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Full term abdominal pregnancy

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FORWARD.

In the preparation of this Thesis, I have tried to assemble a more or less well rounded survey of the subject of abdominal pregnancy, which is still a comparatively little known topic.

While case reports are to be found in the medical literature extending a good many years back, in which the authors have presented the findings in their cases, few men however, have attempted a detailed study of this topic and little is said on the diagnosis and treatment

HISTORY: Abdominal pregnancy from the standpoint of its symptomatology, diagnosis and operative treatment, has caused many discussions and called forth many valuable articles during the past twenty to thirty years, yet the historical side of the subject has received but little attention. From this, many have the impression, that this anomalous form of pregnancy was almost if not quite unknown to our predecessors of a generation or so ago. In a research into medical literature of the past four centuries, Norris (1) brings to light many clear cases of extra uterine pregnancy. The earliest writers mentioned this form of pregnancy, but offered no explanations as to its cause. One of the first and most natural suggestions was that the fetus had died in utero, and afterward had become displaced into the abdominal cavity, where it excited suppuration and thus was finally discharged.

Abdominal pregnancy was apparently unknown to the ancients, there being no allusion to the subject in the works on Greek and Roman medicine. According to Schumann (2), the first record of a case is that of Albucasis, an Arabian physician living in Spain at about the middle of the eleventh century. His case was one wherein during the process of suppuration, parts of a fetal body escaped from the abdominal wall. Most of the abdominal cases reported by the older writers were of this type.

Israel Spach, as quoted by Norris (1), published an

extensive work on Gynecology in 1537, which contained a wood cut of a lithopedian in situ. He dedicated to this fetus, which he regarded as a reversion, the following curious epigram. "Deucalion cast stones behind him and thus fashioned our tender race from the hard marble. How comes it that nowadays by a reversal of things the body of a babe has limbs nearer akin to stone?" This was written to the allusion of the classical myth, that after the flood Deucalion and Pyrrha, re-populated the world, by walking and casting stones behind them, which on striking the ground became people.

Some time after the publication of Spach, Cornax (3), was called to treat a woman with a large draining ulcer near her umbilicus. Four years previous to that time, the woman had attempted labor with no result. The abdomen continued to be large and tender, and after a time there was fetid discharge from the vagina. First one abscess and thereafter another, formed at the umbilicus. Cornax on seeing the woman, dilated the ulcer by an eight inch incision and extracted a semi putrid fetus. The woman survived the operation and conceived again, with a natural delivery. The author believed the first condition was due to a ruptured uterus.

Schumann (2) gives credit for the first surgical interference for the removal of the abdominal fetus, to Primerose in 1594. The history of this patient has

become classical. She was twice pregnant with extra uterine children, first in 1591, and then again around 1594. The cyst of the first child opened spontaneously through the abdominal wall. The fistula was enlarged and this child removed by Jacob Noierus. This operation proved successful and Primerose removed the second by gastrotomy. Later he performed a similar operation. Following this case there were a few authentic reports of abdominal pregnancy until 1714 when Calvo (2) reported a case in France. All of the cases so far reported were full termed, long retained abdominal pregnancies. Another case was reported in 1669 and again in 1718. This brings us up to 1741. At this time Jewett (4) gives credit to Bianchi for making the first true classification of ectopic pregnancy into tubal, ovarian and abdominal. Bianchi's classification was further simplified by Bochiner in 1752, and the work of these two men remains practically unchanged today.

Sometime between 1789 and 1791, and American surgeon by the name of McKnight (5), operated successfully on a woman, who in all respects went through a normal pregnancy twenty-two months before the operation. With the onset of labor pains which stopped in a short time, the woman was then up and in good health. She came into the hospital for an examination and under the advice of Dr. McKnight, she was operated upon. The child was delivered

but the placenta was not removed. The wound closed and the patient recovered with no complications. This case of McKnight's is of great interest, not only from the historical point of view, but in the fact that the wound was closed with the placenta in situ, here introducing a valuable point in treatment, although it was not accepted by the medical profession until more recent years.

Cornell and Lash (6) in their work on abdominal pregnancy at term, bring out the successful treatment of John Bard who removed a nine month fetus through the abdominal wall. In 1816, John King removed the fetus of an abdominal pregnancy through the vagina. The child was delivered through the opening by the use of forceps, but nothing was said about the handling of the placenta. The opinion of more recent writers was that the placenta was left in place. The wound in the vagina was not closed, but the patient was kept in bed with the head elevated. The wound closed in four weeks with an uneventful recovery for both the mother and child.

There is a great deal of controversy in the literature to whom the credit should go for the first successful surgical attempt at treatment of abdominal pregnancy. Schumann (2) gives credit to Primerose in 1594, but Cornell and Lash (6) seem to think the credit should go to McKnight.

INCIDENTS: While this condition is rare, Cornell and Lash (6) are under the opinion that it is met with more frequently than the conception the text books would lead us to believe. These authors have had the good fortune to have had in their hands, during a limited number of years, ten cases which they diagnosed and treated. On the other hand, men with a long practice may never see a case of abdominal pregnancy. With this in mind, it is easy to see why such contradictory statements as to the incidents of this condition arise. In direct contrast to the statement of the above authors is that made by Powell (7). He states, "A condition so rare that many physicians deny the possibility of its existence, and few ever see a case." Wagner and Hahn (8) are of the same opinion as Cornell and Lash (6), and their statements bring out "the fact of a rising occurrence in the past few years, which undoubtedly is due to the factor of a more accurate diagnosis."

