

UTERINE RUPTURE AT TERM AFTER PITUITARY EXTRACT COMPLICATED BY PREMATURE SEPARATION OF THE PLACENTA *

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Uterine rupture is one of the most serious complications occurring during pregnancy. It is fortunate that the condition is a rare accident, since the emergency is followed by such high fetal and maternal mortality. Individual reports as to the frequency of the complication vary from one in 250 cases (Tauffer) to one in 6,100 cases (Leopold¹). Statistics from the Berlin Frauenklinik (Koblanc²) give a frequency of one in every 462 cases; New York Lying-In Hospital (Lobenstine), seventy five in 60,000 cases, or one in 800; Moscow Maternity (Ivanoff, 1877-1901) one in every 956 cases, or 124 cases in a series of 118,581 confinements. Freund,³ collecting statistics of seventeen investigators, reported a frequency of one in every 2,114 cases; in the Royal Maternity Charity in London for the years 1827-1856, eight cases in a series of 48,996 pregnancies, or one in 6,150 cases. The statistics with few exceptions are taken from hospital reports and do not show the true frequency, since it often occurs that the patient succumbs at once at home, or else survives the immediate shock of an incomplete rupture to die later when the delayed death is incorrectly attributed to peritonitis or some other condition.

Rupture of the uterus may be complete or incomplete, and may occur at any time during pregnancy

or labor. Brandt states that it occurs eight times more frequently in multiparas than in primiparas. Spontaneous rupture during early pregnancy is one of the rarest accidents. Baisch,⁴ in 1903, collected eighteen instances of rupture during pregnancy from scar, trauma, overdistention, or diseases of the chorion. Incarceration and placenta praevia may be determining factors, as illustrated in Arnold Lea's cases in which rupture occurred spontaneously at six months and seven and a half months, respectively. During the puerperium, a dissecting metritis with sloughing may terminate in rupture. Yet the great majority of cases rupture during labor and may either be spontaneous or follow trauma. The predisposing causes are numerous, and much stress is laid on the degenerative changes or weakening of the uterine musculature resulting from tumor growths, overdistention, and the scars from myomectomies, perforations and cesarean section. Frequently, however, microscopic evidence of any degeneration of the myometrium is wanting. Becker has reported an interesting case of repeated spontaneous rupture, and has collected twenty-seven similar cases from the literature. Within recent time the profession has been aroused by the many cases which occur in pregnancies following cesarean section. As early as 1886, Krukenberg⁵ stated that rupture occurred in 50 per cent. of such cases; and even in 1914, Rongy⁶ concluded that 3 per cent. of these women will have a ruptured scar with a 50 per cent. mortality. Prolonged labor following a disproportion between passages and passengers with undue thinning of the lower uterine segment predisposes to rupture. Among the many exciting causes we include uterine manipulation and the untimely use of oxytocics. My purpose in this paper is to report a case of uterine rupture occurring after the use of a small dose of pituitary extract.

Dale,⁷ in 1906, had noticed that pituitary extract caused rhythmic contraction of the nonpregnant uterus. The extract was introduced in obstetrics in 1909 by Bell of the Royal Infirmary of Liverpool to overcome uterine inertia and check the bleeding of placenta praevia and of cesarean section; also by Foges and Hochstaetter of Vienna in the same year. These three investigators began the use of the preparation soon after the announcement of Frankl-Hochwart and Froelich that pituitary extract had a marked stimulating effect on the uterus of a pregnant animal.

Like all powerful physiologic principles that have been introduced in therapeutics, it was enthusiastically accepted as a valuable addition to the obstetric armamentarium. Reports began to appear illustrating its widespread acceptance, before its value, limitation and dosage were determined clinically. The dictum of the manufacturers of the product that "the drug was remarkably free from danger even when given in enormous doses" was accepted. Thus, Edgar,⁸ in 1913, advocated its employment with an incompletely dilated cervix for uterine inertia in doses of from 0.1 to 0.4 gm. Gousew,⁹ in 1913, after using the extract in forty-eight cases, declared that "irregular pelves not

5. Stern, K.: Ueber Perforation des Meckelschen Divertikels, Deutsch. Ztschr. f. Chir. **111**: 343, 1917.

6. Peck, C. H.: Murphy Button Retained for Three Years in Meckel's Diverticulum, Ann. Surg. **69**: 134, 1909.

* From the Woman's Clinic, University of California Hospital.

