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RUPTURED RIGHT TUBAL PREGNANCY;

ASSOCIATED WITH PERFORATION OF THE VERMIFORM APPENDIX. CONFIRMATORY DIAGNOSIS BY ASPIRATION; OPERATION; DEATH.

By HUNTER ROBB, M. D., *Resident Gynecologist to the Johns Hopkins Hospital.*

With Remarks by Dr. W. H. WELCH.

(READ BEFORE THE HOSPITAL MEDICAL SOCIETY, OCTOBER 5, 1891.)

Mrs. E. H., colored, aged 23, was admitted to the medical ward of the Johns Hopkins Hospital, March 20, 1891. Prior to admission she was under the care of Dr. Fenby, of Baltimore.

On admission the patient complained of shortness of breath and severe pain in the lower abdomen. She had been perfectly well up to Saturday, one week previous to admission, when she was taken with severe cramps in the abdomen, accompanied by vomiting. Her bowels moved on Saturday, Sunday and Monday, the first three days of her illness, but not afterwards. On Saturday the abdomen began to swell, and she complained of pain all over. Her menses appeared usually at the first of each month, the last one being February the first. She frequently vomited a small amount of greenish brown fluid. Since the preceding Sunday she could only take a small quantity of milk and tea. About one month ago there was a small amount of blood in the stools, the bowels then being loose, but she was not obliged to remain in bed. Owing to the condition of mental hebetude it was difficult to obtain a satisfactory history.

The condition on admission was as follows: Rather anaemic and pale, mucous membranes pale, sclerotic very white; face drawn; temperature between 99° F. and 101° F.; pulse varying from 96 to 130 beats per minute, small, compressible, regular; respirations from 37 to 42. Had some dyspnoea and frequent vomiting of a yellowish green fluid. Lungs were clear in front, in the axillae and behind. Heart dullness at fourth rib and laterally from the left border of the sternum to the mammary line. Apex beat in fifth

interspace. Sounds were clear at apex; first sound well marked. Soft systolic murmur heard at pulmonary cartilage. Abdomen symmetrically distended, particularly prominent in the middle, tense, tender on pressure, but tenderness not localized.

Percussion note: tympanitic in upper zone, lower zone dull, right flank tympanitic, left flank slightly resonant. Liver dullness from sixth rib to the costal margin.

Rectal Examination.—Rectum empty; mucous membrane healthy. Patient's temperature during the two days that she was in hospital registered from 99.5° F. on admission, to 101° F. at 12 p. m., and fluctuated between 100° F. and 99° F. to the time of operation.

I saw the patient for the first time on Saturday, March 21, at 1 p. m., one day after admission, in consultation with Dr. Lafleur. By careful inquiry the cessation of the menstrual period for seven weeks was proven. Previously the period had been regular; also with the first cessation of her menstrual period, March 1, she had morning sickness; this continued with more or less severity for two weeks. She also stated that, at intervals, she passed blood-clots, on two occasions resembling shreds of flesh.

On examination of the abdomen it was uniformly distended, with an indistinct sense of fluctuation. On palpation she complained mostly of pain and tenderness in the right flank.

Examination per Vaginem.—Vaginal outlet relaxed, cervical lips cedematous and rather soft; the uterus appeared to be somewhat enlarged, but could not be clearly outlined. There was

fluctuation on both sides of the pelvic cavity, communicated to the vaginal finger by palpation of the abdomen.

Examination of the Breasts.—Mammary glands slightly enlarged. On pressure, some watery, milky fluid exuded. To ascertain definitely the nature of the fluid in the abdomen, at Dr. Lafleur's suggestion, a hypodermic needle was introduced through the abdominal wall, in the median line, midway between the umbilicus and the symphysis pubis, bringing away dark, bloody fluid.

From the clinical history and the general examination I diagnosed ruptured extra-uterine pregnancy. Her general condition at the time of my examination seemed sufficiently good to justify abdominal section. This was clearly her only chance; she was accordingly immediately prepared for operation.

At 3.30 p. m. she was brought to the operating-room, anesthetized with chloroform, and an abdominal section performed. Upon opening the peritoneal cavity a stream of dark fluid blood, two inches in diameter, spouted seven inches from the incision. As soon as the intra-abdominal pressure was relieved the pulse began to flutter, and the respirations to grow shallow. It was evident that she was rapidly sinking. All the fluid blood was at once washed out with six litres of a sterilized salt solution. As soon as the uterus was palpated the ruptured right tube was recognized. This ruptured portion was about the size of a three-cent piece, with no visible remains of foetal structure attached to it. The tube and ovary were transfixed and incised. The left side was normal. Owing to the feeble condition of the patient further examination of the abdominal cavity was not attempted, and the operation was completed by simply closing the abdominal incision, soon after which life became extinct. Duration of operation fifteen minutes.

