



Endometriosis

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I. CASE REPORTSENDOMETRIOSIS

By Leonard Lang.

Case 1.

White female, 44 years of age, admitted to University of Minnesota Hospitals 11-14-34, discharged 11-28-34 (14 days).

Complaints on admission:

1. Menorrhagia and metrorrhagia.
2. Lower abdominal pain, increased with menses.
3. Sacral and lower lumbar backache.

Development of present illness:

Dates back to severe vaginal bleeding in 1928 (12 pads per day for 9 or 10 days), associated with lower abdominal pain and backache. The menstrual periods following this were much the same during that year, but flow was not so excessive.

In spring and summer of 1929, was flowing almost continually. Pain in abdomen present with menstrual period, but less severe. Backache as before with menstrual period.

In 1932, increase of bleeding and pain with menstrual period.

Flowing from August 5, 1934 to time of admission on November 14, 1934.

Treated for anemia for past 3 years.

Marital History:

Married 25 years. Three children living and well, youngest is 14 years of age. No pregnancies since that time.

Pelvic examination:

Pelvic floor - competent, parous.
Glands and urethra - negative.
Cervix - points down and back, movable.
Corpus - mildly retroverted with limited mobility. Enlarged to size of 3 months pregnancy. Irregular contour.

Adnexae - cul de sac is full and tender, containing medial portion of a large cystic mass (6 to 7 cm. in diameter), arising from the right adnexal region. This mass seems to be continuous with the uterus. Smaller adherent mass on left.

Laboratory:

1. Temperature observed for 3 days preoperatively and every 2 hours after pelvic examinations remained at a normal level. Pulse 80 to 90.

2. Blood - Hemoglobin 55%, erythrocytes 3,160,000, leucocytes 8,600, neutrophils 77%.

Preoperative Diagnosis:

1. Myoma uteri and
2. Ovarian cystitis, bilateral or bilateral salpingo-oophoritis, chronic.

Operation on 11-17-34:

1. Diagnostic curettage done first. Large amount of apparently hyperplastic endometrium. Frozen section was reported as "cystic hyperplastic endometrium".

2. Midline lower abdominal incision revealed an enlarged, irregular uterus of about the size of a 3½ months pregnancy. Mobility was limited due to bilateral ovarian cysts, which were densely adherent to the posterior surface of the uterus and broad ligaments. Both cysts were ruptured, with the escape of chocolate-colored material, in attempting to free them. Both tubes and ovaries were removed and a subtotal hysterectomy was done.

The post cul de sac was infiltrated and thickened as was the anterior medial wall of the upper rectum.

Pathological Diagnosis:

Cross: Uterus and ovaries. The uterus shows diffuse thickening of the wall, the average thickness being about 3 cm. Both ovaries show multiple cysts. In each ovary, there is a

hemorrhagic cyst about 5 cm. in diameter. There are no papillary infoldings. The blood is dark brown in color.

Microscopic: Uterus shows glandular structures dispersed in small nests throughout the musculature. The large cyst in the right ovary shows an epithelial lining which consists of cuboidal and columnar cells without cilia. The nuclei are situated either at the base or at the center of the cell. The cells and the nuclei stain dark blue. The lining of the cyst is for the most part formed by a single layer of cells. Beneath this endometrial lining, there is a loose stroma of connective tissue. In the connective tissue layer, immediately beneath the epithelial layer, there is a dense mass of large macrophages engorged with hemosiderin. Beneath the macrophages, the reticular stroma enmeshes round and rod shaped cells which stain light blue. In occasional areas, just beneath the epithelial layer, there are gland-like structures lined by columnar epithelium. The entire structure suggests endometrium. The large cyst in the left ovary which on the gross looked the same as the right shows a typical lutein cell lining.

Diagnosis:

1. Bilateral cystic ovaries.
2. Adenomyoma uteri.
3. Endometrial cyst, right.
4. Lutein cyst, left.

Case 2.

White female, 39 years of age, admitted to University of Minnesota Hospitals 4-3-34 on the Obstetrical Service.

Complaints on admission:

1. C.T.A. During past year, noticed pain in vagina during menstrual periods.
2. Last menstrual period: 9-17-34. Spotted 1 day in October, November and December.
3. Expected confinement: June 24, 1934.

4. Some dyspnea on mild exertion and weakness during three or four months previous to admission.

Physical examination:

Chest - evidences of double mitral lesion with marked stenosis.

Abdomen - pregnant uterus, size of 6 to 6½ months. Myomata palpable in fundus. Measurements adequate.

Pelvic - palpable infiltrative lesion of posterior vaginal vault on the right, felt rough and granular, not well demonstrated but encompassed an area of 2 x 3 or 4 cms. Rectal wall smooth in area of the lesion.

Speculum - ulcerated area on right posterior wall, high under cervix. Bleeds on manipulation. Reddish in color.

Laboratory:

Pathological report (4-5-34): decidua-like tissue with infection.

Discharged: 4-7-34.

Cauterized in O.P.D.

4-18-34 - Lesion was treated with phenol and alcohol. Following cauterization, the ulceration healed over but the lesion remained about the same size.

Readmitted to Hospital 6-19-34 for rest and observation, largely because of serious heart lesion.

Delivered by low forceps extraction after 3 hours labor. (Infant had a large spina bifida and died of pneumonia after 10 days).

10-16-34 - Speculum - lesion about same size as noted before delivery; bluish discoloration noted.

