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Placenta accreta

Kenneth H. Prescott

University of Nebraska Medical Center

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PLACENTA ACCRETA

SENIOR THESIS

KENNETH H. PRESCOTT
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PLACENTA ACCRETA

In thoroughly understanding an anomalously or definite clinical entity as placenta accreta, it is essential to know the development and anatomy of the normal placenta so that the abnormal can be studied intelligently.

After the "ovum", zygote, penetrates into the uterine wall, the chorionic sac first develops primary villi, and then permanent, highly branching ones containing extensions of blood vessels from the embryo soon forms. The erosion of the maternal mucosa whereby sinuslike spaces arise which communicate with opened arteries and veins gives an association between chorionic villi and uterine blood sinuses which is the material basis of a definite placenta.

At first villi cover evenly the entire surface of the chorion. As the embryo and its sac enlarge, the villi next to the decidua capsularis become both compressed and remote from the blood supply. Normally, however it is not until into the third month that enough of these villi atrophy and disappear to leave a perceptibly bare surface, called the chorion laeve. The villi adjacent to the decidua basalis persist as the chorion frondosum and become the fetal part of the placenta; this part, the area of persistent villi is somewhat circular in form, so the placenta takes the shape of a disc. Since the umbilical cord passes from the embryo to the frondose portion of the chorion when this latter region becomes a part
of the placenta, the cord then of necessity attaches to its fetal side near the midpoint.

No adequate conception of the placenta is possible without the clear recognition of its double origin: the chorion frondosum as the fetal portion and the decidua basalis as the maturnal contribution.

The early true villi of the chorion frondosum are compact, brush like tufts with but few branches, and these are short and plump. The main stems arise from the chorionic membrane and most of the ends are affixed to the exposed surface of the compact decidua basalis. During the middle and later months of pregnancy the villi become much more tree-like, profusely arborizing and with longer and more slender branches. All the villi are contained within the open blood sinus, and in the older trees there are many floating free villi in contrast to the relatively few anchoring villi still attached to the decidual wall.

The decidua basalis forms both compact and spongy layers. The part which is most intimately incorporated into the placenta is the so called basal plate which is simply the remains of the compactum after the period of erosion has been arrested. The basal plate is composed of a connective tissue stroma containing decidual cells, fibrinoid material, and portions of trophoblast originally belonging either to anchoring villi or to the layer which covers the exposed surface of the basal plate.
Pillars and septa extend outward from the basal plate into the intervillous space; the tips of some villi are inserted in their substance, but do not unite with the chorion proper. Such septa represent portions of the compact decidua which have been spared from erosion during both the formative period of the placenta and its subsequent growth. They are called placental septa, and incompletely divide the placenta into some fifteen to twenty lobules, or cotyledons. Each cotyledon is a natural unit, since it contains a main villous tree which distributes its smaller branches and twigs throughout the cotyledonary area.

The uterine arteries and veins pass through the basal plate obliquely, loosening their coats as they proceed. This arrangement favors somewhat the effective intervillous circulation of blood. As the placenta increases in size the vessels grow larger; the floating ends of free villi are frequently sucked into the veins and so interfere with the placental circulation. At the periphery of the placenta is an enlarged channel which varies in extent but never encircles the margin completely. This space is the marginal sinus through which part of the blood is drained into maternal veins.

Placenta accreta, or increta, is a rare complication of pregnancy, which may be defined as a condition in which there is an entire, or almost an entire, absence of the decidua basalis so that the erosive action of the
placenta makes it possible for the villi to grow in between and penetrate the individual fibers of the muscle walls of the uterus. The word accreta means a "growing together". De Lee (67) says it is a condition in which the villi burrow and one sees irregular infiltrations of syncytium and Langhan's cells. The appreciation of this pathology shows why death from hemorrhage, sepsis, and perforation is so likely to occur. This condition is a definite pathological entity and should not be confused with retained placenta or adherent placenta.

