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# HYSTERECTOMY IN ACUTE PUERPERAL SEPSIS, WITH REPORT OF CASES.*

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Hysterectomy for acute puerperal sepsis stands most prominent among the recent surgical procedures suggested and practiced in pelvic work. Scarcely a year since one could count upon his fingers the reported cases. Within the year there has been enough written to evince the sharp interest surgeons are taking in the subject. It is a subject that every careful and thinking surgeon will feel requires to be approached with the greatest consideration, for the manifold aspects of the matter demand deliberation and knowledge exercised from several different standpoints. To say that hysterectomy should be performed in every case of severe puerperal sepsis is to advocate a most dangerous and irrational practice; to say that the operation should never be done in such cases seems equally unwarranted. If good practice is to be found between these extremes, it is to this end that we address ourselves.

In order to correctly comprehend our subject it is necessary to define what is meant by acute puerperal sepsis. I venture a limit of twelve weeks from parturition as a suitable time, for the victim of acute puerperal sepsis has usually died, recovered, or passed into a different pathological category by the expiration of that time. The ideas expressed in this paper have reference solely to the pathological changes, symptoms, and treatment of sepsis observed during the first twelve weeks following parturition. As a matter of fact, a positive decision as to the advisability of an operation will often be demanded during the first ten days.

Puerperal sepsis is not an exception to the rule that to properly diagnosticate and treat the disease we must comprehend its pathology

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and natural history as learned from the bedside. The pathological sequelæ of puerperal sepsis, as found many months and years afterward in the pelvis in which the modern achievements of surgery have been so great, have done much to direct surgeons from the true pathology of acute sepsis here.

*Morbid Anatomy.*—I believe that the common-sense dictum, based upon the experience of many faithful and competent observers, that puerperal sepsis is rarely ever an auto-infection, will hold good. The manner of infection is threefold—(1) hands of the physician or midwife; (2) instruments introduced into the vagina and uterus; (3) the invasion of clots without and within the vulva by saprophytic bacteria, which clots extend by continuity to intra-uterine clots, thus permitting infection of the uterus from a blood clot in contact with air. From the essentially different manner of infection, and the equally different clinical history and pathological changes, to be rational in our treatment we must consider the subject of puerperal sepsis under two heads:

*Puerperal Intoxication, or Sapræmia.*—The essential pathology of this disease consists in the invasion of dead matter, such as retained blood clot and placental tissue by saprophytic bacteria, and absorption into the individual of the products of their growth—viz., toxic ptomaines. Extending, as such infection usually does, from without along blood clots in the vagina, it is rare to observe disease symptoms before the fourth day, and from easily divined reasons we can see how such infection of a patient might be delayed until the sixth or eighth day after labor. Sepsis following abortions and most early miscarriages is undoubtedly primarily of this variety. The toxic symptoms are very marked: Sudden severe chill, followed usually by very high temperature—much higher, indeed, than is observed in what we designate organic or true puerperal infection; the lochial discharges are of the most malodorous kind, without evidence of much pus, but more a sanious watery discharge. High temperature, rapid pulse, and delirium are characteristic of the severer forms of this type of sepsis. Severe pain, tenderness, and tympany are not characteristics. While the symptoms are most alarming, and may rapidly prove fatal if unrelieved, fortunately a little well-directed treatment by the curette, free antiseptic irrigation, and the introduction of a tubular drain into the uterus will cause a rapid and marked improvement.

*True puerperal infection* is essentially a septic cervicitis, endometritis, or metritis. I think this term should be employed as far as possible to define those cases of septic infection nearly always begin-

