ECTOPIC PREGNANCY: ANALYSIS OF 80 CASES

Review of Literature

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There have been 80 cases of ectopic pregnancy treated at the University Hospital from January, 1938 to July, 1944, 41 in Caucasian women and 39 in Negro women. In the past 221 instances of ectopic pregnancy in this hospital dating back to 1919 the incidence in Negro (approximately 40%) and in Caucasian women (approximately 60%) has been identical since the census reports indicate a relatively uniform ratio of 58% white and 42% Negro population. Table 1 shows the age distribution in the two races. Among the white women 39 were married, two were single, 36 of the Negro women were married, two were widowed and one single.

The pathologic reports indicated that 14 white women had evidence of infection and 22 did not, 18 Negro women had evidence of pelvic infection and 17 did not. Infection of the Fallopian tubes is one of the primary etiologic factors in most series of cases. Six white patients in which there was a record had had an average of 1.1 previous uterine abortions each; nine Negro women had had an average of 2.2 previous uterine abortions each. Fourteen white patients had had an average of 2.16 full term labors each and 22 Negro women had had an average of 3.02 full term pregnancies each.

The symptomatology of ectopic pregnancy needs revising in the light of the important symptoms and signs to facilitate the diagnosis for the institution of early proper therapy. The cardinal symptoms and signs are four. First of these is abdominal pain, usually unilateral, of sudden onset so that the patient is able to relate the exact time of onset as a rule and the pain is usually severe enough to cause her to lie down. It frequently begins while the patient is in an act of exertion, but may occur even during sleep at night. A history of the pain is frequently almost pathognomonic of ectopic pregnancy. Its abrupt onset, probably coinciding with sudden fall in blood pressure causes the patient to go to bed. There she stays
until she feels able to be up and about, which may be the next day or as long as a week or so later. However, a recurrence is almost certain to follow and the time of this frequently bears considerable relation to the time that she spent in bed; the shorter the bed rest the sooner the recurrent attack. If the intra-abdominal hemorrhage is profuse the pain spreads to other quarters higher up even radiating to the shoulders and thoracic region when the diaphragmatic peritoneum is irritated by the blood. Pain occurred in all the recorded cases of the white women and in all but three of the recorded cases of the Negro women.

The second cardinal symptom is bloody vaginal discharge which usually is described as a spotting, but may be profuse, even flooding. It may be of short duration or continue for weeks or months. In the white women bloody discharge was present in 35, none in three and no record in three. In the Negro women it was present in 33, none in five and no record in one.

The third cardinal sign is the presence of a tender pelvic mass. This is due to the swollen tube or ovary and/or its attendant blood clot adherent to the neighboring structures. The examiner should be gentle in the vaginal examination for fear of inducting further dangerous hemorrhage, and he should be content to ascertain the presence of a boggy fullness in the cul-de-sac or an exquisitely tender cervix on motion, as equivalent to a mass, which may be so high and inaccessible that attempts to palpate it would be decidedly hazardous. Frequently patients in the emergency room are made much sicker by injudicious and frequent energetic vaginal examinations which cause renewed intra-abdominal hemorrhage. In the white women a mass was present in 26 recorded instances, none in two and no examination recorded in 13 cases. In the Negro women a mass was found in 36 cases, none in two and no record of examination in one case.

The fourth cardinal diagnostic point is amenorrhoea. By the nature of the condition pregnancy may not have been present long enough for a period to have been missed before the vaginal hemorrhage appears as a consequence of attempts to abort the pregnancy which has been disturbed by eroding into blood vessels too large to permit adequate control of the hemorrhage. This may, and frequently does, take place before or near the next due period so that the vaginal hemorrhage is considered by the patient to be indicative of her menstrual period. In most cases, however, the pregnancy continues relatively undisturbed beyond two weeks' time and
amenorrhoea results, as was present in 25 white women and 32 Negro women. In 12 white and in seven Negro women there were no missed periods before the onset of symptoms, and in four white women there was no record in regard to the subject.

**TABLE I.**

<table>
<thead>
<tr>
<th>Age Incidence</th>
<th>15-19</th>
<th>20-24</th>
<th>25-29</th>
<th>30-34</th>
<th>35-39</th>
<th>40-44</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>2</td>
<td>10</td>
<td>13</td>
<td>9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Negro</td>
<td>1</td>
<td>11</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

**TABLE II.**

<table>
<thead>
<tr>
<th>Pulse Rates on Admission</th>
<th>White</th>
<th>Negro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75-79</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>80-84</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>85-89</td>
<td>15</td>
<td>12</td>
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<tr>
<td>90-94</td>
<td>6</td>
<td>2</td>
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<tr>
<td>95-99</td>
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<td>100-104</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>105-109</td>
<td>2</td>
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</tr>
<tr>
<td>110-114</td>
<td>1</td>
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<tr>
<td>115-120</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>121-124</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>138-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No record</td>
<td>1</td>
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</tr>
</tbody>
</table>

Other symptoms of lesser diagnostic import because of occurrence in common with so many other abdominal conditions were nausea and vomiting in 11 white and 20 Negro women, none being present in 23 white and 18 Negro in which there was a record of its presence or absence. The pulse rate was usually elevated (see Table II.). This is often out of proportion to the temperature which usually is nearly normal, but again is of little value for diagnosis because there may be fever to 103° or more in ectopic pregnancy without any pathological evidence of infection. The leucocyte count was below 10,000 in one third of the cases, between 10-15,000 in one third and above 15,000 in one third of the cases in each race, the highest being 25,200 in one white woman and 32,000 in one
Negro woman. Anemia in the protracted cases is almost the rule and usually is of greater degree than in other acute diseases that may be mistaken for ectopic pregnancy.

Other valuable but infrequent diagnostic points are:

1.—Fluid wave, which where it was made a matter of record, was present in two white women and 17 Negro women and was not present in 28 white women and 20 Negro women. Fluid wave of recent onset in a woman of childbearing age and presenting symptoms of an abdominal crisis is very suggestive of hemorrhage of ectopic pregnancy.

2.—Cullen sign with purplish discoloration in the region of the umbilicus is very infrequent and may easily be overlooked in the Negro women. It was present in one white woman, but was pathognomonic in this case.

3.—Surgical shock (hemorrhage) was present in three white women and in 11 Negro women.

Aside from placenta previa and rupture of the pregnant uterus, ectopic pregnancy is the chief obstetrical and gynecological emergency. The diagnosis depends upon suspecting the condition in any woman of child-bearing age who has: (1) Abdominal pain, usually unilateral and pelvic in type; (2) vaginal hemorrhage, usually not at the regular menstrual period; (3) a tender pelvic mass, usually unilateral, but may be a boggy mass in the cul-de-sac generally associated with exquisite tenderness of the cervix on motion; (4) history of amenorrhoea. The fourth is less frequent than the other three. Additional observation in regard to surgical shock, abdominal fluid wave, Cullen sign, two-hour pregnancy test, and undue anemia are of great use in confirming the diagnosis of ectopic pregnancy. The following observations are of little value in that they are confusing since they occur in common with other abdominal conditions more often found, or they unnecessarily delay the diagnosis and consequent proper treatment.