1. Leopold: Zur Behandlung der Uterusruptur, Arch. f. Gynäk. **36**: 324, 1889.

2. Koblanc: Beitrag zur Lehre von der Uterusruptur, 1895.

3. Freund: Deutsch. med. Wchnschr., June 5, 1890; abstr. Am. J. Obst., 1890.

4. Baisch: Beitr. f. Geburtsh. u. Gynäk. (Hegar's), 1903, No. 7, p. 249.

5. Krukenberg: Ueber das Verhalten alter Kaiserschnittnarben bei nachfolgender Schwangerschaft, Arch. f. Gynäk. **28**: 421, 1886.

6. Rongy: New York M. J. **99**: 878, 1914.

7. Dale: J. Physiol. **24**, No. 3, 1906.

8. Edgar: Pituitary Extract in Uterine Inertia, Am. J. Obst. **68**: 20 (July) 1913.

9. Gousew: Med. Press & Circ., Feb. 5, 1913.

beyond a medium degree of contraction were no contraindication for its use even when the presenting part stood above the inlet." The employment of pituitary extract in contracted pelves to force the presenting part through the brim and pelvic cavity, and to stimulate labor pains in such malpositions as face and occiput posterior presentations, was not infrequent. It does not excite comment, therefore, that in the light of our knowledge of the powerful stimulating action of the drug, its indiscriminate use was followed by numerous complications. Thus, reports of fetal asphyxia, maternal collapse, tetanus uteri, premature separation of placenta and uterine rupture began to appear, the last resulting in a high mortality for mother and child.

McNeile¹⁰ cites a case and collected statistics of fifteen cases of rupture after pituitary extract with thirteen maternal deaths; Wertenbaker¹¹ reported two additional cases of rupture, and numerous isolated reports of the same complication have appeared from time to time in the literature. The usual dosage was 0.1 gm., which was repeated when deemed necessary. On the strength of the many unfavorable reports following the administration of the drug in labor, the initial enthusiasm has been replaced by a more conservative notion as to its field of usefulness, and Norris¹² declares that the "innumerable reports of rapidly and safely terminated labors constitute the real danger of pituitrin." Most obstetricians today are keenly aware that in hypophyseal extract we have a powerful therapeutic principle that can be employed in labor only when certain conditions are fulfilled in the presence of definite indications. Briefly stated, pituitary extract has no place in a normal labor, and its use should be limited to uterine inertia coming on when the head is well engaged without disproportion between the child and the mother's pelvis, with complete dilatation of the cervix, and without undue thinning of the lower uterine

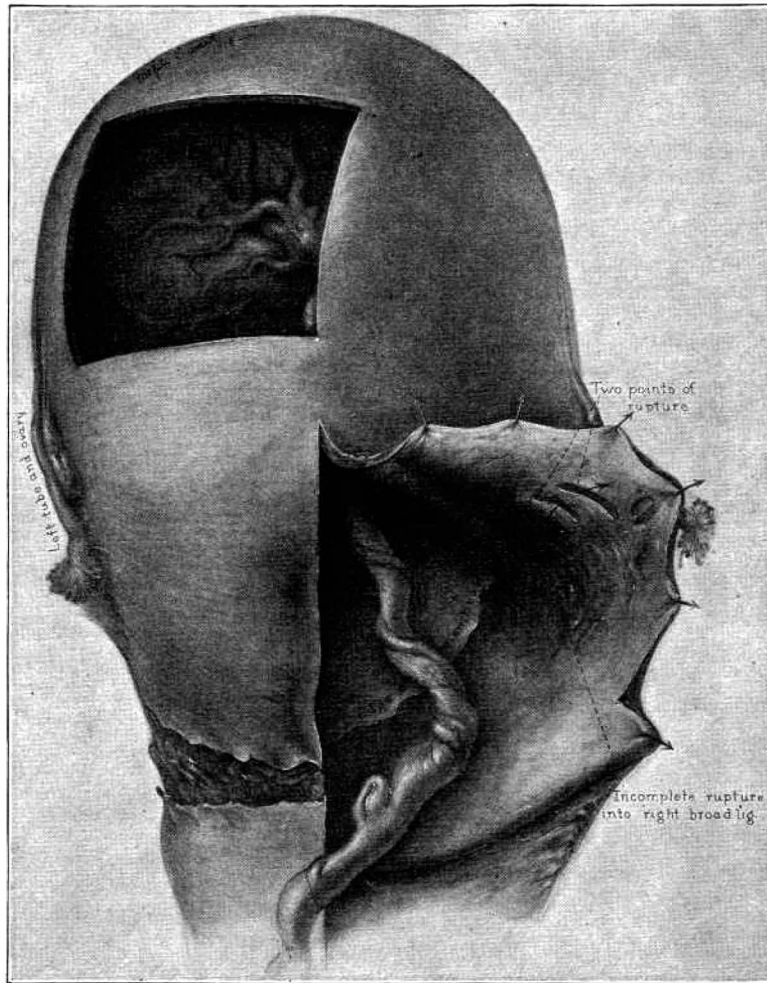
segment. The consensus is that a 1 c.c. ampule equivalent to 0.1 gm. of the drug is too large a dose, and that one half or one third of this amount is within safe limits and may be repeated frequently.¹³

