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Review of abdominal pregnancy

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A REVIEW OF ABDOMINAL PREGNANCY

BY

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INTRODUCTION

Abdominal pregnancy, although rare, is of special interest due to its extreme seriousness for both the mother and fetus, as well as a diagnostic and therapeutic challenge for the most experienced practicing obstetrician.

HISTORY

Most writers attribute the first recorded case of intraabdominal pregnancy to Albucasis (1013-1106), who was generally regarded as the greatest surgeon of the arabic era of medicine. He described the case of a pregnant woman whose fetus died without being delivered. She became pregnant again and the second fetus also died. At a later date an umbilical abscess developed with subsequent rupture and expulsion of a "large number of small bones". King translated the Latin passage of John Channing's edition of Albucasis thusly: "I was greatly astonished at this because as the belly is a place which contains no bones I therefore formed the opinion that these bones came from the dead fetus. Consequently, I investigated the wound and extracted from it many bones. As for the woman, she made an excellent recovery and, moreover, she continued in the best of health for a long time, with but a slight discharge of pus from the sinus."²¹ This case affords an excellent example of an old, long retained, secondary abdominal pregnancy.

Many other interesting examples of ectopic and abdominal pregnancy are scattered throughout the early records. Cordaeus reported in the *Gynaecorium* ("a remarkable compendium of gynecological knowledge produced in 1597 by Israel Spach of Strasbourg").²¹ This contained most of the well known cases of advanced extrauterine pregnancy encountered before the end of the sixteenth century) the famous lithopedion or petrified embryo of the city of Sens. In this case, which occurred during the early part of the sixteenth century, the child apparently remained within

the abdomen for thirty-one years, and on the death of the patient at the age of seventy-one the fetus was found enclosed "in a stony crust in the lower abdomen".

In 1540, according to Donnatus, Christopher Bain, a traveling surgeon operated on an Italian woman in April of that year and extracted the skeleton of a male child. The operation was successful, the patient recovered and later had more children. In 1545, Cornax "enlarged by incision, an umbilical fistula and extracted a semiputrid fetus which had been retained for four years." Ricci - Genealogy of Gynaecology (a most valuable guide to the rather confused literature from Albucasis to the nineteenth century).²¹ Horstius, in 1563, reported the case of a woman who had carried a child in her abdomen for fourteen years.²¹

James Primerose reported a classical case in which a patient conceived twice with extrauterine pregnancies, the first occurring in 1591 and the second time in 1594. According to Schumann, Primerose's work represents the earliest definite report of a laparotomy for removal of an abdominal fetus. He states that "the cyst of the first child opened spontaneously through the abdominal wall. The fistula was enlarged, and this child was extracted by Jacob Noierus, a surgeon." As this operation was successful, the second infant was removed two months later by celiotomy.¹⁹

Also in the sixteenth century is the classical case of Jacob Nufer, a swine gelder:

In the year 1500, Elizabeth, wife of Jacob Nufer, a swine gelder of the village of Sigerhausen, in Switzerland, was pregnant with her first child. After suffering from the pains of labor for several days she called to her aid thirteen midwives, one after the other, and several lithotomists. But she looked to them in vain, for neither could they deliver her of the child, nor could they alleviate her suffering. As the pains grew very severe and

