APPENDICITIS COMPLICATING PREGNANCY.[1]

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It may safely be said that few if any diseases have received such universal attention as appendicitis. The pediatrist, the gynecologist, the surgeon, and the general practitioner, either

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unitedly or individually, devoted time and energy to the study of this grave affection in all its various phases and manifestations; and since it was pointed out that appendicitis invades the pregnant woman, the obstetrician was added to the list of its students. The frequent occurrence of the disease, together with its serious consequences, created a watchfulness and an apprehension in the minds of the laity to the extent that not infrequently, on the strength of a pain in the stomach or side, a diagnosis of appendicitis is made by the patient long before the physician is consulted. But if appendicitis in general merits so much attention, how much more consideration should be bestowed on it in its relation to pregnancy; for here, instead of one, the lives of two human beings are involved in the process. This being the case, I need hardly apologize for inviting your earnest attention to this important subject.

Up to a short time ago the subject of appendicitis in pregnancy was, but for the brief report of one case, unknown to medical literature. I am sure no practitioner could have questioned its probable occurrence, yet it occurred to none to look for it. The everlasting credit is due to our eminent gynecologist, Paul F. Mundé, for introducing in his matchless way this grave accident of pregnancy to the appreciative medical fraternity. The novelty of the complication, the graphic description and excellent results of the first reported case, set the ball a-rolling with an impetus that roused every physician's interest in this new subject. It is not quite two years since that celebrated case was put on record; to-day there is quite a literature of appendicitis in pregnancy, and physicians everywhere are aware of the occurrence and take pains to detect it.

It has seemed proper to me to review the reported cases up to date before I report my new ones and before I enter into the important consideration of the pathology, etiology, diagnosis, prognosis, and treatment.

CASE I. (Mundé[1]).—Mrs. F. P.; eight months pregnant. On September 15th she was seized "with pain and tenderness in the lower part of the abdomen, equally severe in the median line and on both sides." Temperature 101° to 102° F. On the 20th the temperature fell to 99° and the patient was expected to sit up the next day. On the 21st, about 9 A.M., she suffered an attack of violent pain in the pelvic region, accompanied by a pronounced chill and fever, temperature going up to 101.5° F., while at the same time labor set in and kept up. On the 22d,

about 2:30 A.M., a dead child was naturally delivered. The birth of the child was followed by "semi-delirium and prostration." The abdomen still continued universally tender. Twelve hours after delivery "decided dulness could readily be made out, together with a very acute pain on pressure in the right iliac region, the outlines of the uterus being free"; vaginal examination negative, now the pain was localized. Temperature 102°, pulse 120. Diagnosis: Perforative appendicitis. On the 24th and 25th the temperature was nearly normal. On the 26th the temperature jumped up to 102°; temperature on the 27th, 101.8° F. On the 28th operation was done. Abscess found and completely closed by a thick wall of agglutinated intestines. Recovery.

CASE II. (Mundé').—Mrs. H. S.; multipara; gives a decided history of appendicitis in the past. On September 30th, 1895, she was confined by a midwife of a dead anencephalic fetus at term. The placenta was adherent to the right cornu of the uterus, but was completely removed. Two days after—namely, October 2d—retching and vomiting was incessant, pulse 63, dicrotic, temperature and respiration normal. No signs of collapse. Vaginal examination negative. Pain in the right iliac fossa. Careful treatment improved the patient's condition up to the 5th, when the previous tympanites returned, temperature went up to 101° and pulse to 112. No decided dulness or resistance on the right side. Lochia offensive. On the 6th of October operation was performed. The appendix was found perforated. The general peritoneal cavity was shut out by the adherent intestines. Death occurred three days after operation.

CASE III. (Mundé').—I referred this case to Dr. Mundé's service at the Mount Sinai Hospital March 17th. The patient was five months pregnant, confined to bed for five days, running a variable temperature from 102° to 103° F. morning and evening, suffering excruciating pain in the right iliac fossa. Previous history good except for troublesome constipation. Slight dulness on percussing the appendiceal area. When admitted to the hospital temperature fell to normal. "The day after admission, however, the temperature increased to 102.8° F., pulse 120; pain in the right iliac region intense; general tympanites. Examination under chloroform revealed distinct dulness and an abscess tumor in the right iliac region. Operation. A large amount of fetid pus was evacuated from a cavity which was partly closed by adhesion of the intestine. The appendix

was not found." Patient died twelve hours after operation.

