There are many important practical points which Dr. John Taylor communicated to me, some of which have already been used, as the location of the placenta, the hæmorrhage which issued from the uterine veins and walls. There are other matters which shall be spoken of under their respective heads.

INFANTILE MORTALITY.—Infants *in utero* may die during pregnancy from disease within their own bodies, or from any morbid cause existing in the placenta or funis which can interrupt the supply of blood from the maternal system. Undue protraction of labour is extremely hazardous to the lives of infants, and especially so after the discharge of the liquor amnii. The five infants which are stated to have been dead were so before the performance of the operation. Of this number, two were doubtless destroyed by long continued pressure during protracted labour. One presented with the arm, for the delivery of which manual and instrumental attempts had been unsuccessfully made. One presented with the feet, in which case, after drawing down the body, craniotomy was performed; and afterwards the body was dragged away by the feet, leaving the perforated head behind. In another, craniotomy was unsuccessfully performed. It is quite evident from the above statement, that there is not a single infantile death which was caused, either directly or indirectly, by the operation; and there is little doubt that all of them would have been saved, if they had been living at the time of its performance.

OPERATION.—I shall not here enter into all the details which are requisite to be observed before, during, and after this operation; but I shall confine my remarks to some of the more important points. (See observations, BRITISH MEDICAL JOURNAL, vol. i, 1865, p. 263.)

Frequent examinations *per vaginam* are extremely injurious, from the contusions which the vagina and pelvic tissues sustain. There are cases recorded which forcibly prove the necessity of this precaution. When the uterus is deflected, as it generally is in cases in which there is extreme distortion of the pelvis from mollities ossium, this organ must be raised up before the incision is made; so that the fundus, which abounds with large anastomosing veins, may not be incised. Neglect of this rule doubtless would produce hæmorrhage by the division of this portion of the uterus, which is so vascular and eminently contractile, and consequently would interrupt the efficient contraction of

the organ, which is so important to produce a nice adaptation of the edges of the wound, and thereby, in some measure at least, to prevent it from assuming the gaping character which occurred in some of the tabulated cases.

Labour unduly protracted, from any cause whatever, is nearly always attended or followed by some danger to either the mother or to her infant, or to both. The degree of mischief inflicted on the maternal structures is in general in a ratio proportioned to the period of protraction; and, doubtless, in all cases it is aggravated by the nature of the obstructing cause. We ought, therefore, to be extremely watchful, in all cases of protracted labour, but especially so when the impediment arises from a mechanical cause; and we should timely adopt appropriate measures for the delivery of the woman before irreparable mischief is done. (See former observations, BRITISH MEDICAL JOURNAL; also Cases of Laceration of the Uterus, etc., *Obstetrical Transactions*, London, vol. viii, p. 210.)

In ordinary labours, where the infant can pass *per vias naturales*, certain organic changes are waited for; the os uteri must be more or less dilated; but, in those cases which demand the Cæsarean section, it is not only a very great folly to wait, as dilatation cannot be effected, but it is a very great evil.

An early performance of the operation is of the utmost importance. Supposing the woman at full term of pregnancy, it should be commenced as soon as the labour is declared—before, or at least immediately after, the membranes are ruptured. By so doing, the uterine incision would be relatively considerably diminished after the complete contraction of the uterus, and all the dangers of protraction avoided. My friend Dr. Greenhalgh has suggested the performance of this operation before the completion of pregnancy. He says: "I have a strong conviction that greater success would attend our endeavours if all cases were operated upon at, or shortly after the completion of, the eighth month of utero-gestation, when the vessels are smaller, the contractile power of the uterus greater, and the liquor amnii relatively larger in proportion to the size of the child. By pursuing such a course, a smaller incision would be required, less blood would be lost." I am inclined to agree with the above suggestion, especially if the obstructing cause of labour be epithelioma of the os or cervix uteri. Two successful cases are recorded (p. 14) in which the operation was performed before the completion of pregnancy—one at the end of the eighth month, by Dr. Greenhalgh; the other at six and a half to seven months, by Dr. Newman. There is, however, one objection, either real or imaginary,

against having recourse to the operation before the completion of pregnancy, when the os uteri is closed by the mucous plug, and the cervix is undeveloped; which condition would tend to prevent the lochial or other fluids from issuing from the cavity of the uterus. In consequence of this opposition, the fluid would accumulate up to a certain amount, and then be discharged into the abdominal cavity. Such an event happened (closing of os and cervix uteri) on the second day after the operation in Case 95. Care must, however, be taken to keep open, if possible, the oral and cervical portion of the organ by some means or other.