as there remained no other hope of relieving her, the husband told his wife that, if she agreed, he would like to try his own efforts upon her because he hoped, if God so willed, that it might lead to a happy outcome. The woman replied that she was prepared to undergo any ordeal. As the matter was a delicate one, the husband went off to the chief magistrate of the district to explain the matter and ask for permission to undertake the attempt. When he understood the problem the chief magistrate at first, indeed, showed himself rather difficult. Eventually he trusted in the assurance of the husband and gave his consent to the performance of the proposed operation. The husband, having returned home, told the midwives that those who had courage to assist him could remain in the chamber, but that the more timid ones would have to retire, since he was going to attempt something which he hoped, in the providence of God, would save the life of his wife. Eleven of the midwives withdrew after they understood his intention and marvelled at it. Two of the more plucky ones remained with the lithotomists to take their stand by the woman in labor. And so, having first sought divine aid and carefully closed the door, the husband placed his wife upon a table and made an incision in her belly, just as he would have done his swine. He opened the abdomen so neatly with one stroke of his knife that the child was extracted at once without harm. When the eleven midwives who remained outside heard the cries of the infant they vainly implored to be allowed to come in again. But they were not admitted until after the child had been washed and the wound sewn up in the manner used by the veterinary surgeons. After this the wound healed most successfully without any complications supervening. Sometime after the operation she gave birth to twins; after the twins she had four more children. The child delivered by the operation lived until he was seventy-seven years of age. [From King's Translation of Bauhin's original account in his section in Gynaecorium.²¹]

If it is accepted that this was an abdominal pregnancy, then this is the first recorded example of operative delivery followed by the survival of both mother and child. ²¹

The first operation for the removal of an abdominal pregnancy in America was performed by John Bard in 1759 in New York. He described the case in a letter dated December 25, 1759. The patient recovered. Three other operations were performed in the eighteenth century in America for removal of extrauterine fetuses. William Baynham performed the second American operation in 1791 and another similar operation in 1799. Both are thought to be cases of extrauterine conception. The first was

that of a fetus grown to full size and maturity which had been retained more than ten years. In each instance the fetus was extracted successfully. The third operation was done by Charles McKnight. The case was reported by Mease of Philadelphia in 1795. The operation was a success and according to Renner, McKnight was the first to leave the placenta in situ.

A remarkable operation for abdominal pregnancy was performed early in the nineteenth century by John King of South Carolina. King cut through the walls of the vagina and delivered the child by forceps, thus saving the lives of both mother and child (Welton, 1927).¹⁹

King notes three published works in the nineteenth century which were of outstanding importance in relation to ectopic pregnancy, including abdominal pregnancy. The first was William Campbell's Memoir on Extra-Uterine Gestation published in Edinburgh in 1840. He collected nearly all of the material on extrauterine pregnancy up to his time. Lawson Tait's comment on this work was that it "stands as a landmark in the literature on this subject which, up to that time, seems to have been regarded more as a curiosity than as one of the most dreadful calamities to which women can be subjected". The second work was entitled Extra-Uterine Pregnancy by John S. Parry of Philadelphia, and was published in 1816. This scholarly presentation was based on 500 cases of extrauterine pregnancy collected from many sources. This book had a great influence on the subsequent study and treatment of this entity. The third book was by Lawson Tait, whose Lectures on Ectopic Pregnancy and Pelvic Haematocoele, published in Birmingham in 1888, placed the operative treatment of ruptured tubal pregnancy on a sound basis. He laid down the modern classification of ectopic pregnancy and noted

case reports of forty-two patients on which he operated and had but two deaths. Two cases which he treated by abdominal section where the placenta was removed after tying a big pedicle consisting of the remains of the tube and broad ligament were described. In both, child and mother survived. He also described three cases where he was forced to leave the placenta in situ and where the mothers survived only after months of drainage and offensive suppuration.²¹

Since the days of Lawson Tait, advanced extrauterine pregnancy, with the exception of certain countries and special localities, has been seen in constantly decreasing frequency. This has probably been due to advances in early surgical therapy for ruptured tubal pregnancy or tubal abortion along with better treatment for those conditions thought to be responsible for the production of ectopic pregnancy such as salpingitis, adhesions, metabolic deficiencies, tubal neoplasms, endometriosis, etc.

DEFINITION AND POSSIBLE ETIOLOGY

Abdominal pregnancy is classified as primary and secondary. Most, if not all cases, are considered to be of the secondary type. Primary abdominal pregnancy is one defined as having the primary nidation site for the fertilized ovum outside the uterine cavity or fallopian tubes. Some authors feel that ovarian pregnancies are also a type of primary abdominal pregnancy. However, there is much disagreement concerning this point in the literature and the majority of the authors exclude ovarian pregnancies in their discussions of the primary abdominal pregnancy.

