ACCIDENTAL PERFORATION OF THE UTERUS.

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Perforations of the uterus are of far more frequent occurrence than is commonly believed. Cases occurring in the hands of midwives, professional abortionists and ignorant persons generally, in the effort to interrupt pregnancy, are frequently enough seen by physicians connected with public hospitals, consultants in gynecology, and the medical assistants of the coroner's office. But the large majority of cases, which I claim occur in the course of legitimate work and in the hands of honest practitioners of medicine, never see the light of day because of the fear of criminal prosecution, or at least of public ridicule even in cases which do not go on to a fatal termination. As a matter of fact, I am convinced that it is the rare exception for a uterine perforation to end fatally; and I am further convinced that the thorough ventilation of the subject, the proper management of perforations when they do occur, can only tend to reduce even this small mortality to a lesser one.

I shall begin by making a clean breast of all the cases of uterine perforation with which I have come in contact, then narrate many collected from literature, and finally point out conclusions, which I am satisfied will aid in reducing the dangers of this accident when it does occur and save human life in spite of its complications.

PERSONAL CASES.

Case 1. I was called in consultation to see a woman of 40, the mother of several children, the last one born ten years previously. She skipped her period by several weeks and consulted a midwife who curetted her. She was taken with intense pain and fever. A young doctor was called who decided to curette her again. Fever and tympanites were aggravated and I saw the case in consultation. I diagnosticated general septic peritonitis due to perforation of the uterus, but because of the collapsed state of the patient, advised against operative intervention. She died shortly afterwards. The coroner's physician declined to take action because it could not be stated positively who perforated the uterus, and he was satisfied of complete absence of criminal intent on the part of

the attending physician. As the family was loath to get notoriety in the matter all further proceedings were dropped.

Case 2. Dr. X. called me to see a woman of 20 whom he had curetted after her first childbirth, two weeks previously, for puerperal fever. He felt the curette, as he thought, pass into the fallopian tube, but gave the matter no further thought, and irrigated the uterus as usual with corrosive sublimate solution. Little débris had been found in the uterus.

The illustration shows the anterior wall of the uterus split open. The arrow points to the perforation in the posterior uterine wall. A probe could be passed in a backward direction into the peritoneal cavity. A section from this "metro-peritoneal" fistula was carefully examined for me by Dr. S. W. Bandler, who reported that it was "lined with inflammatory granulation and necrotic tissue," thus proving that the injury had been produced during the life time of the patient.

Under antipyretics the temperature had kept down sufficiently to satisfy the doctor, but in spite of strychnia and heart stimulants the patient was going from bad to worse. Hence I was asked to see her.

I found the patient very much emaciated, with expressionless eyes and apathetic appearance. Although her temperature was only 100° F., her pulse was 140 and exceedingly small. The abdomen was not particularly sensitive but showed a curious alternating series of elevations and depressions. To the sense of touch some of these areas over the abdomen were hard, others soft. The vaginal examination excluded exudates or abscesses in that situation.

From the absence of vaginal tumefaction, from the rigidity of the

abdominal parieties, from the irregular aspect of the abdominal wall indicating peritonitis with adherent intestine at various points, from the clinical history, and, chiefly, from my disinclination to accept the doctor's statement that the curette had been passed into the fallopian tube, I diagnosticated accidental perforation of the uterus with subsequent general purulent peritonitis and advised immediate removal to the hospital for operation.