Before the incision is made, it is of great importance to ascertain the location of the placenta. Its position in sixteen cases was as follows. In eight, it was placed anteriorly; in seven of which it was central, in one a little to the left. In eight cases, it was fixed on the posterior part of the uterus; in three of which it was centrally situated; in two, it was towards the fundus; in one, to the left; and in two, to the right side.

During the operations, the placenta was unfortunately cut in two cases; it was partially separated in four cases; and in two cases it was completely detached and removed before the extraction of the infant, which is most hazardous to the mother (see remarks on Hæmorrhage), and also to the infant. In order to avoid as far as possible cutting the placenta, the stethoscope ought to be used; and doubtless, in the great majority of cases, satisfactory information, either negative or positive, will be obtained. If the "placental soufflet" is not heard, the infant being still alive, it is fair to conclude that this organ is not within the reach of the knife. If the infant is dead, there is not much risk of cutting into the placenta.

In sixteen cases, the incision was made longitudinally in the centre along the linea alba; in three cases, it was made a little to the left of it. I prefer the left side, at a little distance from the linea alba.

It is of the greatest importance that the operation should be completed as expeditiously as possible, in order to avoid the hazard of inducing rapid and irregular contraction of the uterus before the incision is made sufficiently long, so as to safely extract the infant. It is of great consequence not to have again to incise the organ when the infant's body is in a great measure brought out. This has happened. In Case 96, the uterine tissue was torn, in consequence of the incision being too small; it was only four inches long.

Sutures.—The edges of the uterine wound have been brought together by sutures in three of the cases. In two, there was considerable hæmorrhage; and in them this practice was adopted to restrain the bleeding, and to bring together the edges, which were gaping. In one,

iron wire was used; in the other, common ligature. In the third, the interrupted suture was employed. These women died. Although I am not disposed to attribute their deaths to the application of the ligatures, yet I am strongly of opinion that sutures ought not to be introduced into the uterine walls; and, indeed, I think that they would prove, in general, not only useless, but, by the uterine tissue yielding, they would be injurious. Since the above was written, a case of recovery after Cæsarean section (96) has occurred, in which the edges of the uterine wound were brought together by eight silver sutures, which were left in the uterus. The abdominal wound was also closed by silver sutures.

CHLOROFORM.—Chloroform is nearly always administered in capital or important operations, for the purposes of inducing a state of quietude in the patient, of diminishing the pain inflicted by the knife, and of lessening nervous shock. To attain these ends, it is most important and valuable. In most operations, there are few objections to be raised against its administration; but in Cæsarean cases it is otherwise. For the success of the operation, it is essential to obtain a full, complete, and energetic contraction of the uterus. This organic condition secures against hæmorrhage, and, both immediately and remotely, not only lessens the size of the wound, but also contributes to a nice and firm adaptation of its edges. Therefore, every method should be adopted to aid this organic state; and everything ought to be avoided which interferes with it or lessens it in the least degree. Chloroform diminishes the energy of the uterus, and induces relaxation; and, therefore, on this ground, its administration is here contraindicated. Its anæsthetic agency in subduing pain is not to be compared to the dangers which may ensue. I have never known the moral courage of women fail, and have always found that they have endured the operation with great fortitude. A common expression has been, that they have suffered less pain during the operation than they have had from one unavailing labour-pain. Vomiting has taken place in most of the cases in which chloroform had been administered. It has varied in degree. In some cases it has been very urgent and continued. In Case 96, it was incessant until the fourth day; the abdominal wound was burst open; a knuckle of intestine was protruded; and fresh sutures were required. Chloroform was inhaled in ten cases; vomiting followed in nine. Whether this effect is to be considered as a *propter hoc* or a *post hoc*, some may doubt; but I am disposed to consider it as the first. At all events, the effect of vomiting after this operation is most hazardous. Dr. Kidd endeavours to trace vomiting after chloroform to other causes. (See his remark, *Edin. Med. Jour.*, January 1868, p. 596.)