Secondary abdominal pregnancies are defined as those having had an original site of nidation either in the uterine cavity or, more frequently in a portion of the fallopian tube. The usual description of a secondary abdominal pregnancy is one which began with nidation in the fallopian tube with a consequent tubal abortion or rupture of a tubal pregnancy with subsequent release of the products of conception into the peritoneal cavity itself. Another interesting instance yielding a secondary type of abdominal pregnancy is described by King. He reported four cases of postoperative separation of the cesarean section wound in the uterus, with subsequent abdominal pregnancies. These were not simply cases of uterine rupture because there was not the usual uterine bleeding, and careful examination of the uteri revealed the uterine scars had separated. In all cases the edges of the wound were noted to be covered with organized exudate. It is interesting to note that King

felt these four cases represented primary abdominal pregnancies. These cases do not, however, meet the established requirements for a primary abdominal pregnancy as will be noted later.

Due to the rarity of accepted cases of primary abdominal pregnancies, it is difficult to establish a responsible etiological factor. Relatively few cases have been reported; however, several are worth reviewing. Galabin (1896) removed a 10-week ovum from the cul-de-sac, which was accepted by the London Obstetrical Society as possibly representing a primary abdominal pregnancy although they did state it could have been secondary. (The patient died of hemorrhage following removal of the ovum.)¹⁴ Another instance is that of Witthauer, who in 1903 removed a blood clot containing chorionic villi, from omentum while both the fallopian tubes and ovaries appeared normal.²⁷ Hirst and Knipe reported a case in 1908 in which the ovum was implanted on the posterior aspect of the left broad ligament while the ovaries and tubes appeared normal.¹⁷ Reifferscheid in 1922 removed a 1.9 cm long fetus which was completely preserved and was found among loops of intestine. The ovum was covered by blood clot; its torn and collapsed amniotic cavity was empty and found to be attached to the underlying bed of the ovum through a fresh chorion frondosum. Decidual changes were clearly observable in the peritoneal matrix. The primitive ovum rested in a depression in the peritoneum and had eroded into it--analogous to uterine nidation. Meticulous macroscopic and microscopic examination of the genital organs dispelled (according to Reifferscheid) all doubt concerning their nonparticipation in the pregnancy.²³ Studdiford in 1942 reported a case which has been generally accepted as being the least doubtful and most impressive instance of primary abdominal pregnancy. The site of implantation was on the posterior aspect of the uterine horn, relatively close

to the interstitial portion of the tube. Because of the relationship of the peritoneum and interstitial portion of the tube he is of the opinion that this represented a primary peritoneal implantation.

Studdiford established the criteria, which have been accepted, which must be met in order to prove a diagnosis of primary abdominal pregnancy. The criteria are as follows: (1) both tubes and ovaries must be normal with no evidence of recent or remote injury, (2) there must be no evidence of uteroperitoneal fistula, (3) the pregnancy must be related exclusively to peritoneal surface, and young enough to eliminate possibility of secondary implantation following a primary tubal nidation.²⁴

The possible etiology for primary peritoneal pregnancy is indeed a subject of great conjecture. Perhaps the most widely held theory is that pelvic endometriosis contributes suitable sites for primary nidation. This is strongly advocated by Cavanagh⁴, Curtis⁹, and others. Cavanagh feels that it is unlikely that nidation could occur on peritoneal surfaces due to the lack of capillary sinuses such as those found on the uterine wall. He further feels the ovum is unlikely to survive without blood supply sufficient to form the placenta. In fact, Cavanagh questions the theory of primary nidation in the abdominal cavity altogether and offers an alternative explanation of "omental transference". He theorizes that a gradual tubal abortion would allow the ovum to implant on omentum, which surrounds the tube, while still getting nutrition from the original nidation site in the tube. He believes this theory better accounts for the bizarre locations of implantation by gradual movement along the omentum. This would more readily explain how the nutrition could be maintained than by chronic erosive action into the mesocolon.⁴