Of the first group are: (1) fever which occurs in ectopic, not often, but frequently enough to be misleading; (2) blood findings, especially leucocytosis which as noted occurs in 66.4% of ectopic pregnancies and thus is confusing with more commonly found intra-abdominal diseases. However, unsuspected anemia is very suggestive. The sedimentation rate is indecisive in ectopic pregnancy.
Belonging to the second group are: pregnancy tests requiring more than 2-3 hours. It may be re-affirmed that a woman with ectopic pregnancy is neglected if she is not operated upon within a few hours after the first physician first sees her. X-ray studies are often time consuming and are frequently indecisive.

If each physician would keep in mind that one in approximately 50-60 of his pregnancy patients once in her life-time is destined to have an ectopic pregnancy, and in all pregnancies to consider vaginal bleeding, especially if associated with abdominal pain as suggestive of ectopic pregnancy, and then to confirm or deny the suspicion by intelligent vaginal examination, the incidence of neglected cases would be decreased. Furthermore, the occurrence of full term abdominal pregnancy with the attendant danger to fetus and mother (probably now once in 1,000 labors) could be admirably reduced. In addition, if every instance of appendicitis in women of child-bearing age, and every instance of acute salpingitis, especially if there is coincident vaginal hemorrhage, were considered as possible ectopic pregnancy, the incidence of early diagnosis would be enhanced.

In all cases in which there is a question of ectopic pregnancy, one may be assured that the symptoms, if serious, are usually due to intra-abdominal hemorrhage, and the diagnosis may be completed by finding of blood, usually old blood in the cul-de-sac of Douglas, as revealed by a posterior colpotomy. Finding of blood in the peritoneal cavity is confirmatory and either the affected tube may be excised through the colpotomy incision or through a laparotomy incision following suture closure of the colpotomy opening. If there is no intra-abdominal bleeding the tubes and ovaries should be inspected by gently drawing them down to the opening. In the series of 80 cases colpotomy was done in 15 white women and 16 Negro women. In addition it was done in probably one-half dozen other women suspected of having ectopic pregnancy but found to have another condition, as threatened or incomplete abortion, pelvic inflammatory disease, etc. These then were saved from an exploratory laparotomy.

In this series correct pre-operative diagnosis was made in 88.7% of the instances, incorrect in 11.3%. The percentage of error in those cases managed on the staff service where the four-point diagnostic routine was used exclusively was less than 11.3% and the errors then were usually due to the fact that the ectopic pregnancy without many symptoms was masked by being a complication of, in
one instance a large fibromyoma, and in one instance an ovarian cyst. In one case, given in detail under mortality report, the four points were at all times in evidence, but there was also a masking thrombophlebitis of the veins of the left broad ligament and left thigh which was considered to be associated with aborting infected intrauterine pregnancy and precluded thorough vaginal examination at the time. However, she was rightly considered to be neglected and the error should not be repeated.

**Prognosis:** The average mortality in America is probably about 10%. One of 3% should be considered good and one of 1% excellent. The prognosis depends mainly upon two conditions: (1) Early diagnosis, (2) early operation, but only if replacement blood is immediately available. Early operation is urged even in the serious cases because here one may quickly ligate the bleeding artery and reinfuse by autohemoclysis after citrating the free blood found in the abdominal cavity.

**Mortality Report:** The mortality in this series was 2.5%. Both fatalities occurred in Negro women.

1.—Negro woman, aged 22. Married 5 yrs. Never pregnant before; entered the hospital first when 5½ mos. pregnant, having felt life one month. She had begun to bleed vaginally two days before and, in addition to tenderness and swelling in the abdomen she had fever and tenderness and pitting edema of the left thigh and ankle. Although she had the cardinal signs and symptoms of ectopic pregnancy, the diagnosis of threatened abortion with thrombophlebitis was made and she was sent to an isolation ward. Here her fever remained between 101° and 103° for six days, then receded along with the evidence of infection and after prolonged rest she was discharged on the 33rd day of hospitalization. During the latter part of her stay her blood was built up by iron and transfusions from 5 gm. hemoglobin on entrance to about 11 gm. During her stay she spotted vaginally off and on, but had ceased entirely on dismissal. However, within less than a week, she returned, having again begun to flow, this time rather profusely, and she complained of abdominal pain and abdominal rigidity and tenderness. The pregnancy, thought to be fundal, extended just above the umbilicus. Fetal heart tones were thought to be heard in the right lower quadrant. The evidence of thrombophlebitis had gone but she now had fever to 101° for several days. After eleven days of rest she again recovered; vaginal bleeding ceased to a mere spotting and she was dismissed with a living fetus considered to be intrauterine. She was not seen again for two months when she came to the pre-natal clinic where it was discovered that her pregnancy sac was much smaller than at dismissal and there was no evidence of fetal life. She was in good condition with normal temperature, 14 gm. hemoglobin; 10,700 white cells, 4,190,000 red cells. A grape-fruit sized
rounded mass was distinguishable in the right adnexa and X-ray revealed a condensed group of fetal bones. She felt too well for operation but consented. She was re-admitted and a laparotomy was performed. The grape-fruit sized sac with the atrophying six months' fetus and placenta was found surrounded by partially organized blood clot high in the right lower quadrant and loosely adherent to the neighboring bowel structures. The sac and placenta were removed without much trouble and without apparent injury to the bowel. The incision was closed without damage. Convalescence seemed to be normal until the 2nd post-operative day when she suddenly developed a high fever, abdominal distension and died. Autopsy permission could not be obtained from the husband. The diagnosis lay between embolus and peritonitis, more likely the latter. This is the only instance in the series of 80 cases in which further delay in operation might have been beneficial.

2. Negro girl, 21 yrs. of age, entered the hospital, ill for two days with pain in the lower abdomen and vaginal bleeding, following amenorrhea of two months' duration. There was a fluid wave present and she was critically ill after the blood pressure was normal. She had WBC 8,000; RBC 1,410,000. Hb. 25%. She was administered nasal oxygen and was immediately operated upon by mesial suprapubic incision. She was found to have a ten weeks' uterine pregnancy and a ten weeks' tubal pregnancy at the distal portion of the ampulla of the left tube, containing a fetus, 5 cm. C-R length, with a head the size of a small cherry. 300 cc. of fluid blood was suctioned out and 500 gms. of clots were removed in addition to the pregnant left tube. Three blood donors were matched and she was given 500 cc. of citrated blood intravenously. However, there had been that very day a change of resident staff and instead of administering the other two transfusions she was given by mistake 2000 cc. of 5% dextrose in saline intravenously. She developed pulmonary edema with coarse rales throughout the chest and died during the night without consultation. Autopsy was not obtainable.