The history of placenta accreta undoubtedly goes back to the first cases of endometritis and atrophy of the endometrium. Maldevelopments and septic conditions of the uterus existed and undoubtedly caused this abnormality, but these cases died following delivery from hemorrhage, shock, and sepsis and the true cause was unrecognized.

The first cases reported in the literature were by foreign writers, especially the Germans. Ahlfeld (2) in 1889, Weisbaden (24) in 1890, Leopold and Leisse (39) in 1891, Hink (23) in 1896, and Neumann (45) in 1896 were among the first to recognize the pathology in a scientific manner and report their cases. Gradually the condition has been called to the attention of the obstetrical practitioners until at the present time an accurate method of diagnosis at the delivery table and an efficient treatment has been accomplished. The clinical aspects as to the treatment have gone through the "trial and error"
method, and the radical type of therapy is now considered
to be the most conservative with the lowest mortality
rate. The most recent article published by Phaneuf (68)
in September, 1933.

Polak and Phelan (69) in 1924 reported one case in
6000 deliveries. Klaften (5) in 1928, collected 45 cases
and Joachimovitz in 1929, rounded out this number to 70.
Phaneuf collected 82 cases. Eighty-nine cases are now
on record. Other authors have reported various figures
as to the occurrence--- Foster (18) reports one in 8000
cases and various other authors report as low as one in
25000; E. C. Hirst (70) had one case in 40,000. The oc­
currence is usually more often than is reported by the
latter. Out of thirty-six cases collected by Kraul (71)
only eight of the cases recovered, and he describes three
cases occurring in a total of 60,000 deliveries during
the last twenty-three years at his clinic. Of these the
first two were fatal; the third survived a vaginal hyster­
ectomy. Mathanson (42), in an excellent contribution to
this subject, reports four cases occurring in a collective
series of 75,000 deliveries, placing the incidence at
approximately 1 in 20,000 also. Dietrick (72) quotes the
following authors, who, in reporting similar cases stressed
the excessively thinned-out condition of the uterine wall:
Kwostansky-Meyer-Ruegg (funders, 1mm thin); E. Martin
could palpate the intestine through the thinned-out uterine
wall; Wigelin (1-3 mm thin); rupture occurred in the tenth
month and was diagnosed and operated two weeks later. Schwenderer describes a case in which Crede's maneuver led to a rupture of the uterine wall thinned out by placenta accreta.

Tennant (61) reported a case in which it was demonstrated that the placental attachment may not alone penetrate the peritoneal coat of the uterus, but may actually invade the visceral cavity. There are several cases of placenta accreta which were also placenta previa. These cases number ten in all. All cases in which manual extraction was done ended fatally. One case was treated by abdominal hysterectomy and survived, two were treated by vaginal hysterectomy and were fatal, and two cases were treated by caesarian section and survived. Gill (70) reports a most unusual case of adherent placenta with prolapse of the uterus, shock, removal of placenta, reposi­tion of uterus and recovery. No bleeding occurred follow­ing delivery and no line of demarcation existed. The placenta was removed with a dull curette and by wiping with a sponge. If the facts as stated are true, then this case could have been called a placenta accreta, however, there is not a detailed enough report to make the diagnosis clear. This case will be included later under inversion of the uterus.