Another idea has been that of a "post mature ovum". This theory proposes that the ovum is fertilized while on the ovary or in the peritoneal cavity and begins to develop to such a size that it is no longer able to traverse the fallopian tube and must, therefore, implant inside the peritoneal cavity. Most authors admit this idea is unlikely. Studdiford, in contrast to many, feels that a fertilized ovum which is not engulfed by the fimbriated end of the tube will and can imbed in any tissue, regardless of character, that its blastocyst can reach. Many others have stated emphatically that it would be impossible for the ovum to implant anywhere except on endometrial or tubal type tissue. In fact, Lawson Tait stated in 1888 "that a fertilized ovum may drop into the cavity of the peritoneum and become developed there is a contingency I cannot accept for a moment, for the powers of digestion of the peritoneum are so extraordinary that an ovum, even if fertilized, could have no chance of development".²⁴

The etiology for secondary implantation in the peritoneal cavity must be looked for among the many causes which are said to yield tubal abortions or tubal rupture.

Among the factors usually stated to be responsible for tubal pathology are salpingitis; adhesions (from appendectomy or other pelvic or abdominal operations, puerperal infection, gonorrhoea, or perisalpingitis); tubal neoplasms; congenital malformations of the tubes; abnormal or enlarged ova; neoplasms or masses yielding pressure on tube from outside such as paraovarian cysts, fibroids, adenomyoma of uterine cornu, etc.; tubal atrophy due to malnutrition or hormonal distribution; tubal spasm due to nerves or drug effect; and even to metabolic deficiency as described by Allen where he states nutritional deficiency causes

marked metabolic defects which might affect not only germ plasm itself but affect adversely the pelvic transportation system by changes in physiology.²

DIAGNOSIS

The diagnosis of abdominal pregnancy is definitely not a clear cut or readily apparent entity and has proved to be most difficult for even the most experienced clinician. The signs and symptoms which are often noted as being characteristic are not always readily apparent. Many times the diagnosis has been made late in a patient's hospital course and often not until the time of laporotomy. As with any other medical problem it is of utmost importance to obtain a good history, do a thorough physical examination, and most of all, to maintain the proverbial "high index of suspicion". King advises to first diagnose the woman as pregnant and then to remember to consider abdominal pregnancy.²¹

Significant history is primarily related to past obstetric history including previous tubal pregnancies, abdominal or pelvic surgery, history of sterility, past pelvic inflammatory disease, as well as subjective comparisons of the present pregnancy with previous pregnancies in the case of multiparous patients. Often the multipara with an abdominal pregnancy complains that "things are not right this time" or "this baby is higher in my stomach". Careful inquiry should be made in an attempt to elicit a possible history of ruptured tubal pregnancy or tubal abortion in the early months of gestation. The physician should ask specifically about missed periods, abdominal pain or tenderness with radiation to shoulders, nausea, vomiting, fainting, spotting, and the usual symptoms of shock and hypotension. Of importance is

whether or not hospitalization was required at the time of these symptoms.

Most of the symptoms in the early weeks of abdominal pregnancy are the result of the location of the implantation in the abdomen. Frequently reported symptoms in the early weeks are the usual symptoms of pregnancy, as well as amenorrhea, nausea, vomiting, signs of internal hemorrhage, weakness, fainting, hemorrhagic vaginal discharge with or without passage of a decidual cast (indicating rupture of a tube or abortion). These symptoms may be severe enough to seek and obtain surgical relief.

