ACUTE PUERPERAL INVERSION OF THE UTERUS

By Palmer Findley, M.D., Omaha, Neb.

FOUR papers have appeared in the Transactions of the American Gynecological Society on this subject. W. H. Byford, in 1879, reported a case of chronic inversion; Edward P. Davis, in 1893, reported a single case of acute inversion; B. Bernard Browne, of Baltimore, in 1899, reviewed operative procedures; and Reuben Peterson, in 1907, discussed anterior colpohysterotomy in the management of chronic inversion.

Browne expressed the opinion that inversion of the uterus was probably more frequent in ancient times as judged from frequent references and accurate descriptions contained in the writings of Hippocrates, Araetius of Cappadocia, A. D. 30-60, Celsus, A. D. 1-50, Themison, B. C. 50, Rhazes of the eleventh century, and Ambrose Paré in the middle of the sixteenth century. That inversion of the uterus may well have been of more frequent occurrence then than now is supported by the methods then employed in delivery in the standing or kneeling position or in sitting upon a hollow stool. A more potent factor than that of position was the lack of means of expediting labor to prevent spasmodic exhaustion.

In 1847 Valentine de Vitry reduced an inverted uterus of sixteen months duration and from that time on we find numerous procedures devised for the correction of the lesion.

All writers on the subject refer to the extreme rarity of inversion. From the fact that the accident occurs more often in homes and in the hands of the incompetent, rather than in hospitals under skilled management, it is fair to assume that inversion is not so rare an occurrence as recorded statistics would indicate. As evidence of this assertion W. H. Fisher collected 38 unreported cases in the neighborhood of Toledo, Ohio, and adds that he was unable to make a complete survey.

I have seen four acute puerperal inversions of the uterus. The first was in a European clinic. A version and extraction had been performed; the placenta was delivered by forcible expression under general anesthesia when the uterus completely inverted. There was much loss of blood and extreme shock. An ineffectual attempt was made at reduction; this was followed without delay by a vaginal amputation. Two hours later a postmortem examination revealed the transfixion of a loop of bowel by sutures. Death was the probable result of shock from operation, superimposed upon the initial shock of the inversion.

Following is a brief history of three cases seen in consultation:

Case 1.—Mrs. A., aged twenty-four years, primipara, was delivered by forceps of a full-term baby weighing 8 pounds. Failing to deliver the placenta by ex-

pression, the hand was introduced into the vagina. It was then that the inverted fundus was discovered. The placenta was removed and the vagina packed with gauze, but the hemorrhage was not effectually controlled. All means at hand were employed to resuscitate the mother, and help was summoned. I saw the patient some six hours later; she was in extreme shock and blood was oozing through the vaginal pack. We removed the pack and an ineffectual effort was made to reduce the inversion. A pack was again inserted, but this also failed fully to control the bleeding. With the able assistance of two surgical nurses and two doctors the fundus was amputated. A minimum of ether was employed; the operation consumed not more than ten minutes. This case occurred in a farmhouse where there were no facilities for blood transfusion. The patient died within a few hours.

CASE 2.—Mrs. B., aged twenty-seven years, primipara, delivered herself after a prolonged labor. The attending physician found difficulty in delivering the placenta and doubtless used considerable force upon a relaxed uterus. Following closely upon the expression of the placenta, there was profuse bleeding and shock, but this condition did not last long. The attending physician failed in his efforts to reduce the inversion. Twelve days later I was called to operate upon the patient. The inverted fundus, which was fully delivered from the vagina, was partially gangrenous. The fundus was amputated; recovery followed. The operation was performed on a kitchen table in a farmhouse.