In a previous series of 141 cases of ectopic pregnancy in the same hospital occurring during the years between 1919 and 1937 the mortality was 12 cases. The reduction in this series to 2.5% was attributable to two factors: first, earlier operation due in part to the recognition of the cardinal symptoms and, second, the commoner use of transfusions including autohemoclysis. The average patient in the first series remained in the hospital four days before operation, while in this series the hospital stay prior to operation was reduced to an average of less than two days. This was entirely to the credit of the recognition of the four cardinal points in the diagnosis and the freer use of diagnostic colpotomy.

The pathology depends upon the site of implantation and the advance of the pregnancy before trophoblastic invasion erodes into
an uncontrollable maternal blood vessel. If this does not occur the pregnancy may continue to full term, even though it erodes through the wall of the containing organ and becomes secondarily abdominal. Possibly 10% of all ectopic pregnancies would continue to near term if not altered by surgical treatment. If tubal, the fertilized egg imbeds in the tubal (Mullerian) mucosa. In most instances the implantation site is in the ampullar portion. The trophoblastic invasion is identical to that in the endometrium, but in the tube while there is a decidual reaction, there is no decidual membrane to protect the maternal tissue from excessively deep erosion. Consequently, as a rule, a highly congested blood vessel is invaded and maternal bleeding in excessive amount surrounds the fetal sac. If this is not immediately fatal to the embryo, continued erosion opens into the lumen of the tube into which the blood flows and from there out the fimbriated end into the cul-de-sac. Or erosion continues in the direction of the peritoneal covering of the tube which is ruptured and bleeding takes place directly into the peritoneal cavity through this break. While there is little tendency for this blood to coagulate, if the patient rests in bed coagulation usually results and a clot is found in the region forming an organizing clot in the cul-de-sac adherent to the adjacent structures, ovary, bowel, etc. Often the condition of the clot and a study of its structure gives a clue to the history of the clinical course of the disease in a particular case. The clot may be laminated and reveal additions of varying time intervals. These represent the acute attacks followed by regressions of the symptoms frequently associated with the periods of prolonged rest in bed. Occasionally the erosion is directed into the mesentery of the tube between the peritoneal covering of the broad ligament and then continued hemorrhage gives rise to a broad ligament hematoma, or if the pregnancy continues, to a broad ligament ectopic pregnancy, one of which we had which went to full term. Rarely, the egg is fertilized before it leaves the follicle and the ovum develops within the ovary giving rise to ovarian pregnancy. Equally as rare, the fertilized egg may implant within the interstitial portion of the tube and result in interstitial pregnancy. In these cases the blood vessels of the region increase enormously in size in the adjacent uterine wall. Erosion into them, with erosion into the peritoneal cavity usually causes severe and sudden hemorrhage initiating immediate collapse with large quantities of fresh blood flowing into the abdominal cavity. Possibly if the implantation is very close to the uterine end of the interstitial portion the enlarging sac may gradually intrude into the uterine cavity, with resulting
circumvallate placenta in some cases, or possibly with placenta accreta in others.

A white woman, aged 24, slender constitutional type came to the hospital with the following recorded history: “one pregnancy 5 yrs. ago. Menses came at regular time 5 days ago, but lasted only two days instead of normal 5-7 days. Then two days ago she was struck with severe lower abdominal pain slightly to right of midline and this caused her to go to bed. Then at 9:00 P.M. same day, she took a hot douche and within five minutes she felt weaker and in 20 minutes had doubling up cramps with fainting and nausea.” Examination revealed near shock condition with abdominal distension and fluid wave. Vaginal examination revealed slight bleeding from cervix. The uterus was indefinitely outlined due to abdominal distension. There was no definite lateral mass felt. There was distinct fluid wave noted. A diagnosis of ectopic pregnancy was made and posterior colpotomy done from which incision free blood gushed out. Low midline laparotomy incision then revealed 200 cc. blood clots and 1000cc. free blood in the abdominal cavity. The majority of the clots were collected around the right tube and ovary, but careful examination revealed no tubal or ovarian or uterine gross pathology discernible. The tubes were the same size, both apparently patent. There seemed to be a little fresh blood in the lumen of the right tube but there was no enlargement at all. Surgeons were called in consultation to ascertain the possibility of the cause of the hemorrhage elsewhere, but there was no evidence of any. The free blood was aspirated and the clots removed and the abdominal cavity closed without drainage, as also was the colpotomy incision. She recovered without incident except that she developed a recurrent attack of rheumatic fever before dismissal. While this case was not included in the series of ectopic pregnancy, we are convinced that it was an extremely early case with the site of implantation in the ampullar end of the right tube and that erosion into an uncontrollable blood vessel in the wall of the tube was so early that there was no gross evidence and inasmuch as the tube appeared so normal it was thought not justifiable to remove it merely for the sake of proof of the diagnosis.

In ectopic pregnancy the uterus usually increases in size to that of a 2-3 months' intrauterine pregnancy and the endometrium develops into decidua vera throughout the cavity. When the ectopic pregnancy first becomes disturbed by uncontrolled maternal hemorrhage about it the uterine decidua is usually shed in small pieces or rarely as a cast along with vaginal bleeding or spotting. In the 80 cases here reported there were 36 white and 29 Negro ampullar, three white and five Negro isthmic, no white, three Negro interstitial and no white and one Negro ovarian. Thus the percentages were: ampullar, 84.4%; isthmic, 10.4%; interstitial, 3.9%; and ovarian 1.3% in this small series.
In these 80 cases the right tube was more often affected than the left, 23 to 16 in the white women and 20 to 18 in the Negro women. Ectopic pregnancy occurred simultaneously in both tubes, both ampullar in one Negro woman. In two Negro women there were heterotopic pregnancies, uterine and tubal. One of the most interesting pathologic conditions noted was that in a Negro girl, age 27. She had given birth to seven full term fetuses. She was six months pregnant but gave a history of having had a bloody vaginal discharge and abdominal pain throughout pregnancy. Vaginal examination, however, gave the examiner the impression that the six months' pregnant uterus was complicated by an orange-sized tumor, extending from the fundus into the lower right broad ligament, and the diagnosis was made of pregnancy with fibromyoma. However, at laparotomy, it was found that there was a six months unruptured pregnancy of the ampullar portion of the right tube and the supposed tumor was the fetal head presenting alongside the large orange-sized hypertrophied fundus. The fetus was well formed and measured C-R 18 cm. The unusual fact however, was that the whole sac was lined by placental tissue without any membrane area; placenta membranacea. This was the only instance of placenta membranacea ever seen here, none having been seen in a study of more than 5,000 intrauterine placentas.