CASE IV. (Abrahams[4]).—Mrs. X. About the ninth week of pregnancy patient began to feel pain in the right iliac region—a history of long constipation preceded this. The pain continued for three days, when she miscarried. This event afforded her relief for one day. Thereafter the pain returned and continued in the same place with increasing severity. The patient was seen eight days after abortion and eleven days after the occurrence of the pain. At this time she was admitted to the hospital. Dr. Mundé operated and found "a big appendiceal abscess, ill-smelling pus, gangrenous appendix, and agglutinated intestines." The patient died.

CASE V. (Frederick H. Wiggin[5]).—Mrs. A. V.; married; age 25; habitually constipated; pregnant three months. Was seen for the first time on July 21st, 1889. At this time the chief complaint was nausea. On the 24th the temperature was 99°, pulse 100; bowels moved. "On the 27th nausea continued, and for the first time patient complained of pain at McBurney's point. No tumor could be made out, and the pain was not increased on pressure; temperature 100° F., pulse 106. Diagnosis: Appendicitis. On the 28th the patient had had a fairly comfortable night. Pain at McBurney's point had disappeared and was now complained of over the left ovary. No tumor or dulness on percussion could be made out. There was some slight distension over the abdomen and the muscles were somewhat rigid. During the afternoon the patient had another chill, and when seen an hour later the temperature was 103° F. and pulse 126. Perforation of the appendix was suspected. Operation refused. Death occurred on the 31st. The autopsy confirmed both pregnancy and gangrenous appendicitis.

CASE VI. (L. L. McArthur[6]).—Mrs. M. C. R., age 31; married; multipara; pregnant four and a half months. Was admitted to St. Luke's Hospital (Chicago) Friday, January 19th, 1894. She was seized with intense pain, intermittent in character, in the right iliac region early Wednesday morning, accompanied by painful vomiting and soon followed by chill and fever. The bowels failed to move by enemata. Her suffering continued Thursday and Friday, the temperature ranging between 101° and 103° F. On admission to the hospital pulse 120, small, wiry, and weak; temperature 103° F.; respiration 38; expression anxious and pinched; skin hot; extremities cold; abdomen prominent, not tympanitic; uterus

enlarged, extending to the umbilicus; abdominal walls tense, with flatness on percussion over the right iliac area; exquisite tenderness with sense of tumefaction existing over this region; no vaginal discharge; cervix soft and somewhat patulous; tenderness without marked bulging in the right vaginal vault. Diagnosis: Appendiceal abscess or ruptured tubal pregnancy, probably the former. Operation. Large abscess, the peritoneum and uterus respectively forming the anterior and inner walls of the abscess. Appendix gangrenous. Abortion and death of the fetus followed the next morning. Death occurred on the second day after operation.

CASE VII. (McArthur[7]).—Mrs. Theresa B., age 34; IIIpara; between four and five months pregnant. Admitted to hospital October 11th, 1894. Previous history good. Took sick three weeks ago with "pain, vomiting, and fever. Pain colicky in right inguinal and iliac region. Temperature 99.2° F., pulse 112, respiration 26. Tumor in the right iliac region about the size of a fist. Upon vaginal examination a tumor could be felt in right vaginal vault, which was tender and continuous with the tender tumor in the right iliac area. Uterus normally posed. Diagnosis: Abscess. Operation. Stinking pus escaped; appendix was found in an agglutinated mass of intestines forming an apparent protection from the general peritoneal cavity. The right uterine wall formed the inner part of the abscess wall. Patient miscarried. Died.

CASE VIII. (Archibald C. Harrison[8]).—Mrs. S., multipara; five months pregnant. After taking "a large dose of pills," which purged her liberally, began to feel pain in the right iliac region and was somewhat feverish. On the 14th the doctor found the abdomen "tympanitic and very tender." On the 15th induration and pain in the right iliac fossa; no fever. On the 16th patient had another chill and pain over the abdomen; vomiting incessant. Labor began; temperature rose to 107° F. Fetus was delivered on the morning of the 17th. Grave symptoms promptly subsided. On the 21st fever and pain again. On the 22d operation was done; appendiceal abscess found. Patient recovered.

