

RUPTURE OF THE UTERUS:

A SERIES OF EIGHT CASES, INCLUDING THREE CASES TREATED SUCCESSFULLY BY OPERATION.

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THE best method of treating cases of rupture of the uterus is still one of the problems of obstetric medicine upon which a good deal of difference of opinion exists; nor, indeed, is it likely that this difference will be entirely overcome, since these cases may vary greatly both in the severity of the symptoms and in the degree of the injury. If we are to be in a position to come to any certain conclusion, it will be necessary for a considerable number of cases to be fully recorded from lying-in hospitals and clinics, so that by a comparison, so far as this can be done, of the results obtained by different modes of treatment under much the same conditions, we may be able to formulate rules to guide us in our treatment of these difficult cases.

I propose in this paper to put on record the cases which have occurred in the extern maternity department of University College Hospital during the 18 years from Jan. 1st, 1894, to Nov. 30th, 1911. During this period 33,781 women have been confined in the department, and among these cases there were eight cases of rupture of the uterus, or a frequency of 1 in 4222.

The details of the cases are shortly as follows.

CASE 1 (Reg. No. 690).—The patient was delivered spontaneously in the extern maternity department on March 27th, 1894, the child being born before the arrival of the student called to the case. She had had five previous normal pregnancies. After delivery she became markedly collapsed, and complained of severe pain in the lower part of the abdomen on the left side. With treatment she recovered to some extent, but died six hours after her confinement, the exact condition not having been diagnosed. At the post-mortem examination an incomplete tear 6 cm. long of the left side of the cervix was found extending into the lower uterine segment, and opening up the base of the broad ligament. The lower end of the tear was situated 1½ cm. above the edge of the posterior lip of the cervix. The presentation was a vertex, the labour rapid and apparently quite normal, and on this account I concluded wrongly that the case was probably not one of rupture of the uterus. The specimen is in the University College Hospital Medical School Museum, No. 731.

CASE 2 (Reg. No. 1922).—The patient was confined in the extern maternity department on August 25th, 1894. She had had six children, all delivered with great difficulty with forceps. The true conjugate measured 3½ inches. The child, weighing 8 lb. 10 oz., was delivered by the craniotriector after perforation, forceps having failed. On examination a tear in the right side of the cervix, passing into the right broad ligament, was found. The patient's condition did not admit of any operative treatment, and she died ten hours after delivery. (University College Hospital Medical School Museum, specimen No. 726.) The case is fully reported in the Transactions of the Obstetrical Society of London, Vol. XXXVI., p. 316, 1894.

CASE 3.—This case, under the care of Dr. Herbert Spencer, has been reported by him in the Transactions of the Obstetrical Society of London, Vol. XLII., p. 18, 1900. The patient, a multipara with a contracted pelvis, the conjugata vera measuring 3½ inches, was delivered by podalic version, on account of a shoulder presentation, on Oct. 29th, 1896. The child was delivered alive, but after delivery the patient became greatly collapsed and bled freely, and after removing the placenta a tear was found extending into the broad ligament. No communication with the peritoneal cavity could be found. The cavity in the broad ligament was plugged with iodoform gauze, and the woman made an excellent recovery.

CASE 4 (Reg. No. 250).—The patient, a six-para, was delivered in the extern maternity department on Feb. 3rd, 1897. The left shoulder was presenting, and the arm was outside the vulva. The child was easily delivered by internal version by the obstetric assistant. The patient became markedly collapsed immediately after delivery, and vaginal examination revealed an extensive tear of the left side of the cervix and lower uterine segment extending into the peritoneal cavity. An attempt was made to plug the tear with iodoform gauze, but the patient died 45 minutes after delivery. (University College Hospital Medical School Museum, specimen No. 734.)

CASE 5 (Reg. No. 1352).—The patient, aged 32, was admitted to University College Hospital on July 3rd, 1904. She was a very fat woman with a pendulous abdomen, and was delivered by forceps of a stillborn child weighing 15½ lb. The shoulders and trunk were extracted with considerable difficulty. On examination after delivery it was found that there was a large tear in the lower uterine segment and in the vagina, on the left side, opening into the peritoneal cavity. The tear and the vagina were plugged with iodoform gauze under an anæsthetic and saline transfusion was carried out, but the patient died six hours later. (University College Hospital Medical School Museum, specimen No. 722.)

The three following cases were treated by operation and recovered, and they are therefore recorded in greater detail.

