

Bacon (C. S.)

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DIAGNOSIS OF ECTOPIC GESTATION.*

BY C. S. BACON, M. D., CHICAGO,

Professor of Obstetrics, Chicago Polyclinic.

In presenting a few of the important points connected with the diagnosis of ectopic pregnancy, I must admit that there is little or nothing new to offer. During the last six or eight years there has been no great advance in this field. At least no new diagnostic criteria of especial worth have been discovered or established. While little by little the pathological anatomy of this condition is becoming better known, and while the principles and methods of treatment are being established and the therapeutic results are constantly improving, the advance in diagnosis consists chiefly in the fact that attention is being called more and more to the frequency of the condition. All practitioners of medicine, both general and special, now keep in mind the possibility of the occurrence of ectopic gestation, and thus many cases are discovered which were formerly overlooked. The fact that hæmatocele and hæmatoma are almost always due to ectopic pregnancy is now generally recognized as such by specialists, and is becoming universally understood.

The increased interest in the subject has improved diagnosis. On the other hand, the proposition to curette the uterus in order to obtain uterine decidua for microscopic examination which was made a few years ago and which, it was hoped, would prove a great addition to our diagnostic resources, has been somewhat disappointing.

With the supposition that a uterine decidua always existed in pregnancy, which could be easily demonstrated by the microscope, and thus prove the existence of pregnancy, and that the presence of decidua and the absence of foetal membranes in the uterus proved the existence of ectopic pregnancy, curettage in suspected cases seemed a

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most reasonable procedure. The fears were urged that curettage would provoke uterine contractions, and contractions of the tubal sac do not seem to have been realized, for curettage has proved no more dangerous than bimanual palpation. The danger of producing abortion in intra-uterine pregnancy is shared by the introduction of the sound to determine the condition of the uterine cavity. This danger one is fully justified in incurring on account of the great importance of establishing a diagnosis. The results of the procedure, however have been disappointing. Wyder, the advocate of the method, failed in his first case. Martin has failed twelve times. In five cases he did not find decidual tissues. The cases were nevertheless operated on and tubal pregnancy found. In other cases tissues that were considered decidual were found in cases of gonorrhœal salpingitis.

This failure to find characteristic decidual tissue can not be due to absence of those decidual changes of the uterine mucous membrane first described by Ercolani, and since confirmed by so many other observers. It is more probably explained by the occurrence of degenerative changes in the uterine decidual membrane which are not yet fully understood. The various descriptions of this membrane do not correspond in all respects. The investigations of Dobbert are among the latest, and his results agree substantially with those of Langhans and others in showing three layers—the superficial compact layer of decidual cells without glands, the middle spongy layer with dilated gland spaces and little connective tissue, and the deeper layer with the base of the glands and comparatively unchanged connective-tissue cells. After spontaneous expulsion of the decidual membrane only patches of the inner layer were found, which of course one might easily fail to recognize as decidual. The superficial and glandular epithelium of the outer layers sometimes disappears more or less completely. When present, the cells are shorter and more cubical. The transformation of the uterine membrane into a decidual membrane takes place more rapidly when the fœtus is located near the uterus, as in an interstitial pregnancy. The change may not be as great in an ampullar pregnancy of three months as in an interstitial pregnancy of one and a half month. Certain changes of a degenerative nature sometimes occur in the superficial decidual layers, even when they remain *in situ*, which tend to render them less recognizable and to lessen their diagnostic value. These changes have not been sufficiently studied, and the fact remains that inability to find decidual tissue is not proof of the absence of pregnancy.

Can decidual tissue exist, however, without the presence of preg-

nancy? The claim that was made by C. Ruge some years ago, that decidual cells are sometimes found in cases of endometritis, has not been recently supported, and the three cases of Ruge, Leopold, and Overlach still stand alone. The criticism of Wyder has shown that in none of these cases was pregnancy absolutely excluded. Attention has also been recently called to the fact that decidual cells may penetrate the muscularis and be found some weeks or even months after the close of pregnancy. I recall a case of this kind reported by Chiari. Therefore, in the absence of other confirmatory observations, I think the cases of Ruge and Overlach can no longer be used to controvert the long-established doctrine that the production of decidual cells occurs only in pregnancy. There may be more uncertainty concerning the changes in the glandular and superficial epithelium. In general it must be admitted that the presence of decidual membrane is proof of pregnancy. Of course the presence of foetal structures—for example, chorionic villi—shows uterine gravidity and so speaks against extra-uterine gestation.