ETHER-SPRAY.—The profession are greatly indebted to Dr. Richard-

son for the introduction of ether-spray as a local anæsthetic. This mode of subduing pain inflicted by the knife has been employed in four Cæsarean cases, and doubtless it is a most valuable agent. It has been remarked, that it not only completely subdues sensibility, but it also promotes energetic contraction of the uterus. In all the four cases, the abdominal parietes were completely æsthetised; but, in two only, as far as I can ascertain, was the ether-spray played upon the uterus. In both these cases, strong uterine action was induced, which seized and firmly embraced the bodies of the infants, and thereby rendered their extraction difficult. In one of these cases, "the uterus contracted so firmly as for a short time to impede the introduction of the hand into its cavity." Uterine contraction after the removal of the infant and the placenta is the most effective security against the dangers of hæmorrhage, etc.; but, if it be inordinate in degree and prematurely induced, it then becomes mischievous and dangerous to the life of the infant, by firmly grasping it, and rendering its withdrawal extremely difficult. There is also some risk of the uterine tissue being lacerated, as the length of the wound becomes comparatively so much diminished by the contraction of the womb. In one of the cases (93) at which I was present, the uterine tissue appeared to be hardened, and thereby rendered less fit for a nice adaptation of the edges of the wound. They presented a gaping character, which was very conspicuous after death. Serious reflection on the effects of ether-spray which I witnessed in this case (93), and also on those reported to have happened in the other cases, has convinced me that the application of the anæsthetic agent should be solely confined in Cæsarean cases to the abdominal parietes. I agree with Dr. Roberts, that the uterus should not be subjected to its influence, because I feel certain that there is less mischief to be apprehended from the pain inflicted by incising the organ, than what is likely to accrue from the playing of the ether-spray on the part when the abdomen is laid open. I do not apprehend that the edges of the abdominal wound are likely to suffer in the way, Dr. Kidd (*loc. cit.*) states that the lips of the abdominal wound after ovariotomy may mortify; he says, "under ether-spray the lips of the wound, too, may mortify."

In conclusion, I think I may fairly state that, although the maternal statistics of this operation present an unfavourable aspect, I am fully warranted, after a full and candid investigation of the causes of the death of the mothers, in concluding that they are not, in most of the cases, to be attributed to the operation. Some of these causes are avoidable, or preventable; some are controllable.

My opinion as to making the Cæsarean operation conditionally one of election remains unchanged.

TABLE OF CASES OF CÆSAREAN SECTION IN GREAT BRITAIN AND IRELAND.