**Therapy:** Probably without exception immediate operation with ligation of the bleeding artery is in order for ectopic pregnancy. So important is this that I am of the opinion that any patient is neglected if she is not operated upon within a few hours after the first physician first sees her. So few cases recover without operation that none can rely upon non-operative treatment to improve the condition. Even in surgical shock cases with extreme hypotension, delay is not necessary for want of blood, for in these cases the patient has a large quantity of free blood in her abdominal cavity that may be citrated and used for autohemoclysis.

While getting the operating room set up in these serious cases, the patient should lie recumbent with the head of the bed low. An ice bag may be placed upon her lower abdomen while her feet should be kept warm. By all means if she is anemic and her blood pressure low, oxygen should be administered. While blood transfusions may be permissible, other fluids should not be given intravenously. Dextrose in normal saline may, if thought necessary, be given subcutaneously. Morphine is of value in quieting movement due to pain and thereby aids in temporarily controlling hemorrhage.

**Operation technic:** Posterior colpotomy in case of doubt of diagnosis is performed by thorough cleansing of the vaginal tract by soap and water, alcohol and antiseptic application. Following proper draping and introduction of a weighted speculum, one grasps the
cervix by a couple of tenacula and pulls it down and upward. A lateral incision is made in the vaginal vault near its reflexion onto the cervix. This incision is bisected by the midline and is short, so that the laterally placed vessels are not injured. The incision is then spread by forceps and hemostasis is secured prior to incision of the peritoneum so that blood in the peritoneal cavity if present is distinguishable. Ordinarily the determination of the presence or absence of blood in the peritoneal cavity is all the information desired. But it is possible to retrovert the uterus, if it is not too large, and bring into view its appendages, tubes and ovaries for inspection, and it is even feasible to resect the affected part if early ectopic pregnancy is discovered, as described by Heaney[2]. However, in our experience we have usually been content to close the incision by gut suture and then complete the operation by mesial suprapubic laparotomy incision, to ligate the vessels to the tubal or ovarian site of the pregnancy and to remove it along with the clots. The free blood, if found in quantity of 500 cc. or more, is aspirated into citrate solution (25 cc. of 5% sodium citrate per 500 cc. of blood) for autohemoclysis if the patient is in need of blood. Other surgery is not done unless greatly indicated. The appendix probably should not be removed at the time of ectopic pregnancy operation, although many surgeons have reported its simultaneous removal and without marked increase in mortality. Closure of the abdominal wound should be in layers without drainage. Drains only add to the danger of infection and to subsequent adhesions.

In the cases of late abdominal pregnancy there are three rules to follow: (1) Early diagnosis; (2) three or four pints of matched blood immediately available for administration during and following operation; (3) operation without delay by laparotomy; removing the fetus, also the membranes and placenta if the latter is so attached that the resulting hemorrhage can be controlled. If not, by removing the cord and mebranes only and allowing the placenta to remain in situ. Closure of the abdominal incision should be without drainage, even when the placenta is allowed to remain. Sulfanilamide powder (10 gm.) may be introduced into the peritoneal cavity before closure.

In this series posterior colpotomy was done 31 times to confirm or make the diagnosis. In approximately one-half dozen other instances of suspected ectopic pregnancy colpotomy saved the patient a laparotomy. Transfusions were done in 43 instances and autohemoclysis was done in 12 cases. There was no harm from autohemoclysis.
Excerpts from the Literature in Regard to Early Ectopic Pregnancy

Heaney in 1919 in Chicago was the first to exploit the diagnostic value of the four cardinal symptoms or signs of ectopic pregnancy, and he recognized the value of posterior colpotomy in obscure instances in early cases. In the same year, Wynn at Johns Hopkins Hospital reviewed the case histories of 303 cases of extrauterine pregnancy. He showed an increased incidence in Negro patients, 1.9% to 1.16% of the gynecological entrants. He found abdominal pain in 84%; vaginal bleeding in 31%. Blood transfusions were never used in these early series and he did not believe in autotransfusions, however, colpotomy was resorted to in the diagnosis quite frequently. Subsequent to the operation 61 patients were found to have become pregnant, and 37 had full term children. Sixteen miscarried and six had ectopic pregnancy. The mortality was 13 cases in 303.

In 1922 Lavell reported a clinical analysis of 410 cases at Bellevue Hospital. These were well analyzed with excellent tabulations. He found abdominal pain in all cases, vaginal hemorrhage in all but 19 cases, a mass in 90% and amenorrhoea in 69.4%. He found the leucocyte count to be 10,000 or less in 151 cases; from 10,000 to 15,000 in 100 cases, and more than 15,000 in 100 cases. The total diagnostic error was 15.3%—one of the lowest in all the literature.

In 1933 Jonas reviewed 90 cases from Peter Bent Brigham Hospital, Boston in which abdominal pain occurred in 97.7%, a mass in 60% and amenorrhoea in 60%. The mortality was 33%. He stated that “recent cases are easy to diagnose and old cases most difficult”. The errors most often were salpingitis, fibroids and ovarian cysts. Bush in 1934 at Roosevelt Hospital, New York City, reported favorably upon the use of needle colpotomy in 46 cases of 161 ectopic pregnancies. In the same year, Echols in Milwaukee reported 103 cases from private practice, operated upon without any mortality. He advised immediate operation. He did not advise auto-transfusions, nor did he do colpotomies. Diagnosis was 70-80% correct. He showed that in Milwaukee County in 1933 there was a fairly accurate ratio of one ectopic in 250 pregnancies. (Schumann found one in 267 in Philadelphia in 1918.) In the same year, 1934, Goldberger, Salmon and Frank stated that the Friedman test ordinarily done, gave 22.2% incorrect negatives on ectopic pregnancy. In 44 other cases using two rabbits for each test, there was 32% error. The test remained positive for 30 days in the case with
intrauterine dead fetus. They state that only the chorion needs to be alive. In 1935 Meagher quoted McDonald as having collected 6,626 cases of ectopic pregnancy with 7% mortality in those operated upon. Meagher's cases numbered 247 with 3.2% mortality. His review of the etiology is good. In 58 instances the ectopic pregnancy followed some sort of abdominal operation; in 56 cases there was evidence of infection following marriage. In 122 cases there was a previous abortion and 49 patients had suffered from dysmenorrhoea. He reported abdominal pain in 100%, vaginal bleeding in 93%, pelvic mass in 80% and amenorrhoea in 81%, and a correct diagnosis of 88%. His mortality statistics are not opposed to a certain degree of delay in operation. In tragic cases which numbered 80, immediate therapy consisted of rest, shock position, etc.