It remains true, however, that this proposed method of making a sure diagnosis of extra-uterine pregnancy has proved to some extent a failure, and the uncertainty in diagnosis which still exists is well illustrated by the statistics of von Schrenck, who found only two hundred and twenty-one correct diagnoses out of six hundred and ten cases.

In considering the subject of differential diagnosis it will be convenient to make two periods of ectopic gestation—namely, the first four months and the later months. The first period is the most important, since few cases progress beyond it. In the first period the diagnosis can never be absolute unless the presence of an undoubted *decidua graviditatis* can be found in the uterus with no chorionic elements. In the second period an absolute diagnosis can be made from the foetal heart sounds and the movements of the foetal body.

The diagnosis must deal with the changes produced by pregnancy in various locations. These we classify as interstitial or tubo-uterine; isthmic; ampullary; infundibular, or tubo-abdominal, or tubo-ovarian; and cornual. We must also observe the changes produced by extra-peritoneal and intraperitoneal rupture of the fruit sac, complete and incomplete tubal abortion, the resulting hæmatocele and hæmatoma, and the death of the fruit followed by absorption, maceration, mummification, calcification, or suppuration.

The diagnosis is made by study of the symptoms and by physical examination. The chief symptoms of importance in diagnosis are irregularity of menstruation; pain; effects of internal hæmorrhage;

milk secretion; urinary manifestations, (a) vesical, (b) renal; bowel and reflex manifestations.

Nothing need be said of reflex symptoms, such as vomiting, etc., as they do not differ essentially, as regards severity or frequency of occurrence, from those of normal pregnancy, and hence are of value only in determining the presence of pregnancy.

Mechanical obstruction of the bowel may occur when the fruit sac is located in the pouch of Douglas, but is more liable to occur when a perirectal hæmatocele exists.

Painful micturition and other bladder symptoms are not more common before rupture of the sac than in intra-uterine pregnancy; after rupture they depend on the amount of the hæmorrhage and the resultant pressure. They have no special diagnostic value.

Eclampsia and severe kidney disease are so frequently noticed as to be of some diagnostic significance.

The milk secretion has no diagnostic value except in determining the existence of pregnancy.

The symptoms due to hæmorrhage, such as shock, dyspnœa, etc., are rarely absent after rupture, and indicate by their severity the amount of hæmorrhage. These symptoms, together with those of pain and irregularity of menstruation, are by far the most valuable of all the symptoms, and generally raise the first suspicion of the condition.

Pain in the first period, aside from the pressure symptoms caused by the growing tumor or hæmatocele, is generally of a colicky character, and is probably due chiefly to uterine contractions. In connection with the discharge of pieces of decidual membrane from the uterus this symptom is very important. Rupture of the fruit sac is usually but not always accompanied by pain. Veit and Martin call attention to the fact that recurring pains in the side, accompanied by symptoms of hæmorrhage, indicate tubal abortion. After the fourth month abnormal location of the child may give rise to pain. Peritonitis may also be present and cause pain.

Persistence of regular menstruation is rare. Amenorrhœa was found by Fraenkel in twenty-six out of fifty-four cases, and by Martin in thirty-two out of fifty-seven cases. In nearly half of the cases menstruation occurs at irregular intervals, varying in quantity from a few drops to profuse hæmorrhage. The menstrual discharge often contains pieces of decidua which may be of great diagnostic value.

In determining the existence of ectopic pregnancy physical examination is of prime importance in all stages, while in the first period,

before rupture of the sac, it is almost the only means of diagnosis. I include under physical examination not only bimanual exploration, but also the use of the finger, sound, and curette for exploring the uterine cavity.