The etiology—both practical and theoretical responsible for this anomaly—is: 1. The condition of the uterine mucosa at the time the ovum is implanted i.e.
maldevelopment of the uterus, infantile uterus with atrophy or hypoplasia of the endometrium are among the primary factors. Secondary destructive changes due to repeated curettages, septic endometritis, vaporization or medication of a destructive and erosive type, previous manual removal of retained or adherent placenta, diverticular pregnancies, atrophic thinned-out endometrium above uterine myomata or other tumors are of great importance in establishing a definite etiology. To this may be added previous caesarean sections with placenta formation at the site of the scar, and the fact that there is a manual removal of the placenta at the time of operation must also be remembered. It is still a matter of debate as to whether the scar disappears completely after caesarean section by the replacement with muscular tissue or whether the fibrous tissue remains. Many obstetricians definitely deny the persistence of the scar; however, Kwartin and Adler state that they have repeatedly seen at the time of caesarean sections, as well as in hysterectomized and post-mortem material after previous caesareans, the persistence of such scars. 2. Excessive growth of the chorionic elements. Some authors believe that a primary tendency toward excessive growth on the part of chorionid villi can be made responsible for this anatomic defect. 3. Insufficient antiferment production against the erosive power of the trophoblast, possibly due to deficiency in the hormonal cycle of the maternal organism. These assumptions are more of a theoretical nature and need further invest-
As a matter of comparative pathology Dietrick calls attention to the similarity of conditions existing in placenta accreta and tubal pregnancies. In both conditions the villi are forced through the maternal structures and in many cases rupture of the organ follows.

The normal separation of the placenta is greatly facilitated by the spongy decidual layer. After the expulsion of the fetus, the venous spaces fill with blood and as the contractions and relaxations of the uterine musculature continue, separation occurs by forcing the layers apart by means of pressure on the blood. If this spongy layer is absent one can easily realize that separation would be more difficult. The partial or complete absence of the decidua compacta will cause a still greater difficulty in the separation. If the chorionic villi are in direct contact with and penetrate into the muscle layer, separation will be impossible without tearing portions of the myometrium. In the presence of only a thin layer of decidua compacta or in the absence of same, the condition is called placenta accreta vera by some authors. If the chorionic villi penetrate into the muscle layers, the condition known as placenta increta results. Many authors do not attempt to make any differentiation between the two, but merely give the conditions one name of placenta accreta. However, from these basic anatomic considerations one can easily perceive that the clinical course will be influenced by the extent of chorionic invasion.
A very typical case history with pathological report and the radical type of treatment is well represented in an article by Dr. H. C. Williamson (71)---Mrs. M. M., white, twenty-eight years of age, para V, applied to the Manhattan Maternity and Dispensary June 11, 1929.

Menstruation began at fourteen years, was irregular, and there was marked dysmenorrhea until after her marriage at seventeen years of age, when the periods became more regular and less painful.

During her first pregnancy there was intermittent bleeding for four months and a premature delivery occurred at the twenty-eighth week. A living child was born but died in a few minutes. The placenta was retained and had to be manually removed. The puerperium was normal.

The second pregnancy and labor, lasting twelve hours, was normal. The placenta was again manually removed; this time a profuse hemorrhage occurred. These two deliveries took place at her home in Ireland.

In the third pregnancy and labor she was attended by the out-patient service of a New York hospital. The labor was short, and the placenta was again removed manually with profuse hemorrhage. The uterus was packed immediately and the packing removed forty-eight hours later. She states that the puerperium was febrile, and it was necessary to remain in bed for three weeks.

During her fourth pregnancy she was under the care of the Manhattan Maternity and Dispensary and had a moderately difficult ten-hour labor at home. The placenta was again
retained, manually removed, and the uterus packed for hemorrhage. The uterine packing was removed in twenty-four hours. During the first four days postpartum the temperature varied from 99 to 102 F.; during the remainder of the puerperium, it was normal. There was a moderately profuse, foul smelling lochia during the puerperium.

Present Pregnancy--The prenatal period was normal. The Wassermann reaction was negative. She was admitted to the hospital September 1, 1929, in active labor. The delivery was spontaneous; the total duration of labor was twelve hours. For one and a half hours thereafter no bleeding occurred, and the placenta could not be expressed. One c.c. of pituitary extract was then given and an attempt made to express the placenta by the Crede method. The maneuver resulted in profuse bleeding. An attempt was then made to remove the placenta manually. The operator estimated that he had removed about one-third of the placenta when he was forced to stop on account of profuse bleeding. The uterine cavity was tightly packed. The patient was in marked shock, with a systolic blood pressure of 45 and a pulse rate of 200. Appropriate measures were instituted and as soon as possible a transfusion of 800 c.c. of blood was given.