On the following morning she was in collapse with a temperature of 101° and pulse of 150. Under a few whiffs of chloroform the abdomen was rapidly opened and the whole peritoneal cavity was found to be divided into a large number of independent pockets of pus among the coils of intestine. One of my assistants estimated the amount of pus at about one gallon. The patient only survived the operation by five hours. The uterus removed post mortem showed a perforation in the posterior wall leading into the peritoneal cavity. (*See illustration.*)

Case 3. A young woman of 24 had been married four years, but had borne no children. One of the younger members of the profession undertook to overcome the sterility by subjecting her to a curettage. Although perfectly healthy before, she immediately became sick after the operation and was confined to bed with pelvic pain and fever for nearly three months. When I saw her, the vaginal examination revealed nothing, but, from the history and persistent fever, I diagnosticated an intrapelvic pus focus and decided on doing a laparotomy. The operation showed the suspicion of purulent tubes to be unfounded but an abscess was discovered between the anterior surface of the uterus and the bladder, which was entirely shut off from the general peritoneal cavity. This was opened and a cupful of pus escaped. It was not allowed to contaminate the peritoneal cavity by a wall of gauze-pads previously placed *in situ*. Thorough drainage was established but the patient is not making a satisfactory recovery and will require further operative intervention. I am satisfied that the uterus was perforated in the anterior wall during the curettage.

Case 4. I asked my house-surgeon, some years ago, to do a curettage for persistent bleeding in a woman after an early abortion. During the operation he felt the curette slip away to an unexpected depth. He completed his operation with a thorough intrauterine irrigation with corrosive sublimate. As the patient began to emerge from the anesthetic she was noticed to be very low and I was called up from the wards. I never have seen a picture of greater physical suffering in my life. With the thighs drawn up on the abdomen she emitted shriek after shriek of the most agonizing character. Although I should have liked to have

done something for her, as she was still on the operating table, I found her so absolutely pulseless that I did not dare to take the risk. She was ordered morphine and strychnine hypodermically with an ice-bag to the uterus in the hope that she might rally sufficiently to give us a chance to do something for her. Unfortunately she never emerged from her condition of profound shock and died a few hours later.

I will now briefly allude to some perforations, which I have done myself. In nineteen years I have accidentally perforated the uterus four times.

Case 5. In a woman, after labor, it occurred in my practice for the first time many years ago, while curetting the uterus for retained secundines. I recognized the nature of the accident immediately, stopped my operation at once, and omitted the usual intra-uterine irrigation. Morphine was given hypodermically, an ice-bag was applied over the hypogastrium, and, after several sleepless nights and a few days of untold misery on my part, the patient made an uneventful recovery. She has had several children since.

Case 6. I was curetting the uterus of a woman after a miscarriage for hemorrhages, when my instrument was felt to have entered to a depth beyond the uterine limits. Everything was stopped, no irrigation into the uterine interior was made, morphine and local refrigeration were resorted to, and my patient recovered after passing through a low grade of pelvic inflammation which confined her to bed for several weeks. She has since given birth to at least one child.

Case 7. I undertook to dilate and curette the uterus of a woman in order to assist her in becoming pregnant, as she had been sterile since her marriage. The curette perforated the uterus. The same plan was followed as narrated above and the patient never showed the slightest reaction. She developed, however, a backache which she had never complained of before, and I never tried to explain its origin to her. After a year she has not been pregnant, although the pain in the back has entirely disappeared.

Case 8. A woman came to me with an extensive laceration of the perineum. It had been repaired a number of times, but with each successive confinement it was torn afresh and perhaps deeper. She was willing to have it repaired again, provided I would guarantee her that she would bear no more children. As she had given birth to ten I felt that she was reasonable in her request and promised to do a double salpingectomy in addition to the perineorraphy.

In the course of the preliminary curettage my curette suddenly slipped through the posterior uterine wall, although very little pressure

was employed. I demonstrated to my assistants and medical friends in the operating-room that I had accidentally perforated the uterus by introducing a sound to its entire length into the cavity of a uterus which was otherwise not enlarged.

Without recourse to irrigation I delivered the fundus uteri through an anterior vaginal incision, exposed the puncture on the posterior uterine surface so that all could see it, and then proceeded to repair it with a few catgut sutures. The operation, as originally projected, was then done. This patient had no reaction and, after several years, has remained perfectly satisfied because the perineum is intact and she has never since become pregnant.