Farrar (9), at the Womans Hospital in New York, worked on a series of 320 cases of ectopic pregnancy. In this group only one case of full term abdominal pregnancy was reported. However, in his series there were a large number treated surgically. As will be brought out later in the discussion of symptoms and the course of a full term abdominal pregnancies, the onset at the beginning may be stormy, giving the symptoms of a ruptured ectopic, which are definite indications for surgery. It is

interesting to speculate on the final outcome of some of the cases, if they had not been treated surgically. In this group of cases, forty-four fetuses were found; eleven were 5 to 19 cm. in length; two were intact with the placenta still in the tube; five were tuboabdominal in type; and thirty-nine were in the abdominal cavity, several being macerated.

From the New York Lying In Hospital, Harrar (10) reports ten cases of advanced ectopic pregnancy out of 156,000 confinement cases, or .0064 % out of this number. Out of this group three were abdominal, which would make the percentage for the occurrence of abdominal pregnancies .0024 %. Wagner (8) gives a slightly higher frequency; .003 % for the occurrence of abdominal pregnancy.

The rarity of primary, abdominal pregnancy is too well recognized to require any special emphasis. Although case reports appear spasmodically in the literature, a critical survey renders the fact that the majority of the cases are not primary implantation of the ovum on the peritoneum, but are secondary to tubal and ruptured tubal pregnancies (see Williams (11)). There are only twelve authentic primary cases reported to date according to Nelson (16), though most authors accept only three, those of Whitthaur (12), Golbin (13), and Hirst and Knipe (14).

Horsley (15), brings out a factor that should alter somewhat the incidence of abdominal pregnancies, that is due to the fact that so many of the cases are listed only as advanced ectopic and extra uterine cases in the Surgeon General's index. Many authors have left these cases out in their surveys. He lists 34 cases omitted between 1897 and 1912. These had continued to full term or nearly full term. Horsley gives the total of 138 cases prior to 1912, where there has been a full term abdominal pregnancy with a living child. Cornell and Lash (6), base their studies on 226 cases taken from the literature and ten cases of their own. To date this is the most complete survey made.

CLASSIFICATION AND ETIOLOGY:

One of the best classifications of abdominal pregnancy to be found in the literature is that given by Davis (17).

Primary: Implantation of the fertilized ovum on the peritoneum.

Secondary: 1. Continued growth of unruptured tube. This is theoretical and difficult to prove. This however is not a true abdominal pregnancy.

2. Continued growth after the rupture of the tube. This is possible when the embryo escapes alive and the placental attachment remains undisturbed. That the ovum can escape through a rent in the tube and replace itself on the peritoneum, seems somewhat doubtful.

3. Continuous growth through the end of the tube (tubal abortion).

4. Continued growth after rupture of an ovarian pregnancy. Here, as in the tube, the placenta remains attached after rupture, the pregnancy continuing to term.

Bishkow (18) reports a case that would add another sub group to the secondary form. His case was one in which the uterus was ruptured while an abortion was being performed at the end of the first month by means of a catheter. Some of the membranes were passed. Four months later, due to severe abdominal pains, the patient was operated on and a four months fetus was found in the abdominal cavity, with the placenta still being attached to the inner surface of the uterus. His case while being very unusual, cannot be considered one of the typical factors in abdominal pregnancy. Although the rupture of the uterus at the site of scars from a Caesarian section are often etiological factors of this type. It is interesting to note that these are all reported cases of the classical Caesarian section and not of the low type.

Primary Abdominal Pregnancy, as shown by most authors, is indeed one of the rarest types of ovarian implantation. When one thinks of the phagocytic and absorptive power of the peritoneum, and it's ability to handle mass contamination (Babcock (19)), it is difficult to conceive an ovum remaining vital long enough to implant in the

abdominal cavity. However, Hirst and Knipe (14) in their report of a case in which surgery was necessary to stop severe hemorrhage, showed beyond doubt that this condition can occur. The patient died due to the hemorrhage. The autopsy findings showed a gestation sac between the rectum and uterus entirely filling the pouch of Douglas. The fetus on examination compared with that of a ten week normal uterine gestation.

In order to sustain the claim that there has been a primary implantation of the ovum on the peritoneum, there must be:

1. A normal condition in the tubes, ovaries and broad ligament, except where the ovum is implanted.
2. No penetrations of the intra-ligamentary space from the ovarian fimbra.
3. No intraligmentary rupture of the tube.
4. No escape of the ovum from the uterine cavity.
5. Proof that the peritoneum constitutes the reflexia of the ovum.

Hirst and Knipe (14) applied the above in their study of the case, proving beyond doubt their case was primary. The twelve cases of true primary abdominal pregnancy reported by Nelson (16), have had to fulfill the above five requirements in order to be classified as primary abdominal pregnancies.

Webster (21) laid down the rule that the ovum always imbeds in Mullerian tissue. His concept was that all ectopic pregnancies were primary tubal, when the fact was proven that primary ovarian pregnancy could and did occur, he explained the fact, by altering his theory and saying that Mullerian tissue rests were to be found in the ovary.

As far as fertilization taking place in the abdominal cavity, there can be no doubt of that. Williams (20) in his work on ectopic gestation, shows that active motile sperm can be found in the peritoneal cavity and spread over the surface of the ovary in the human.

Secondary Abdominal Pregnancy. Schumann (2) classifies this as terminations of extra uterine pregnancy.

1. Tuboabdominal pregnancy.
2. Secondary abdominal pregnancy.
3. Tubalovarian pregnancy.
4. Intraligamentous pregnancy.
5. Ovarioabdominal pregnancy.
6. Secondary abdominal pregnancy.

In the study of the etiological factors of secondary abdominal pregnancy one must state that it is a final result of a tubal or ovarian pregnancy.