On September 3, 1929, her general condition had improved. The blood pressure was 124/72, and the red blood count 3,800,000 with 70 per cent Hb. It was thought advisably to give a second transfusion of 500 c.c. of blood before attempting an operation.
Operation--The packing was removed and the uterine cavity carefully explored. It felt as though a large amount of placenta was firmly adherent to the uterine wall. A supravaginal hysterectomy was then quickly performed. The uterus presented an unusually ischemic appearance, and there were a few petechial hemorrhages on the anterior surface. The postoperative course was uneventful. The highest temperature was 102.4 F. on the second day. It became normal on the third day and remained so thereafter. She was discharged on the fifteenth day. At the follow-up clinic, six weeks later, she was found to be perfectly well.

The specimen was submitted to two pathologists, Doctors A. Fraser and J. Ewing. Their reports are quoted.

Dr. Fraser--Sections from the adherent patches show no decidua or spongy endometrium. The musculature is riddled with large venous sinuses, making a "spongy layer". In many of these caverns the villi are present and in places attached. Some are empty and others contain pus. The muscle surrounding them often shows piling up of new muscle nuclei representing regenerated muscle fibers. The outer layer of villi is imbedded in a poorly staining hyaline homogeneous substance containing kariorrhectic pus cells representing probably necrotic "endometrial decidua". I interpret this as necrosis of "endometrial" decidua and formation of a "spongy layer" from the muscle. Diagnosis--Placenta Accreta.

Dr. Ewing--The main pathologic features in the sections of the uterine wall are: 1. Practically complete absence
of decidual reaction. There are very few isolated foci about 1 m.m. in diameter in which there are traces of atrophic decidual cells, but these foci are very scanty. 2. The well developed fetal villi penetrate deeply into the sinuses. 3. The muscular wall of the uterus ends abruptly in a zone of hyaline tissue in which the villi are embedded or tightly adherent. At these points there is no trace of decidual tissue. 4. There are several strata between villi and musculature which show polymorphonuclear leucocytic infiltration, indicating the presence of some chronic infection. 5. Throughout the deeper musculature there is a moderate invasion by isolated syncytial wandering cells, which is probably normal.

The hysterectomy has been accepted as probably the best type of treatment as given in the previous case. In this manner the mortality rate has been greatly reduced. Examples of the early type of treatment are shown best by a review of cases reported by Kellogg, Wilson, and Andrews. This type of treatment may have some advantages in certain cases, but the mortality rate is very high.

Kellogg's case (27) gives the usual progress of placenta accreta treated by manual removal and is as follows—

Mrs. G., 34 years, B. L. H. No. 22652, January 12, 1925. This woman a para 1, but had undergone curettage four years previous to pregnancy. In the eighth month, fetal movement ceased and the foetal heart could not be heard. Patient had leaked what was apparently amniotic fluid off and on for two months. She also showed a large trace of albumin.
Referred to hospital from O. P. D. Labor was induced with a Voorhee's bag. A long drawn out labor ensued. Placenta showed no sign of separating. Nine hours later attempt at expression failed. Manual removal attempted. The cervix was shut down firmly, and in the process of dilating the lower uterine segment was torn deeply on the right side. Placenta was found adherent to the right lateral wall. Large piece of hard infarcted placenta removed. Patient showed shock but not enough bleeding present to warrant packing. Further removal of placenta abandoned. Patient transfused with citrated blood, followed by normal saline solution intravenously. She did not react and died. No autopsy. Post mortem examination of the uterus revealed large amounts of placental tissue attached to uterine wall which could not be manually separated. This with history seemed to warrant diagnosis of Placenta Accreta.

The case reported by Wilson (66), in which the placenta was removed piecemeal, terminated in a fatality. The diagnosis was placenta accreta, gangrene of uterus, pelvic peritonitis, venous thrombosis, and gangrene of lower extremities.