PUBLISHED CASES.

A rapid survey into the literature of the subject permits me to subjoin the following brief abstracts bearing on this interesting study.

Beuttner says that everybody has met cases during curettage in which the uterus becomes stretched and gives the impression of having been perforated. After describing two cases in which instruments suddenly passed, in the fairly normal uterus, to depths of 13 to 20 cm. he concludes that the uterus was not perforated but behaved "peculiarly" (Eigenthümliches Verhalten des Uterus beim Einführen von Instrumenten.)

Döderlein (Ahlfeld) made clinical observations and experimental studies proving that under certain circumstances intrauterine injections could be proved to enter the peritoneal cavity. Doléris refers to cases of pseudo-perforation of the uterus (Courant).

Ahlfeld is satisfied that on four or five occasions he was able to pass sounds in the living subject through the fallopian tubes into the peritoneal cavity.

According to Kossmann, Biedert has proved by experiments on the cadaver that the sound can be passed into the tube. Beuttner, in doing a vaginal operation for retroflexion is convinced that the Orthman sound passed some distance into the fallopian tube without perforating the uterus. Bischoff and Lehmann (Kossmann) have shown a wide os at the uterine extremity of the tube in cases in which the sound passed 17 and 28 cm. Gönners (Kossmann) passed the curette in a uterus only 6 cm. deep to a distance of 13 or 14 cm. He then did a colpotomy and examined the uterus carefully but found no evidence of injury. Playfair (Tait) thinks that many supposed perforations are really due to a misinterpretation of the passage of the instrument into the Fallopian

tube. Kossmann is satisfied that the non-puerperal as well as the puerperal uterus may undergo a sudden paralysis of the muscular coat and become converted into a relaxed bag which may be very much elongated or stretched during the passage of instruments.

On the other hand there is a preponderance of reported cases of uteri actually perforated in the course of examination or operations.

As long ago as 1872, Tait published three cases of "metro-peritoneal" fistulas. He had, in the course of an ovariotomy and a hysterectomy, seen two cases of perforation due to the sound. He adds a case in which he perforated the uterus in the course of a curettage and was able, nine months later, when he removed the same uterus, to recognize the injury which had produced a metro-peritoneal fistula. He never saw a fallopian tube with abnormally large uterine opening and was never able to sound the tubes through the uterus on the cadaver.

In 1890, Haynes published two cases of perforation of the uterus by the curette with recovery in each case.

While dilating the uterus with Hegar's dilating stems, Wertheim perforated a carcinomatous uterus. Fourteen days later, when the uterus was removed, a funnel-shaped cicatricial dent was seen, indicating that the perforation was in the process of healing.

Odebrecht, after referring to a case of Alberti in which a uterus of very soft consistency was met, refers to a case of his own which was perforated by the Orthman's sound while raising the uterus preliminary to doing a ventrofixation.

Courant quotes Pozzi as believing that punctures of the uterus are of frequent occurrence, but that the lack of danger associated with these accidents is accounted for by the antiseptic surroundings usually present in the cases. Courant did a laparotomy twenty-four hours after sounding and curetting the non-pregnant uterus, during which the uterine wall was punctured. He found on the posterior uterine surface a lacerated wound with adherent edges and, in the cul-de-sac of Douglas, a half ounce of blood.

Flandrin reports two cases of perforation of the uterus caused by the intra-uterine catheter in the course of irrigation. The prognosis in these cases he regards as unfavorable.

While passing the sound preliminary to a curettage, in a woman three months after confinement, Glaeser felt it slip in suddenly to the handle. After repeating this several times and concluding that the uterus had been perforated he became very much alarmed and at once did a vaginal hysterectomy. The uterus was as soft as "goose-fat" and showed four punctures in continuity at the fundus. At certain points

the sound, of its own weight, perforated the uterus and next day it was still soft enough to permit the finger to push through.