The importance of physical examination is so great that all aids to its efficiency should be employed. One of the most valuable aids is narcosis, which should never be omitted when a satisfactory examination can not otherwise be made.

I must, however, call especial attention to the dangers of all physical examinations, including bimanual palpation, sounding, and curetting. Numerous cases have been reported where rupture of the sac has occurred during an examination. The physical examination is so important that this danger must be risked, but it is only right that before undertaking it preparation should always be made for immediate operation if indicated. Anæsthesia is a source of danger on account of the vomiting and struggling of the patient.

The necessity of preparation for immediate operation before beginning an examination has never been sufficiently emphasized. The danger from examination would be realized if all the patients who have died and all the cases of ectopic pregnancy in which rupture has occurred during examination were collected. Such a collection would be impossible, because data are rarely given. I know of one fatal case, and have myself produced a rupture during examination. My experience, and the impression gained from reading the casuistic literature, induced me to emphasize the rule I have given.

The uterine sound is employed generally in the second period to find out whether or not the uterus is empty. It is also used in suspected two-horned uterus to determine the patency of the canal connecting the uterine cavities. It is not necessary to call attention to the danger of perforating the uterine wall. The risk of producing an abortion is justifiable if the diagnosis between extra-uterine and intra-uterine pregnancy can not otherwise be made.

The use of the curette for obtaining decidua for examination has already been considered.

In employing these means of diagnosis I call your attention to the most important conditions which demand differential diagnosis—namely, intra uterine pregnancy, retroflexed uterus, uterine myomata and tumors of the annexa.

Differential Diagnosis between Intra-uterine and Extra-uterine Pregnancy.—While in all other cases the differential diagnosis is a problem of the first period, the chief difficulties in this case are in the second period.

Before the fifth month the uterus may generally be distinguished from the ectopic fruit sac by bimanual palpation. Before rupture of the fruit sac the difficulties arise only in cases of interstitial pregnancy and cornual pregnancy. When the egg lies in the middle or outer end of the tube the determination of the fruit sac as a tumor, independent of the uterus, is easy. A rudimentary horn is also frequently separated from the developed part of the uterus by so long a pedicle that it is easily found to be apparently independent of the uterine body. In such a case it is of no importance that the cornual pregnancy can not be differentiated from a graviditas isthmica or graviditas ampullaris, for the treatment is the same in all cases. In other cases the tumor of a cornual pregnancy, like that of an interstitial gestation, can not be distinguished from a gravid uterus by palpation. The insertion of the round ligament into the external surface of the tumor sac can very rarely be determined by physical examination. A corresponding irregularity in the shape of the uterus would not excite attention. Before rupture, symptoms of pain and collapse are not present. The only thing that can call attention to an interstitial or cornual pregnancy before rupture is irregularity of menstruation. Should such irregularity, together with the discharge of decidua, lead to the suspicion of an abnormally located egg, the exploration of the uterine cavity by the finger or sound is indicated. The especial importance of an early diagnosis of interstitial pregnancy is evident, because the rupture of the sac leads to the most dangerous form of hæmorrhage. The rarity of this condition is an element in diagnosis. Martin found only one case out of ninety-one.

After rupture of the sac the symptoms of pain and shock, in addition to the character of the frequent uterine discharge and the physical examination, make the differential diagnosis between intra-uterine and extra-uterine pregnancy comparatively easy.

It is also not difficult to establish the existence of a recent retro-uterine hæmatocele or of a hæmatoma by physical examination. Only in cases where the uterus is surrounded by large quantities of blood is the distinguishing of its contour difficult. Here the symptoms are sufficient to make such a differentiation superfluous.