CASE 6 (Reg. No. 247).—Complete rupture of the uterus, following delivery by traction on the foot in a case of placenta prævia, at the fifth month of pregnancy; suture of the tear; recovery.—The patient,

aged 40, a multipara, was admitted into University College Hospital on Jan. 26th, 1911. She had had three children. At the first confinement a part of the placenta was retained and had to be removed manually. After the second child she was laid up in bed for three weeks, and at her third confinement she sustained a bad tear of the perineum and rectum. Her last period had occurred at the beginning of September. About the middle of December the patient began to bleed, and this continued almost every day until three weeks before admission to the hospital. Since this date she had been confined to bed with continuous hæmorrhage.

On admission to the ward the patient's general condition was good; some vaginal hæmorrhage, however, was going on. The uterus was the size of the organ at the twentieth week of pregnancy, tense, and somewhat cystic to the feel on palpation. No foetal parts could be felt and no foetal heart sounds heard.

As the hæmorrhage continued and the cervical canal admitted two fingers, the provisional diagnosis of a placenta prævia having been made, a sound was passed and the membranes were ruptured at 2 P.M. on Jan. 26th. Slight bleeding continued, but only very slow progress was made in the dilatation of the cervix. At 8.45 P.M. on the 27th the cervix admitted 2½ fingers, and a small foot could be felt presenting. The placenta could be readily felt on the anterior wall of the uterus reaching to the internal os. Chloroform was administered, the other foot was brought down by the obstetric assistant, and the foetus was readily extracted with some traction. During this procedure, however, the cervix was apparently badly torn, and severe hæmorrhage followed the delivery of the foetus. As this could not be controlled by massage of the uterus the assistant introduced his hand into the uterus to extract the placenta, and apparently during this manoeuvre the tear in the cervix was prolonged into the lower uterine segment, and the peritoneal cavity was opened up. A gauze plug was packed into the tear, and I was sent for.

When I saw the patient at 9.20 P.M. her general condition was good. There was some hæmorrhage going on from the vagina, and on examination a tear was found in the posterior lip of the cervix on the right side involving the lower uterine segment, with an opening into the peritoneal cavity through the lateral portion of the pouch of Douglas, readily admitting four fingers. The torn lips of the cervix were drawn down with vulsella, after the peritoneal cavity had been swabbed out, and the edges of the tear were approximated with three thick catgut sutures passed from above down. A plug of iodoform gauze was then placed in Douglas's pouch below the tear in the uterus, and the vagina was also plugged with iodoform gauze. The vaginal plug was removed 20 hours later and the plug in the peritoneum on the morning of the third day. At this time a small plug was placed between the lips of the opening in Douglas's pouch, and this was finally removed on the seventh day.

For the first four days after the operation the temperature was slightly raised, the highest point reached being 101.4° F. The patient made an uninterrupted recovery, and left the hospital with the wounds soundly healed on the seventeenth day.

CASE 7 (Reg. No. 1105). Complete rupture of the uterus following an attempt at the performance of version for a transverse presentation; Cesarean section followed by total hysterectomy; recovery.—The patient, 38 years of age, was admitted into University College Hospital on April 6th, 1911. She had had six children and no miscarriages. All the labours had been normal, except that with the second child the shoulder presented. The last period had occurred at the end of July, 1910. Labour pains started at 4 A.M. on April 5th, at about the thirty-sixth week of pregnancy, and the membranes ruptured at 10 A.M. on the 6th.

When the patient was seen by the obstetric assistant at her own home he found that the right arm and the pulseless cord were prolapsed into the vagina. Uterine contractions were present, but feeble. The mother's pulse was 80. The cervical canal was dilated to the size of a crown piece, and an attempt was made by the obstetric assistant to replace the arm and cord with a view of performing, if possible, bipolar version. On attempting to replace the arm there was suddenly a smart hæmorrhage, and the operation was accordingly abandoned. On a further examination a tear was found in the anterior and lateral fornix large enough to admit the whole hand into the peritoneal cavity.

The patient was admitted into the hospital from the extern maternity department about 2.30 P.M., a large iodoform gauze plug having been inserted into the tear. On examination the right arm of the child was found to be prolapsed into the vagina with the cord, the child lying with its back posterior, and the head in the right iliac fossa. The patient's condition was now very grave, and she was practically pulseless, blue, and cold. The tear was found to be situated in the utero-vesical pouch mainly to the left of the middle line. The uterus was not tetanically contracted. Although the child was obviously a small one, I felt that any attempt to deliver by version would certainly increase the extent of the tear, and it was therefore decided to perform abdominal section. Two pints of normal saline solution were transfused into the left median basilic vein, and the abdomen was prepared with iodine.

