REPORT ON A CASE OF RUPTURE OF CORPUS LUTEUM WITH INTRAPERITONEAL HEMORRHAGE.*

BY

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At or about the height of menstrual congestion, the normal mature Graafian follicle ruptures spontaneously on reaching the peritoneum covering the surface of the ovary. The evolvement of the corpus luteum follows in this fashion—the cavity of the ruptured follicle is at first filled with blood, later this is encapsulated and the central portion becomes lighter in color and clearer, the capsule thickens and infolds toward the center while the color of the entire mass changes to a paler red verging on yellow and then to a yellow, hence its name. In the event of pregnancy not ensuing, within the month the corpus luteum shrivels until it is a small depression on the surface of the ovary; should pregnancy occur, however, it becomes larger, almost one-third the size of the ovary, remaining stationary until the middle of pregnancy when it begins to atrophy and at term is only two-thirds of its original size. A month later it is only a small mass of fibrous tissue (1).

When we consider the soft consistency of the normal young ovary and the succession of physiological breaks in its cortex and remember the varying changes in intraabdominal pressure that do occur, some of the conditions may be explained that are found in later life where a "normal" ovary is a rarity.

The following case serves as a basis for the writing of this paper:

R. S., Hosp. No. 36381, age nineteen, single, was admitted to Lebanon Hospital on Feb. 29, 1912, in the service of Dr. Parker Syms, with the following history: two days before admission this patient was seized with severe abdominal pains which were cramp-like in character; this was followed by retching and vomiting. The pains were general at first but later became localized in the lower abdomen, most marked on the right side. After a severe attack of vomiting the patient stated she felt very faint. Bowels were constipated. Menstruation had occurred normally nine days before admission. There was no history of any previous attack. Temperature 101.8°, pulse 100, respiration 26.

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Physical Examination.—Fairly well nourished but slightly anemic. Heart and lungs negative. Liver, kidneys and spleen not palpable. Over the lower half of the abdomen there was some muscular resistanec on the right side, but no distinct rigidity. No masses felt. As the patient was unmarried, no vaginal examination was made.

Operation.—Feb. 29, 1912. Dr. Bookman. Gas and ether anesthesia. Abdomen opened through a low right rectus incision and on exposure of the peritoneum the dark blue-violet color, seen in cases of ruptured extrauterine pregnancy was noted. On opening the peritoneum there was an escape of a considerable amount of fluid and clotted blood which caused the cecum to prolapse into the wound; appendix found markedly congested and with the cecum was wrapped in a taped pad and returned within the abdomen. A number of blood clots and bright red blood were sponged out of the pelvis from whence the bleeding seemed to come, the uterus was steadied with a volsella forceps and the adnexæ explored. The left tube and ovary were found normal as was the right tube. The right ovary was the size of a small hen's egg and there was considerable bleeding from a small perforation near the hilum. As several sutures cut through, the ovary was ablated. The appendix was now removed and the abdomen closed in layers without drainage. Patient discharged cured on the fourteenth day.

Pathological Report.—Ovary shows some fibrous degeneration of a corpus luteum which has ruptured. Appendix shows some exudative inflammation with congestion of the vessels under the peritoneum.

The sequence in this case was undoubtedly first a mild appendicular inflammation and with the increased intraabdominal pressure from the attendant vomiting the corpus luteum was ruptured with the resultant free intraperitoneal hemorrhage; the symptoms of the mild peritoneal irritation caused by the latter tending to further complicate matters.

Primrose(2) in a paper reports two cases of intraperitoneal hemorrhage due to a rupture of a normal Graafian follicle. His two cases are of interest, the first having been caused by a strain while lifting a heavy weight and the second being coincident with an attack of acute suppurative appendicitis. He is the first we believe to point out the coexistence of the appendicular affection and the condition in the ovary. He also mentions the fact that straining of any sort has a distinct etiological significance whether induced by voluntary effort or by vomiting. Jayle is reported by him as citing two cases in which a blood cyst was ruptured during an examination under an anesthetic.

Primrose goes on to deplore the paucity of mention of any accidental rupture of the corpus luteum in the text-books, most of which ignore the subject entirely or dismiss it with a mere statement of its

possible occurrence. On searching the literature, however, he was able to find numerous papers on the subject and mention of this condition was made as far back as 1851 by Nélaton. Peuch in 1858 applied the term "apoplexy of the ovary" to the rupture of the Graafian follicle with injury to the ovary.

In the discussion that followed the reading of this paper, several men reported similar cases and Maurice H. Richardson of Boston stated that "he had frequently seen a ruptured Graafian follicle and had removed more than one ovary, considering it to be the cause of an intraperitoneal hemorrhage, which now he believed might have been simply an excessive hemorrhage during menstruation without any pathological significance whatever."