The following case occurred in the obstetric department of the University of California Hospital:

REPORT OF CASE

Mrs. E. C., multipara, aged 44, 5 feet 7 inches in height, whose abdomen at term was not pendulous, and whose pelvis was normal, had had seven spontaneous miscarriages between one and three months, and eight full term pregnancies. She had never been curetted or had had any other gynecologic procedure. Her sixth labor was terminated by a midforceps operation for fetal indications. The fetus weighed 11 pounds.

The seventh labor terminated spontaneously in ten hours, the child weighing 9 pounds. Our interest centers in her eighth full term pregnancy. When the patient was at term she had a sudden hemorrhage without pain. She could not be persuaded to enter the hospital, and refused to report for further examinations and was not seen again until midnight two weeks later, when she entered the hospital. She had been bleeding slightly for a week before entry, and had lost about 200 c.c. a few hours previous to admission. Examination revealed a soft abdomen, left occipito-anterior position, with a floating head. The cervix was undilated, and there were no signs of hemorrhage. The uterus was irritable, and contracted irregularly. One hour after entrance, the membranes ruptured spontaneously. Five hours later, weak pains began. The fetal heart was not heard at any time during the labor. At 9 a. m. the cervix was completely dilated; the head was well fixed. Because of



Incomplete and complete rupture in right uterine segment: normal implantation of placenta; premature detachment 5 cm. in extent.

the good condition of the mother, the absence of fetal heart sounds, and the cessation of all signs of hemorrhage, there was no indication to deliver the patient. One-third c.c. of pituitary extract (pituitrin, B. W. & Co.) was given intramuscularly, and the pains, which had been irregular, became more frequent and stronger. For one and a half hours the advance of the head was slow but steady, and then the pains became very weak and infrequent. The patient's condition at this time was good. With the head at the level of the spines, one-third c.c. of pituitary extract was repeated. Contractions began immediately, but were not

10. McNeile, L. G.: Rupture of Uterus at Term, *Am. J. Obst.* **74**: 432 (Sept.) 1916.

11. Wertenbaker, William: Spontaneous Rupture of Uterus Following Administration of Pituitary Solution, *J. A. M. A.* **68**: 1612 (June 2) 1917.

12. Norris, R. C.: Use and Abuse of Pituitrin in Obstetrics, *Am. J. Obst.* **71**: 741 (May) 1915.

13. In addition to the references already given, the following will be found of interest:

Brodhead: Spontaneous Rupture of Uterus During Labor, *Tr. New York Obst. Soc.* **17**: 51 (Nov. 9) 1909.

Davis: Review of Literature and Case Reports on Uterine Rupture, *Surg., Gynec. & Obst.*, July, 1913.

tetanic, yet in a few minutes the patient complained of air hunger, went into extreme shock, and died within a few minutes after the administration of the drug.

At necropsy when the abdomen was opened, there was considerable free blood in the pelvis. There had been retro-peritoneal bleeding, which had started in the right broad ligament and had extended along the vertebral column up to the lumbar region. The fundus of the uterus was intact, but the entire lower uterine segment to the right of the midline posteriorly was so thinned that only the peritoneum remained, and the body of the child could be seen through this layer. Here there were two slitlike ruptures of the peritoneum about 4 cm. long.

When the uterus was opened, the placenta was found attached to the fundus, but had separated over an area about 5 cm. in diameter. This condition explained the bleeding during pregnancy. An incomplete rupture was present on the right side, extending into the broad ligament through the uterine vessels. The child was in the left occipito-anterior position, weighed 10 pounds, and its palms and soles showed beginning maceration.

Microscopic examination revealed the typical invasion of the myometrium by blood cells at the site of rupture, but no degeneration of the uterine musculature in the region of the placenta or elsewhere.

COMMENT

There were no predisposing causes of rupture, that is, no cicatrix from previous operative procedures or sepsis, nor prolonged labor, the duration from first pain to time of rupture being less than six hours. Before the necropsy, it had been suggested that the premature separation of the placenta might have led to a weakening of the uterine walls by a diffuse hemorrhagic infiltration of the muscle fibers, but this was not confirmed at postmortem or by subsequent microscopic examination. Moreover, the site of rupture in the lower segment was remote from the placental site, namely, the fundus. Pituitary extract employed in a conservative manner was administered in the presence of well established indications and in doses well within the limits of safety, with disastrous results.