By way of criticism I would say, that this is a case which a surgeon would certainly not select for statistics; however, it is one in which it is his moral duty to attempt to relieve. It is the only chance such a patient has, and even if it is one chance in a hundred she certainly should be allowed that chance. I am not able to decide from the specimen, nor from the history, when the rupture occurred. I do not believe it was a recent one. She must have slowly bled to death, as the history which she gave of suddenly being seized with cramps, one week previous to her admission, rather suggests a case in which a leakage takes place, which condition continues until the patient bleeds to death into the abdominal cavity. It is rather an unusual case from the fact that there existed an old suppurative appendicitis, which was completely walled off from the peritoneal cavity. The existence of the appendicular condition was suggested by Dr. Lafleur, in which I concurred, but secondarily to the diagnosis of extra-uterine pregnancy.

From the Pathological Laboratory of the Johns Hopkins Hospital.

Examination of the blood, by Dr. W. S. Thayer, two hours before operation, showed, red corpuscles, 2,281,333; white corpuscles, 15,666; proportion, 1 to 145+. Examination of the dried and stained specimens showed a considerable number of nucleated red corpuscles. The leucocytes showed an excess of polynuclear neutrophils, as one would expect in a leucocytosis of this degree.

Autopsy.—March 21, at 5 p. m., one hour after death.

Anatomical Diagnosis.—Right tubal pregnancy, isthmic. Rupture of the foetal sac. Extensive hemorrhage into the perito-

neal sac. Perforation of the vermiform appendix, causing circumscribed abscess. General acute peritonitis. General anemia. Marrow in the long bones red and with many nucleated red-blood corpuscles and these also in the circulating blood. Peculiar chronic inflammation, with granular condition of the mucous membrane of the urethra, trigonum vesicae, left ureter, left renal pelvis, and calyces. Moderate dilatation of left renal pelvis and some of the calyces. Atrophy of the left kidney. Hypertrophy of the muscular wall of the bladder, and of the pelvis of the left kidney. Hemorrhagic decidua in the hypertrophied uterus, corpus luteum of pregnancy in the right ovary. Old perihepatitis and perisplenitis. Cicatrized typhoid ulcer with polypoid thickening of the adjacent mucous membrane. Enlargement of the solitary follicles of the ileum. Old adhesions of the left pleural cavity and circumscribed emphysema of the upper lobe of the left lung. Moderate general pulmonary oedema, bronchitis with foreign particles in the bronchi.

The result of the autopsy as to the organs of the pelvic cavity and surrounding structures is as follows:

Peritoneal Cavity.—The abdominal cavity contains about 30 cc. of dark blood-stained fluid. The visceral and parietal layers of the peritoneum are lined over a large part of their extent with a dark brownish-red membranous layer of coagulated blood, which is rather firmly adherent, but can be stripped off, leaving a comparatively intact peritoneum. The pelvic viscera are covered with coagulated blood. In places there is a thin greyish fibrinous exudation, chiefly on the visceral peritoneum. The coils of the intestines are agglutinated by the blood coagula. There are a number of old fibrous adhesions over the liver and spleen.

Bladder.—Contracted, contains a little fluid, the muscular coats much thickened, the walls measuring 13 mm. in thickness, nearly all of which belongs to the muscle. The mucous membrane is smooth and glistening, but trabeculated in consequence of the hypertrophied ridges of muscles; same over the trigonum vesicae. Here the mucous membrane presents a dry lustreless thickened appearance, with finely granular surface. The same condition existed in the pelvis of the kidney. This granular appearance is most marked on the side of the trigonum towards the mouth of the left ureter, which is dilated, measuring 2.5 cm. in diameter, whereas the mucous membrane immediately around the mouth of the right ureter looks smooth and glistening. The mucous membrane of the urethra shows in a marked degree the same finely granular appearance of the surface already described; its inner circumference at about the middle is 15 mm. There are the same coarse granulations noticed on the ureteral mucosa as on the other parts similarly affected.

Intestines.—The large intestine contains soft fecal material. The vermiform appendix measures 8 cm. in length, and extends downwards towards the brim of the pelvis. It is enveloped in closely adherent blood coagula. On scraping this away an extensive perforation and sloughing of the wall of the appendix is brought to view. This process is most intense at a distance of 8 cm. from the mouth of the appendix. Over its entire circumference for a distance of 1 cm. in length the wall of the appendix is converted into a dirty grayish-white sloughy mass, and on the median surface at this place there is a sloughy opening, 2 mm. in diameter, communicating with an abscess cavity about 2 cm. in diameter, containing grayish-red purulent material and necrotic shreds. This abscess cavity appears shut in by the surrounding adherent blood laminae, and beneath this some fresh fibrinous

exudation. The vermiform appendix to the distal side of the necrotic patch has thickened walls, measuring 4 mm. in thickness, in which the hypertrophied muscle can be seen. The mucous membrane is covered with a dirty grayish mass of mucus and fibrin, but on scraping this away it is not ulcerated, although it appears thickened and red.