Luker(3) mentions a case of rupture of a corpus luteum into an intraligamentous cyst. Warnshius(4) records a case in a young girl, probably hemophilic in origin, with symptoms of acute appendicitis which was complicated by a severe nasal hemorrhage and an intramural hematoma. Adams(5) reports a case of hemorrhage from a corpus cyst clinically similar to the one reported herein. Bonneau(6) also notes a case.

Most of the cases are reported under the caption of ruptured hemorrhagic cysts of the ovary, ovarian hematomata or ovarian hematoceles. Hedley(7) concludes after a careful study of eighteen cases that "there seems to be no reason to doubt that the actual process of formation of ovarian hematomata is one of rupture of several or many Graafian follicles into one another instead of on the surface of the ovary separately." Savage(8) divides these hematomata into two types, (*a*) of the Graafian follicle, and (*b*) of the corpus luteum. These local collections of blood clots in the region of and intimately connected with the ovary have often been mistaken for a ruptured extrauterine pregnancy on superficial examination.

It seems to us that the difference between the ovarian hematomata and those cases in which the blood suffuses the peritoneal cavity, is only one of degree; in the former the blood is extruded slowly from the tear in the ovary and in the latter the blood is poured out so rapidly that there is no chance for clotting, thus giving symptoms of free blood in the peritoneal cavity. The classification of this condition into the affections of the Graafian follicle and those of the corpus luteum is also misleading, in as much as the Graafian follicle is but the immediate precursor of the corpus luteum. The small blood cysts on the surface of the ovary are formed by the proliferation of a layer of lutein cells over the site of the physiological rupture in the cortex of the ovary and the persistence of this membrane leads to their

formation. According to Cohn(9) the peritoneal cavity communicates with the inner part of the ovary for a time at the seat of the rupture of the follicle and the layer of lutein cells mentioned is further thinned out by the accumulation of fluid in this space; this new cyst may rupture and tear the ovarian stroma if the pressure is strong enough and the various degrees of hemorrhage follow. The source of the hemorrhage as just stated is from the ovarian stroma if the causative pressure is strong enough and the natural conclusion must be that if it is a vein that is torn the bleeding is slight with more opportunity for clotting to take place whereas if an artery is injured the hemorrhage is apt to be more severe and inundate the peritoneal cavity.

How often are cases seen in young girls where they complain of severe pain at a menstrual period, with a slight elevation of temperature and some nausea and vomiting and how often are these cases ascribed to having caught "cold" or to an attendant catarrhal salpingitis, where the condition is no doubt due to a small pelvic hemorrhage from a torn corpus luteum.

The so-called pelvic hematoceles are undoubtedly caused by a similar process with subsequent encysting of the blood, and many of the adherent ovaries with normal tubes may be attributed to this cause.

The diagnosis is difficult. From a low acute appendicitis of a mild type, the differentiation is almost impossible, the diagnosis can only be surmised at, but if the hemorrhage is severe the attendant anemia may serve as a diagnostic guide. From a ruptured extrauterine pregnancy it differs in the fact that the history of irregular bleeding, decidual fragments and the physical signs of a tubal mass are lacking. Judging from the literature it seems that this condition has never been diagnosed accurately.

The cases in which the blood is confined to the pelvis are not difficult to treat; the affair is self-limited and the treatment is symptomatic, but in those cases where the hemorrhage is more severe and symptoms of peritoneal irritation due to the free blood are present, the treatment is essentially surgical.

The prognosis is usually good except in those cases associated with pathological blood conditions.

Conclusions.—Suddenly increased intraabdominal pressure or trauma predisposes to the rupture of the forming or newly formed corpus luteum.

The small so-called hemorrhagic cysts of the ovary when ruptured may easily cause laceration and bleeding.

Cases of intraperitoneal hemorrhage due to this cause are fre-

quently mistaken for ruptured extrauterine pregnancy or acute appendicitis.

Ovarian apoplexy, ruptured hemorrhagic cysts of the ovary, ovarian and pelvic hematoceles (when due to no other cause), ovarian hematomata and hemorrhage into the peritoneal cavity from a ruptured corpus luteum, may all be grouped as having the same etiology and differing only in degree.

With acute pelvic pain at or about the time of menstruation, slight rise of temperature, signs of peritoneal irritation with some anemia and a history of straining, the existence of a ruptured corpus luteum must be kept in mind.

Treatment of the mild cases is symptomatic, of the severe cases, surgical.

Prognosis is usually good in all cases except in those cases with associated pathological blood conditions.

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