CASE 3.—Mrs. C., aged thirty-five, para iii, was delivered by low forceps after a fairly easy labor of six hours duration. The placenta was expressed, but no great amount of force was employed. The inverted fundus appeared at the vulvar outlet immediately following the delivery of the placenta. There was little loss of blood and no pain. The patient went into profound shock but had rallied somewhat when I saw her an hour later. Efforts at reduction failed, due to the presence of a gripping cervix. The patient's pulse was running at about 160, but disappeared at every effort toward reduction. The fundus was pushed back into the vagina, a gauze pack applied and for four hours efforts were directed toward restoring the patient, but there was little or no improvement. Another effort was made to reduce the displacement and we again failed. I then proceeded to amputate the uterus. Because of the extreme shock I was able to complete the procedure without general or local anesthesia and without occasioning pain to the patient who was in a semiconscious condition. To those who advocate abdominal section in all such cases I would say it is my belief that this patient could not have withstood the added shock of the operation. As it was, the pulse regained its force immediately upon removal of the uterus and recovery was speedy and complete.

In perusing the literature on inversion of the uterus one is impressed with the diversity of opinion relative to its frequency of occurrence, its etiology, mechanism, prognosis, and treatment. In 1,932,164 labors collected from the literature, there were 17 inversions, or one to 113,068 labors. Zangemeister estimates 1 in 400,000, while Küster's estimate is 1 in 23,000. The extreme rarity of the occurrence is evidenced by the finding of but 76 cases reported in German literature in the past twenty-one years.

The inverted uterus has been tersely described as "upside down and inside out." Faulty technic in delivery is responsible for a large proportion of all recorded cases. Forcible expression of the placenta and traction on the cord are, of course, contributing factors in the production of inversion, but no amount of force in the effort to deliver

the placenta would invert a firmly contracted uterus, nor would the cord withstand sufficient traction to invaginate a uterus well contracted. Furthermore, these factors do not explain the occurrence of inversion in which the placenta has been delivered with no assistance. More than half the cases occur in primipara in whom fundal attachment of the placenta is more common than in multipara and the uterine contractions are more forceful. That fundal attachment of the placenta is not essential is evidenced by the occurrence of inversion in placenta previa. Moreover, a firmly contracted fundus may find its way through a dilated and relaxed lower uterine segment and cervix; hence, it is apparent that complete relaxation of the uterus is not essential to the development of inversion. Given a limited area of atony under direct pressure from above or traction from below and the contractions of the uterus may well participate in effecting a complete inversion. Reeve is quoted as saying that "the accident may occur independently of anything done or omitted."

Jones gives the following terse description of the mechanism of puerperal inversion: "After any portion of the uterus becomes indented to a considerable extent the rest of the organ seizes this invaginated portion as it would grasp a foreign body, and in attempting to expel it, turns itself inside out." This would seem to tell the story as well as it can be told. Doubtless spontaneous readjustment of a partial inversion not infrequently takes place and is seldom recognized where there is but an incupping of the fundus. Where there is general relaxation of the fundus the inverted portion is dragged in a downward direction. It is this traction in a downward direction that plays the chief rôle in forcing the inverted fundus into and through the relaxed cervical canal. The brutal force that is often applied to the uterus in endeavoring to deliver the placenta in the presence of uterine inertia and without causing inversion, adds emphasis to the factor of traction on the part of the incupping fundus. Probably one-third of all puerperal inversions arise spontaneously in the abscence of traction on the cord or pressure from above. Eighteen of the 61 cases reported by Evans were spontaneous and without forcible expression or traction on the cord. Of the 437 postpartum inversions recorded by Thorn, 54 per cent were spontaneous and were not contributed to by traction on the cord or by forcible expression of the placenta.

While inversion usually occurs within an hour after labor, it has been known to be delayed until the fifth day of the puerperium. It seems incredible that a diagnosis should be long delayed, but Peterson's case eluded recognition for twelve years and Reeve's for twenty-five years. As to time of recognition of the inversion Jones, in his analysis of 191 cases of acute inversion, found 19 recognized at the end of the second stage; 44 at the completion of the third stage; and 141 within twelve hours following delivery of the placenta. It is surprising, however, to

note the great number that have escaped recognition for one or more years. Instances of mistaken identity are recorded.

E. H. Smith (1897) writes of a midwife who pulled upon the inverted uterus for three-quarters of an hour and finally completed a manual hysterectomy with one tube and ovary thrown in for good measure. Incidentally, the patient survived. But the results were not so fortunate in a case attended by a midwife who mistook the inverted fundus for the head of a second child. She completed her task, but the patient died.