CASE IX. (J. W. Thomason[9]).—Woman about 20; nine months pregnant. On April 3d complained of sudden pain in the right side of the abdomen and constipation. Vomited during the night. On the 4th temperature rose to 104° F., pulse 132; pain excessive over appendiceal region. Tumor could not be felt; vaginal examination negative. Diagnosis:

Appendicitis. From the 4th to the 8th the temperature varied between normal and 102° F.; pulse always out of proportion to the temperature. Pain over the appendix continued. At 1:30 A.M. on the 8th of April the temperature fell to 96°, pulse to 90, and patient felt better. The patient continued well for a period of twenty-two days, although she still complained of pain in the right iliac fossa. On the 30th labor set in; delivery was unaided. The placenta was attached to the right side of the uterus; it was somewhat inflamed and presented calcareous degeneration. The patient's temperature was 102° F. after delivery, but it shortly disappeared. The reporter of this case states that a few weeks ago (writing in September, 1895) an examination revealed tenderness in the right iliac region. The doctor wavers in the diagnosis, thinking that the train of symptoms described might have been due to an inflammation of the placenta, but the very fact of the existence of lingering pain in the right iliac fossa is sufficient to stamp the case as one of appendicitis.

CASE X. (Howard Crutcher[10]).—Young woman, unmarried, was seized with abdominal pain and vomiting. History of constipation. "On July 18th, two days after the attack, a two months' fetus was expelled. Uterus curetted and packed; abdominal pain and constipation continued." Pulse 160, temperature 102.5° F. Operation was performed after long delay. Appendix found gangrenous and attached to the fundus of the uterus. Large quantity of foul pus discharged. At autopsy uterus was found normal.

CASE XI. (Hirst[11]).—Mrs. ——, four and a half months pregnant, was seized with violent, unaccountable pain. The abdomen was tender, distended; temperature 101° F., pulse rapid. Next morning was worse. In the afternoon she was operated on. "A large quantity of thin pus ran out when the peritoneum was opened." This was a case of "typical suppurative peritonitis" due to a diseased appendix. This woman made a good recovery. She carried to full term and was delivered of a healthy child.

I shall now add four new cases of undoubted appendicitis in pregnancy. The interest attached to these four instances of the disease lies in the fact that the mothers as well as the children escaped untimely death.

CASE XII.—This case occurred in the practice of Dr. S. Schaie, of this city, to whom I am indebted for the report. Mrs. B., 24 years old; mother of one child. From time to time

during gestation the patient complained of pain in the lower right side of the abdomen. Examination revealed nothing tangible to account for the pain. Bowels were kept open either naturally or by aid of mild cathartics. Toward the end of the seventh month of pregnancy the pain was more annoying, especially so when the child kicked up in the direction of the right iliac region. On October 1st, 1895, the temperature rose to 100.5° F., pulse 84; pain over McBurney's point, and a small area of dulness, distinct from that of the uterine tumor, could for the first time be felt. Through the application of ice and administration of opium the pain, swelling, and temperature which never rose higher than that mentioned, all gradually disappeared. On October 20th labor set in; delivery was natural, the period of gestation having been seven and a half months. The child lived six days; its death was due to lack of care and lack of nourishment. There was no recurrence of the pain, either immediately after delivery or at any time since then. Diagnosis: Catarrhal appendicitis.

Case XIII.—Mrs. L., age 42; previous history good; pregnant for the fifteenth time; suffers from habitual constipation. During her last pregnancy, just about the end of the seventh month, she was seized with a sharp, lancinating pain in the right iliac region, radiating to the left side of the abdomen. Vomiting occurred twice during the first hour. Twelve hours after this attack the pain was decidedly localized at the right iliac fossa. Temperature 100.5° F., pulse 90. The next day the temperature and pulse remained the same; bowels moved considerably after calomel, salts, and enema. The temperature, pulse, and pain continued nine days; on the tenth day the severity of the pain became less, while pulse and temperature were reduced to normal. While the appendiceal area was tender and painful, yet no dulness or tumefaction could be made out on the most careful examination. Diagnosis: Catarrhal appendicitis. The patient was delivered at full term of a living child; the placenta was normal in appearance, normal in delivery, and the puerperal period was, to use the conventional phrase, "uneventful." That the diagnosis of appendicitis was justified is shown by the fact that since her last confinement, six months ago, I treated the woman twice for recurrent attacks of the same trouble. During each recurrence the temperature was very slightly elevated and the pulse very little accelerated; dulness and tumefaction were absent. The woman stubbornly refuses operation, but I am afraid that when she gets in the

family way for the sixteenth time her consent to it may not be considered necessary.