Williams (20) in his work on the Etiology of Ectopic Pregnancy, states, "It is universally held that the cause must lie in some interference with the passage of the ovum from the fimbriated extremity of the

tube to the uterine cavity." "Such interference" Schumann (2) states, may result from:

1. Obstruction of the tubal lumen from without
   a. Peritubal adhesions causing strictures and kinks.
   b. Constrictions resulting from the presence of a tumor of the neighboring organs.
2. Obstruction of the tubal lumen from within.
3. Anomalies of the lumen, accessory tubes, etc., into which the ovum falls and can be propelled no further.
4. Decidual reaction in the tube.
5. Growth of the ovum so that when it enters the tube it's size prevents further passage. This may be due to external migration.

Salpingitis is probably the most frequent etiological factor in ectopic gestation, as most observers are able to elecit a history of previous inflamation, gonorrhea being the most frequent. Follicular salpingitis is the factor in 90 % of the cases. (Falk (22)).

Cornell and Lash (6) gives a clear description on the etiology of abdominal pregnancy. The three main causes are: tubal pregnancies; primary abdominal pregnancy; and ovarian pregnancy. The first being far the most frequent. The tubal pregnancy ruptures or aborts, and the ovum becomes imbeded secondarily in the abdominal cavity. It may attach itself to some abdominal viscera or the placenta may remain attached to the tube and it's adjacent structures. Schumann (2) classifies this condition where the placenta remains in the tube, as

tuboabdominal pregnancy.

The next common factor is classed under trauma to the uterus. Rupture of the scars in Caesarian section is first under the heading. This usually follows the classical type. No cases have been reported of rupture of the lower type of operation. Traumatic rupture of the uterus has been reported several times by Bishkow (18).

PHYSIOLOGY AND PATHOLOGY: Primary abdominal pregnancy and it's associated changes are so rare, that no more than mention of them is to be found in the literature. Schumann (2) dismisses it with the statement, "like it's existence, remains in obscurity, and requires no further mention". However, the associated changes discussed in regard to secondary pregnancy will hold for the primary abdominal pregnancy.

The method of implantation of the ovum must be similar to that in the uterus, except for the lack of the decidua. Davis (17) brings out the point that in the absence of a decidua the ovum rapidly penetrates the mucous membrane and the villi enter the muscularis beneath. This being true in the tubes, why could not the same procedure take place on a peritoneal surface?

The rapidity with which the ovum burrows in and becomes fixed, is brought out by Schumann (2), who operated

on a woman five days after the onset of typical symptoms of ruptured tubal pregnancy. She at first refused to be treated, when symptoms of intestinal obstruction necessitated surgery, the ovum was found in a deep crater one inch in diameter, located over a loop of small bowel. In the five days it had become imbeded so firmly that the bowel had aglutinated, and on removal of the ovum the villi were so deep that the mucosa of the bowel was exposed at the bottom of the crator. A case very similar to this was reported by Hirst and-Knipe (14). The ovum was found deep in the posterior surface of the broad ligament, forming a large raged crator.

Due to the rapidity with which the ovum implants itself, the sight which the ovum meets after the extrusion from the tube would be the sight of growth. The ruptured tube as a rule extrudes it's contents in the posterior pelvus, while tubal abortion and ruptured ovarian pregnancies implant in the anterior pelvus. Morgeston and Ogilvie (23) in their case, report a placenta adherent high on the anterior abdominal wall incorporating most of the great omentum and a section of small bowel. Dickinson (24) on operating on a case giving typical symptoms of chronic gall-bladder disturbance, found a three months fetus hanging from it's placental attachment over the gall-bladder and liver. Cases such as these makes it impossible to state definitely where the implantation will occur.

Decidua formation and fetal membranes. With the lack of true Mullerian tissue in the abdomen there must be some decidua formation in order to properly sustain the ovum in it's process of implantation and development. Unless you are inclined to follow Webster's (21) views that implantation can only take place in arrests of Mullerian tissue.

The decidua according to Edgar (25) is formed from the peritoneum, usually from the posterior surface of the uterus, and fiberous bands reinforce the walls of the gestation sac. Muscle fibers are derived from the subserous tissue contributing to the muscular element. Fibers with transverse striations have been found. The author states that similar fibers have often been found at the placental site in the uterus of a normal gestation. In all ectopic gestations the thickness of the walls, and, therefore the possibility of a rupture depends on the state of the muscularis. Frequently there is a decidua reflexa formed.

The fetus may escape from the tube with it's membranes intact (Dickinson (24)) and in cases of an early extrusion of the ovum before there is the true development of the membranes, the formation is similar to that of a normal pregnancy. However most of the cases reported in the literature where the fetus had developed to full

term, report the fetus had escaped from its membranes. This point is well brought out by Sutton (26). The woman had gone to full term, the child was free in a sac composed of adherent intestines and omentum. Fibrin like tissue may form and Horsley (15) reports such a case. When a normal sac is present it is usually found tightly adherent to the coils of the intestines and surface of the omentum, all the adhesions being very vascular. In Morgetson and Ogilvie (23) case the fetus was found in what the authors termed as a false uterus, composed of peritoneum, transverse colon and greater omentum, coils of small intestines and the pelvic peritoneal pouches.

The position where the placenta is found on operation determines the point of original implantation of the ovum, unless in secondary abdominal pregnancy the tube or ovum ruptures before there is any true placental formation. In most cases little or nothing is said about the placenta other than the position of its attachment, Schumann (2) does not believe that a normal placenta is found due to the poor blood supply. Other writers often state in there case histories that a normal placenta was found.