Rosenfeld was about to do a vesicovaginal fixation when the sound suddenly slipped from 7 cm. to a depth of 15 cm. Next day he proceeded to curette when his instrument suddenly passed in to a depth of 16 cm. He delivered the uterus through an anterior vaginal incision, repaired the injury on the posterior uterine surface, and fixed the uterus to the bladder. The patient recovered.

v. Guerard reports the case of a woman who, thinking herself pregnant, was subjected to the passage of a bougie in order to induce labor. The bougie suddenly slipped from a depth of 8 cm. to that of 20 cm. The injury to the uterus was repaired in the course of a subsequent laparotomy, and the woman recovered.

Queisner passed a sound 10 cm. and then an intra-uterine irrigator two-thirds of its length into the uterine cavity. He recognized a perforation from the free hemorrhage, tamponed the uterine interior, applied ice externally, and gave opium. The woman recovered.

Kentman perforated the uterus and then did a hysterectomy. Portions of the uterus were "as soft as butter." This he attributes (with Reinecke) to extensive degeneration of muscular tissue and claims is due to errors in circulation from malposition.

Schwartz, while curetting after an abortion, had the sound and then the curette slip in to a depth of 16 or 18 cm. The tip of the instruments could be felt externally with the hand on the abdomen. The operation was interrupted, the uterine interior packed with gauze, and, after passing through an attack of circumscribed peritonitis, the patient went on to recovery.

Fleischmann reports a case of abortion in which the operator punctured the uterus with polyp-forceps and drew the intestines down to the vulva. Billroth did a laparotomy, and found a 3 cm. tear in the fundus uteri in which an empty coil of intestine was strangulated. The gut was drawn up, the uterine injury repaired, 24 cm. of small intestine and a portion of the large intestine were resected, and the patient recovered.

Alberti, three hours after the uterus had been perforated in the course of a curettage, did a laparotomy, drew back 17 cm. of gut out of the uterine cavity, closed the wound in the uterus and the patient recovered. This patient subsequently successfully went through two curettages.

Mann reports a case of perforation of the uterus during abortion with prolapse of the intestine in which he did a laparotomy, resected intestine, anastomosed the small intestine to the cecum with the Murphy

button, and the patient recovered. He knew of two other cases, one operated but with fatal result.

Boldt has published a very interesting case. A physician had curetted the day before and had removed some "lumps of fat" after tearing through a white membrane. Although suspecting a perforation the patient's condition was so good that he decided to temporize. After fifty hours there was a sudden onset of peritonitic symptoms. Celiotomy showed that the ileum was torn through and separated from the mesentery. The patient died of shock.

Le Roy Brown reported a case in which, during dilatation of the uterus preparatory to a curettage after abortion, the uterus was torn. He was called in and did an immediate laparotomy, sewing up the uterine rent. The patient made a good recovery.

Dr. P. W. Nathan has narrated to me an unpublished case in which he was called to a doctor's office and found a woman in collapse with intestine protruding into the vagina. She had evidently had a pregnancy interrupted with the above unfortunate result. She was transferred to the hospital, where she died. The doctor had told him that the patient had walked into his office in this condition.

Dr. G. W. Tischner sends me the report of an unpublished case in which a woman perforated the uterus with a darning needle while endeavoring to interrupt an early pregnancy. She recovered under rest and ice.

Dr. H. J. Boldt has met many cases of perforation of the uterus, four of which terminated fatally.

Dr. T. G. Thomas reported a fatal case in a doctor's wife some twenty years ago.

Dr. Simon Marx tells me he has met half a dozen cases in which the uterus was perforated in the course of operative intervention.

Rebreyand has written an excellent paper on surgical perforations of the uterus not due to the sound or curette as ordinarily used, but occurring in the course of operations for polypi, fibroid tumors, inversion of the uterus, etc. He has collected 15 cases, which are carefully tabulated, and of which 11 recovered and 4 died.