On opening the peritoneal cavity a considerable quantity of free blood was found. The tear in the anterior fornix was complete, involved the cervix to a slight extent to the left of the middle line, and the child's left shoulder was seen presenting in the tear. The left broad ligament was almost entirely torn through, so that the left Fallopian tube was seen passing in an arch-like manner to the left side of the pelvis. The peritoneum was cracked in several places on the anterior surface of the uterus to the right of the middle line, and hæmorrhage had occurred under the peritoneum.

The uterus was rapidly incised by enlarging the tear in the anterior wall of the cervix upwards to a sufficient extent and the child and placenta were extracted. The broad ligaments were clamped, leaving the right ovary and removing the left. The tear in the utero-vesical pouch of peritoneum was continued round to either side with scissors, the uterine arteries were clamped, and the uterus was removed by cutting across the posterior vaginal wall. The clamps were replaced by silk ligatures. There was very little hæmorrhage during the operation. The vesical flap of peritoneum was sewn to the rectum over a plug of iodoform gauze brought out through the vagina, and the abdomen was closed with through-and-through silkworm gut sutures, with interrupted silk mattress sutures for the fascia, and continuous horse-hair suture for the skin.

The operation lasted 40 minutes. Two or three pints of saline solution were left in the abdomen at the end of the operation. A

hypodermic injection of 10 minims of pituitary extract was administered. The patient's condition at the end of the operation was very good, the pulse about 80, and of fair volume. The foetus was a small macerated child weighing 2 lb. 10 oz.

Three hours after the operation the patient was put up in Fowler's position, and except for a little bronchitis she made a rapid recovery and left the hospital quite well on the twenty-eighth day. The vaginal plug was loosened a little each day, and it was finally removed under gas on the fifth day. The temperature remained slightly elevated for the first ten days after the operation, the highest point reached being 101.2° F., whilst the pulse never exceeded 100 per minute. (University College Hospital Medical School Museum, specimen No. 735a.)

CASE 8 (Reg. No. 1116). *Complete rupture of uterus at full term; cephalic presentation; delivery by version; total abdominal hysterectomy; recovery.*—The patient, 34 years of age, was admitted into University College Hospital on April 8th, 1911. She had had three children in two confinements, and on each occasion the labour was normal. She was seen at 2 P.M. on the 7th by the obstetric assistant on duty in the Extern Maternity District on account of a prolonged second stage. Labour had commenced at 9 P.M. on the 6th, and when seen the cervix was fully dilated. The head was in the pelvic cavity, and an attempt was made to apply the forceps. On the introduction of the lower blade, however, the head appeared to recede out of reach above the pelvic brim and severe vaginal hæmorrhage occurred. On further examination a hand was found to be presenting, and what was thought to be the edge of the placenta was felt; there had been a considerable amount of hæmorrhage during the first stage. A foot was brought down and the child was delivered stillborn at 4 P.M. with some little trouble, the arms becoming extended. No undue force appears to have been used in introducing the blade of the forceps, and no undue difficulty was experienced in bringing down the leg. No contraction of the pelvis was present. The placenta was expressed 20 minutes after the delivery of the child.

The patient complained of severe abdominal pain with the onset of the severe hæmorrhage soon after the head receded. The possibility of a rupture of the uterus having occurred was not realised, and when the woman was seen by the obstetric registrar next day at 11 A.M. she was found to be collapsed and dyspnoic, with blue lips, and gave a history of having bled fairly freely all night. The pulse was very small, 124, and the abdomen was distended and very tender. She had vomited several times, and the bowels had not acted. On vaginal examination a tear could be felt passing into the peritoneal cavity. The patient was at once brought up to the hospital in a cab.

On admission at 12 noon on April 8th on pelvic examination I found a large tear in the left postero-lateral vaginal fornix and the cervix, through which the hand could be passed into the peritoneal cavity; a catheter was passed and 8 ounces of clear urine were drawn off. The uterus, well contracted, lay to the right of the middle line. The patient was put to bed for a couple of hours to recover from the shock of moving her to the hospital.