"The treatment at this time consisted of absolute rest, ward screen, shock position, complete morphine immobilization, one-fourth to one-half grain on admission, often a fourth within the hour and another fourth every three or four hours, external heat, no stimulation, no enema. We have found hypodermoclysis with Ringer's solution very valuable and, on account of its slow absorption, not at all contraindicated. Blood transfusion played an important role; however, in many instances this measure was not resorted to, improvement taking place to our satisfaction without it. We feel that in spite of the most careful typing and cross-matching of bloods, transfusion is not without risk".

However, in spite of low mortality in general, in four tragic cases not operated upon death occurred within six hours, four hours, five minutes and three hours respectively. The series had few transfusions and no auto-transfusions. In the same year, Fitzgerald and Brewer reviewed the rather complete histories of 500 cases from Cook County Hospital in Chicago. They found abdominal pain in 96.4%, vaginal bleeding in 83%, a mass in 65%.

"Several interesting facts are apparent in a study of the results of pelvic examination. Palpable masses were found in a large majority of the cases (65.2%) Bleeding sufficient to cause bulging of the cul-de-sac was noted in more than one-third (33.8%). The frequency of extreme tenderness was striking. Tenderness characterized as either extreme or marked was noted in 71% of our patients. This phenomenon has been subject to much dispute".

A correct diagnosis was recorded in 60% of cases. The location of the ectopic pregnancy was about equally divided between right and left side. Most by far were ampullar in the tube, eight were cornual, six heterotopic (both tubal and uterine). Evidence of pelvic infection was distinctly noted in 28.4%. They found leucocytosis:
none in one-third, 10,000-15,000 and above 15,000 in one-third. Ninety-one of the patients were in collapse on entrance; one-third of these died (blood transfusions were not quickly available then). The mortality of those operated upon at once was 34%, exactly the same as in those in whom the operation was delayed. The total mortality in the 500 cases was 7.8%. One patient in excellent condition died from infection of the colpotomy puncture. In the same year, Krueger analyzed 37 cases from Texas, reporting abdominal pain in 100% and bloody vaginal discharge in 100%. Likewise Mueller made a five year survey of ectopic pregnancy at Kings County Hospital, Brooklyn, N. Y. He reported upon 38 cases. He cited Schauta and Parry in the latter part of the past century who found more than three-fourths of all patients with ectopic pregnancy died when treated non-surgically. In 1936 Gordon quoted Schauta who in 1891 demonstrated that prompt operation reduced the mortality from 86.7% to 5.7%. He also cited the Children's Bureau study of maternal mortality in 15 states in 1933 which revealed that 4% of the 7380 deaths were due to ectopic pregnancy. He also quoted the Philadelphia report of 1931-1933 in which in 717 maternal deaths, 4.6% were due to ectopic pregnancy and the New York Academy of Medicine Report of New York City for 1930-1933, in which 5.9% of maternal deaths were in ectopic pregnancy cases. Many of these deaths were due in part to lack of transfusions and to the performance of gratuitous multiple surgical operations in the ectopic pregnancy patient. He stated that reduction in mortality depends more upon early recognition than upon the treatment. He leaned toward Polak's views in regard to delay in operation in some cases:

"A conservative plan was formulated by the late Dr. John O. Polak in the preparation of the critical case for operation. The Trendelenburg position was employed and external heat, morphine and hypodermoclysis were administered. When the systolic pressure returned to 100 mm. of mercury and the pulse had fallen to about 100, operation was begun. The donor, matched in the interim, was ready for the transfusion as soon as the mesosalpinx was secured."

In 1936 Falk and Rosenbloom analyzed 313 cases from Harlem Hospital, New York City. There was a mortality of 8.3%. Five patients died without operation and 10 died immediately after operation. Diagnosis was correct in about 80% of instances. L. Miller in 1937, analysing 104 cases, showed well the danger of incorrect or delayed diagnosis. He reported abdominal pain in only 57%, amenorrhoea in 79%, vaginal bleeding in 50%. The diagnosis was correct in 55%, suspected in 35%, total of 70%. He proved colpotomy to be an aid in diagnosis. In the same year, Grier studied 100 con-
secutive cases. Abdominal pain was present in 100%, vaginal bleeding in 88%, pelvic mass in 56%, amenorrhoea in 76%. Leucocytosis above 10,000 occurred in 77.5%. Few colpotomies were done. Forty-eight percent were operated upon the first day and 16% after the third day. They did not use auto-transfusions. The mortality was 3%, one post-operative pneumonia, one shock and hemorrhage after operation, and one delayed operation. In the same year, Nixon advised immediate operation. He quoted Girardin as saying that "the man who suspects every woman of having the condition is the one who is least liable to err in diagnosis".

In 1938 Graffagnino, Seyler and Bannermann reported upon the case histories of 445 patients at New Orleans. There was 11.4% mortality. Only about 2.5% had transfusions and only 7 patients had auto-transfusions. Sixty-two percent were correctly diagnosed. There were 51 deaths, 12 before operation, 5 on the table and 34 after operation. Also in this year Heaney wrote advocating colpotomy for diagnosis in early obscure cases and for completing the operation through the same incision when possible. Pride in the same year advised that physicians become ectopic-pregnancy-minded to cope better with this disease of difficult diagnosis. Jennings and Hunsucker reported 44 cases in 1938. They found abdominal pain to be present in 100%, vaginal hemorrhage in 95% and a pelvic mass in 86% of the cases. In 1939 there appeared papers by E. Allen, who described vaginal removal of repeated ectopic pregnancy; by Eastman who presented an excellent review of the literature and experience with ectopic pregnancy. Weil in 1938, in analysing 100 cases found abdominal pain in 95%, vaginal spotting in 74%, a pelvic mass in 89% and amenorrhoea in 62%. He considered the Friedman test for pregnancy in very ill patients as an unnecessary delay. He showed that even previous vaginal hysterectomy in a patient was no bar to ectopic pregnancy. There were 12% transfused, and auto-transfusion was used favorably in 22% of cases. Astonishing amounts of blood were retrieved from the abdominal cavity and given by hemoclysis. He stated that the average amount obtained was 1700 cc. The free blood was aseptically siphoned into a flask containing 25 cc. of 5% sodium citrate to each 500 cc. of blood and immediately inserted into the vein by gravitation. There were no bad effects from the autohemoclysis. Colpotomy was done four times. Langman and Goldblatt reviewed 310 operative cases with 70% correct preoperative diagnosis. Four of the cases had colpotomy. Shaw in Los Angeles, analyzed 319 cases in which there was the astounding number of 122 auto-trans-
fusions. In this report abdominal pain occurred in most cases, vaginal hemorrhage, 60%, history of preceding amenorrhea, 56%. Colpotomy was used in 11 cases. Hillis\textsuperscript{27} of Chicago, in 1940, stated that “from a study of the histories of 250 patients who had had ectopic pregnancy, it would appear that about one woman in eight who has had one ectopic may expect another, whereas one half of them have the prospect of future normal childbirth”. H. E. Miller\textsuperscript{28}, in 1940, reported upon 137 cases from New Orleans. Correct diagnosis including suspected cases was made in 70%. Abdominal pain was usually present, vaginal hemorrhage in 81%, amenorrhea in 52.8%, and a pelvic mass was found in 39.5% of instances. He advocated immediate operation and stated his position as follows:

“No time should be wasted before surgery by transfusion or infusion in an attempt to rally these patients. Such procedures can be accomplished during the progress of an operation, and the patient will benefit greatly from the time saved. Cases can always be recalled in which death occurred, without operation, while valuable time was lost in search for blood donors, or in a period of “watchful waiting” for the general condition of the patient to improve. On the other hand, it is customary to note a marked improvement in the pulse of a gravely shocked patient as soon as the bleeding vessels have been ligated at operation, despite the fact that no fluids or stimulants were administered. It is well to repeat that the time for the administration of fluids is during, or after, the control of the hemorrhage by ligature”.

Pearse\textsuperscript{29} in 1940 analyzed 56 cases from Duke Hospital. He showed that 50% of the patients not operated upon died from hemorrhage and very soon. One went into shock after examination in the admitting room and died soon after an incomplete operation. A colpotomy was done in 20% without ill effects. A needle was not used. Thompson\textsuperscript{30} in 1940 analyzed 40 cases from the School of Medicine, University of Maryland. The diagnosis was made or suspected correctly in 60% of instances. The mortality was 7.5%. Four other patients during the same time were operated upon for ectopic pregnancy and did not have it. Woodhouse\textsuperscript{31} in 1940, in a rather exhaustive review of the literature concludes that the diagnosis of ectopic pregnancy is difficult to make. In the series of 73
cases he reported, the diagnosis was entirely incorrect in 32.8% of the cases, and the diagnoses in these cases were salpingitis in 14 cases, uterine abortion in 10 cases, appendicitis in 5 cases, fibromyoma in 3 cases and ovarian cyst in 3 cases. In the ectopic cases, abdominal pain occurred in all but one or two, vaginal bleeding in 81.4%, pelvic mass in 68% and amenorrhoea in 56.7%. Falls in 1941, wrote upon the diagnosis and treatment of ectopic pregnancy. He quoted the Department of Commerce Bureau of Census reports to the effect that there were 437 deaths in the United States in 1938. Ware and Winn in 1941 analyzed 150 consecutive cases from the Medical College Hospital, Richmond. They found abdominal pain in 98% plus, vaginal hemorrhage in 74%, pelvic mass in 66.6% and amenorrhoea in 50%. They found the white cell count to be less than 10,000 in 36%, from 10,000-15,000 in 35% and above 15,000 in 29% of cases. The diagnosis was correct in 53%, and mortality was 8%. Transfusions were used in 40% of the instances and autotransfusions in one patient. Fever was absent in 26%; 99-101° in 58%, and 101-103° in 16%. They believe in immediate diagnosis and transfusions during the operation. Schauffler and Wynia in 1941 analyzed 65 cases of ectopic pregnancy. They suggested the more accurate term autohemoclysis for that of auto-transfusion. It was used five times, and in three cases was thought to have saved the life. They had no unfortunate experience with it. Shaw reported autohemoclysis 122 times and Wallingford 28 times without accident. Schaffey, in discussion, revealed that 28 patients were operated upon for ectopic pregnancy and did not have it. This was about 20% of the ones who did have ectopic pregnancy during the same time. He also stated that he used autohemoclysis 15 times and then had one septicemic death considered due to it and since then he has given it up. Schauffler and Wynia favor colpotomy. Rock in 1941 stated that the annual death rate from ectopic pregnancy is approximately 450, i.e. 4% of all maternal deaths. He believes pregnancy tests are pointless and he advises immediate surgery. R. S. Miller in 1941 reported a small series of five cases of ectopic pregnancy missed because they were considered to be intrauterine abortions. Sadler in 1942 analyzed 182 cases of ectopic pregnancy from Minneapolis. He found abdominal pain present in 97%, vaginal bleeding in 77%, pelvic mass in 64%, amenorrhoea in 70%. The sedimentation rate was determined in 36 cases, but was inconclusive. He believes in immediate operation. Johnson in 1942, studied 115 cases. Abdominal pain occurred in 91%, vaginal hemorrhage in 55%, pelvic mass, 50%. He states that pregnancy tests were not reliable and were too slow to be of help. Colpotomy was done in
six cases. He cites the fact that a tender cervix on motion is of value. He suggests a new sign which should be considered, i.e. unilateral pulsation of the uterine artery. In discussion, Schneider favored autohemoclysis and Fischman advised more use of colpotomy. Lisa, Alessi and Solomon in 1942 studied 115 cases. They found abdominal pain in 100%, vaginal hemorrhage in 84%, pelvic mass in 77% and amenorrhea in 80%. The admission diagnosis was 54.3% correct. They found the sedimentation rate to be not entirely reliable. Colpotomy was used in nine cases, but they doubt its value. Johnson in 1942 studied 115 cases. He stated that the only factor in ectopic pregnancy is its inconsistency. He found abdominal pain in 91%, vaginal bleeding in 50-60%, pelvic mass in 50%. The admission diagnosis was 50% correct. He stressed the diagnostic value of the tenderness of the cervix when it is moved by the examining fingers. He believes that there is no conservative treatment. Posterior colpotomy helped in six cases and he was favorable to it. He stated that the Ascheim-Zondek test required too long a time and therefore was dangerous and that the sedimentation rate was not important. Autohemoclysis was used in 20% of cases. Stein in 1942 advocated the use of hysterosalpingography and pneumoperitoneum alone or in combination, and with X-ray studies for the diagnosis of ectopic pregnancy. He stated that colpotomy was an accepted procedure. Rogers, in a general hospital in 1943, reported 65 cases without mortality. Transfusions were used in 28 cases, autohemoclysis in 18 cases. No serious reaction resulted. These were managed by 25 surgeons. The diagnosis was correct as diagnosed or suspected in 74% of cases. In 1943, Farrell and Scheffey analyzed 75 consecutive cases. They found abdominal pain in 100%, vaginal hemorrhage in 93%, pelvic mass in 59%, adnexal tenderness in 77%. Twenty-five percent had symptoms before the next due period, and 68% at the time or later. The preoperative diagnosis was correct in 72%. The incorrect diagnoses were pelvic inflammatory disease — 5, incomplete uterine abortion — 4, intrauterine pregnancy — 3, retroversion of the uterus — 3, ovarian cyst — 1. There were 13 other patients diagnosed as ectopic pregnancy and operated upon. These had pelvic inflammation — 4, ruptured Graafian follicle — 2, tubo-ovarian abscess — 1, fibromyoma and uterine pregnancy — 1, dermoid cyst and uterine pregnancy — 1, ovarian cyst with twisted pedicle — 1, ruptured appendix — 1, and no pathology — 1. The mortality was one case, 1.3%, but in spite of this good record, they state that delay in operative treatment contributed to the fatality.
EXCERPTS FROM THE LITERATURE IN REGARD TO LATE ECTOPIC PREGNANCY—ABDOMINAL PREGNANCY