If the patient survives the early symptoms without medical assistance, she continues to have the usual signs of pronounced peritoneal irritation. Abdominal pain and tenderness are the most constant symptoms reported. Other gastrointestinal symptoms are nausea, vomiting, constipation or diarrhea and urinary complaints of difficult and frequent micturition. Cornell and Lash report "vomiting of blood and passage of blood per rectum are seen occasionally. This seems to occur when the placenta is attached to the intestines".⁶

After the fifth month of gestation the abdomen becomes very sensitive due to further peritoneal irritation, which may be severe enough to keep the patient in bed. Jarcho notes that if the fetus dies and maceration occurs, the patient often has a low grade fever, pronounced toxemia, weakness, increased constipation and malaise. He further notes these symptoms often disappear with fetal calcification.¹⁹ If labor goes to term, spurious labor often sets in, often with increased fetal movements if of course the fetus remains viable. Painful uterine contractions may ensue and vaginal bleeding with expulsion of blood clots and decidual tissue also occurs. Spurious labor has often been termed

false labor without the thought of abdominal pregnancy being entertained until the fetus has died.

Physical examination usually reveals an unusual lie, most often transverse, and fetal parts are often noted to seem extremely superficial and easy to define. The fetus is usually noted to be higher in the abdomen than an intrauterine pregnancy. These findings are easily overlooked and are not present in all cases. Most authors note the absence of Braxton Hicks contractions with abdominal pregnancy. King notes that there is often an abnormal fetal attitude with a tendency for extension in abdominal pregnancy.²¹ Others have reported that the abdominal fetus has its dorsum directed toward the pelvis and its extremities directed cephalad in contrast to intrauterine pregnancy. Dixon and Stewart stress the importance of a constant maternal vascular souffle. They point out that if the ovarian vessels are dilated and hypertrophied a constant souffle can be heard just medial to the iliac spine on the side where the placenta is located. With cases of placental attachment near the vessels along the round ligament the souffle is heard just above the inguinal ligament. Stewart points out that this is distinctly louder than a normal uterine souffle, and is audible over a quite small but constant area of the abdomen. This would be expected, since the sound usually originates in a single vessel, often the ovarian.¹¹ Various other authors state the fetal heart tones are louder than usual due to the close proximity to the abdominal wall.

Pelvic examination and bimanual exam offer other clues to the diagnosis. Jarcho and others stress the finding of a somewhat enlarged softened uterus along side of the fetal mass.¹⁹ He notes that the uterus usually is not larger than that of a four month gestation. The cervix

is usually reported as being firm, long, undilated or only minimally dilated, and movement yields moderate to marked pain. Hegar's sign and ballotment usually are not present.

Radiological aids to diagnosis are frequently employed. A flat plate of the abdomen may yield clues such as the apparent abnormal position--transverse, oblique, breech--and the fetus lying high in the abdomen. There is no characteristic position, but as Dixon and Stewart have stated "the position and attitude of the foetus are exceedingly odd".¹¹ Other findings include the absence of the uterine shadow around the fetus, presence of intestinal gas shadows intermingled with the fetal parts, and signs of fetal death such as Spalding's sign (overlapping of fetal skull bones), hyperflexion of the fetal spine and calcification of the fetal soft parts or sac. It should also be noted that the fetus usually does not change positions as evidenced by repeat films. The lateral view of the abdomen may yield a "pathognomonic sign of abdominal pregnancy", when any of the fetal parts are seen to overlay the shadows of the maternal spine and vertebrae.

Hysterosalpingograms made with radioopaque dye have been used to demonstrate the empty uterus and the extra-uterine fetus. However, most authors caution against using this technique until the diagnosis is fairly certain for fear of interrupting a normal intrauterine pregnancy.

Cross and his associates have emphasized the oxytocin test as being a valuable aid in the early diagnosis of abdominal pregnancy.⁸ One half unit is given initially while the abdominal mass is carefully palpated abdominally. If no contraction occurs in fifteen minutes, another subcutaneous injection of 1.5 units is given. If an intra-uterine pregnancy is present, the uterine wall surrounding the fetus

usually (but not always) goes into a state of contraction which is readily palpable. If definitely positive, this test serves to rule out an abdominal pregnancy. If negative, no conclusion can be drawn because the uterus may for some unknown reason fail to respond to the oxytocin.