All reports, seem to bring out the fact that there is increased vascularity found within the abdomen on section. Where the placenta is attached to the surface of the broad ligaments or the uterus, as seen so often in

abdominal pregnancy a rich blood supply is found due to the normal vascularity in these parts. The blood supply of the omentum and the intestines increase greatly in size then there is any placental attachment to them. Horsley (15) reports in his cases a tremendous increase in the size and number of the blood vessles in the vacinity of the placenta and fetal membranes. This is typical of most cases of abdominal pregnancy. This condition brings out nicley the physiological function on increased blood supply in the responce to the increased demand.

In abdominal pregnancy associated changes take place in the uterus, as in all forms of ectopic, due to the stimulation of the developing ovum. Davis (17) states that uterine reaction is due to the response to the ovarian hormone, the same as occures in normal pregnancy, perhaps to a slighter digree. This not only is an increase in size but a decidual development which may be as much as one cm. in thickness. It presents all the characters of a intrauterine pregnancy decidua, except that it contains no chacteristic villi. At the time of superious labor, the decidua is shed either in one piece as a cast, or it breaks up and is pased simular to clots.

DEVELOPMENT OF THE FETUS. In its development it is limited a great deal. The uterus while being confining to the fetus in normal pregnancy, gives support to the membranes

containing the fluid so that it acts as a cushion to the fetus. When the fetus is free in the abdomen and in many instances devoid of it's membranes, the viscera are in close contact with it. This causing the frequency of deformities found in this type of pregnancy. Fairbain (27), in reviewing the literature prior to 1919, reports fifty-six abdominal cases, of this series nineteen were living and eleven normally developed fetuses were delivered. Eight of this number were malformed to some degree.

a. Four cases of cranial asymetry.

b. One case of torticallis.

c. One case of cranial asymetry and torticallis.

d. One case of talipies equino varis and torticallis.

e. One case of bilateral talipies.

As can be seen by the cases reviewed by the above author, the deformities are mostly due to postural defects. While one would say such conditions may be found in a normal pregnancy, but never in such a large percentage of cases.

DIAGNOSIS: While this condition is a pathological pregnancy, the changes which physiologically take place in normal pregnancy are found. Edgar (25), brings up the following points. If the idea of a pregnancy has been entertained to begin with from the characteristic signs, the examiner is struck with the unexpected early rising

of the gravid portions above the symphysis, the early appearance of the fetal heart tones over that area. The subjective symptoms are much intensified and the fetal movements occasion the woman great pain. From the fourth to the fifth months portions of the fetus can be distinctly palpated. The discharge of the uterine deciduae as a rule does not take place until false labor sets in and cannot be used as a point of diagnosis.

In response to the stimulus of pregnancy the uterus enlarges, but the growth is not as much as though it was carrying the ovum. All authors comment about the slight increase in the size of the uterus. Douglas (33) brings out some important points in regard to the uterus. He claims that the condition of the uterus and it's position depends upon the stage of gestation and the relation of the gestation tumor. It is generally stated that the uterus is enlarged, but early it is a very difficult thing to prove. The cavity of the uterus increases early from three to four inches and in advanced cases it rarely reaches more than six inches. In these cases the position of the uterus is of more importance than it's size.

Webster (21), in his text on obstetrics, describes the changes in the uterus in advanced extra uterine pregnancies. His work has been quoted by many authors in describing uterine changes. When the pregnancy advances,

the cervix becomes somewhat softened and darker in color, though not usually to the extent found in uterine pregnancy.

The tumor of the misplaced pregnancy as it develops in it's primary and secondary positions may be somewhat altered in size and shape due to the accumulation and clotting of blood, which has effused in consequence of rupture or abortion of the tube. The embryo and sac at the fourth week give a tumor about the size of a pigion's egg. By the sixth week it becomes the size of an English walnut; progressing to twelve weeks, it is the size of a man's fist, (Douglas (3)).

In uterine gestation, after the third month, there is a fairly constant progressive rate and form of increase in the size of the abdomen. In abdominal pregnancy there is much less uniformity. The more advanced the case becomes however, the more it resembles normal pregnancy. In the majority of cases however, the increase in the size of the abdomen especially during the first five or six months, is usually one sided, (Powell (7)).

On palpation of the tumor mass, most authors bring out not only the shallowness of the fetus, feeling in some of the cases as if it was covered only by thin parchment, but also the failure to feel at any time normal uterine contractions. The positions of the fetus may aid in the

diagnosis. Many cases of malpositions are reported. The longitudinal axis of the fetus may be anterior to posterior, but in the usual case report the axis is from side to side. (Powell (7)).

While the diagnosis of this condition presenting the classical symptoms may have it's difficulties, those cases that show atypical signs and symptoms are very confusing and the diagnosis is not made until the abdomen is opened. It would be proper to insert at this point a case history, in order to bring out the points and possibilities in diagnosis.

This case reported by E. Cornell and A. Lash (6), is more or less a typical case showing the symptoms, problems in diagnosis, and method of treatment used by the authors.

Mrs. K., white, age 26 years, Grav. 1. She menstruated last on June 12, 1929. July 25 she had a curettment for criminal abortion. Following this she bled for three days. Shortly afterwards she began vomiting. Aug. 31 she was suddenly seized with a terrific pain in the lower back and through the abdomen. The pain lasted from 1 to 5 p. m. when the second curettment was made. The pains ceased thereafter, but the vomiting continued. She flowed for three days and then recovered sufficiently to be up and around, even going swimming several times.

The last week in September she was suddenly seized

with a violent pain in the lower abdomen, accompanied by a great deal of gas. She fainted, stiffened out similar to a convulsion and her lips became blue. Another doctor was called who did not make a definite diagnosis. Following this attack she had pain around the ribs and heart, making it necessary for her to sleep in an upright position. At times the pain was noticed in the shoulders and neck. She recovered sufficiently to see the doctor at his office on Oct. 16.