To the peripheral side of the necrosis the lumen of the appendix is narrowed, so as to admit, near the necrotic place, only a fine glass probe, but between this stricture and the mouth of the appendix the lumen is wide, apparently dilated. Just above the ileo-caecal valve the mucous membrane of the ileum over an irregular area, 3 cm. in width and 2 cm. in length, appears slightly depressed and presents a greyish-white fibrous slightly puckered appearance, as if from a cicatrix, and especially in the irregular margins of the apparently cicatricial area there are numerous polypoid-like excrescences of the mucous membrane, 2 to 3 mm. in width, and projecting 2 to 4 mm., sessile with a broad base. (This cicatricial area, with polypoid thickenings of the mucous membranes in the margins, is probably a cicatrized typhoid ulcer). The Peyer's patches in the lower part of the ileum appear prominent, and have an irregular, somewhat reticulated surface, in which the follicles can be seen. The solitary follicles in the lower part of the ileum are swollen, prominent, hard and numerous.

Pelvic Viscera.—The right Fallopian tube and ovary are absent. The tube has been cut away close to the uterus, where the stump is closed by sutures. The left Fallopian tube and ovary appear essentially normal. This tube is free from adhesions, its abdominal mouth patent. It measures 12 cm. in length. The abdominal half of the tube appears a little thickened. The left ovary presents a number of Graafian follicles, several larger than a pea; does not contain a fresh corpus luteum. The uterus is large, its length is 10½ cm. The cervix is 4 cm. in length, the cavity of the body 4.5 cm. The thickness of the wall of the uterus, at the middle of the body is 15 mm., that of the cervix 9 mm. The os externum is widely opened. The entire inner surface of the corpus uteri is covered with a dark red soft mass, which fills the cavity of the body of the uterus.

The site of the mucous membrane of the uterus is occupied by a dark red, almost black tissue about 0.5 to 1 mm. in thickness. In the upper part of the cervical canal is an extension of the same dark red, bloody, tolerably firm material, adherent to the mucous membrane. Elsewhere the cervical canal presents a well-marked arbor vitæ. The mucous membrane of the vagina appears to be normal. All of the pelvic viscera are covered on their peritoneal surface with closely adherent coagulated blood. This blood is firmly adherent and spread out as a distinct membrane in which organization appears to have begun.

Bone-Marrow.—That of the left femur and of ribs is red and contains little fat. Microscopical examination shows red-blood corpuscles, many uninuclear, neutrophilic marrow cells, some with eosinophilic granules, and quite a number of nucleated red-blood corpuscles. The red-blood corpuscles are largely distorted, as in poikilocytosis.

Examination of Specimens Removed at Operation.—They consisted of the ovary and attached Fallopian tube of the right side, and many blood coagula from the peritoneal cavity. The ovary is large, presents one dropsical Graafian follicle the size of a pigeon's egg, and just beneath and by the side of this a large corpus luteum of pregnancy, with thick, yellowish-white festooned

wall, and a soft, grayish-red, partly-organized centre. The abdominal extremity of the Fallopian tube is patent, with normal and well-marked fimbriae. Close to the uterine extremity of the tube where it was cut off, the tube is dilated into a sac about 2 cm. in diameter. This sac is widely ruptured; its inner surface presents a rugous appearance with adherent, dark red masses. The wall of the sac is about 2 mm. in thickness. The blood coagula contain a few small, whitish or grayish particles and some membranous shreds. In these coagula are found typical chorion villi. The blood in these coagula, as well as some withdrawn by Dr. Lafleur before the operation by a hypodermic syringe, shows the most extreme poikilocytosis, pear-shaped, tail-shaped, fusiform, and many other deformities of the red-blood corpuscles.

The microscopical examination of the dark red, bloody, adherent membranes on the surface of the peritoneum shows such a large number of leucocytes that there is undoubtedly a peritonitis, but the inflammatory exudation is obscured by the blood extravasation. Bacteria are found on cover-slips from the bloody material in the peritoneal cavity. The predominating variety are bacilli resembling the bacterium coli commune. The purulent material in the abscess around the perforated vermiform appendix is immensely rich in bacteria of various kinds; not many long forms, mostly short ones, which may be bacterium coli commune. A very few cocci, chiefly in form of diplococci, are present. Cultures in gelatine as roll cultures are made from the peritoneal contents, spleen, liver, and bowels. A cover-slip from the surface of the left renal pelvis does not show any gonococci, but shows a number of short, oval bacteria, which may have gotten there accidentally post-mortem. Cultures made from the blood removed by hypodermic puncture from the abdominal cavity through the abdominal walls midway between the umbilicus and the symphysis pubis, are pure cultures of the bacterium coli commune. This was also obtained in pure cultures on human blood serum from the bloody fluid on opening the abdominal cavity.