At 2 P.M. abdominal section was performed, the abdomen being prepared with iodine, a simultaneous transfusion of 1½ pints of normal saline solution into the left median basilic vein being carried out. A hypodermic injection of digalen (6 minims), pituitary extract (15 minims), and erlutine (10 minims) was also administered. On opening the peritoneal cavity the intestines were found considerably distended and injected, the serous coat was dull and covered in places by patches of lymph; no pus, however, was present. There was a good deal of free blood in the peritoneal cavity, and the tear was found to extend through the cervix and the lower uterine segment, tearing through the left broad ligament into the peritoneum. A large hæmatoma was present in the cellular tissue on the left side.

The remains of the left and the right broad ligaments were clamped internal to the ovaries, and the bladder was turned down. The uterine arteries were then clamped, and the whole uterus was removed, the vessels being subsequently tied with silk ligatures. The peritoneal cavity was swabbed out, and an iodoform gauze plug was passed from the peritoneal cavity into the vagina, and another was brought out from the stump of the vagina through the lower angle of the abdominal wound. The abdomen was closed with through-and-through silkworm gut sutures, silkworm gut mattress sutures for the fascia, and a continuous horse-hair suture for the skin.

The operation lasted 35 minutes. The condition of the patient improved somewhat under the anæsthetic, the pulse at the conclusion being of fair volume and 136 per minute. The operation was rendered difficult by the distended condition of the intestines.

On the patient's return to the ward she was placed in Fowler's position. During the afternoon and evening there was very frequent vomiting. At 11 P.M. the pulse was very weak, and she was complaining of severe spasmodic pain in the upper part of the abdomen, which was very tender and distended. A hypodermic injection of pituitary extract (15 minims) every eight hours, strychnine (5 minims), and digalen (6 minims) every four hours, and eserine salicylate (4 minims) every six hours, was ordered. One grain of calomel and 1 grain of elaterine were given by the mouth.

During the next day (April 9th) the vomiting was almost continuous and the abdomen was more distended. At midday a soap-and-water enema was given, and flatus was passed with some liquid fæces. The pulse was now 145 and very small. During the afternoon continuous rectal injections of saline solution and glucose were given, about two pints being retained. After this very severe paroxysmal pain was complained of, coming on every two or three minutes and lasting about the same time, and the patient became very restless. The digalen was now stopped owing to the vomiting.

At 5 P.M. the pain was so severe that the woman was shouting in agony. The pulse was 165 and very small. An intravenous infusion was started, and about half a pint had been run in slowly when the patient became collapsed and the pulse at the wrist failed altogether. The infusion was stopped and 10 minims of adrenalin chloride were given intravenously. The pulse gradually returned, as did the pain so severely that a hypodermic injection of heroin (5 minims) had to be given. At 7 P.M. a large liquid motion was passed, the pain became less severe, and the patient more comfortable.

The continuous rectal injection was continued for 3½ hours during the night, and by next morning the condition had much improved. The vomiting ceased, and from this time the pulse-rate became progressively slower and better in quality, and the woman gradually recovered. For some days the bowels were very loose, and the temperature remained elevated for 24 days, varying between 99° and 101.8° F.

The plugs were removed under gas on the fifth day, and the patient left the hospital quite well on the thirty-eighth day after the operation.

The uterus, measuring 18 × 13½ × 11 cm., shows a tear extending for 10 cm. above the anterior lip of the left side, opening into the peritoneum; it does not extend quite to the top of the broad ligament. The cervix is infiltrated with blood, and the posterior lip is much thickened, measuring 3 cm. antero-posteriorly. The wall of the body is also thickened, measuring 5.5 cm. (University College Hospital Medical School Museum, Specimen No. 735.)

Remarks.

These three cases present several points of considerable interest. The first is a good example of traumatic rupture involving the cervix and lower segment, undoubtedly due to the forcible extraction of the foetus through the partly dilated cervix, and the subsequent enlargement of the tear by the introduction of the hand for the purpose of removing the placenta.

The second case is an example of the same variety of rupture, but due to attempts at the performance of version in what was probably an impacted shoulder presentation, and affecting mainly the vaginal vault, although the left broad ligament was extensively torn as well. Von Winckel maintains that such tears are especially likely to occur in cases of transverse presentation; and no doubt in these cases, owing to the faulty position of the foetus, there is a liability to marked over-distension of the vaginal fornix, either anterior or posterior.