At this time a lump appeared in the lower right side of the abdomen and the doctor diagnosed a pregnancy of about four months. He recognized that the pregnancy was abnormal and called consultation. The consultant saw the patient Oct. 23 and diagnosed no pregnancy, but a large fibroid tumor. An X-ray picture was made at this time which showed evidence of a baby. Life was felt Nov. 9. She then consulted another group of physicians who stated that she was pregnant and did not have fibroids.

Nov. 22 another attack of severe pain was experienced. It was located in the groin and was followed by vomiting. The vomitus shortly contained blood. For the next three days she vomited blood on an average of every hour. A stomach specialist was called in, who injected some serum to stop bleeding. On a restricted diet the vomiting was relieved temporarily.

Nov. 26 she was taken violently ill. Another physician was seen, who made a diagnosis of abdominal pregnancy or a ruptured uterus. He stated that she was not a good operative risk at the time and that her condition should be built up before attempting surgical interference. She gradually improved, the vomiting ceased except for occasional attacks. X-ray pictures showed the fetus in the transverse position and high in the abdomen.

The patient steadily lost weight, the appetite was poor and she was bothered continuously with heart burn.

The patient was seen on Dec. 29. Abdominal examination showed the baby to be in a transverse presentation, with the head on the right side, the back upward and one of the arms placed in a peculiar position as if it was held by some obstruction. All the parts were readily palpable, the heart tones easily audible. On vaginal examination the cervix was short and small, somewhat softened. It was found close to the pubis. The body of the uterus was palpable to the left, straightened backward and not easily outlined. It was the size of a six week's pregnancy. Nothing was found in the culdesac fornices. The patient entered the hospital Jan. 22 and was operated on Jan. 29, 1930.

An incision was made from the pubis to 5 cm. above

the umbilicus in the mid line. The fetal sac was discovered directly beneath the peritoneum. On spreading open the incision the omentum, a portion of the placenta, and two loops of small bowel were exposed. The sac and placenta were intimately adherent to the parietal peritoneum, omentum, loops of the large and small bowel and the fundus of the uterus. Large veins showed themselves in the fetal sac at various points.

The membranes were ruptured in an avascular area and the baby delivered by breech extraction, and the cord clamped. The extraction caused the sac to tear through several of the large veins in it's walls. The bleeding was profuse, but it was controlled by the use of intestinal clamps and ligatures. The relationship of the secundines to the abdominal viscera was carefully explored. The uterus was normal in position and about the ten-week's pregnancy size. An orange sized hematoma (lower half firm, upper half fluctuant) was seen adherent to and lying on the fundus of the uterus. The placenta was adherent to the intestines, both large and small. On the left two loops of small intestine were found to be fixed in the mass. The many adhesions and large vessels prevented the exploration of the pelvis and colon. The sac was adherent to the small intestines, transverse colon, and inferior surface of the liver. There was a small fibroid 4 x 2 cm.

in the left broad ligament and attached to the uterus. Because of intimate and numerous invasions of the placenta, it was deemed advisable not to attempt to remove the sac or placenta.

The ovular sac was attached to the parietal peritoneum with a few interrupted sutures, following which the abdomen was closed in the usual manner with no drainage.

The baby was alive and in good condition. It weighed 1940 gm. It was fed mother's milk and on the 15th day weighed 2030 gm. There were no deformities. The baby seen, one year later, was normal in every respect, both mentally and physically.

The mother's recovery was uneventful except for some abdominal distension, temperature 101 for a half day and 100 for three days. She left the hospital on the 15th day in good condition. She was seen on March 4, 1930, when a mass in the abdomen was found to be the size of a six-month's pregnancy. It was not tender. She had had a period which was accompanied by severe pain the first day.

On may 6, 1930, she complained of some pain in the abdomen and fever. On vaginal examination the cervix was closed, the body of the uterus was pushed to the left and a cystic mass was found occupying the right fornix. The

vagina showed bluish discoloration. The mass fluctuated. On abdominal examination the mass was pear-shaped, being 22 cm. above the symphysis, 18 cm. wide at the top and 12 cm. at the bottom. It was decided to tap the cyst. Eight to ten ounces of a serosanguinous thick fluid were obtained. It was impossible to drain any more than this amount, even with a vacuum pump. On May 13th an incision was made 10 cm. long in the old scar. On opening the peritoneum the thick fluid excaped under pressure. It had a foul odor. Several small pieces of degenerated placenta came away. On exploration the placenta was found to be still attached to it's previous anchorings. The exploration was carried on inside the sac wall. The sac was adherent to the abdominal wall, so that all that was necessary was to insert cigaret drains to it's lowest portion. The abdomen was closed around the drains. From this time on the patient recovered rapidly, and by July 1930 she had recovered her usual weight.

It is stated there is a 40 % error in the diagnosis, which is not too high an estimate. Dorsett (28), however, feels that it is entirely too high. When the statistics of the larger clinics are studied and in Dorsett's own series, the mistaken diagnosis was only 8 % of the cases.

Halstead (29) says that "the patient may describe her symptoms as having missed one of two periods, and then

she noticed more or less some vagina discharge which never was profuse. At the time, or shortly before the onset of the bleeding, she noticed some discomfort in the abdomen, more frequently located on the right side near Pouparts ligament. In the typical case, the patient is required to lie down because of the severity of the pain. Syncope may or may not be present, or only dizziness may be noted. If the symptoms are not pronounced, no further attention to the attack may be paid by the patient."