No	Year.	Name and residence of the patient.	By whom and where the case is related.	Operator.	Cause of the difficulty.	Duration of the labour.	Mother.		Child.		Mother survived.
							Presrvd.	Died.	Presrvd.	Died.	
78	Aug. 29, 1837.	FrancesM., aged 38, Lambeth Workhouse.	Mr. T. Bryant, *Obs. Trans.*, vol. vi, p. 197; London.	The late Mr. T. E. Bryant.	Distorted pelvis from rickets.	66 hours; 18 hours after rupture of membranes.		D.	P.		31 hrs.
79	April 27, 1863.	Mrs. S., aged 21 years.	Dr. M. T. Sadler, *Edin. Med. Jour.*, vol. 10, page 268; *Medical Times and Gazette*, vol. ii, p. 141; 1864.	Dr. M. T. Sadler.	Supposed to be exostosis; found after death to be an enormous cyst filled with hydatids, which was rendered so hard as to represent a bony growth.	Some days in lingering labour; membranes ruptured 8 days before operation.		D.		D. §	Rather more than 24 hrs.
80	July 31, 1864.	J. G., aged 31 years, Westminster Hospital.	Dr Frederic Bird, private communication to the writer.	Dr. F. Bird.	Dwarf 3 feet 10 inches high; distorted pelvis; antero-posterior diameter, 1¼ inches.	72 hours before operation; 48 hours before the rupture of the membranes and 24 after.		D.		D. ‖	15 hrs.
81	January, 1865.	A poor woman; as she resided in a miserable room she was remov'd to the Lying-in Hospital, Belfast	Dr. Pirrie, BRITISH MED. JOUR., vol. i, p. 94, 1865. Dr. Pirrie kindly furnished me with notes.	Dr. Pirrie.	——	Had been four nights and days in labour before she came into the hospital.		D.	P.		About 20 hrs.
82	1865.	—	Dr. Wiblin, BRITISH MEDICAL JOUR., vol. xi, page 261, 1865.	Dr. Wiblin.	Deformed pelvis.	——		D.	*	*	25 hrs.
83	Oct. 15, 1865.	Mrs. ——, an Irishwoman.	Sir J. Y. Simpson, Bart., *Edin. Med. Jour.*, vol. xi, page 865.	Supposed Sir J. Y. Simpson, Bart.	Deformed pelvis; found the promontory of sacrum projecting greatly forwards like the size of a closed fist.	Liquor amnii discharged, as far as I can calculate, about 96 hrs. before the operation; had slight pains several days; os uteri dilated to nearly full size many hours bef. opertn.		D.		D. §	67 hrs.

84	Sept. 27, 1865.	Mrs. L., aged 28 years.	Dr. Greenhalgh, *Obs. Trans.*, vol. vii, p. 220; also an abstract of case BRIT. MED. JOUR., vol. ii, 1867, case vi, p. 400.	Dr. Greenhalgh.	Distorted pelvis from rickets.	About 28 hours; membranes ruptured and liquor amni discharged 28 hours, or thereabouts.		D.		D. ¶	31 hrs.
85	Nov. 11, 1865.	Mrs. W., aged 32 years.	Dr. Greenhalgh, *Obs. Trans.*, vol. vii, p. 275; also an abstract of case BRIT. MED. JOUR., vol. ii, 1867, case vii, p. 400.	Dr. Greenhalgh.	Distorted pelvis from mollities ossium.	As far as I can compute, about 112 hours, or nearly 5 days; liquor amnii discharged about 24 hours.		D.		D. §	80 hrs.
86	1865.	E. B., aged 34 years, Middlesex Hospital, London.	Editor of *Lancet*, Mirror of Practice of Med. and Surg., vol. ii, pp. 700 and 722, 1865, under the care of Dr. Hall Davis.	Mr. De Morgan.	A cancerous growth from os uteri and vagina.	The membranes were ruptured; liquor amnii discharged 10 days before operation. Strong bearing pains set in perhaps 2, 3, or more hours before its performance, but slighter uterine pain may have existed before.		D.	P.		About 40 hrs.
87	Feb. 3, 1866.	M. G., aged 30, St. Bartholomew's Hospital.	Dr. Greenhalgh, BRIT. MED. JOUR., vol. ii, 1867, case viii, p. 491.	Dr. Greenhalgh.	A large epithelomatous growth of the cervix uteri.	About 5 or 6 hours; membranes entire.		D.	P.		69 hrs.
88	Jan. 23, 1866.	Ellen O., aged 27 years, Cottesmore, Rutland.	Dr. W. Newman, *Obs. Trans.*, vol. viii, p. 343, London.	Dr. W. Newman.	Extensive epithelioma of the cervix and lower part of the body of the uterus.	4 days; the liquor amnii discharged two days before the operation.	P.		P. †		Recovered.
89	Mar. 29, 1866.	Sarah W., aged 37 years, St. Bartholomew's Hospital.	Dr. Richardson, *Med. Times and Gaz.*, vol. i, 1866, p. 362; Dr. Greenhalgh's patient, BRIT. MED. JOUR., vol. 2, 1867, p. 491, case ix.	Dr. Greenhalgh.	Epithelioma of the cervix uteri.	Labour had not commenced, and the membranes had not ruptured.	P.		P. ‡		Recovered.
90	May 27, 1866.	—Barnes, aged 38 years, Westminster Hospital.	Dr. Frederic Bird, in a private communition to the writer.	Dr. F. Bird.	A large fibrous tumour impacted in the pelvis.	10 hours before the operation was performed, the liq. amnii having just escaped.		D.	P.		33 hrs.
91	June 14, 1866.	A woman, a patient of the Lying-in Hospital, Liverpool.	Liverpool correspondent of the BRIT. MED. JOUR., vol. i, 1866, p. 673.	Dr. Grimsdale.	High distortion of the pelvis from disease of the spine and ankylosis of the right hip. The conjugate diameter did not exceed 1½ inch.	——	P.		P.		