Andrews (6), reports a case of placenta accreta removed piecemeal, with recovery and states that it is his belief that if extreme care is used, the separation being made really between the tips of the fingers of the two hands, the effort is justified. However, this method is extremely dangerous and carries with it the highest mortality rate of any procedure in the treatment.
Summary of Case Reports of--Placenta Accreta.

I Treatment by Manual Extraction.

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Author</th>
<th>Outcome</th>
<th>Complication</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Meyer-Ruegg (42)</td>
<td>D. L.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Hink (23)</td>
<td>D.</td>
<td>Placenta Praevia</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Baisch (7)</td>
<td>L.</td>
<td>Diverticulum</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Labhardt (27)</td>
<td>L.</td>
<td>Perforation of peritoneum</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ahlfeld (2)</td>
<td>D. D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Hense (22)</td>
<td>D. L.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Martin E. (40)</td>
<td>D. D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cooper (13)</td>
<td>L. L.</td>
<td>Piecemeal removal</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Jackson (27)</td>
<td>L. L.</td>
<td>One-third of Manual extract-placenta adherent</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Anderson (5)</td>
<td>D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hofmeier (24)</td>
<td>D.</td>
<td></td>
<td></td>
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<tr>
<td>12</td>
<td>Goethals (21)</td>
<td>L. L.</td>
<td>Inversion of Manual extraction</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>(Quoted by Jackson)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Bauereisen (8)</td>
<td>D. L.</td>
<td>Embolism</td>
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<tr>
<td>14</td>
<td>Lehmann (38)</td>
<td>D. L.</td>
<td>Diverticulum and rupture of Uterus</td>
<td></td>
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<tr>
<td>15</td>
<td>Dorsett (15)</td>
<td>L. D.</td>
<td>Sepsis, Pelvic abscess, Pelvic cellulitis</td>
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<tr>
<td>16</td>
<td>Freund-Hitschmann (19)</td>
<td>L. D. (5 mos.)</td>
<td>Detachment of placenta</td>
<td></td>
</tr>
</tbody>
</table>
17. Andrews (6) L. D. Piecemeal removal

18. Leopold-Leisse (39) D. L.

19. Kellogg (30) D. Cervix torn (Quoted by deeply on right Jackson) side

20. Dietrick (14) D. D. Rupture of uterus


22. Schwoerer (57) D. L. Placenta left in uterus

23. Vogt (63) D.

24. Schmidt (51) D. Placenta praevia

25. Nordmann (46) L. L.

27. Polak and Phelan (48) D. Haemorrhage-excessive

28. Polak and Phelan (48) D. Sepsis Piecemeal

29. Polak and Phelan (48) D. Sepsis Piecemeal

30. Schmidt (52) D. Placenta praevia

31. Wilson (66) D. Gangrene of Piecemeal Uterus

32. Schweitzer (54) D. D. Placenta praevia

33. Neumann (45) D. L. Placenta praevia

34. Steinbiss (58) D. D. Abortion. 2/3 placenta ingrown
35. Tenant-Wilson and Craig-Sullivan (61) D. D. 5 months pregnancy