TREATMENT

The treatment generally agreed upon is laparotomy with removal of the extrauterine fetus, and disposition of the sac and placenta. However, there are definite differences of opinion when the procedure should be undertaken, and what should be done in regard to the placenta.

The question as to when the operation should be undertaken applies first to the recently dead fetus. The main controversy deals with whether or not to delay removal of the fetus for a few weeks to allow the blood supply to the placental site to decrease and questionably reduce the possibility of severe hemorrhage. Most authors presently agree that operation should be done as soon as the diagnosis is made because no one has definitely been able to demonstrate how long the operation should be deferred. With a living fetus most authors feel it is possible to wait until 36 to 38 weeks of gestation but with close observation in the hospital, if at all possible, so that immediate operation is possible.

Beacham, Hernquist, Beacham, and Webster stress the following preoperative necessities: (1) careful evaluation of the patient, (2) gastrointestinal decompression with the tube being left in place, (3) an indwelling Foley urethral catheter, (4) an empty large bowel and rectum, (5) an infusion running intravenously with at least an #18 gauge needle and the necessary equipment for intraarterial transfusion within reach, and (6) at least 2000 cc of blood within the operating room and several more liters of adequately crossmatched blood readily

available.³

The actual surgical techniques are varied from one case to another and can only be outlined in broad terms. King notes that on opening the abdomen the surgeon usually encounters a number of adhesions between the sac, omentum, and abdominal wall. After these have been separated it is generally possible to identify the fundus and its appendages. An impression is then gained as to the side from which the pregnancy has arisen, generally from the ruptured tubal pregnancy. Next the adhesions between the sac and other abdominal structures particularly the transverse, descending and sigmoid colon, are dissected. It is most important to preserve the blood supply to the colon, and special care should be taken in separating the transverse mesocolon and pelvic mesocolon. It may be necessary to allow a little of the outer layer of the gestation sac to remain on these structures rather than risk injury to colonic vessels by too close removal. Following this, the sac is attached only by pelvic structures and by dividing the peritoneum of the broad ligament above and parallel to the round ligament on the side from which the pregnancy springs, it is usually possible to enucleate the entire mass, with or without the uterus, after clamping and dividing the usual vascular pedicles.²¹

The management of the placenta has been the topic of much discussion in the past. The present feeling is that the placenta should be left in situ and the abdomen closed without drainage whenever removal may cause hemorrhage or damage to a vital organ. The placenta can be removed if its blood supply can be easily tied off or bleeding can be controlled with usual surgical procedures. Eastman states "by and large, the best results will be obtained by avoiding unnecessary

exploration of the surrounding organs; the infant is simply delivered, the cord tied with catgut close to the placenta, and the abdomen closed without drainage".

Jarcho notes that the remaining placenta will undergo either absorption, liquefaction, or formation of a fluctuant tumor which will require incision and drainage.¹⁹ Ware reports that when the placenta is allowed to remain in situ, the Friedman test may remain positive for as long as thirty-five days.

Dixon and Stewart described changes in the placenta removed from a case of abdominal pregnancy. They stated (1) the anatomy was greatly distorted, (2) tremendous hypertrophy of all vessels near the placenta had occurred, and (3) the placenta itself appeared relatively healthy and normal in size and shape for the stage of pregnancy. Microscopic examination revealed amazingly small amounts of trophoblastic invasion as compared with a normal intrauterine placenta. The placenta located on the peritoneum showed no anchoring villi at all. They offer the explanation for the placenta's ability to remain in the same position as being due to intraabdominal and intraamniotic pressures. If so, it follows that this pressure and the pressure within the placental space must be nearly the same--otherwise the placenta would be forced off its bed or the blood would be prevented from entering the space. How this precarious balance is maintained despite changes produced by straining or hypertension is a matter of speculation. The extrauterine placenta has a thick ring of fibrin around its margin in marked contrast to the normal structured placenta. This presumably prevents the retro-placental pool of blood from leaking out under the placental margin.¹¹ This would appear to be a possible explanation why the woman may

develop intraabdominal hemorrhage prior to surgery, i.e., the fibrin barrier may not be adequately formed.