CASE XIV.—This patient was under my out-door hospital (Mount Sinai) treatment. A woman about 40, five months pregnant; habitual constipate, otherwise her health was good. Was seized with general abdominal pain, vomiting; temperature 100° F., pulse 90. In twenty-four hours the pain became localized in the right iliac fossa. For seven days the temperature varied within a fraction of the initial degree, the pulse remained good, full, and 90. No tumefaction, but most exquisite tenderness in the appendiceal region. An enema for the constipation and an ice bag for the pain constituted the therapeutic measures. On the eighth day her temperature rose to 102° and pulse ran up to 110, somewhat weak. Slight dulness was perceptible on percussion, and by turning the patient on her left, so as to tilt the pregnant uterus to that side to give me a clearer field for examination, I could detect resistance over the appendix. At this time she was sent to Mount Sinai Hospital with the diagnosis of appendicitis. The diagnosis was concurred in by Drs. Brettauer and Lilienthal, attending gynecologist and surgeon respectively. Operation was decided upon, but shortly after the temperature went down to normal, and in a week the patient was discharged "cured." This patient escaped my further observation.

CASE XV.—Mrs. K., 26 years old; multipara; previous history good; more or less bothered with constipation; just entered the ninth month of pregnancy. On or about the 18th of September, 1896, she found herself vigorously engaged in a tenement-house brawl. An hour after the encounter her condition was as follows: A good-sized hematoma on the scalp; bruised and contused in body, limbs, and optical territories; her temperature in the axilla 106° F., pulse 120; half-unconscious, with twitchings of the muscles of the face and hands. Twelve hours later she felt like her former self, but complained of pain in the right iliac fossa; evidence of external injury corresponding to that region was in the form of a blue mark. The pain was quite intense on pressure. Temperature and pulse normal. On the 26th I delivered her of a healthy boy. There was no difficulty in removing the placenta. Her condition was excellent up to the fifth day of the puerperium. She still, however, complained of pain in the same place. On the fifth day she suddenly developed intense, diffuse abdominal pain, pulse grew rapid and feeble, temperature 104° F., vomited once, face

pinched and anxious, cold feet, and skin covered with clammy perspiration. After administering strychnine and morphine under the skin she grew quiet, pulse improved, and the pain was somewhat less severe; the temperature went down to 102° F. The next day she presented a picture of collapse; although she was half-unconscious, yet the slightest pressure on the abdomen was sufficient to rouse her from her stupor. The abdomen was not tympanitic, it was not tense, and while the tenderness was universal it was most severe on the appendiceal area. Vaginal and rectal examination failed to show anything abnormal. I regarded the case as appendicitis of traumatic origin. The temperature was still 102° F. and the pulse of excellent quality, 90 to the minute. I could hardly reconcile the patient's appearance with the existing symptoms. I thereupon decided to call in Dr. Mundé. The doctor kindly saw her in the evening. She still looked collapsed, the pulse and temperature the same as in the morning. After a most careful and painstaking examination my distinguished consultant indorsed the probable existence of appendicitis, but counselled against operative measures until further developments. For two days more her condition remained the same, particularly with reference to the diffuse abdominal pain and tenderness in the right iliac fossa. Thereafter she gradually grew brighter, until she completely recovered full consciousness. In a day the diffuse pain disappeared, but the tenderness over the appendix remained as acute as ever. This painful area existed for eight days longer, with the same temperature and the same pulse. Twelve to thirteen days after the onset of the attack the temperature and pulse were abruptly reduced to normal; the tenderness was also reduced, but not entirely. I examined the patient, during her illness, twice a day with the hope of discovering more than pain over the appendix, but more than slight dulness I could not find. Other features which the disease was characterized by were the following ones: Very heavily coated tongue, fetid breath, accelerated breathing (26 to 30 per minute), nausea, anorexia, uncontrollable diarrhea after ten grains of calomel, salt, and enema; lungs, heart, kidneys, and bladder normal. Treatment consisted in the continuous application of ice to the right iliac fossa and good nourishment. The child died on the eighth day with symptoms indicating profound septicemia, although no source of sepsis was discovered.

A few days ago the patient was in my office to pay her prac-

tical tribute to the art and science of medicine, but she was still complaining of pain "at the old stand." [1]

Bearing in mind the different clinical pictures of appendicitis in pregnancy which I had the pleasure of portraying, I beg leave to invite your further attention to a consideration of the other features of the subject.