"If the symptoms are pronounced the physician may be called, the rupture of an ectopic diagnosed and operated on. In some of these cases the patient may refuse surgery. The history in such cases is, further attacks may be so severe that surgery is necessary, or the attacks diminish in intensity and the pregnancy continues. At the 5th month, the abdomen becomes very tender, and the movements of the child causes considerable pain. The pain is more severe if the placenta is located near some vital organ, such as the liver and small intestines. If the placenta is on the uterus or it's appendages, the attacks are usually less severe. Attacks of intestinal disturbances are usually very frequent. Nausia and vomiting may be present throughout the last one hald of the pregnancy. Vomiting of blood and the passing of blood per rectum are seen occasionally, this occurring when the

placenta is attached to the small bowel and Halstead (29) seems to believe it is due to the perforation of the bowel by the villi.

In contrast to the work of Halstead (29), Ware (30) reports a case in which there were only slight symptoms of nausea and vomiting at the onset. The patient continued as a normal case until term. However abdominal pregnancy was suspected due to the unusual contour of the abdomen, the close proximity of the small parts of the fetus to the abdominal wall, and the clearness of the fetal heart. Powell (7) brings out the point that the fetal movements are very distinct and feel as if they were just under the skin. Richards (31) reports a case very similar to that of Halstead's, but in his case at no time was there any suspicion of an abnormal pregnancy, until after a failure of progress in labor, surgical intervention was necessary to deliver the child.

Constipation, while often present in normal pregnancy, is not as severe a symptom as occurs in most cases of abdominal pregnancy. Hoyd and Potter(32) claim constipation is an important symptom in these cases of abdominal pregnancy and is caused by the fetus and it's membranes becoming adherent to the intestines. This, while not being a constant symptom, has to be met

with in most cases.

Pain is one of the constant symptoms in abdominal pregnancy, and Cornell and Lash (6) state, "on the palpation of the abdomen a patient may complain of great pain and the weight of the clothing may aggravate the tender abdomen. In some cases the pain may be so severe and debilitating that they are required to remain in bed more or less throughout pregnancy. This is in sharp contrast to normal pregnancy, yet many overlook this unusual situation. Any woman who remains in bed voluntarily throughout pregnancy due to the pain, should be carefully investigated, with the idea in mind that the pregnancy is abdominal."

There are few cases giving bizarre symptoms which would cause difficulty and often lead to a wrong diagnosis. One of these cases reported by Dickinson (24) is of a case simulating a chronic gall bladder. This woman was operated on and at that time the fetus was discovered. The symptoms were caused by the attachment of the placenta over the gall bladder. In some early periods of cases of pregnancy, there may be no symptoms other than that of the pregnancy, but as the fetus grows in the abdomen there is a tumor present whichdue to it's increase in size, may cause a mutiplicity of symptoms. However, the important factor is the diagnosis and differentiation of this

from a normal pregnancy, before the onset of superious labor. The danger lies in allowing the woman to go into labor, for the effort may dislodge the placenta, endangering both the mother and child. (Cornell and Lash (6))

Halstead (29), in a report of eleven cases of advanced abdominal pregnancies of which ten live mothers and six live babies was the outcome, remarks that the most startling thing about the condition was the fact that there was such a delay in making the diagnosis in many instances. In two of the cases failure of a normal delivery and as a result they resorted to a caesarian section before the correct diagnosis was made. Two of the cases were diagnosed at term and delivered by laperotomy. One case was seen several times before term and numerous times after term before the diagnosis was made.

The two not diagnosed before term by Halstead (29) were colored women, and in these patients due to the frequency of fibroids in the colored race, a difficulty in diagnosis arose. The author places great importance on the Braxton Hicks contractions, as he claims the thin abdominal wall and thin uterine musculature may in some cases of normal uterine pregnancy, give the fetus the shallow feeling as met with in abdominal pregnancy. If at any time you can feel uterine contraction over the

fetus, one can be assured that it is not an abdominal case.

In concluding the statements on the diagnosis of abdominal pregnancy we cannot overlook the word of Davis (35), who recognizes the chances of abdominal development of the ovum. The question arises as to the life of the child as well as to the life of the mother. The diagnosis of this condition is often missed, because the patient, if she has cares and other anxieties, may neglect her own condition and avoid coming to a doctor until the abdomen has become so large that she believes herself near term. Where a patient is under accurate observation, it should not be difficult to recognize an extra uterine pregnancy and also identify the probable time when the rupture of the envelope occurs. Evidently it is only in cases long unobserved, that the embryo proceeds to develop, for if the patient was under medical care when the rupture of the envelope occured, she would no doubt be subjected to operation. The risks, however, of the ruptured ectopic are so great, that it should be treated surgically as soon as it is recognized.

When the diagnosis of an abdominal pregnancy with a living child is made, the question arises as to whether the pregnancy may continue to viability in the patient, and the child saved. If this attempt is made, the patient should be in the hospital after the 6th month. It must

be remembered that false labor develops in these cases, followed by the death of the fetus. When this takes place, the patient has abdominal pains similar to those caused by the contraction of the uterus. After a brief period, these pains cease and so do the movements of the child. On examination the heart can no longer be heard. If the patient is observed over a period of time, the abdomen decreases in size.

THE TREATMENT AND MORTALITY OF FULL TERM ABDOMINAL PREGNANCY: When an abdominal pregnancy has advanced until the fetus is viable, there are various considerations of importance bearing directly upon the safety of the mother which demand the greatest of care and judgment on the part of the doctor. All agree however, that the only method of handling these cases is surgical, (Halstead (29)). The development of the sac, the increase in size and number of the blood vessels, the development of the placenta and the probable presence of adhesions, all combine to increase the danger of interference very materially.

There is a question concerning the time surgical procedure should take place in order to save both mother and child. Davis (35) and Cornell (6) both feel that the danger period in the treatment of these cases lies between the 5th and 6th months. At that time the mother should be placed in the hospital under the strictest of

care, as the danger lies in the onset of pseudo labor setting in, which is disastrous to both mother and child. Prior to the 5th month, surgical intervention proves to be the most satisfactory as far as the maternal mortality is concerned according to Beck (36).