It has seemed to me worth while to place this case on record from several points of view. In the first place, it is desirable that a condition as important and interesting as one of extra-uterine foetation should be recorded. The very extensive hemorrhage which took place in this case, sufficient to distend the peritoneal cavity so that the blood spouted out on opening it at the time of the operation, probably began one week before admission, and it is interesting that it should have been attended with so few characteristic symptoms. An unusual and most serious complication existed in perforation of the vermiform appendix. The condition of the walls of the appendix indicated chronic disease, which may possibly have been present since the attack of typhoid fever, of which positive evidence was found, both in the history and at the post-mortem examination. It is possible that adhesions may have formed between the appendix and the right Fallopian tube, and that the immediate cause of perforation is referable to the condition of tubal pregnancy, but this cannot be positively stated.

It is also interesting to note the sudden collapse of the patient after opening the peritoneal cavity, although her condition before the operation was most grave and gave little promise of a successful issue.

REMARKS BY DR. W. H. WELCH.

There are many points of interest in this case reported by Dr. Robb. The peculiar form of chronic inflammation, attended

with a granular condition of the mucous membrane of the urethra, extending thence along the left ureter into the left renal pelvis, is probably gonorrhoeal in origin.

Sections of the mucous membrane of the ileum from the areas supposed at the autopsy to correspond to old healed typhoid ulcers, have been carefully studied by Dr. Reed and this diagnosis confirmed. Of special interest is the demonstration of the reproduction of the mucous membrane, containing crypts of Lieberkühn, resting in places directly upon the main muscular coat, where the submucous coat had been destroyed by the ulceration. This specimen shows conclusively that the glands of Lieberkühn are reproduced after typhoid ulceration.

The finding of the bacillus coli communis in large number in the bloody fluid withdrawn by hypodermic syringe during life, suggests the value of a bacteriological examination of the fluids withdrawn for purposes of diagnosis from the peritoneal cavity. The existence of intestinal perforation was suspected in this case, not on the grounds of any symptoms pointing during life to this accident, but simply on the ground of the bacteriological examination. This suspicion was confirmed at the autopsy, which revealed perforative appendicitis. The symptoms referable to this condition were obscured by those resulting from the ruptured sac of tubal pregnancy.

The sudden death in this case during or immediately after the operation, may be explained in the following manner: The abdominal contents, including, of course, the abdominal vessels, were evidently subjected to great pressure from the large amount of blood extravasated into the peritoneal cavity. This is proven by the statement of Dr. Robb, that as soon as the peritoneal cavity was incised a stream of blood two inches in diameter spouted up to a height of seven inches. Now, we know that the abdominal vessels are capable of holding almost the entire amount of blood

in the body, so that if the portal vein in a dog be ligated the dog soon dies from the withdrawal from the circulation of the large quantity of blood accumulated in the abdominal vessels. The animal dies, as it were, from hemorrhage into its own blood-vessels. In the present case the sudden lifting off of the pressure on the abdominal vessels by the removal of the blood from the peritoneal cavity permitted the vessels to expand and receive a much larger volume of blood. In consequence of the great reduction in the volume of circulating blood which had already resulted from the intra-peritoneal hemorrhage, this sudden accumulation of blood in the dilated abdominal vessels brought about a condition incompatible with the continuance of the circulation. We know that death from hemorrhage is the result of a diminution in the volume of the blood and not simply of the withdrawal of a nutritive fluid, for just as much good is accomplished by injections of salt solution as by transfusion of blood. What is necessary in such cases is an increase in the volume of fluid in the blood-vessels, and in the present case it was the sudden diminution of this volume in the rest of the circulatory apparatus in consequence of its accumulation in the abdominal vessels, which brought about the final collapse of the already greatly enfeebled circulation. Of course there is only a remote analogy between the conditions in the present case where a sudden extravasation of a large amount of blood had occurred into the peritoneal cavity and soon after this was withdrawn, and the conditions in an ordinary case of chronic ascites where the fluid has accumulated slowly, the vessels have had time to adjust themselves to the altered mechanical conditions and the general volume of circulating blood has not been greatly reduced by previous hemorrhage. We should not therefore expect such an accident to follow the withdrawal of the fluid in an ordinary case of ascites as occurred in the present instance.