36. Smith (73) D. Collapse on delivery table

37. Schweitzer (54)

II. Treatment by Abdominal Hysterectomy

38. Foster (18) L. D. Type not stated

39. Abrams

(Quoted by Dorsett) (1) D. L. Peritonitis Type not stated

40. Bortkewitsch (10) D. Supravaginal Amputation

41. Bortkewitsch (10) L. D. Ruptured Uterus Total extirpation

42. Feiner (17) L. D. Mac. Supravaginal Amputation

43. Dorsett (15) L. L. Supravaginal Amputation

44. Baumgart and Beneke (9) L. D. Supravaginal Amputation

45. Breuer (12) L. L. Porro.

46. Alerandoff (4) L. D. Ruptured Uterus Abdominal Hysterectomy
<table>
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<th>Case</th>
<th>Name</th>
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<td>47</td>
<td>Blagodarow</td>
<td>L.D.</td>
<td>Mac. Type not stated</td>
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<td>48</td>
<td>Albrecht</td>
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<tr>
<td>49</td>
<td>Phaneuf</td>
<td>D.L.</td>
<td>Supravaginal Amputation</td>
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<tr>
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<td>L.L.</td>
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<td>Gellert</td>
<td>L.D.</td>
<td>5 months Total extirpation</td>
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<td>52</td>
<td>Holzbach</td>
<td>L.L.</td>
<td>Diverticulum Supravaginal Amputation</td>
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<td>53</td>
<td>Piccoli</td>
<td>L.L.</td>
<td>Type not stated</td>
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<tr>
<td>54</td>
<td>Piccoli</td>
<td>L.L.</td>
<td>Twins Type not stated</td>
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<tr>
<td>55</td>
<td>Lyon</td>
<td>L.</td>
<td>Supravaginal Amputation</td>
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<tr>
<td>56</td>
<td>Kearns</td>
<td>L.L.</td>
<td>Supravaginal Amputation</td>
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<td>57</td>
<td>Jackson</td>
<td>L.L.</td>
<td>Supravaginal Amputation</td>
</tr>
<tr>
<td>58</td>
<td>Kellogg</td>
<td>L.</td>
<td>Submucous myoma Supravaginal Amputation</td>
</tr>
<tr>
<td></td>
<td>(Jackson)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Polak and</td>
<td>L.D.</td>
<td>Mac. Supravaginal Amputation</td>
</tr>
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</table>
60. Schwarzenbach (58) L. Submucous myoma Supravaginal Amputation
61. Stephan (59) L. Supravaginal Amputation
62. Williamson (71) L. Supravaginal Amputation
63. Wegelin (64) L. Supravaginal Amputation
64. Tiemeyer (62) L. L. Supravaginal Amputation
65. Proctro and Glascock (49) L. L. Supravaginal Amputation
66. Kratochvil (33) L. D. Ruptured Uterus Supravaginal Amputation
67. Irving (Jackson) (26) L. Supravaginal Amputation
68. Klosterman (32) L. L. Supravaginal Amputation
69. Sussig (60) L. D. 6 mos. Type not stated
70. Neumann (44) L. L. Total placenta praevia Type not stated
71. Nathanson (43) L. L. Type not stated
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<tr>
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<th>Procedure</th>
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<tr>
<td>72.</td>
<td>Reib</td>
<td>(50) L. L.</td>
<td>Porro</td>
<td></td>
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<tr>
<td>73.</td>
<td>Meyer</td>
<td>(41) L.</td>
<td></td>
<td>Total extirpation</td>
<td></td>
</tr>
<tr>
<td>74.</td>
<td>Kwartin and</td>
<td>Adler</td>
<td>(35) L. L.</td>
<td>Porro</td>
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<td>75.</td>
<td>Kakanow</td>
<td>(29) L. L.</td>
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<td>Invasion thru Uterine wall</td>
<td>Porro</td>
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<td>76.</td>
<td>Joachimovits</td>
<td>(28) L. L.</td>
<td></td>
<td>Atony of uterus</td>
<td>Porro</td>
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<td>77.</td>
<td>Ecke</td>
<td>(16) L. L.</td>
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<td>Multiple myoma Vaginal total extirpation</td>
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<td>Joachimovits</td>
<td>(28) L. D.</td>
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<td>3 mos. preg. Vaginal extirpation</td>
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<td>79.</td>
<td>Joachimovits</td>
<td>(28) L. L.</td>
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<td>Vaginal extirpation</td>
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<td>80.</td>
<td>Klaften</td>
<td>(31) L. L.</td>
<td></td>
<td>Vaginal extirpation</td>
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<td>81.</td>
<td>Klaften</td>
<td>(31) L.</td>
<td></td>
<td>Myoma of uterus Vaginal extirpation</td>
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<td>82.</td>
<td>Klaften</td>
<td>(31) D. D.</td>
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<td>Sepsis Vaginal extirpation</td>
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<td>83.</td>
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<td>(31) L. L.</td>
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<tr>
<td>84.</td>
<td>Klaften</td>
<td>(31) D. D.</td>
<td></td>
<td>Inversion of uterus Vaginal extirpation</td>
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<td>85.</td>
<td>Kraul</td>
<td>(34) L. D.</td>
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<td>Vaginal extirpation</td>
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In the survey of the case reports of placenta accreta three cases of inversion of the uterus have been found. Goethals' case reported by Jackson (21) was a patient a para 2. First pregnancy terminated normally in O. P. D., 1925. Present pregnancy uneventful throughout and delivery normal, 7 A. M. in O. P. D. on March 23, 1927; but the placenta failed to detach. H. O. gave pituitrin and attempted Crede without success. No evidence of bleeding. Uterus firm. Patient began to show shock with pallor and pulse weak at 110. B. P. reduced to 70. Transferred to hospital at 12 N. (6 hours). No external evidence of loss of blood. G. and O. given for manual exploration and placenta found on anterolateral wall of uterus. Placenta slowly separated off. In freeing and pulling down on the final third of placenta, the uterus inverted completely. The remaining attached portion of placenta removed externally from uterine wall with scissors, curette, and gauze under
the eye. The inversion of uterus was then easily reduced and uterus packed firmly with gauze. Patient immediately transfused and reacted well. Pack removed twenty-four hours later and patient discharged on sixteenth day post-partum. The pathological report showed choronic villi, decidual cells, hyaline membrane between villi and uterine wall. Diagnosis--Placenta Accreta.