Pathology.—There is no reason to presume that the appendix vermiformis in a pregnant woman should be governed by pathological laws and processes different from those in man or child. One feature, however, which may be designated as anatomico-pathological, must be prominently mentioned. This is graphically illustrated by Cases 6 and 7. I refer to that peculiar and unfortunate condition in which the uterus forms one of the walls of the abscess. For if you stop to think that the great and only safeguard, in case of suppurative appendicitis, against general septic and fatal peritonitis are the surrounding walls of inflammatory adhesions, which walls effectually prevent the escape of pus into the peritoneal cavity; and if you stop to observe how zealously the surgeon aims to preserve the integrity of the walls, you will readily appreciate what a grave feature is added to the deplorable situation when the contracting and enlarging gravid uterus, with the restless denizen within it, is one of the walls of the abscess. For whether the inevitable abortion or miscarriage occurs before or after the operation for appendicitis, the uterine contraction resulting from the process of labor is sure to break the welcome adhesion and allow the pus free escape into the peritoneal cavity.

Etiology.—As to the etiology of appendicitis in pregnancy, it must be the same as when the affection occurs in man or unimpregnated woman, with which you are all undoubtedly familiar. One point, however, I would venture to impress on your minds, which perhaps you have already gleaned from the long recital of all the recorded and unrecorded cases embodied in this paper—namely, that, with one unstated exception, all the pregnant victims of appendicitis gave a history of long, distressing, and obstinate constipation. As there was no other abnormal condition which could be considered a factor in the causation of the disease, it would be reasonable to infer that the constipation was the essential cause. If this inference be permissible, then the practical lesson to be learned from it is self evident—viz., insist that the pregnant client keep her

[1] The same patient suffered a recurrent attack, lasting a few days, since this paper was written.

bowels in perfectly good working order. Just as the careful physician inquires into the action of the kidneys during the pregnant state and quickly corrects any deviation from the normal function, so must he be on the alert regarding the healthy performance of the alimentary tract, removing especially all causes leading to torpidity of the bowels. Constipation is very frequent among women, and pregnancy promotes or creates the habit, hence the imperative necessity of watchfulness.

Apropos I would like to state that I am not prepared to subscribe to the prevailing belief that appendicitis is less frequent in woman than in man. My observation would lead me to assume that the frequency is the same or possibly greater among women. I can easily imagine that more than one woman harbors within her abdomen a diseased appendix vermiformis while she receives treatment for salpingitis, ovaritis, and a dozen other "itis," and thus the mistake in the statistics arises.

Diagnosis.—The diagnosis of appendicitis in pregnancy, unlike that of appendicitis in general, is attended by more than one obstacle. The presence of a uterine tumor, small or large, filling the pelvic or abdominal cavity; the fact that the abdominal walls in pregnancy are on the stretch, lacking the softness and pliability so essential in the examination of the abdominal contents—these are sufficient to interfere with the usual physical signs obtained from percussion and palpation of the suspected area. You must have been forcibly impressed with the almost uniform absence of dulness and flatness, tumefaction or tangible outlines of appendiceal tumors, in all the cases, which either operation or autopsy demonstrated to have been present. For all that, a little attention and sufficient presence of mind will enable the examiner to arrive at a correct diagnosis.

All the cases herein recorded show a certain uniformity in the symptomatology, differing only in the severity of its expression. First, there was the history of constipation; second, the sudden onset of acute abdominal pain, especially severe in the right iliac fossa; third, the subsidence of the diffuse pain and its localization over the region of the appendix; fourth, vomiting; fifth, rise in temperature and acceleration of pulse; sixth, save in one case, the negative result of a vaginal examination. Under ordinary circumstances an array of symptoms such as this would undeniably point toward appendicitis, and there is no reason to think that the same clinical picture, added to a negative vaginal examination, presented by a preg-

nant woman, should not warrant the diagnosis of the same disease. In closing my remarks on diagnosis I would like to allude to one more important point—namely, in all doubtful cases, in all obscure cases, it would be highly advantageous (it was done in Case 3) to examine the patient under anesthesia. This procedure is clearly indicated. Suppose an appendiceal abscess or other operable condition is revealed during the examination, the same anesthesia could be continued to serve for the operation. A parallel plan is advised in case of strangulated hernia where taxis is first to be employed, and, when failure attends the attempt, the anesthesia is prolonged and the surgeon proceeds. On the other hand, should the examination under anesthesia reveal nothing abnormal no harm will have been done by it.

Differential Diagnosis.—It may be worth our while to stop and consider other pathological conditions in the female pelvis or abdomen existing during pregnancy for which appendicitis might be mistaken, and how to differentiate them.