ning in the infection-atrium of a lacerated cervix, extending thence to the body of the uterus in several different ways—first, as a purulent endometritis, which ultimately infects the Fallopian tubes. However, such a pathological course, I am satisfied, does not mark the acutely severe types of the disease, and there is more time to consider the question of operative interference. It is my conviction from observation that the morbid changes taking place in the structures will demonstrate that tubal changes are more in the nature of secondary or later extension of the infection, both in sepsis following sapræmia and in primary puerperal infection. Again, the cervical infection, by virtue of its intensity, extends readily to the endometrium, also through enlarged lymphatics, to the glands situated upon either side of the cervix. This adenitis and the periadenitis which attends it renders any bimanual examination with a view of determining the condition of the uterine appendages unreliable. Large masses may often be felt, giving the impression of diseased tubes, when in reality these structures will remain above in a healthy condition. The pericervical inflammation gives rise to abscesses which usually point beside the cervix into the vagina. Occasionally pus dissects between the vagina and rectum as far as the perinæum. Again, it may dissect beneath the peritonæum so far forward as to reach well above the pubes. The most characteristic lesion of this form of the disease seems to be the formation of subperitoneal uterine abscesses. These are usually multiple, varying in size from half an inch to four inches in diameter. They are no doubt due to direct absorption, through enlarged lymphatics, of septic matter from the endometrium and cervix. I think I have been able to mark the formation of these abscesses, as they occurred from time to time in a case of lingering puerperal sepsis, by the temperature waves. In two cases of multiple subperitoneal abscesses I have observed there was no attachment to other peritoneal surfaces. The uterus sat up clearly in the pelvis, and had much the appearance of being filled with small, multinodular myomatous growths. The propriety of a hysterectomy in such a case seems undoubted. Can we diagnosticate such a condition? With attention to the mode of infection, character of early symptoms, and physical signs, it may be made nearly as certain as most pelvic conditions.

True septic infection is due to the implantation upon the torn cervix, or more rarely the perinæum, of pathogenic bacteria by the hands of the attending physician or midwife. This form of infection is probably most often due to streptococci; though such a variety of

pathogenic germs have been found in puerperal sepsis, this point is not quite clear. Two points are susceptible of proof: the nature of the communication, and its origin in an infection-atrium, such as a torn cervix, more rarely the raw uterine surface. That Nature, when undisturbed by unscientific and meddlesome midwifery, is capable of resisting pathogenic organisms found so abundantly in the vagina we have much evidence to support. Several years ago I was forcibly impressed with what to me then seemed a remarkable fact. My hands are much given to chapping during the winter months; more than once I have had occasion to notice how my chapped hands would improve after attending a woman in confinement. In my case it was so distinct as to be plainly appreciated. I did not understand the importance in those days of as rigid asepsis as now, and probably in the long, weary night watch did not wash my hands before and after examinations as carefully as now.

As bearing upon this subject, the recent experiments of Stroganoff upon bacteria of the birth canal are of especial interest. He finds, in cultures made from cervix secretion, no bacteria as a rule, and that the mucous secretions of the cervix kill micro-organisms. What a lesson is to be learned from this! The rude accoucheur who sweeps his infected index around the cervix not only makes abrasions and sows the seeds of untold misery to the helpless victim, but in so doing actually robs her of that protection—an antiseptic mucus—which a generous Nature has provided to protect her in case rents and tears occur from unpreventable causes. It seems a rash commentary, but our statistics would probably more than prove that all the women saved by the art of midwifery will not offset in numbers those lost by the evils attending its practice before the aseptic era.

*Treatment.*—Our part of the subject of treatment is only to deal with cases requiring a hysterectomy for their relief; but, in order to determine the propriety of this very difficult question, it is necessary that we take into account what has previously been done for the patient. If the uterus has been cleansed by irrigation and probably curettage, and properly drained with tubular drainage—in other words, if the infected tract has been repeatedly and rigidly treated as we would an infected amputation stump, and the symptoms do not yield in three days, we may suspect extension to structures which can not be reached by such measures. We have to deal, in all probability, with a true septic infection. Combined with such rigid local treatment as has been indicated, free purgation by mercurials and salines should be practiced. The septic infection once extended to deeper

structures, the living tissue invaded by pathogenic organisms may yet prove amenable to less radical measures than hysterectomy. This depends more upon the course of a given case than upon any treatment that has been pursued. I have seen such a case after ten days, marked fever (the birth tract having been purified six days before) terminate in a lymphatic abscess about the cervix, which being incised *per vaginam* and drained, the patient rapidly and completely recovered. Again, I have evacuated such collections of pus about the cervix, but the temperature and all symptoms have progressed, sepsis continuing. Such a case is almost certainly one of the formation of subperitoneal uterine abscesses, and demands hysterectomy for its relief. In rarer cases there may be tubal involvement as well. We must conclude, then, that the time for hysterectomy in true puerperal infection is after thorough local and general treatment has failed to stay the progress of the disease. If successful, the non-operative treatment will arrest the disease in three days. If the birth canal is purified by mechanical means, antiseptics, tubular draining of the uterus, and the symptoms persist or become more grave, the question of hysterectomy must at once be considered. Every day lost after this status of the case is reached greatly imperils the life of the woman and diminishes the prospect of success from an operation. From what has been said concerning the morbid anatomy of cases requiring hysterectomy, I believe most surgeons would advocate the vaginal method as the safest way to deal with the majority of such cases. In the two cases of acute puerperal infection that I have subjected to hysterectomy a different procedure has been employed, but, guided by the experience of these two cases, I would now under similar circumstances do a vaginal hysterectomy.