Many mistakes have been made in the differential diagnosis between extra-uterine and intra-uterine gestation in the second period—that is, after the fourth month, and these mistakes are the most annoying. Should such a mistake lead to a laparotomy, and the discovery of a normally implanted egg, it would be a mistake that could not be hidden. To distinguish the uterus from the fruit sac by palpation

is often impossible, because the uterus changes so that it feels like a part of the wall of the sac. The shape of the sac has been mentioned as a diagnostic sign, but this is evidently of no value. The more lateral location of the tumor holds true only till the sixth month. The same may be said of the value of the other diagnostic points, such as the statements that the foetal parts may be better felt and the heart tones better heard through an extra-uterine sac. The unusual pressure and the kidney symptoms are to be remembered. More pain may be present, which may be due to displacement of organs and of the peritonæum, and peritonitis may even occur, but it is remarkable how little subjective disturbance from this cause is present as a rule. The history of symptoms and the irregular menstruation are of some value. In doubtful cases the use of the sound is indicated and justifiable.

Differential Diagnosis between Extra-uterine Pregnancy and a Retroflexed, Enlarged, or Gravid Uterus.—A number of mistakes of this kind are reported each year. Many of them are serious, for they often lead to efforts to replace the supposed dislocated uterus, and consequent rupture of the abnormal fruit sac. Only the first period of pregnancy is here concerned.

Before rupture, the condition which simulates a retroflexed uterus is a tubal sac lying in the pouch of Douglas. Careful bimanual examination in narcosis should be sufficient to distinguish the condition, although it must be admitted that a long cervix in the case of a retroflexed uterus often feels like a small uterine body lying on a post-uterine tumor. Repeated examinations should clear up the diagnosis in most cases without the use of the sound.

After rupture of the sac the retro-uterine hæmatocele must be considered. Here the history and symptoms of hæmorrhage, with the examination, are sufficient to clear up the diagnosis.

Differential Diagnosis between Subserous Myomata of the Uterus and Ectopic Pregnancy.—Here also only the first period is concerned. Before rupture, interstitial and cornual pregnancy and the isthmic and ampullar varieties of tubal pregnancy are to be differentiated from a more or less pediculated myoma. The consistence of the tumor is generally sufficient to establish the diagnosis. If not, the decidua can be examined.

Differential Diagnosis between Tumors of the Annexa and Ectopic Pregnancy.—Here the difficulties are also in the first period. Before rupture of the fruit sac, in the absence of symptoms of pregnancy, the diagnosis by bimanual palpation may be difficult. A gravid tube

feels very much like a hydrosalpinx or pyosalpinx. Veit says that the tumor of pregnancy is softer and not so elastic as a cyst of the tube. The enlargement of the uterus in ectopic pregnancy is not to be forgotten. The examination of the uterine decidua will probably clear up the diagnosis. The greatest difficulties arise when there is a concurrent extra-uterine and intra-uterine gestation. Such a condition is not very rare, probably not more uncommon than twin pregnancies, which Churchill estimates as one in ninety. Von Schrenck reports forty-three cases in which a correct diagnosis was made but twice. Here all symptoms, as well as examination of the uterine decidua, are absolutely without diagnostic value, if not misleading, before rupture of the fruit sac.

After rupture, the differential diagnosis is not difficult, for the symptoms and the presence of blood in the pelvis are sufficient to determine the existence of the condition. The concurrent presence of a sactosalpinx and a tubal pregnancy is not rare. As the therapy is the same in both cases, the impossibility of certainly diagnosing this condition is not of so much consequence.

It is not necessary to speak of the differential diagnosis between ectopic pregnancy and hæmatocele. Practically, all cases of hæmatocele are due to ruptured gravid tubes. The elaborate theories and classifications of Bernutz and others of former years are not supported by observations, but are, on the contrary, opposed to the results of all recent investigations. Hence, the attempt to distinguish between hæmatoceles due to different causes may well be given up.

In closing this necessarily brief synopsis of the chief diagnostic points of ectopic pregnancy, I will simply repeat that the recognition of the comparative frequent occurrence and great importance of ectopic pregnancy has done much toward preventing the neglect of the cases which formerly obtained. The diagnosis never can and never will be made with certainty in all cases, and must depend, as in the diagnosis of other pathological conditions, on the proper estimation of various symptoms, among which the most important are pain, irregularity of menstruation, and symptoms of internal hæmorrhage, and upon skillful physical examination.

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