In 1919 Beck reported a case of full term abdominal pregnancy in which both mother and infant lived, and in association with this report he analyzed the results of a questionnaire to 200 obstetricians in the United States, collecting 262 cases. From this study he concluded that it is best to wait until the 38th week for operation in order to give the fetus a better chance. This study was made, however, before the era of generalized use of blood transfusions in surgery. Not a great deal other than single case reports was written on the subject until 1933 when Cornell and Lash analyzed 238 cases, 226 from the literature and 10 of their own. They reported a maternal mortality of 14.3% and a fetal mortality of 67.3%.

"Peritonitis and shock accounted for 25 of the 34 deaths. Shock alone accounted for 17 (50%). In reading the case reports, it is surprising to note the number of surgeons who persist in attempting to remove the placenta in spite of the severe hemorrhage. We believe that the mortality can be lowered greatly if we desist from interfering with the placental site when it becomes evident that hemorrhage is uncontrollable. Packing, with or without marsupialization, will give the best results. If the placenta is located on the intestines or liver, it should be left undisturbed without drainage. Although hemorrhage may occur and prove fatal as the placenta separates or disintegrates, it is far safer to leave the placenta alone as this accident is rare."

The course of the pregnancy and the diagnostic findings are given.

"The course of the pregnancy is generally characterized by pain in the iliac fossae or around the umbilicus. Term is reached, but labor does not begin or the abdominal distress is mistaken for labor. Abdominal and vaginal examinations are of importance in the diagnosis. On abdominal palpation, the abdomen is found to be sensitive, but no uterine contractions can be stimulated. The round ligaments cannot be palpated. The child is very readily felt and is close to the surface. The fetal heart tones are loud and near the surface. The child usually lies in an abnormal position, i.e. a transverse or oblique position or high in the abdomen. Occasionally another mass, the non-pregnant uterus, may be palpable.

On vaginal examination the cervix is usually found high behind the symphysis in an abnormal position or pushed down into the vagina so that it reaches or extends out of the orifice. The corpus may be felt as a structure separate from the gestation sac, but associated with the cervix. Careful exploration of the uterine cavity with a sound may be of further diagnostic aid, although in one of our own cases the uterus was perforated by a sound. X-ray visuali-
zation of the uterine cavity with the aid of lipoidol may help, and a roentgenogram may clearly indicate a peculiar position and an unusual amount of freedom of movement of the child manifested by extension or a strange position of the extremities”.

Only 35% of the cases were diagnosed before operation. In 58 cases the fetus of seven months or more was high in the abdominal cavity in 17 instances, low in 20, and in 21 cases it lay transversally. “Because of the frequency of transverse presentation in abdominal pregnancy, the obstetrician should think of abdominal pregnancy in every case of transverse presentation”. In regard to treatment they state that most of the fetuses die in “labor”. The chances for the fetus are not good and they do not encourage a woman to continue to term to secure a live baby. Deformities were noted many times, mainly due to pressure. This occurred in the head 23 times, trunk seven times, and clubfeet occurred 15 times. Their first five conclusions are excellent:

1.—The diagnosis of advanced extra-uterine or abdominal pregnancy is warranted by: a history of pain in the lower abdomen throughout pregnancy, with or without irregular vaginal bleeding; a transverse or high position of the baby, absence of uterine contractions; impalpable round ligaments; and an empty uterus.

2.—X-ray examination of the abdomen with the use of lipoidol and exploration of the uterine cavity with sounds may be confirmatory aids.

3.—The proper preparation of the patient is essential to combat hemorrhage.

4.—Operation is indicated as soon as the diagnosis of abdominal pregnancy is made, since many children of such pregnancies die early or have deformities and the life of the mother is jeopardized less by immediate than by delayed operation.

5.—Removal of the placenta in toto is best when the placental blood supply can be ligated and the site of the placenta is not a vital organ”.

The bibliography is probably the most complete up to that time.

Longley in 1935 presented a case report—a full term seven pound four ounce dead fetus, extraperitoneal abdominal pregnancy secondary to rupture from the left tube which was removed by operation. During pregnancy the patient had had attacks of abdominal pain and vaginal bleeding. Posner in the same year reported a case in which the fetus, weighing seven pounds thirteen and one-half ounces removed by operation, lived, but the mother did not survive long after the operation.
In 1935 appeared a classic paper on the subject by Hellman and Simon, who reviewed all the cases in the literature in which a living child resulted, a total of 316 cases, but when further analyzed there were only approximately 80 instances in which both mother and baby lived, and this might have been reduced to 50 cases in which both were healthy and thrived. In two cases there were combined intra-uterine and intra-abdominal pregnancies, and in both cases the mother and all infants survived. They append a table of summary of all 316 cases. In 1936 Woods reported a case of term abdominal pregnancy in which the fetus survived but the mother died. She received one transfusion after operation, none before. Vaginal bleeding and abdominal pain were present throughout pregnancy. Likewise in 1936, Eisaman and Ziegler reported a case of abdominal pregnancy in which both mother and fetus survived. The fetus weighed seven pounds, was delivered by laparotomy and the placenta was left in situ, the abdominal incision being closed without drainage. In the same year Krishnan reported the case of a full term abdominal pregnancy in which the fetus was found within the amniotic cavity rising from the region of the left broad ligament. Both mother and infant lived six weeks at least, but the infant's jaw was deformed by pressure upon the mother's spinal column. In the same year Anderson reported a case of 8 months' abdominal pregnancy diagnosed and operated upon, removing a six pound infant which did not survive long. The placenta was removed and the mother lived. In both of the last two reported cases the mothers had abdominal pain and vaginal bleeding throughout their pregnancies. In the same year Reel and Lewis reported the histories of 10 cases, many not at full term. All gave a history of abdominal pain during pregnancy and six had vaginal bleeding.

In 1937 Friedman reported a case with a seven months' macerated fetus. The Ascheim-Zondek test was negative at the time of operation. Hysterography revealed that the uterus was separate and empty. The mother recovered. She had had abdominal pain and vaginal hemorrhage throughout pregnancy. In the same year MacGregor reported a case of abdominal delivery of an eight months' live fetus with club feet due to pressure, and a slight asymmetry of its head. The mother had had abdominal pain and early vaginal spotting.