McCullagh says that half the cases show no immediate symptoms. With the placenta in situ or the cervix tightly constricting the protruding uterus, there will be little loss of blood. Shock may be present without hemorrhage and is variously ascribed to the sudden decrease in intraabdominal pressure, to compression of the ovaries (McCullagh), and to traction and stretching of peritoneal structures. With shock and hemorrhage averted there may be an interval of relative safety to be followed by gangrene of the uterus from strangulation and consequent sepsis.

The mortality is variously estimated at from 14 to 25 per cent. Here, again, we are at a loss to make any reliable statement, for the reason that many of these cases occur in the home, are often unrecognized, and are seldom recorded. Half the deaths occur in the hour following delivery and possibly nine deaths in ten occur within two hours of the completion of labor. Mason and Rucker, in an analysis of 63 cases, found no mortality in hospital cases where prompt and efficient treatment was available, this in comparison with a mortality of 12.5 per cent in the hands of the doctor in the home and of 26 per cent in the group delivered by midwives. Jasche estimates that about one-fourth of the deaths result from hemorrhage, one-fourth from shock, and the remaining half from sepsis. He believes that correct therapy could reduce the mortality to 3 or 4 per cent. In the 399 cases of acute puerperal inversion reported by Thorn, the mortality was 16 per cent. Approximately half the deaths were due to hemorrhage, nearly one-fourth to shock, and a trifle over one-fourth to sepsis. Two of the patients died of pulmonary embolism.

In considering the management of acute puerperal inversion we should bear in mind that a successful correction of the inversion at the expense of a life is not an obstetric triumph. In perusing the records of cases reported in the past twenty years, I am profoundly impressed by the appalling number of deaths following early or late upon a reduction of the displacement by taxis. Phillips records a mortality of 30 per cent following reposition in the presence of shock and hemorrhage, as contrasted with a mortality of only 5 per cent where no attempt at replacement was made prior to restoration of the patient from the effects of shock and hemorrhage. To attempt reposition in the presence of shock and profound anemia is to invite disaster. Unquestionably, the sheet anchor in the presence of shock and hemorrhage is blood transfusion. In studying case reports one is impressed by the number of lives saved by the simple process of checking hemorrhage by packs and

the transfusion of blood before resorting to any methods of replacement. Such precautionary measures will lower the mortality fully 50 per cent. The uterus has been replaced by taxis and the patient succumbs to shock and attending hemorrhage. Operative procedures, both vaginal and abdominal, have been employed in the presence of profound shock and the patient died. The uterus has been replaced by taxis or operation with delayed death from sepsis. In many instances the fatalities are unquestionably the result of ill-advised intervention in the presence of shock. A blanched patient is always a poor surgical risk and here, as in placenta previa, it is imperative first to control the loss of blood, second to combat shock, and with this accomplished, it is time enough to correct the inversion. In the absence of profound shock, great loss of blood and known sepsis, the uterus should be replaced and at the earliest possible time. Under such favorable conditions early replacement is seldom difficult. Delay of one or more hours may result in a tightening of the constricting cervix and defeat all attempts at replacement short of operation.

While hemorrhage is the cause of death in the greatest number of recorded cases, sepsis following replacement must be reckoned with. About one-third of all fatalities are ascribed to sepsis. Every inverted uterus is a potentially infected uterus, and in the presence of extreme depression and acute anemia it is not surprising that the morbidity and mortality from sepsis following replacement are so great. I am convinced that results would be bettered by a more general application of vaginal hysterectomy where there is good reason to fear sepsis. I would go one step further in advocating vaginal hysterectomy where vaginal replacement has failed, rather than to enter the abdomen under general anesthesia in the presence of profound shock. Better to sacrifice the uterus than the patient. I am aware of the splendid results recorded by Huntington, Kellogg, and Irving in which abdominal replacement was effected and in the presence of profound shock, but I affirm that such an undertaking would not be justified in the hands of less skillful operators. In a personal communication from Foster Kellogg he expresses preference for abdominal reposition in the presence of shock because of the readiness with which the uterus can be replaced with almost instantaneous disappearance of shock. He is of the opinion that more loss of blood and greater intensity of shock will result from efforts at vaginal replacement. I grant that his position is defensible under the favorable conditions of master surgery and modern hospital facilities. But, unhappily, such are not the usual conditions. The dictum in force when "Knighthood was in Flower" applies here with added force, "Choose your weapon according to your cunning."