* No account. † Premature, 6½ to 7 months; born alive. ‡ Lived an hour. § Dead before operation. ‖ Head perforated before admission. ¶ Dead before from craniotomy.

Table of Cases of Cæsarean Section (concluded).

No.	Year.	Name and residence of the patient.	By whom and where the case is related.	Operator.	Cause of the difficulty.	Duration of the labour.	Mother.		Child.		Mother survived.
							Presrvd.	Died.	Presrvd.	Died.	
92	Aug. 19, 1866.	Mrs. W., aged 29 years, Shoreham.	Dr. Greenhalgh, *Lancet*, vol. ii, p. 203, 1866; BRIT. MED. JOUR., vol. ii, 1867, p. 491, case x.	Dr. Greenhalgh.	A cancerous tumour of the rectum; solid and immoveable; of such a size that in no part of the pelvis could more than the index-finger be passed.	Not in labour; eight months and a week advanced in pregnancy.		D.	P.		6 days.
93	June 3, 1867.	Ann Kinsey, aged 21 years, Northern Etchells, Cheshire, brought to St. Mary's Hospital, Manchester.	Dr. D. L. Roberts. Read at the Obstetrical Society, Dec. 4, 1867. Abstract of case, *Lancet*, vol. ii, page 769, 1867.	Dr. D. L. Roberts.	Deformity of the pelvis from an undeveloped state of the bones and malformation of the apertures.	The exact duration of the labour is a little uncertain; but, as far as it can be computed, it was fully 48 hours. The liquor amnii had been discharged for a considerable time; it may from 30 to 40 hours.		D.	P.		4 days 15 hrs.
94	Oct. 6, 1867.	Martha Baggot, aged 21 years, 28, Stafford St., Lisson Grove, British Lying-in Hospital, Lond.	Dr. Eastlake, BRIT. MED. JOUR., vol. ii, p. 314, 1867. Further particulars, private communication made to the writer.	Dr. Eastlake	Distorted pelvis from rickets.	96 hours; viz., 48 before, and 48 after, the rupture of the membranes.		D.	P.		4 days.
95	Oct. 25, 1867.	Informed she was about 24 yrs. of age; Guy's Hospital.	Dr. J. Braxton Hicks, private communication to the writer.	Dr. J. B. Hicks.	Distorted pelvis rostrated, from softening of the bones about puberty for eight months only.	Operation performed at 8½ months of pregnancy, inducing uterine pains by secale a few hours previously.		D.	P.		4 days.
96	Dec. 28, 1867.	Mrs. H., 23 yrs. of age, Pickering Place; removed to the London Surgical Home.	Dr. John Taylor, *Lancet*, vol. i, 1868, p. 85. Further particulars communicated to the writer.	Mr. Baker Brown.	Pelvis distorted from an exostosis springing from the sacrum. The whole internal surface of this bone is thickened by bony deposit, which is greatly and suddenly increased at its promontory, reducing the ant. posterior diam. to 1¼ inch. The deformity is increased by the extreme angular position of the pelvis in relation to the spine.	18 hours; membranes not ruptured.	P.		P.		Lived.

POSTSCRIPT.

As a postscript to my former observations on the Cæsarean section (BRITISH MEDICAL JOURNAL, March 28th, 1868, page 295), I now tabulate two cases which were then omitted, and append a few remarks. These two cases are English. One (97) stands, in the history of this operation, quite unique. There are numerous important points belonging to it; and, although I have analytically brought some of them before my readers, yet the entire case ought to be carefully read and studied, as cited in the *Medical Times and Gazette*, vol. ii, 1865, p. 359.