Gill (70) reported a similar case but not in detail enough to determine whether it was a case of adherenta or placenta accreta.

The latest article was published by Klaften (31). The method of treatment was by vaginal hysterectomy and the outcome was fatal resulting from complications.
PLACENTA ACCRETA

Drawing shows villus with blood clots implanted directly on the myometrium, hyaline layer and absence of a decidua basalis.

1-Villus
2-Blood clot
3-Hyaline layer (degeneration)
4-Decidua basalis-absent
5-Uterine musculature
In a recent article by Phaneuf, Sept. 1933, (68) the maternal mortality in manual extraction was 72.1 per cent; 26 mothers died and 10 recovered. A case reported by Smith (73) in Feb. 1934 added another to the mortality list and gave a death rate of 78.7 per cent. Those who recovered from this type of operation probably had a partial placenta accreta, however, this point is not stated, but it is hardly believable that the whole placenta could be separated from the uterine wall without tearing the uterus and without severe hemorrhage and sepsis. Complications in this type of procedure are to be feared and usually result in death when this method is persisted in.

In the group of cases collected by Phaneuf in which abdominal hysterectomy was performed there were 32 recoveries and 2 deaths in 34 cases. This gives a mortality rate of 5.8 per cent. In the collection of 39 cases in this article there were 3 deaths giving a mortality rate of 7.6 per cent. From the standpoint of results this method of treatment stands out as the rational one and is advocated by most of the recent writers. The mortality rate is about that of a hysterectomy on a puerperal uterus. In the vaginal hysterectomy group in the literature 7 mothers recovered and 4 died, a mortality of 36.3 per cent. There have been no new cases reported that were treated by this method. Even with this high mortality it is a very marked improvement over the manual removal.

Treatment by caesarean section has given the best results, however, there are only two cases on record.
One of these cases was reported by Solomons (72) and the other by Neumann (44). In these cases the indication for this type procedure was placenta praevia. In these cases the mothers and babies are living—mortality rate is 0. The success of this type of treatment is because there had been no secondary infection and complications following as there had been in other types of treatment.

The presence of placenta accreta cannot be diagnosed except as the ordinary procedures for delivery and removal of the placenta fail one after the other. The operator eventually has the idea of placenta accreta forced upon him as his final attempt at manual removal of the after-birth has failed and he feels that further efforts will only result in considerable damage or perforation of the thinned uterine wall.