The etiology of the third case is difficult to explain. On the whole, it appears to be a case of spontaneous rupture due to undue prolongation of the second stage in a multipara. As the head was in the pelvic cavity and the cervix was fully dilated, it is unlikely that the introduction of the forceps played any part in the production of the tear.

Although all three cases were complete tears, they illustrate very varying degrees of severity as regards the symptoms the patients presented. In the first case the general condition of the patient was good, in the second the condition of the patient was very grave, while the third woman appeared to be moribund at the time of the operation. Further than this, there is the interesting contrast that the second patient was still undelivered, while in the case of the third the operation was performed upon a patient who had all the physical signs of commencing peritonitis 24 hours after the time at which the rupture of the uterus probably occurred. The fact that very severe tears of the lower uterine segment may occur in cases of placenta prævia is, of course, well known, but the fact is apt to be overlooked that such tears may be produced at the fourth or fifth month of pregnancy almost as readily as at full term, and often to a degree which seems almost impossible when the consistence even of the head of the foetus at this period of development is considered.

Of this series of eight cases, in two the tear was incomplete and in six complete. Of the former, one in which the shock alone was treated, the condition remaining unrecognised, died, while the second, Dr. Herbert Spencer's case, recovered after plugging. Of the six cases of complete tears three died and three recovered. Of the fatal cases two were treated by plugging, in one the shock alone was treated, while the three successful cases were all operated upon, one by vaginal suture and two by hysterectomy. The total mortality was 50 per cent. The series of cases is too small to allow of any deductions being drawn, but it illustrates the frequency of this complication of labour—viz., 1 in 4222 confinements—in an extern maternity department among the poor of London, and the cases are fair types of the different varieties of rupture of the uterus.

The problem we have to consider at the present day in regard to the treatment of these cases is concerned mainly with two points—namely, the employment of gauze plugging or drainage per vaginam, so-called conservative treatment, and the performance of abdominal section, with or without removal of the uterus. The particular method of dealing with the uterus after the abdomen is opened is more or less of a detail, and the degree of shock is not likely to be much more increased once the abdomen is opened by suturing the peritoneum over a torn uterus, or by suturing the tear itself, than by the removal of the damaged organ. The real point at issue is, Should we, or should we not, in all complete tears—and for the moment I propose to consider these chiefly—perform an abdominal section, or possibly vaginal hysterectomy, or should we content ourselves with vaginal drainage or plugging?

There are certain conditions in which an abdominal

section is essential—namely, when the child has escaped through the tear into the abdominal cavity, or in most instances where the placenta, after the child has been delivered, is found to have passed through the rent out of the uterine cavity. Even in cases of complete rupture of the uterus, however, the child does not escape into the abdominal cavity so often as might be expected from the statements of some writers. Thus, this did not occur in any one of our cases of complete tear, while in the ten cases recorded by Dr. A. L. Smith¹ the child in two, and the placenta in four, is stated to have been in the peritoneal cavity. Of the three cases recorded by Dr. T. W. Eden,² in one the child had escaped from the uterus and in two the placenta. Of Lobenstine's³ 46 cases of complete rupture the child was in the abdomen in seven instances, or in 13·5 per cent., and the placenta, so far as is stated, in four. The exact position of the placenta is not given in all the cases, but apparently it escapes more frequently from the uterus than does the child.

It is obvious, then, that in the majority of cases of complete rupture of the uterus the child is still in the uterine cavity, and our decision as to the best treatment must be made without the guidance afforded by the presence of the child or placenta in the abdominal cavity. In the greater number of these cases the presence of a tear is only recognised after the child has been delivered, or before it is delivered but while it is still in utero.

The dangers these patients are exposed to are, of course, shock, hæmorrhage, and sepsis. The first is the main cause of death occurring soon after delivery, and in complete tears is usually very severe. Indeed, many patients succumb to shock before it is possible to carry out any treatment at all. This element of profound shock is one of the most important factors, and is the main reason of the heavy mortality which attends the treatment of these cases by abdominal section.

The amount of hæmorrhage that occurs varies very considerably. Of my three cases operated upon, in only one was the hæmorrhage at all severe—namely, in the third case. The danger from hæmorrhage is not only immediate but also remote—that is to say, the shock of the rupture is often greatly aggravated by profuse hæmorrhage occurring at the time, and there is a very great risk, if the hæmorrhage ceases spontaneously, as it sometimes does, that as the shock passes off it will recur and kill the patient.