I. Right tubal pregnancy. Inasmuch as the utmost duration of tubal pregnancy before rupture is four months, it is self-evident that appendicitis in an ordinary pregnancy beyond this period could not even be thought of as an instance of extrauterine fetation. The mistake, therefore, can only arise when the complication occurs in the first three or four months. or when the pregnant uterus still occupies the pelvic cavity. The symptoms of appendicitis in pregnancy which would by their existence simulate or suggest right tubal pregnancy are the following: Subjective signs of gestation, as nausea, morning sickness, pain in the breast, etc.; enlarged uterus, soft cervix, vomiting, and colicky pain in the right side of the pelvic cavity. Then, at the time of rupture of the tube, the patient is attacked by a sudden, sharp, lancinating pain confined mainly to the right side of the abdomen, and, just as in gangrenous appendicitis, the rupture may be followed by peritonitis.

The absence of the following symptoms would at once exclude extrauterine pregnancy: 1. A history of sterility. 2. Irregular menstruation. 3. The skipping of one menstrual period. 4. Escape of decidual membrane. 5. Constitutional evidence of internal hemorrhage, as sudden pallor, thin rapid pulse, subnormal temperature, and a few other well-known symptoms resulting from hemorrhage.

With reference to the value of physical signs obtained from a vaginal examination, in the shape of enlarged tube (before

rupture) or a hematoma or hematocele (after rupture), while there is no question as to the importance of such symptoms, yet I would remind you of Case 7, in which a doughy tumor was found above the vaginal vault and which proved to be a continuation of the appendiceal abscess.

II. Second in order of differentiation comes salpingitis, pyosalpinx, or oöphoritis. Again these diseases can only be mistaken for appendicitis when it complicates early pregnancy. My time does not permit me to enter into a full discussion of the differential diagnosis. One point, however, I wish to remind you of—namely, an inflammation of the female pelvic organs is almost always the result of sepsis, so that if an undoubted history of infection, specific or otherwise, is present the differential diagnosis is rendered quite easy.

A subject worthy of careful study, but yet foreign to the aim and object of this paper, is the relation appendicitis in the unimpregnated woman bears to the inflammatory diseases of the right tube and ovary. As all general practitioners are practising minor, and some both minor and major, gynecology, I am sure the unique case which I wish to relate will elicit from them the deepest interest. The case was in Dr. Mundé's service at the Mount Sinai Hospital. I am indebted to Dr. Mundé for the permission to mention it here.

A. S. was admitted to the hospital September 26th, 1896. For six months had pain in the lower abdominal regions. On admission temperature 99.6° F., pulse 88, respiration 24. For several months she passed water very frequently; urine often very cloudy and offensive. One month ago passed some clots of blood in the urine. Must strain very much in order to empty the bladder. Has great pain before and during menstruation. Bowels constipated. Since two months troubled with prolapse of rectum. Three-weekly type of menstruation; duration one day, amount very small. On the 30th of September Dr. Mundé operated on her for the prolapse of the rectum, and on the 13th of October the patient was out of bed. October 18th she complained of intense general abdominal pain, more marked at the right side; temperature normal. October 19th, 6 A.M., temperature 102° F.; examined under anesthesia; resistance found in the right iliac fossa; ice bag applied. October 20th, vomited; temperature 102.6°; after the bowels had been moved by calomel and salts the temperature went down to 99°. The temperature rose again; the resistance became demonstrable, so that a diagnosis of appendicitis was made. Operation by Dr. Mundé.

Usual incision for appendicitis was made. Peritoneum opened. A large tumor, the size of an orange, was exposed, lying in the free abdominal cavity. Aspirated; pus withdrawn. The tumor proved to be a large ovarian abscess. Upon further examination another tumor (intraligamentous) was felt on the left side, but could not be removed through this wound. Median laparatomy was done after closing the latter. The tumor, which was easily removed, proved to be an intraligamentous ovarian abscess.

Within the last year I treated two women, one six months, the other eight months pregnant, both of whom showed apparent signs of appendicitis. The first complained of a constant dull pain, at first in the right hypochondriac region, later in the right iliac region. A tumor distinct from the pregnant uterus could easily be made out. Everything else about the patient was normal. After delivery the pain, with the tumor, moved up near the edge of the liver. The tumor was a floating kidney. This patient was seen by Dr. Gerster, the diagnosis confirmed. The other woman suffered most excruciating pain in the right iliac fossa, radiating down to the pelvis. No signs of a tumor; temperature very slightly raised; bowels moved with difficulty; pain in passing urine. On the eighth day she passed a stone the size of a hazelnut, together with a considerable amount of gravel.