Case I.—The first of these cases was in a primipara aged twenty-four years. I saw her in consultation nine weeks after her confinement, which had necessitated the employment of instruments. The cervix was much lacerated; the posterior wall of the vagina, about one inch below the external os, contained the cicatrix of a vertical tear some two inches in length. There was also an incomplete tear of the perineal body. Fever developed in this case on the third day. Local treatment by antiseptic irrigation was practiced; sepsis had been continuous and progressive. When I saw her there was great emaciation, some fever, morning temperature 97° to 99° F., evening temperature 103° F., heavy night sweats, pulse 130 to 150 and thready, abdominal tympany and tenderness, alternating constipation and diarrhœa—in short, a typical picture of profound sepsis. Locally there

was an offensive discharge of pus and fæcal matter. Examination revealed a torn perinæum about healed; a large, fluctuating sac in the recto-vaginal interspace; a small, soft, fluctuating point in the right side of the cervix; a discharging sinus still farther to the right of the cervix in the vaginal vault; the uterus could be felt distinctly enlarged. The abscess between the vagina and rectum was opened freely, the cervical phlegmon incised, and all together, with the uterine cavity, freely irrigated with mercuric chloride (1 to 2,000); drainage by antiseptic packing. Stimulants and iron had already been prescribed in what seemed to me to be the proper way. This treatment was faithfully persevered in for ten days, the wounds being cleansed and irrigated twice daily. No improvement in any of the symptoms followed. It was a fearful thing to contemplate, much less advise, a hysterectomy in a patient so advanced in sepsis and so thoroughly bad from an operative standpoint, yet it was advised as a last resort, and accepted.

Operation was performed on February 16, 1895, eleven weeks after confinement. I selected the combined abdominal and vaginal method, for I suspected extensive tubal and broad-ligament disease. The operation was completed in fifty minutes. The specimen which I exhibit to you displays the pathological changes found, except that I wish to say in making the abdominal incision I encountered a quantity of green pus between the peritonæum and fascia, which had dissected subperitoneally from the cervix anteriorly by the neck of the bladder and above the pubes. The interior of the peritoneal sac was smooth, and without adhesion of any of its surfaces. The uterus was removed by ligating the ovarian arteries and clamping the uterine arteries and lower portion of the broad ligaments from below with a single pair of light forceps on either side. The uterus was delivered above, as pus from the first incision had already defiled the peritonæum. Liberal through irrigation from above, and drainage made with gauze *per vaginam*, were practiced. After closing the peritonæum above, the lower abdominal wound was packed with gauze. The patient left the table with a pulse of about 160, and it remained around this point, varying from 148 to 174, for six days. After this there was gradual improvement for a week, the pulse going as low as 120. The vaginal wound did fairly well; the peritoneal wound healed without the slightest evidence of peritonitis; the abdomen remained flat; the bowels moved freely in their efforts to eliminate septic material accruing from other storehouses. During the latter part of the second week evidences of metastatic infection developed; the blood was so charged with septic matter that the irritation produced by hypoder-

mic needles was sufficient to cause localization of pathogenic bacteria and abscess formations. A small pulmonary abscess developed, which ruptured in the bronchus, giving rise to a most horrible odor. This complication, however, seemed well-nigh overcome by the vital resistance, when, in the third week after operation, constitutional pre-existing blood sepsis continuing, signs of cerebral infection became manifest, and death closed the scene March 6th, eighteen days from the date of the operation.

While this case terminated fatally, it was most instructive. It contained much of the pathology of progressive puerperal infection, illustrating in a most beautiful way the uterine lesion with multiple uterine subperitoneal abscesses. It is also instructive as leading us to believe that if such cases are operated before the blood is irreparably charged not only with toxic ptomaines, but pathogenic bacteria as well, there is a very good prospect of recovery. Our methods are adequate to stay peritonitis, even in the presence of vast quantities of very septic pus, provided such pus is in contact with the peritonæum for a short time only.