The exact amount of blood lost is difficult to determine, as the blood escaping externally is usually not measured, and the amount of blood present in the peritoneal cavity or outside the peritoneum is difficult to estimate in the hurry of an abdominal section. The majority of the cases bleed considerably either internally or externally, and no doubt slow oozing of blood often continues, especially into the sub-peritoneal tissues, after the external hæmorrhage has ceased.

Some writers—Eversmann,⁴ for instance—maintain that, as in a large number of the cases, the uterus after the delivery of the child usually contracts and retracts, with a surprising degree of efficiency, the hæmorrhage is arrested by the closure of the vessels in the uterine walls. This contention does not, however, hold good. In the first place, a great deal of the hæmorrhage undoubtedly occurs while the child is still in utero, even when it ultimately escapes into the peritoneal cavity; and in the second place, since the tear in most cases involves the cervix and lower uterine segment, hæmorrhage no doubt continues, as it does in lacerations of the cervix, even although the fundus of the uterus may be well contracted.

An analysis of Lobenstine's 46 cases with regard to this point shows that of 43 in which the information is given, in 30 the hæmorrhage was profuse or severe, and in 13 moderate. Eden suggests that dangerous hæmorrhage occurs in over 40 per cent. of cases of rupture of the uterus; it is, of course, difficult to define what amount of hæmorrhage is dangerous, but probably we are right in saying that the great majority of cases at any rate of complete rupture are accompanied by profuse or severe hæmorrhage. In one of Smith's cases at the post-mortem examination it was estimated that there were between

four and five pints of blood present in the peritoneal cavity, while in one of Lobenstine's cases the abdomen is described as being full of blood.

Whatever mode of treatment, then, is adopted, it must be one which will enable us efficiently to arrest the hæmorrhage which may be occurring at the time the patient is seen, and also to guard her from any recurrence of the bleeding later on. The large part played by recurrent hæmorrhage in causing the death of these patients is brought out by Ivanoff's⁵ figures, for he has shown, as Eden points out, that the great majority of deaths from hæmorrhage occur not immediately, but within 2 to 12 hours after the rupture—namely, after repeated hæmorrhage or oozing has occurred.

Besides the immediate risk of shock and hæmorrhage and the remote risk of recurrent hæmorrhage these patients all stand a very great chance of succumbing to septic peritonitis or general septic infection, and we are justified in assuming that the main factors in the causation of this risk are the presence of the damaged and possibly infected uterus, and the presence of blood free in the peritoneum or in the cellular tissues.

Any mode of treatment, then, which we may select for dealing with this grave accident of child-bed should fulfil three postulates—viz., it should not increase the shock, it should provide for the arrest of hæmorrhage, both immediate and remote, and it should preserve the patient as far as possible from the risk of dying from septic infection.

Those obstetricians who recommend that cases of rupture of the uterus should, whenever possible, be treated by gauze packing or the provision of free drainage through the vagina, maintain that this method does not increase the shock, that hæmorrhage is prevented by the pressure of the gauze, and that the risk of septic infection is lessened by the provision of drainage through the vagina, and by the avoidance of any great amount of manipulation. Let us now for a moment examine the truth of these three contentions.

The first must be at once conceded; there can be no doubt that gauze packing is the least likely of any procedure to increase the shock.

That gauze plugging in cases of incomplete rupture will probably arrest the hæmorrhage is no doubt true; but it must be borne in mind that in many of these cases the hæmorrhage is not very severe, as, indeed, it is not even in some cases of complete rupture. In a case of complete rupture, however, it requires a very robust faith in the efficacy of gauze plugging as a means of arresting bleeding to enable us to believe that a gauze plug passed into a tear in the uterine wall opening into the peritoneal cavity can have much effect in arresting bleeding by making pressure on the bleeding points. It would be absurd to say that it has no effect of this kind, but that it is a certain means of arresting hæmorrhage, or one that can be relied on in the case of extensive complete tears, is a statement hard to accept. The extreme difficulty of plugging a large tear with gauze was forcibly impressed upon my mind by my experience in Case 4. The results obtained by Lobenstine by this means are exceedingly bad. Thus of his 46 cases 13 were treated by gauze-plugging alone, and of these no less than 12, or 92 per cent., died, figures which appear to eloquently demonstrate the futility of gauze-plugging in cases of complete rupture.