I mention these two cases for the sake of completeness. In both a provisional diagnosis of catarrhal appendicitis was made, but time and patience corrected the error.

Typhoid fever is the last disease which will be taken into consideration with regard to a differential diagnosis. This affection was considered in and excluded from several of the cases herein reported. In case of appendicitis in pregnancy in which there is an absence of dulness over the appendiceal area, in which there is some tympanites, abdominal pain, pain over the ileus, steadily increasing temperature, and loose bowels (Case 15), and if all these symptoms continue undiminished for five or six days, the temptation to diagnose typhoid fever is very great indeed. But a little thinking will exclude it. The prodroma of typhoid is absent in appendicitis. In typhoid there is no sudden onset of acute abdominal pain. The symptoms characterizing the first week of typhoid—namely, headache, vertigo, apathy, epistaxis, pharyngitis, frequent stools resembling pea soup, sometimes bloody stools—all of these are conspicuously absent in appendicitis. The typhoid symptoms of the second

week are still more illustrative to exclude it.[1] Finally, I may be allowed to cite a case which was cited by McArthur, of Chicago, with the object of demonstrating the difficulty which may occasionally arise in the diagnosis of the subject in question:

"A young woman, aged 23, unipara, of good family history, who was four and a half months pregnant complicated by cystitis, suddenly developed, after a long railway journey, a temperature of 105° with general pain and vomiting. The pain after a day became localized in the right iliac area. The pain continued for a week. The temperature varied between 103° and 105°. Her condition on the eighth day was as follows: Temperature 105.3°. The uterus reached umbilicus and was not easily movable laterally. The right iliac area was flat on percussion throughout from umbilicus to spine and from Poupart's ligament to the uterine body. Distinct tumefaction could be felt, but could not be clearly defined from the uterus. Great tenderness on palpation. No tumefaction in vaginal vault. Rectal examination negative. Typhoid and rheumatism were excluded. There was a possibility of pyosalpinx (?)," although a diagnosis of appendicitis was made by more than one competent physician. "An incision was made and a normal appendix and a normal tube were found." The next day there was an abortion of a macerated fetus. The doctor regarded this case as one in which pregnancy occurred in the right cornu of the uterus, causing sacculation of the uterus, the right side filling out the entire iliac fossa. The constitutional symptoms were attributed to the long railway journey.

Prognosis.—The prognosis must be considered from the standpoint of both mother and child. The limited number of cases thus far reported does not yet warrant fixed or general prognostic conclusions. I shall simply give you data and ask you to draw your own inferences.

With reference to the mother, there is the melancholy picture of seven deaths out of a total of ten suppurative cases, or a mortality of 70 per cent; all but one were operated on. All the instances of catarrhal appendicitis recovered, or the mortality is *nil*. On the other hand, taking all the cases considered, eight of the fifteen recovered and seven died, a mortality of 46⅔ per cent. Either way you shift the facts the situation

[1] Evidence attesting the value of Widal's blood test for the diagnosis of typhoid fever is rapidly accumulating. Should it become pathognomonic its importance in the differential diagnosis between typhoid fever and appendicitis in pregnancy or otherwise needs no emphasis.

remains pretty gloomy. As to the children, only one child in all the operative cases survived; all the rest perished either before or after operation or never saw the light at all. In the catarrhal cases, with the exception of one which disappeared from observation, only one child lived; the remaining two died a few days after birth from causes probably relating to the maternal affection—to put it numerically, the children's mortality is 85¼ per cent.

Treatment.—In the discussion of this final topic of the paper I must necessarily confine myself to the methods of treatment employed in the reported cases. Yet I ask your kind indulgence should the drift of the argument tempt me to draw comparisons between general appendicitis and as it occurs in pregnancy.