Beck (36) in his work on a large series of cases, formulated his basis of treatment on a review of the literature prior to his time, for he felt the experience of any one author was so slight that their conclusions were more or less unsatisfactory. The careful search of the literature as well as a questionaire sent out to 200 obstetricians were the basis of this author's conclusions. That the treatment should always be surgical and that the proper time should be decided upon, are important issues in order to reduce the mortality rate. This depends upon the following three factors according to Beck (36).

First, the danger to the mother in waiting for a viable child. The maternal mortality risk gradually but slightly increases in the eighth and ninth months, to become a dangerous factor in the tenth month. With this growing danger during the latter stage of pregnancy, the important thing to be considered is the life of the mother, therefore the time to operate is between the 6th and 7th months. However, the risk in waiting for a well developed child is slight up to the 39th week. The

The danger of a catastrophe is sufficiently great in the last two weeks to warrant interference before this period is reached.

Second, the operative risks at various periods of gestation. The danger from the operation itself increases as the pregnancy advances until the last month is reached, when it is less than at any previous time. Cases show this to be due to the lessened tendency for hemorrhage. The maternal mortality is 30 % at 6 months, 33 % at 7 months, 37 % at 8 months, 45 % at 9 months, and 32 % the 10th month.

Third, the best time to interfere in the interest of the child is during the 38th week, and Beck (36) feels that there are justifications in waiting, providing the patient is kept under observation. This plan will best consider both the interests of the mother and child. This may be explained to mean that, as interference is practiced before term, the child as well as the mother is spared the danger of superious labor, and further, the fetus is subjected to greatly increased pressure during the last two weeks of pregnancy, due to the diminution of the amount of liquor amnii at that time.

Schumann (2) feels that since the risk in waiting for the 38th week is slight for the mother, and since this is the time of election for the child, this should

be the time chosen for surgical interference. However, the factor must be kept in mind that in most cases, while striving to obtain a live baby, there are other factors, both mental and physical and also the danger of deformity. Therefore, increased risks and unhappy disappointments should not be forgotten in the hope of getting a live baby, (Hoyd (32)).

Fairbain (27) presents a series of 100 cases of extra uterine pregnancies, 57 of these being abdominal. 39 of the abdominal fetuses were dead at the time of delivery, or lived but a few minutes. 19 were born living, but of this number 11 were normal and 8 deformed. In reading the literature, one would be under the impression that the number of fetal deaths would be in a much larger proportion than this. But in cases reported, it must be kept in mind that treatment was necessary to save the mother and as a result, surgery was necessary before the viability of the child.

The best method of procedure in the treatment of these cases found in recent literature, is that outlined by Cornell and Lash (6). They feel that the treatment of abdominal pregnancy has for it's aims the proper preparation of the patient for operation and for the mamagement of the extra uterine placenta and the sac.

The preparation of the patient includes typing for

blood transfusion for use before or after the operation. It is impossible to carry out such a procedure without danger of hemorrhage. Fluids, rest, the overcoming of distension when present, and the choice of anesthesia, are all important, and should be carefully considered. Prolonged exploration is usually necessary and the operation may be lengthy, therefore ethyl, ether, or spinal anesthetics are desirable.

Schumann (2) feels that no definite technique for the performance of the operation can be advised, since each case is a law within itself, but certain directions will be found valuable. The incision is made preferably along the outer border of the rectus. After obtaining proper exposure, the most careful exploration is necessary to determine the site of implantation of the placenta and the abnormal anatomical relations of the gestation sac, which vary in different individuals, (Cornell and Lash (6)). This information and the condition of the patient are the determining factors for the management of the placenta. Beck's (36) statistics show that in 159 cases from which the placenta was removed, the mortality was 21.3 % as compared to 98 cases in which the placenta was left and the mortality was 56.7 %. Schumann (2) and Cornell (6) explain that possibly the reason for the high mortality in the latter cases in which the placenta was left, may be due to the period of time over which the data

was colected. Therefore, the factors such as asepsis, operative technique and anesthesia must be considered in the entire series. The total mortality being 35.8 %.

Beck (36) explains that in the removal of the placenta it must be atached by a peduncle so that the whole base may be removed. The uterus in some cases had to be removed with the placenta and in others the vessles supplying the area, the uterine and ovarian arteries were ligated. Halstead (29) agrees with Beck on the matter or removing the placenta, but if any attempt is made to remove it a careful study of the blood supply to the part should be made. If the entire inflow of blood can be controlled the placenta should come out, even at the sacrifice of the tubes, uterus, ovaries and the broad ligament.

In cases where the placental attachment cannot be exposed and the ligation of the blood vessles supplying that area cannot be ligated in mass, there are two methods of procedure. The time honored plan of marsuplization Davis (35), after the cord is cut and tied, the membranes may be stitched to the edges of the abdominal incision. The cavity from which the embryo was removed is thoroughly packed with 10 % iodiform gauze and the placenta is allowed to separate and discharge itself gradually. A sinus will form, which should be allowed to heal from the bottom. This, while being slow and tedious for the patient, is

much safer than profuse hemorrhage in the effort to separate the placenta at once.

The other plan is that advocated by Beck (36). The cord is tied close to the placenta leaving it in situ and closing the wound without drainage, depending on the absorptive power of the peritoneum for the removal of the gestation products left in the abdomen. To test this power of the peritoneum to remove fetal products, Beck put 3/5 of a 500 gram placenta in the abdominal cavity of a dog. The animal seemed to suffer no ill effects from the procedure and on opening the dog two months later, none of the placental tissue could be found. In his statistics, there were twelve cases treated in this manner, four of which died, giving a mortality of 33.3 %. During the same period, marsuplization was praticed on fifty two women, twenty two of which died or a mortality of 38.7 %.