428 Aquila Court,

Society Transactions

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FIFTY-FOURTH ANNUAL MEETING

OLD POINT COMFORT, VA.

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The papers presented at this meeting were as follows. For lack of space, the discussions necessarily must be presented in abstract.

Acute Puerperal Inversion of the Uterus, by DR. PALMER FINDLEY, Omaha, Nebraska. (For original article, see October issue, page 587.)

DISCUSSION

DR. B. P. WATSON, NEW YORK, N. Y.—This is a rare condition and none of us can have any large personal experience with acute cases. There is not a single case in the Sloane Hospital for Women records between 1921 and 1929, during which time over 13,000 patients have been delivered. I, personally, have seen only one case of acute inversion and operated on three cases of chronic inversion. None of them had been recognized at the time of labor. One case was rather remarkable.

The patient had a normal labor, but there was some slight delay in the expulsion of the placenta. A slight dimpling in the uterine fundus after expulsion of the placenta was noticed, but the fundus was palpable through the abdomen. The patient began to run a temperature immediately, and by the third day she was acutely ill with a temperature of 105°. Cultures from the vagina and from the blood were positive for hemolytic streptococcus. The course was very stormy for the next ten days when temperature was falling, blood culture had become negative and she looked better. Vaginal examination was then made and the inverted fundus felt in the vagina. It was obviously unwise to do anything at that stage. Three months later I operated by the abdominal route. The ring was incised posteriorly and the uterus reinverted. The peritoneal surface of the reinverted uterus was found covered with shaggy adhesions and I deemed it wise to do a supravaginal hysterectomy.

One of the other cases had a somewhat similar history. She was delivered in one of the city hospitals in Edinburgh, and had run a septic temperature in the puerperium. Patient was examined at the end of three weeks when inversion was discovered. In this case also, after an interval I reinverted by the abdominal route. The pelvis in this case was quite free from adhesions, and we left her with a functioning uterus.

In cases of acute inversion treatment of shock before attempting reposition is most important. An acute inversion is in the nature of an acute abdominal lesion, and the shock may be profound.

DR. HARVEY B. MATTHEWS, BROOKLYN, N. Y.— At the Methodist Episcopal Hospital we had four cases of acute inversion in about 17,000 deliveries. Strange to say these four cases happened in two consecutive years, viz. 1925 and 1926. I think there are two reasons for this: first, we had a house officer who persisted in manipulating the fundus and otherwise interfering with the normal

During the last five years we have given pituitrin routinely after the baby is born and have had only this one inversion, so I doubt if the pituitrin can be incriminated. In two of my cases the uterus began to turn inside out as I was watching the third stage. I reinverted the fundus of the uterus very quickly and packed. Had I been less watchful these cases would undoubtedly have had to be recorded as complete inversions.

I did a cesarean section on a woman who had an inverted uterus in a previous labor where Spinelli's operation had been performed. She had had a stormy recovery but lived to have her second child. At the subsequent cesarean I found a very thin scar.

The case mentioned first was attended by an intern who was very nonchalant; when the uterus turned inside out, he simply pushed it back again as though nothing had happened, and the woman made a complete recovery.

Since then a patient died in her home before she could be brought to our hospital.

DR. JOHN O. POLAK, BROOKLYN, N. Y.—Statistics are absolutely unreliable because there is no question that the incidence of inversion is much greater than appears from recorded instances. In 17,000 cases that we have had in our service there has not been a single case of inversion and yet in my personal experience I have seen six cases, none of which has been reported. The first one was the most appalling and happened 30 odd years ago in a tenement house. There was no hemorrhage but the shock was severe. We infused this woman with a saline solution, gave her morphia, and she recovered from the shock promptly.

There is one point I would like to make in regard to the use of anesthesia and that is there is no anesthetic that will relax the cervix so perfectly as chloroform. Gas or ether will not do it.