The treatment adopted in all the recorded instances of the complication was both surgical and medical. In all the operative cases the treatment was for some time, perhaps too long, purely medical or symptomatic. With the exception of one mild catarrhal case (12) which received the opium treatment, all the rest were treated with salines and the ice bag (Cases 13, 14, 15). From the data and the results alluded to in my remarks on prognosis, you might apparently be justified in concluding that drugs are superior to cutting. Such a conclusion, unaccompanied by a careful analysis of the histories of all the cases, if adopted as a trustworthy guide in the management of future cases of appendicitis complicating gestation, would indeed be a calamity to the patients and an assault on sober judgment. I ask you to bear in mind two facts which, in my humble opinion, are responsible for the disastrously large mortality. First and foremost, all the fatal cases were submitted to the surgeon at a time when the disease had already advanced far enough to place them beyond the ken of the knife. Second, the disease not having been previously observed, the attendants, surgeons or physicians, failed to realize its gravity sufficiently early to apply the proper means to cure it. There is not a more cogent argument to support this explanation for the terrible mortality than that furnished by the unique case of diffuse septic peritonitis due to gangrenous appendicitis operated and reported by Hirst, of Philadelphia. In that case the diagnosis and operation were made "bright and early," and the result speaks for itself: the mother recovered, the child carried to full term and born healthy. Delayed interference means a mortality of 70 per cent; early interference, as is attested by the statements of many authorities, means a mor-

tality of a fraction of a per cent. A physician must be beyond redemption if these facts and figures do not move him to adopt the view that appendicitis is a surgical disease and its treatment is early operation. The pregnant woman who suffers with acute appendicitis should, unless the affection runs an extremely mild course with the pregnancy very near term, be regarded from the very inception of the attack a subject for the table and the knife. As a practitioner who knows his mind would not allow a woman with an extrauterine pregnancy to walk about without having urgently counselled her to submit to operation, although a sporadic case here and there does escape, so should his attitude be toward his pregnant patient who suffers with acute appendicitis, as both of these are treacherous diseases. The two are like a package of dynamite in the pocket, always ready to explode and destroy at slight provocation and without warning. Mundé's dictum is, "Treat the disease early, regardless of pregnancy"—a safe rule for everybody to follow.

Now as to the question of "when shall the operation be done and what are the indications for doing it?" Believing, as I do, that the rules which apply to appendicitis in general hold good in appendicitis in pregnancy, I propose to recapitulate the rules of guidance laid down by Willy Meyer, with one or two others as the result of personal observation. They are substantially as follows:

1. Operate early, within twelve hours, in acute perforative appendicitis.

2. Take the pulse as your guide; a quick, rapid pulse (116–120 beats to the minute) is an indication for operation. This indication was well exemplified by several of the cases herein reported. I should add that not only should the pulse be rapid, but it should also be out of proportion to the accompanying temperature. This, too, was well shown in the cases mentioned.

3. In case of doubt the operation is better than waiting. If an abscess is found the effort is well rewarded; if not, the conscience is clear and the woman is none the worse for it. The fear of interrupting gestation by an exploratory incision is counteracted by the accumulated instances on record in which pregnant uteri were operated on, cauterized, where ovarian and other pelvic tumors were removed, and yet pregnancy remained undisturbed.

4. Another strong indication for operation which I observed in my own cases, and which an analysis of other cases seems

to confirm, is this: namely, a sudden lull, and in ten or twelve hours a sudden recurrence of all the symptoms.

5. The fifth and last indication is a recurrent attack of an old appendicitis occurring during pregnancy.[1] The operation should be done even if the attack is ever so mild, and especially when it takes place in the early months of gestation. The laparatomy then is easy, aseptic, and removes the possibility of future attacks probably occurring late in pregnancy when the procedure will not be so easy and safe.

If some of my country brethren, who mostly raise the hue and cry against operation, should say, "All that talk about operation is fine exercise for you city doctors, who have well-equipped hospitals, skilful and willing operators, but what shall we do, away from hospitals and ready help?" the answer is—a sigh! The want of good hospitals and good surgeons, however, should not blind them to the fact that the early removal of a diseased appendix is infinitely preferable to the method of treating it with hope and opium until the pus providentially escapes through the rectum, bladder, or mouth. The want of antitoxin does not invalidate its curative properties in diphtheria; the difficulty and impracticability in private practice of carrying out, at times, the Brandt treatment in typhoid fever would be no excuse for condemning it. And as to those practitioners, in the city or in the country, who filially hang on to the apron strings of the good, kind, and thoughtful Mother Nature rather than to the art and science of surgery, I have a nice little anecdote to relate which I read in Huxley's essay on "Social Diseases." He says: "I was once talking with a very eminent physician, the late Sir W. Gull, about the *vis medicatrix naturæ*. 'Stuff!' said he. 'Nine times out of ten Nature does not want to cure the man: she wants to put him in the coffin.'"

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