If the fetus should die in the later months, the procedure of treatment should be changed, (Kelly(37)). After the death of the child the placental circulation continues for a period of two or three weeks. Unless the symptoms are urgent it is best to wait for several weeks to allow thrombi to form in the placental attachment, then the detachment will not be associated with the risk of hemorrhage. After the death of the fetus, as long as

the bruit can be heard the circulation is still continuing at the placental sight. During the six weeks of waiting for the separation to take place, the patient should be under constant observation in a hospital, in order that immediate operation may be performed in the event of any infection of the gestation sac supervening, as evidenced by an elevation of temperature and pulse rate with an increasing leukocytosis.

Should at any time the fetus die and infection set in, Shumann (2) advocated the following treatment. The ideal method of treatment is vaginal incision, the extraction of such of the products of gestation as are within reach, and the establishment and maintainance of free drainage. Suppuration is the only condition arising in connection with extra-uterine pregnancy, in which the vaginal rout of operation is indicated, the author feels that the time involved and the trauma inflicted are far less and the completeness of the operation is best attained by abdominal attack in all cases, save those complicated by pus formation.

The technique of vaginal incision is so well understood that any detailed description would be out of place here. Suffice it to say that the posterior vaginal fornix is the point of attack, and the incision into the abscess cavity is to be of sufficient size to admit thorough

digital exploration, in order to extract any large portions of the fetal body, if such be present.

Drainage is best maintained by the suturing into the cavity a large sized rubber drainage tube, through which the abscess cavity may be flushed with Carell-Dakin solution, or other antiseptic agent at the option of the operator.

The post operative care of these cases of abdominal pregnancy is fundimentally the same as that given in all cases of caesarian section, with the exception that post operative hemorrhage is much more likley to occure, either from the detachment of the placenta in cases where it has been left in the abdominal cavity, or from absorption of sutures put in place in cases in which the placenta was removed.

There is in many of the cases a failure in lactation and involution of the uterus and Ware (30) explains this on an endocrine basis. In the authors opinion the woman is still physiologically pregnant for more than a month after delivery. This being explained by the retention of the viable placental tissue, which beond all doubt acts as a gland of internal secretion.

In rare cases the pregnancy advances to full term without presenting any symptoms other than a normal pregnancy; then at, or near term false labor sets in, the

fetus dies, and remains behind with the placenta as a foreign body, which may lie undisturbed within the abdomen for many years, becoming calcified and forming a lithopedion. In some cases however, skeletonization may take place by the action of the phagocytes, (Kelly (37)). Kuchenmeister (38) divided these long retained products of extra uterine gestation into the following:

1. Lithokelyphos, where the calcification is limited to the membranes of the fetal sac.
2. Lithokelyphopedion, when the membranes and the fetus are involved in the calcareous process.
3. Lithopedion, when the fetal body alone is involved in the calcification.

The interesting termination of abdominal pregnancy known as a lithopedion, occurs when the dead fetus of variable age becomes infiltrated with calcium salts and converted into a more or less completely calcified mass.

It is interesting to note that in many cases these calcified fetuses are long retained in the abdomen causing the woman no discomfort; Hayd (39) reports a case in which this condition had been present for thirty-three years.

CONCLUSION

While abdominal pregnancy is rare, it should be born in mind in cases where a pregnancy runs a more or less atypical course.

This condition lacks the proper statistical work to give a definite percentage of cases which occur, but from reports in literature it is somewhere in the vicinity of .003 % of all cases of pregnancy.

Abdominal pregnancy may occur from direct implantation of the ovum on the peritoneum, but this is rare; only twelve authentic primary abdominal pregnancies are to be found in the literature. Most of these cases occur secondary to tubal, ovarian, or uterine.

The fetus is limited a great deal in it's development, due to the pressure upon it by abdominal viscera. Deformities occur in a large percentage of cases which are born living, these being mainly deformities of the feet and head. One author states that this occurs in almost one-half of the living fetuses. Infant mortality is high, slightly less than one-half of the infants which are allowed to develop to term are born living.

While this condition is a pathological pregnancy, the changes which physiologically take place in normal pregnancy are found. The main points in the diagnosis

of this condition are:

1. Early rise of the gravid portions above the symphysis and transverse position of the parts.
2. Pain and tenderness in the abdomen, aggravated a great deal by both maternal and fetal movements.
3. Disturbances of the gastro intestinal system. Nausea and vomiting are more marked than in a normal pregnancy, and constipation or complete obstruction is often a major complication.
4. The fetus is felt just beneath the skin, the small parts, movements, and heart tones are more distinct than in normal pregnancy.

In the consideration of the surgical treatment, three important points are to be considered:

1. Life of the mother.
2. Life of the child.
3. Operative care of the placenta.

No doubt the best time to operate with the life of the mother in mind, is early with the onset of abdominal pregnancy. In the advancement of this condition at or near term other factors enter in. Between the 5th and 6th months, the mother is in the greatest danger and should be under the strictest observation. From the 7th to the 9th months there is less danger, but to wait for the onset of labor causes a high mortality in both mother and child. The time to operate in the interest of both mother and child is during the 39th week.

Whether to remove the placenta or leave it in the

abdomen, seems to be the big problem in such cases. If there is a possibility of controlling the hemorrhage, the placenta should come out if it's removal will not cause too much trauma or necessitate too long a surgical procedure. The placenta left in the abdomen causes no symptoms and is quickly absorbed in most cases.

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