Mr. T. Spencer Wells commenced his operation solely with the object of removing a large ovarian tumour. Before he had completed it and cut through the pedicle, he found another tumour, which he considered to be the right ovary cystically enlarged. He now passed a trocar into it; and, after withdrawing it, three pints of a bloody fluid escaped through the cannula. The tension being thereby so much lessened, he was now able to see the Fallopian tube passing from the upper part, which at once convinced him that he had punctured the gravid uterus. On the cannula being withdrawn, a soft, spongy, bleeding mass protruded. He now introduced his finger, in order to push this back into the uterus, and also to examine the cavity of this organ, during which its tissue, which was soft and friable, as if it had undergone fatty degeneration, gave way along the middle from the puncture (which was near the fundus) to the extent of three or four inches towards the neck. By very slight pressure, a quantity of liquor amnii, and also a fœtus of five months, escaped. The foregoing circumstances constitute what may be considered the cause or necessity for Cæsarean section. The clear, bold, and unequivocal statement made by Mr. Wells reflects the highest honour upon him; and his conduct throughout in relation to the case affords a noble example of high professional morality.

Rickety distortion of the pelvis was in the other (98) case the ob-

structing cause to the passage of the infant. The brim measured one inch only in its antero-posterior diameter; the transverse was 4¼, and the oblique 4¾ inches.

STATISTICS.—These two cases (one saved, and one lost), added to the nineteen which were tabulated in my last communication, make twenty-one cases. The one (97) added to the four before reported gives five, or 23.80 per cent., saved. The other (98) case, added to the number (fifteen) last registered, gives sixteen, or 79.04 per cent., lost. The two infants (one dead, one alive), added to the nineteen already mentioned, make twenty-one, of which fifteen, or 71.42 per cent., were preserved, and six, or 28.57 per cent., were lost. The one dead, belonging to the woman (Case 97) was dead when forced out from the uterus, and was non-viable, being only at five months.

MATERNAL MORTALITY.—The woman (Case 98) was rickety. She died four days after the operation.

PERITONITIS.—The cause of death in Case 98 was peritonitis. She appeared to progress favourably until the third day, when the disease came on. But it is quite evident that the peritoneum could not have been in a healthy condition previously to the operation; for, as soon as the incision was made through the abdominal parietes, some ounces of serum escaped. The low vital state of this membrane must most assuredly have been greatly damaged by the after-treatment. Dr. Hardin says: "Her chances of recovery were considerably lessened by want of proper care and nourishment."—The woman (Case 97) had a pretty smart attack of peritonitis. It commenced on the second day, and became worse on the third. It was, however, subdued and auspiciously terminated.

HÆMORRHAGE.—Hæmorrhage happened in one case (97). There was, as already mentioned, bleeding from three arteries at the lower part of the lacerated tissue, which was effectually subdued by silk ligatures. Oozing of blood from the placental surface of the uterus continued; but it was checked by the introduction of a piece of ice into the cavity of the uterus, and also by firmly grasping this organ. Mr. Wells passed his finger *per vaginam* and os uteri, in order to make a free passage for the discharge, and thereby prevent its passing into the abdomen. Two hours after the operation, bleeding became rather free; but it was at once checked by a drachm dose of the liquid extract of ergot.

RECOVERY.—The recovery of the woman (Case 97) from such a complication and number of very serious matters affords further and still stronger evidence of the wonderful conservative powers of nature. A

careful perusal of the case, as detailed by Mr. Wells, ought to convince the most violent and prejudiced anti-Cæsareanist that this operation ought to be recognised and performed with the same confidence of success as that with which other capital operations are now undertaken.

OPERATION.—Few remarks need be made on this part of the subject. The location of the placenta should, if possible, be ascertained by the stethoscope. In fact, this instrument ought to be carefully employed in all cases in which the abdominal cavity is intended to be laid open, either for the removal of an infant from the uterus, or for the extirpation of an enlarged ovarium. The necessity of observing this rule is most forcibly proved by the results of Case 97. Mr. Wells has kindly informed me that the placenta in his case was situated anteriorly and towards the left side. In the other case (98), the seat of the placenta is not mentioned; but it is presumed that it was on the posterior part of the uterus.