MATERNAL AND FOETAL MORTALITY

King has noted the maternal mortality from 1809-1946 from various workers thusly:²¹

Comparitive Results of Operative Treatment
of Advanced Extrauterine Pregnancy, 1809-1946

<u>Author</u>	<u>Cases</u>	<u>Years</u>	<u>Maternal Mortality</u>
J. S. Parry	62	prior to 1876	51.61%
A. A. Kelley	77	1809-1896	57.3%
P. B. Bland	240	1813-1907	34.7%
Hellman & Simon	316	1809-1933	31.9%
Cornell & Lash	236	1919-1932	14.3%
H. H. Ware	249	1933-1946	14.85%

The primary killers in abdominal pregnancy have consistently been shock, hemorrhage, and sepsis. With improved surgical procedures and techniques, free use of blood transfusions to combat shock and hemorrhage, judicious management of the placenta, early diagnosis, and anti-biotic therapy the above figures will continue to decrease.

The significance of maternal and foetal mortality can be evaluated better when the incidence of abdominal pregnancy is also known. Eastman states there is approximately 1 per every 15,000 deliveries.¹³ Douglas reports 26 cases in 1946 which yielded a total incidence of 1 per 16,370 deliveries. When he compared white and Negro cases he found that the incidence in his Negro population was 1 per 4,188 as compared to 1 per 67,534 in his white population. This is approximately 16 times more frequent for the Negro than the white.¹² He believes the higher

incidence in Negroes to be representative of a higher incidence of tubal pathology rather than to any racial tendency for abdominal pregnancy.

Other authors list the following incidence:

<u>Reference #</u>	<u>Incidence</u>	<u>Year</u>
8	1:2,207	1951
7	1:3,161	1949-56
3	1:3,371	1962
5	1:2,075	1966

Thus the incidence for abdominal pregnancy is shown to be quite variable depending on the author. It would appear that the more recent figures indicate that abdominal pregnancy is becoming more frequent, at least in given populations.

Foetal mortality has been consistently high and few authors include statistics concerning this factor. Eastman refers to 130 cases of Beacham and Beacham in which the foetal mortality was 85%. In analyzing 249 cases reported in the literature since 1935, Ware found a total foetal mortality of 75.6%.²⁶ He further showed that a large percentage of the infants show congenital malformations. Although this is questioned by some authors, they quote a figure of approximately 50%. When a foetus has reached a certain size and succumbs in its intrauterine environment it cannot be absorbed and must eventually have one of the following outcomes: suppuration, mummification, calcification, or adipocere formation.

SUMMARY

1. A historical review of abdominal pregnancy has been presented.
2. Abdominal pregnancy has been defined and classified as primary and secondary. The usually reported etiologies for both primary and secondary pregnancies have been reviewed. Most if not all cases of abdominal gestations are of the secondary type and usually result from early tubal abortions or ruptured tubal pregnancies.
3. The classical signs and symptoms of abdominal pregnancy are reviewed. It is worthy to reiterate once again that the diagnosis is often times extremely easy--if the clinician will only maintain a "high index of suspicion". Delay in diagnosis may make all the difference in determining the outcome for the mother and fetus from this obstetrical catastrophe.
4. Surgical correction for abdominal pregnancy has been outlined in general terms. Preoperative care, and the necessity for having adequate amounts of suitable blood on hand have been stressed. The management of the placenta has been discussed. The conclusion has been reached that it is best left in situ unless its blood supply can definitely be ligated.
5. Various authors' figures on incidence, maternal mortality and fetal mortality have been cited. Shock, hemorrhage, and sepsis

are still the main three hazards of abdominal pregnancy. With greater use of massive blood transfusion, earlier diagnosis, greater knowledge of surgical hazards which may be encountered, and antibiotics, the high mortality rates should decrease.

However, as Eastman states, "abdominal pregnancy will always remain one of the most grave complications in obstetrics both to mother and infant".¹³

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