In 1938 Cameron and Thomson reported the case of a full term dead fetus in the right Fallopian tube. There was no history of abdominal pain or bleeding noted. Gaines, Collins and Brown reported two cases in 1938. No. 1—pain, but no bleeding was recorded.
The placenta was left in and drainage of the abdominal cavity instituted; both mother and fetus died. No. 2—there was no history of abdominal pain noted. A dead fetus was removed along with the placenta, and the mother recovered in spite of abdominal cavity drainage. In the same year Bigelow reported a case of questionable primary abdominal pregnancy. The mother had abdominal pain and vaginal bleeding during pregnancy. In 1938 Crecca and Cacciarelli reported the case of full term abdominal pregnancy in which the infant (weight: five pounds, 14 ounces) and the mother both lived. There was no history of abdominal pain or vaginal bleeding. The placenta was attached in part to the appendix and both were removed. Posner in 1938 reported two cases with recovery of mother. No. 1—pain was not present but vaginal hemorrhage was. A macerated fetus was removed and the membranes about the placenta were marsupialized to the abdominal incision and the cavity drained by iodoform packs. No. 2—during pregnancy she had abdominal pains and vaginal hemorrhage. A macerated fetus (weight: two pounds) and the placenta were removed. Closure was without drains. In 1938, Hellman and Simon reported an abdominal pregnancy in a sacculcation of the left wall of the uterus from which a finger-sized canal extended back into the uterine cavity. This may have been a pregnancy which implanted in the depth of an endometrial gland extending into the uterine musculature (see Figure 3 in their article). Only four other similar cases have been described.

Mason in 1940 compiled a classic paper upon abdominal pregnancy with reference to the management of the placenta. He also analyzed 66 cases in addition to three of his own. He showed that there was no improvement in the mortality of the mother (18.8%) over that of the former report of 14.3%. A total of 75% of the recoveries were in two groups: (1) where the placenta was easily removed, and (2) where the placenta was left in situ. He found that there was no maternal mortality in those patients in whom no attempt was made to remove the placenta and in whom the abdomen was closed without drainage. When the placenta was marsupialized or packed and drained the mortality was 22.7%. When the placenta was removed with ease the mortality was 7%, but when it was removed with difficulty the mortality of the mothers was much higher. He concludes:

"1.—Factors in the diagnosis of advanced abdominal pregnancy have been enumerated above."
2.—If the placenta is so situated that it can be easily removed, without damage to vital structures or without undue consummation of time, and when the circulation to it can be easily and completely controlled by ligature, this should be done, and the abdomen closed without drainage.

3.—If observation and gentle exploration show that this is not possible or probable, no attempt should be made to remove the placenta, and again the abdomen should be closed without drainage. Marsupialization of the placenta, or drainage of the abdomen with the placenta left in appears to be the worst treatment of all.

4.—Necrosis of the placenta and membranes is a physiologic process, and should not of itself be an indication for drainage.

5.—Mortality and morbidity rates for this condition appear to be much higher than they need be. The factors which should lower these rates are: (1) earlier recognition by having the possibility in mind in cases showing one or more of the diagnostic points noted above, which would prevent loss of time before operation, and dangerous and futile attempts to "induce labor", and (2) better surgical judgement at the time of operation, chiefly in regard to management of the placenta."

In 1940 Nicodemus and Saccigga reported a case of abdominal pregnancy which had abdominal pain but no history of bleeding. Labor induced by catheter insertion failed, and was followed by Cesarean section and recovery of a live infant. The uterus was the size of three months' pregnancy. The placenta and membranes were left in situ, and the abdomen was closed without drainage. She recovered, but infection succeeded the operation and the abdominal cavity filled with pale pink fluid with staphylococcus aureus albus was found. A secondary operation on the seventh day after admission removed the placenta and recovery followed.

Slotover in 1942, reported a case of abdominal pregnancy in which the live fetus (female, weighing eight pounds, 10 ounces) was in transverse presentation, secondary to ampullar pregnancy in the right tube. Cesarean section resulted in complete recovery of both mother and fetus. The placenta was attached to the intestines and was left in situ but a small drain was inserted to the abdominal cavity. There was no history of either pain or bleeding during pregnancy. In 1942 also Mattingly and Merville wrote an excellent review of the X-ray diagnosis of abdominal pregnancy. In 15 out of 16 cases there was found transverse presentation of the fetus. There were 10 cases in 25,000 labors in New Orleans. The maternal mortality was 40% and the fetal mortality 90%. Gushue-Taylor in 1942 reported a case of abdominal pregnancy in which the infant lived
following operation, but the mother died. In this case the placenta was left in (no mention of drainage). There was a history of abdominal pain and vaginal hemorrhage during pregnancy.

In 1944 Kobak reported a case of abdominal pregnancy near term secondary to right tubal pregnancy in which there was evidence at the operation of infection of the left tube. There was a history of abdominal pain and vaginal hemorrhage during pregnancy. At operation there was found a dead fetus with digits of the left hand adhered to the membranes and both feet were clubbed. The mother recovered following removal of fetus, membranes and placenta. In the same year Mann and Meranze reported the case of an unruptured left tubal pregnancy which at six and a half months had caused severe abdominal pain and the diagnosis of premature separation of the placenta resulted in abdominal operation when the condition was found. The abdominal cavity contained free blood arising from hemorrhage through the fimbriated end of the tube containing the fetus.

Denoon and Henderson reported a case of a Negro woman 40 years of age, pregnant and due in August, 1935. She then had fetal movements, but during that month they ceased. She never did deliver and refused to be operated on. In 1943, eight years later she returned with symptoms of intestinal obstruction. Operation revealed full-term fetus in a sac which rose from the region of the left tube or ovary. The calcification was limited to the membranes. The fetus was leathery and dry. These authors give a small bibliography of lithopedions. Dibbins also in 1944, reported a case of a white female, aged 22, operated on for ectopic pregnancy. She was seen and watched throughout her second pregnancy in which she had much abdominal pain. At term the fetus was high and transverse. An abdominal operation found and removed a partially calcified full-term fetus, but the placenta bled so severely it was left in without drainage. About six weeks later because of anemia and signs of infection her abdominal cavity was opened and the necrotic placenta removed. A fecal fistula to the sigmoid resulted, but it healed spontaneously. Pearson and Parks in 1944 reported a case of a Negro female, gravida II, para I. During pregnancy she had abdominal pain and slight bleeding. Diagnosis of abdominal pregnancy was made and operation produced a two pound, 15 ounce living fetus which died in twelve hours. The placenta was left in the abdominal cavity. She gradually developed a cystic tumor in the lower abdomen and she was again operated upon.
taining 500 cc. of rusty-colored fluid was found in the region of the placental site. The placenta, uterus, tubes and ovaries were removed. This was followed by recovery.

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