It may be of interest to note that of 66 cases, in which the uterus has been perforated, which I have been able to collect and which I do not pretend to claim as even all of the cases on record, there have been 17 deaths and 49 recoveries. It is more than likely that a very large number of cases, in which the patients recovered, has never been reported. Hence we cannot judge the mortality rate from these figures.

Although the possibility of a sound or curette being passed into a

fallopian tube cannot be denied, there can be no doubt that this is of exceedingly rare occurrence and that it is far better to assume that a perforation has taken place.

In view of the fact that perforations of the uterus may occur in the hands of the most experienced physicians, it is wrong to conceal these cases. In the first place the proper recognition of these accidents is essential—particularly as far as the younger members of the profession is concerned—so that the proper course of procedure shall be clear to everyone. Secondly, the fear of malpractice suits ought not to deter those able to contribute to the literature of this subject from publishing their cases because this can be the only method of establishing the correct principles of treatment. More than this, it can be demonstrated that perforation of the uterus under certain circumstances is really unavoidable and hence cannot subject the properly trained and careful practitioner to criminal or other legal proceedings.

What, then, is the proper course to pursue, as far as our present knowledge and experience goes, in the management of accidental perforations of the uterus?

1. The first set of cases are those in which during the passage of a sound or curette, the uterus is perforated. The accident is recognized from the fact that the instrument passes to a depth beyond that of the size of the uterus previously mapped out by bimanual examination. The suspicion that the instrument has passed into a fallopian tube may justifiably arise, but in the present state of our knowledge, cannot be safely assumed. It is far safer to accept a possible injury to the uterus because this actually does occur in the large majority of the cases. Under these circumstances the prognosis is good, provided that the instrument, operator and field of operation have been aseptic. These cases will usually get well if manipulations within the uterine interior are brought to a sudden termination, and, particularly, if no intra-uterine irrigations are made. If the curettage or sounding was preliminary to an intraperitoneal operation this may be proceeded with and the injury to the uterus repaired with several catgut sutures. No drainage is necessary. If no intraperitoneal operation was originally projected the patient ordinarily can be safely put to bed with an ice-bag over the hypogastrium and given morphine or opiates.

2. If the uterus has been injured and the operator has irrigated the uterine interior, three sets of conditions may arise. In the first set a mild local peritonitis may call for nothing more than the same line of treatment. In the second set an acute septic peritonitis may call for an immediate hysterectomy (usually vaginal) with drainage *per vaginam.*

The third set of cases may be less virulent and more chronic. They are apt to terminate in localized abscesses which may be located in the pelvic connective tissue or in the pelvic peritoneum. According to their seat they may require being attacked from above or below. Only very rarely will it be indicated in such cases to do a hysterectomy. The operation in most of these cases will be in the nature of an exploratory laparatomy and the exact line of work can only be determined on with the abdominal cavity opened.

3. In those cases in which the uterus has been injured and intestine has been dragged through the wound and become strangulated, laparotomy must be done as early as possible. If the strangulation has been fatal to the vitality of the gut this must be exsected. The uterus may then, according to the judgment of the operator, be repaired or removed. That even this state of affairs is not necessarily fatal, can be inferred from the studies of Miquel, who reports five recoveries in eight operations.

Lastly, although I recognize that the sounding or curetting of the uterus belongs to the domain of the general practitioner, I cannot insist too much that these proceedings should not be undertaken too lightly. I belong to the ranks of those who are convinced that the sound and curette are employed far too often. I believe that hysterometry and curettage should be resorted to far less frequently than is at present the case. Personally, I have very little use for the uterine sound and limit my indications very strictly for the use of the curette.

But, given the proper case and the proper man to handle it, these procedures will always be justifiable; and, if the unfortunate accident or perforation of the uterus does occur, I hope the present paper may tend to make clear the proper course of action and perhaps serve to save human life.

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