It is, however, quite easy to adduce figures from the literature which present much better results obtained by simple drainage or plugging, so-called conservative treatment. Thus, Eversmann collected 360 cases. Of these, 129 were treated by laparotomy, with 66 recoveries, or 59 per cent., while 78 were treated by drainage or tampons with 49 recoveries, or 63 per cent. Again, of 217 cases collected by Klein⁶ 155 of the cases of complete rupture were treated by laparotomy, of whom 68 recovered, or 62 per cent., while 30 were treated conservatively, with 22 recoveries, or 73 per cent. These figures, however, refer to cases published by a large number of different observers and are therefore not of great value.

In view of the fact that different writers quote figures supporting both methods of treatment, in endeavouring to form a correct conclusion we must not rely too much upon statistics unless they include a sufficiently large series of

¹ A. Lionel Smith: *Journal of Obstetrics and Gynaecology of the British Empire*, vol. xv., No. 6, p. 382, 1909.

² T. W. Eden: *Ibid.*, p. 363.

³ R. W. Lobenstine: *Bulletin of New York Lying-in Hospital*, vol. vi., No. 2, p. 31, 1909.

⁴ J. Eversmann: *Archiv für Gynäkologie*, vol. lxxvi., p. 601, 1905.

⁵ Ivanoff: *Annales de Gynécologie et d'Obstétrique*, p. 459, August, 1904.

⁶ H. Klein: *Inaugural Dissertation*, Bonn, 1904.

cases. For this reason the figures given by Petré⁷ are of considerable importance, as he has collected a series of no less than 754 cases. Analysing these figures, he finds that, of the whole, 501 were treated conservatively. These include all cases not subjected to laparotomy, and of these 140, or 28 per cent., recovered; while of the 174 cases subjected to laparotomy 82 recovered, or 47 per cent., a very striking difference in favour of abdominal section.

If, in spite of these figures, we admit for the moment that gauze plugging fulfils the first two postulates and acts efficiently as a hæmostatic, while it does not increase the shock, how does it fulfil the third demand—namely, the prevention of sepsis?

The mortality from this complication has been estimated to vary between 37 and 74 per cent., and no doubt it accounts for a very large proportion of the later deaths. The best that can be said for gauze plugging is that if properly employed it forms an efficient drain, but that its efficiency as a drain is in inverse proportion to its efficiency as a hæmostatic plug. If, however, the plug is loosened after the first 24 hours, this objection is to a large extent overcome, while if an antiseptic gauze such as iodoform is used the antiseptic properties of the gauze may be of value. The main source of the sepsis, the uterus, however, is not in any way influenced, nor are the raw surfaces from which infection can occur in any way lessened by the use of a plug. On the contrary, they are rather increased in extent by efficient, and therefore tight, plugging.

We are therefore justified, I think, in concluding that while gauze plugging answers one of our postulates fairly well, it fulfils the other two certainly inefficiently, and possibly in many cases very badly.

If now we consider the usual alternative to the use of a gauze plug—namely, abdominal section or vaginal section—we are at once confronted with the difficulty that such a procedure must inevitably tend to markedly increase the degree of shock, which is already almost sufficient in many cases to kill the patient. In view of this great drawback does operative treatment present any counterbalancing advantages? To this question I suggest we may certainly give an affirmative answer.

By abdominal section—and to a lesser degree by vaginal section—we can assure the complete arrest of hæmorrhage, not only immediate but also remote; and if the uterus is removed at the same time the gravest source of danger, as far as infection is concerned, is removed, and the best possible drainage is provided for the peritoneal cavity should it be already infected. In view of these advantages it cannot be denied that if it were not for the profound shock so often present, operative treatment would probably give the best results in all cases. Indeed, judging by the cases which have been recorded of late years, operative treatment—even in spite of the fact that it increases the shock—appears to hold out the best hope for the patient, at any rate in complete tears.

Thus, Schütte⁸ records 13 cases treated by operation—2 of incomplete rupture and 11 of complete rupture—with 12 recoveries. Of his series of 19 cases, 5 were hopelessly infected when first seen, and 1 was an old case, in which the child had been some weeks in the peritoneal cavity, which, however, recovered after operation.

Petrén's figures, already quoted, show the same result, and in order to avoid any error from the inclusion of small series of successful cases he has analysed the results obtained in the four large clinics of Berlin, Moscow, Budapest and Bukarest, giving a grand total of 382 cases, and he finds that of these 139, or 36 per cent., recovered—49, or 29 per cent., after conservative treatment, and 76, or 51 per cent., after laparotomy. Of a total series of 192 cases of complete rupture treated by conservative measures in these four clinics, no less than 155 died—a death rate of 81 per cent. He sums up very strongly in favour of laparotomy—at any rate, in all cases of complete rupture.