I take the stand with Dr. Findley that the vaginal procedure of reposition is the safer one because in the cases we have seen so far we have not lost any and have operated by the vaginal method. In two cases where we could not relax the cervix, we have split the cervix, reinverted the uterus through the enlarged ring, and followed with firm packing.

Another point which must be emphasized in regard to hemorrhage is that whether it be placenta previa or inversion, these patients will not stand any operative procedure unless they are previously transfused.

DR. F. C. IRVING, BOSTON, MASS.—Dr. Huntington, Dr. Kellogg, and myself have had six cases of inversion. They have all been treated by abdominal operation, and all six have recovered. The time when operation was instituted following the appearance of inversion varied from one-half an hour to twelve hours. In three of these cases previous attempts had been made to reduce the inversion from below, but the hemorrhage was so severe and the attempt so fruitless that it was abandoned. All cases were transfused at the time the operation was started.

The operation as we have done it is not very complicated. All we do is to open the abdomen in the midline, the inversion presents itself, and the operator and his assistant reach down, grasp the uterus with forceps and both pull at the same time. They reduce the inversion in the reverse order from which it went down so that it is like putting a stocking on wrong side out and pulling it over your foot. We have seen no shock whatever. As a matter of fact, the patients come out of their previous shock as soon as the uterus is reinverted.

DR. BARTON COOKE HIRST, PHILADELPHIA, PA.—I have had six cases of inversion of the uterus; three were reduced by taxis and three by Spinelli's operation. It is not to report these cases but to record an observation that is very unusual that I take part in this discussion.

care of the patient during the third stage of labor. It is surprising to those who have witnessed the energy employed by young assistants and nurses in handling the fundus during the third stage, that this condition has not occurred more frequently.

DR. E. L. KING, NEW ORLEANS, LA.—I saw an inversion in a case of placenta previa. The patient was moribund. The uterus was easily replaced but the patient died shortly afterward.

I know of two other cases of inversion occurring in private homes, one in the practice of my brother, who has delivered about 3,500 patients, and the other in the practice of a physician of less experience. Both uteri were manually replaced at once, and both patients recovered.

DR. L. A. CALKINS, UNIVERSITY, VA.—I would like to report one case of what we thought was inversion of the uterus, in view of its value from a differential diagnostic viewpoint. This woman was admitted to the University of Virginia Clinic approximately a year after an incomplete abortion which had been treated by curettage. She had a large mass protruding into the vagina and covered with a very thick endometrium. Diagnosis of inversion was made and vaginal reposition attempt failed. Examination by laparotomy, however, revealed a hernia, posterior to uterus and down into the vagina. There was a loop of intestine caught in this hernia, but the woman had no signs of intestinal obstruction. We were rather ashamed of our diagnosis, but in view of these reports this morning I think it worth while to report this case as a point in differential diagnosis.

DR. CHARLES C. NORRIS, PHILADELPHIA, PA.—I would like to place on record a case which is perhaps a little different from those reviewed this morning. The patient was a very stout individual who had been delivered by high forceps six months before I saw her. She was sent to me with a diagnosis of submucous myoma and this was the superficial appearance of the tumor-like mass which presented from the vagina. Bimanual examination was unsatisfactory on account of the extreme thickness of the abdominal wall; however, on deep palpation what appeared to be a small uterus could be felt; no cupping could be detected. On account of the size of the uterus and history of the case an inversion was suspected, and the diagnosis verified under anesthesia. The fundus resembled Dr. Findley's specimen but was considerably smaller. It was impossible to replace, and a vaginal hysterectomy was performed with a successful result.

DR. ALEXANDER M. CAMPBELL, GRAND RAPIDS, MICH.—I would like to report a case of puerperal inversion of the uterus in which I attempted the Spinelli operation on the fifth day. I found in this case that this procedure was mechanically impossible and instead did a rapid supravaginal hysterectomy using a continuous circumferential suture to control the hemorrhage. Following the operation a direct blood transfusion was performed, and the patient recovered after a prolonged and stormy convalescence.

I agree with one of the previous speakers who remarked that the Spinelli operation is not always easy to carry out.