Any placenta remaining in the contracting uterus two hours or more after birth of the baby without the clinical signs of separation—1. Bleeding, 2. Descent of cord, 3. Doming of the fundus—must be considered as abnormally adherent and a possible placenta accreta. Gentle attempts at Crede may be used, but in complete accreta will be entirely unsuccessful. Forceful Crede without signs of placental separation in partial accreta may result in profuse bleeding due to incomplete separation without expulsion of the placenta. Under careful asepsis manual loosening is next attempted, and may be successful where the area of adherence is not too great,
and the accretal process has not invaded the muscle too extensively. An idea of how far the operator can pursue this method can be obtained only by using the bi-manual method of examination—with the free hand used to give counter pressure over the abdomen. In practically all cases a partial separation may be accomplished but with the feeling of the loss of cleavage line or advance into the uterine muscle itself, further attempt at manual loosening should be abandoned. The diagnosis of placenta accreta under these conditions is undoubtedly confirmed. The striking clinical observation is that there is no bleeding or severe loss of blood until the operator begins an attempt at separation of the placenta. Any attempt to remove the placenta piecemeal before the structure is free from the uterine wall should be condemned. The results of such a procedure are ordinarily, 1. increased hemorrhage, 2. shock, 3. perforation of peritoneum, 5. inversion of uterus, 6. sepsis, 7. gangrene of uterus and 8. collapse and death immediately. Some cases with this type of procedure and one of the complications mentioned have recovered, but it is not the rule as can be seen from the mortality rate given previously.

If profuse bleeding follows the attempt at manual removal, a tampon placed in the uterus as a temporary measure may be used till the immediate hysterectomy can be arranged. Most cases at this time will be in shock
resulting from fatigue, trama, and hemorrhage so supportive treatment should be started such as normal saline by rectum and under the pectoral muscles. Blood transfusions should be given immediately or during operation, if the hemorrhage has been severe.

Hysterotomy at the time of abdominal operation should not be done for the following reasons: 1. It prolongs the operation with greater risk of shock and hemorrhage to a patient who is already in poor condition. 2. There is very little chance that any more of the placenta can be removed by a hysterotomy after a thorough attempt at manual removal from below. 3. It increases the possibility of uterine sepsis and peritonitis regardless of the aseptic technique. 4. If the hysterotomy would be a success the same condition might result at the next pregnancy.

It is quite possible for mild degrees of placenta accreta to be removed manually but the preceding precautions must be observed. This is considered a conservative treatment but according to the mortality rate it is certainly the most radical. The patient has about one chance in four of being able to undergo such a procedure while with the treatment by hysterectomy the chance of recovery is fifteen times greater. Certainly the method of choice in treatment of a case of Placenta Accreta is abdominal hysterectomy.
Conclusions.

1. The pathology is in the uterus primarily, according to the practical etiology.

2. Accreta is a definite pathological entity.

3. Every delayed placenta with no hemorrhage should be viewed with suspicion.

4. In the presence of an attached placenta without bleeding, aseptic exploration under anesthesia should be made to determine the next procedure.

5. If no line of cleavage can be demonstrated, hysterectomy should be done. It is the only rational procedure.

6. The characteristic features of this abnormality are partial or total absence of the decidua basalis and an invasion of the musculature of the uterus by chorionic villi.

7. The etiological factors are too vigorous curettage, endometritis, submucous fibroid, previous manual removal, caesarean section and others previously mentioned.

8. Blood transfusion where there is severe hemorrhage is of the utmost importance.

9. The literature has been reviewed on placenta accreta and 89 cases of this pathological entity have been collected.

10. The average incidence was found to be 1 case in 14,622 deliveries. At the two extremes are found 1 in 6,000
to 1 in 40,000.

11. Manual removal is impossible with true placenta accreta. It results in rupture of the uterus, hemorrhage, sepsis, and usually death.
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