Case II.—Lady aged thirty years, second confinement. She was delivered April 22, 1895, by forceps. Three days after confinement there was a slight chill, followed by fever, temperature reaching 103° F. A vaginal douche and purgatives were administered. The fever did not decline, but I was informed reached 104.5° F. several times during the subsequent week. There was considerable abdominal distention and pain. Under large and frequently repeated doses of saline cathartics, combined with local treatment by irrigation, the temperature subsided, being marked by normal temperature in the morning, evening temperature 101° to 102° F.; distention greatly diminished; very slight purulent vaginal discharge. This was essentially the condition of the patient at the time I first saw her on May 14th, or twenty-two days after delivery. An examination revealed a small cervical phlegmon in the right side which had broken into the vagina and was discharging; the uterus was perceptibly enlarged and inclined toward the right, giving the appearance of a mass in that side. Thinking the process of involution had been arrested by septic infection, and that the lower cervical phlegmon not draining properly might account for the symptoms, I curetted this thoroughly, irrigating the uterine cavity with an antiseptic solution, with the implantation of a tubular drain in the uterus. The symptoms were not relieved by this practice; *per contra*, the next ten days showed a varying temperature, with progressive asthenia; the evening temperature

would occasionally rise to 103° F., followed by a profuse sweat at night, the morning temperature occasionally subnormal. The clinical picture presented by this case seemed to me most typical of Case I as I learned it from the attending physician. I felt sure that the condition of progressive yet slow sepsis was going on in the deep uterine tissue, and that in all probability the formation of just such phlegmons as occurred on the cervix and broke into the vagina was taking place beneath the uterine peritonæum. My experience in the first case led me to urge hysterectomy as offering the only prospect of recovery. This alternative was accepted both by consultants and the patient.

The operation was performed May 26th, five weeks after the birth of her child. The patient was much emaciated, presenting a picture of continued sepsis; the pulse ranged from 110 to 138. I thought it more than probable there was extensive tubal involvement, and selected the abdominal route. The uterus was removed by ligating the broad ligaments and a complete enucleation with the exception of the merest ring of cervix. Some difficulty was encountered in separating the uterus from the bladder on account of extensive pericervical and perimetral inflammation. The small portion of cervix was completely divulsed, and after most liberal irrigation poured through from above, a gauze drain, well impressing the broad-ligament stumps, was carried through into the vagina. The peritoneal flaps were approximated by a running silk suture and the abdomen closed without drainage. Her convalescence was not an easy one, the pulse ranging as high as 170 on the second morning following the operation. The septic broad-ligament stumps suppurated freely through the vagina, but did not impress the peritonæum above, this structure remaining intact and unirritated; the bowels moved liberally and freely when called upon to do so. After the second week convalescence was steady, and, except for the slight debility which would naturally follow so severe a septic infection, the patient is now well. The specimens which I show you reveal one large subperitoneal uterine abscess on the right side, with evidence of other smaller ones throughout the uterine tissue. As in Case I, this abscess when viewed from above looked very much like a neoplasm. There was limited disease of the right tube which had not gone on to suppuration. There was no adhesion of the peritoneal surface within the pelvic cavity.

*In Conclusion.*—1. From our present knowledge of the causation and nature of puerperal infection, we may say it is largely a preventable disease.

2. When occurring it is of the greatest importance to differentiate

between puerperal intoxication or invasion of a piece of putrescent placenta or blood clot by saprophytic germs, and true septic infection or invasion of living cells by pathogenic bacteria. Puerperal sapræmia, though in many cases producing the most alarming symptoms, is usually amenable to energetic treatment by curettage, antiseptic irrigation, and satisfactory tubular drainage of the uterine cavity.

3. True septic infection should be treated by sterilizing the birth canal at the earliest possible time, free elimination by purgation, and the prompt evacuation of superficial abscess accumulations about the cervix. Such a course may save the patient from more radical measures.

4. The chief differential points between puerperal intoxication and true puerperal infection are the comparative absence of pain, tympanites, and abdominal tenderness, and the more sudden onset and severe character of the symptoms in puerperal intoxication. Hysterectomy as a primary measure is never justifiable in septic intoxication, and when necessary it can only be after the mixed or secondary infection which may follow in the track of a primary sapræmia.

5. Progressive involvement of the deeper structures, as evidenced by daily elevation of temperature—probably 103° F. in the evening and subnormal in the morning—together with night sweats, scanty secretions, and ascending pulse, are indications for hysterectomy.

6. It is often impossible, from the involvement primarily of the low pelvic structures, to make a bimanual examination which will reveal the true condition of the uterine appendages ; but, in view of the fact that these structures are not so prone to be invaded in the acute, violent type of the disease, vaginal hysterectomy should be the operation of selection.