Lobenstine's figures are also striking, and are the more valuable since they are all from one hospital, and a large majority were treated by operation. Of his 46 cases, as I have already mentioned, 13 were treated by gauze plugging and only 1, or 8 per cent., recovered; 30 were treated by

laparotomy, and of these 11, or 35 per cent., recovered; while 3 died undelivered.

Of 19 cases recorded by Munro Kerr,⁹ 3 died unoperated upon; of 5 all incomplete tears treated by plugging 4, or 80 per cent., recovered; of 11 all complete tears treated by hysterectomy 5, or 46 per cent., recovered. I cordially agree with Dr. Munro Kerr when he says that panhysterectomy is the soundest treatment, and I would maintain that—while, for cases of incomplete ruptures, gauze plugging or gauze drainage may give very fair results—in all cases of complete rupture laparotomy and removal of the uterus, with gauze drainage of the pelvic cavity, is indicated.

This mode of treatment will undoubtedly entail a very heavy mortality; but if carried out in large numbers of cases the ultimate results will, I believe, surpass those obtained by no treatment at all, or those obtained by the use of gauze plugs if this latter method is employed in cases of complete tears.

On the whole, abdominal section would appear to be preferable to vaginal section, mainly because it enables the abdominal cavity to be more efficiently cleansed from blood and because it will enable the operator to deal more effectively with retroperitoneal hæmatomata—a point laid great stress upon by Schütte. Further than this, abdominal section enables the exact extent of the tear to be accurately defined, and by its employment hæmostasis may be more perfectly attained, and thorough drainage more certainly provided for.

If, then, we are to treat severe cases of complete tears by abdominal section, it is essential that we should take all conceivable means to lessen shock. A considerable number of cases of rupture of the uterus will certainly die from the immediate effects of the accident, but if in all cases that survive for a sufficient length of time immediate steps be taken to combat the shock, and whenever the circumstances permit abdominal section is performed as soon as possible, I believe that even better results will be obtained in the future than have been attained in the past.

For the treatment of the shock the employment of Trendelenburg's position and of warmth, the injection of pituitary extract, and, best of all, if possible, the practice of intravenous ether anæsthesia, are likely to give the best results. The last is a method of anæsthesia which is, in my experience, most useful in all cases of prolonged and severe operations likely to be accompanied by much shock, such as Wertheim's extended hysterectomy for cancer of the uterus, and in these cases of rupture it should prove most useful.

To sum up the treatment, then, of cases of rupture of the uterus as regards conservative treatment or laparotomy, I would say that while in cases of incomplete rupture gauze plugging or vaginal drainage may prove a useful method, in all cases of complete rupture the treatment most likely to give the best results in the future will prove to be abdominal section, followed by the removal of the damaged uterus and the provision of efficient drainage for the peritoneal cavity.

Wimpole-street, W.

⁹ J. M. Munro Kerr: *Operative Midwifery*, p. 642, 1911.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—

A meeting of the General Council of King Edward's Hospital Fund for London was held on Jan. 8th, at the offices of the Fund, 7, Walbrook, E.C. There were present: The Speaker of the House of Commons (in the chair); the Right Hon. Sir T. Vezey Strong, Bart.; the Right Hon. C. Stuart-Wortley, K.C., M.P.; the Right Hon. Sir Savile Crossley, Bart. (honorary secretary); Sir Henry Burdett, Sir Horace Marshall, Sir John Craggs, Dr. Edwin Freshfield, and Mr. John G. Griffiths (honorary secretary). The Speaker announced that the Governors had appointed the Rev. R. F. Horton, D.D., as a member of the General Council in place of the late Rev. J. Guinness Rogers, D.D. The order of appointment, signed by the Governors, of the members of the General Council, members of committees, and officers for the year 1912 was read. The resolutions providing for the work of the Fund for 1912, which were approved at a meeting of the Governors and General Council held at St. James's Palace on Dec. 11th, 1911, were formally adopted.

⁷ Gustaf Petré: *Monatschrift für Geburtshilfe und Gynäkologie*, vol. xxix., pp. 299 and 461, 1909.

⁸ Chr. Schütte: *Monatschrift für Geburtshilfe und Gynaekologie*, vol. xxix., p. 842, 1909.