CHLOROFORM.—Chloroform was administered in both the cases. For my opinion upon the influence of this anæsthetic on the uterus, the reader is referred to my two former communications. Vomiting occurred afterwards in both cases. On the question whether the vomiting was a *post hoc* or a *propter hoc*, I again refer my reader to observations already made. Mr. Wells, in his letter to me, states: "I don't think we can judge very well what share chloroform had in the sickness." The incision made in the abdominal parietes was in both cases longitudinal and along the linea alba.

SUTURES.—Both abdominal and uterine sutures were used in each of the cases. In Case 97, Mr. Wells brought the edges of the uterine wound together by an uninterrupted suture of fine silk, one long end of which was passed into the uterine cavity, and out through the os uteri into the vagina. The edges of the uterine wound were accurately adapted by seven or eight points. The other end of the silk was brought through the abdominal walls along with the three ligatures which were applied to the bleeding arteries: and all the ligatures were tied to the clamp, which embraced the ovarian pedicle. It is worthy of remark, that Mr. Wells burnt off by a hot iron a portion of the omentum; and, as there was free bleeding, he afterwards applied three silk ligatures; and, after cutting their ends short, he returned the omentum into the abdomen. The edges of the abdominal wound were adjusted by one superficial and six deep silk sutures. In the other case (98), as "the uterine incision was somewhat serrated, it was deemed advisable to put in a couple of metallic sutures. Several others were put in the abdominal walls." In my former observations, I stated that

I had an objection to the use of uterine sutures, as I considered them likely to be injurious. I then mentioned one case of recovery that had taken place in which metallic sutures were applied. We have here another example of recovery. Mr. Wells used the uninterrupted silk suture. He thought that the escape of blood or of the secretion from the uterine cavity into the peritoneal cavity might be one cause of the mortality of the Cæsarean section; and, if so, sutures might be useful. If the reader refer to my former observations (BRITISH MEDICAL JOURNAL, April 4th, p. 321), he will find that I have already adverted to this danger, and referred to a case (95) in which the death from peritonitis was attributed to the passage of the uterine discharges into the peritoneal cavity, which were prevented from flowing *per vaginam* by the closed condition of the os and cervix uteri. Whether uterine sutures should be employed, is a most important question to decide. There are cases of recovery after this operation in which sutures were not used, as well as cases of recovery in which they have been applied. But, as regards the evidence to be obtained on the two sides of the question, it would, I think, preponderate in favour of their non-employment. Notwithstanding this may be so, yet I think the subject demands further consideration. If I used a suture, I should prefer the uninterrupted, put in at long points, and with only one long end passed through the os uteri into the vagina; the other end closely cut off, according to the last opinion of Mr. Wells.

TABLE OF CASES OF CÆSAREAN SECTION. (*Continued.*)

No	Year.	Name and residence of the patient.	By whom and where the case is related.	Operator.	Cause of the difficulty.	Duration of the labour.	Mother.		Child.		Mother survived.
							Presrvd.	Died.	Presrvd.	Died. (When removed.)	
97	Aug. 14, 1865.	A married woman, aged 24 years, Samaritan Hospital.	Mr. T. Spencer Wells, *Medical Times and Gazette*, vol. ii, 1865, p. 359.	Mr. Wells.	No pelvic obstruction, but the operation was performed in consequence of a trocar having been thrust into the gravid uterus, after the removal of a large ovarian tumour, etc.	Labour did not exist; she was about five months pregnant.	P.			D.	She lived.
98	Feb. 25, 1865.	Mrs. H.	Mr. Walter Hardin, *Lancet*, vol. ii, 1865, p. 369.	Mr. Hardin.	Distortion of the pelvis from rickets. Brim, antero-posterior diameter, one inch.	The liquor amnii had escaped six to seven hours. There were no uterine contractions.		D.	P.		4 days.