11-27-34 - Lesion slightly increased in size; no ulceration. Patient refuses to permit another biopsy.

II. ABSTRACT

ENDOMETRIOSIS

By Leonard Lang.

The term was introduced by Sampson to include a variety of adenomatous lesions of the female with the histological and functional characteristics of endometrium.

A. History

1. 1860 - Rokitansky reported a case of adenomyomata with a theory as to origin.

2. 1880 - Von Recklinghausen and Cullen described cases of adenomyomata of uterus and round ligament. Cullen demonstrated the endometrial origin of adenomyomata.

3. 1899 - Russel first described aberrant endometrium in the ovary and he regarded it as a Mullerian rest.

4. 1921 - Revived by Sampson. Theory of transtubal implantation.

B. Theories as to origin

1. Wolffian Theory of Von Recklinghausen noted that adenomatous lesions were more common in posterior uterine wall and inner end of the tubes, situations where Wolffian rests are commonly found.

2. Mucosal Invasion Theory (Cullen): He traced communication between gland spaces and the endometrium in adenomyomata of the uterus. He thought the more remote lesions were due to Mullerian Rests.

3. Serosal Theory: Under influence of inflammation, the endothelial cells of the peritoneum may be transformed into cylindrical or cuboidal cells and connective tissue surrounding such structures can undergo hyperplasia resembling stroma of uterine mucous membrane.

Robert Meyer demonstrated that epithelial heterotopy can occur in the serosa. This begins as a healing process in which "repair runs riot".

This is also applicable to the germinal epithelium of the ovary.

Ludwig Pick subscribed to above. In 1905, he reported 4 cases of typical chocolate cysts with endometrial lining. He gave the lesion the name "cystoma ovarii endometrioides".

Novak favors the coelomic origin of aberrant endometrium, noting that the former gives rise to both ovary and peritoneum. He believes that in adult life, probably under endocrine influence, the developmental potentialities of peritoneum or germinal epithelium are stimulated to form endometrium or tubal epithelium.

4. Mullerian Rest Theory (Russel). He found endometrium in the ovary and accounted for it thus: ovary and Mullerian duct are both derived from mesothelium and their anlage are in close anatomical continuity.

5. Implantation Theory of Sampson, 1921 - First paper dealing with "perforating hemorrhagic chocolate cysts of the ovary". He reasons that uterine or tubal epithelium may escape during menstruation into the peritoneal cavity via the tubes. Regurgitated fragments lodge on the ovary, intestines, etc. and have the ability to penetrate surfaces. With further growth, adenomata may develop in suitable soil. Such growths react to menstruation and may in the course of time form hematomata which may remain superficial or invade deeply (chocolate cysts). Tension leads to perforation of the cyst wall, rupture, fresh implants arise. Dense adhesions form at the site of perforation due to peritoneal irritation. Sampson says secondary implants are more invasive and have a wider distribution. He has also found fragments in lymph and venous spaces of the uterine wall and thought that these could be transported to myometrium and distant structures.

Summary of Evidence (Sampson):

1. Structure and function same as of uterine mucosa.
2. Occur in women only and during menstrual life.
3. Blood can be seen escaping from the tube in menstruation.
4. Early lesions are found near the ends of the tubes.
5. Lesions found in different stages of development in the same patient.
6. Tubes are usually patent.
7. Histological studies in pelvic peritonitis of bacterial origin do not demonstrate same lesions.
8. Usually multiple and scattered, suggesting that the chemical irritation of menstruating blood alone is not responsible.
9. Lesions also observed in abdominal scars when field may have been contaminated with mucous membrane tissue.
10. Jacobson produced similar lesions by autotransplantation of mucous membrane bits into peritoneal cavity of rabbits.

Novak argues vs. Sampson:

1. Never saw regurgitated blood at operation.
2. If so, would expect symptoms of peritoneal irritation as in ectopics.
3. Would be against the normal tubal peristalsis.
4. Tortuous course would not permit travel of fragments.
5. Fragments of menstrual blood have non-viable cells.

Experimental Work:

1. Jacobson - growth from auto-transplants in 84% of rabbits (also Hossena, Katz and Azines).
2. Dahl-Iverson - 12 of 13 guinea pigs had growth in 3 to 4 months after transplantation. (Grew only where serosa was injured at laparotomy.)
3. Heim - No transplants in monkey or human female from menstruating blood.

Pathology:

Histology is identical with uterine mucous membrane in typical cases. Functionally, the lesions react to men-

struation, pregnancy and the menopause, following ovarian stimulation. There is periodic swelling and discharge of blood from lesions of the umbilicus, laparotomy scars, inguinal region and rectovaginal septum.

In pregnancy, stroma shows typical decidual reaction; in the menopause, there is atrophy of the glandular structure.

Microscopic Pathology:

Uniform in typical cases, with scattered areas of glandular tissue from microscopic size to several centimeters. Glands may be empty or filled with debris and dark blood. They are lined by a single layer of low cuboidal cells or cylindrical with dark central nuclei. Epithelium is often identical with that of uterine cavity; at times, resembles tube. Cilia may be in evidence.

Stroma consists of loosely packed round cells and fibrous tissue with scattered smooth muscle cells frequently. Stroma may be absent at times.

At or near menses - may be recent subepithelial hemorrhage and epithelial lining may be lifted from the stroma. Blood may break out into the gland space, often with bits of epithelial lining. Some blood remains in the wall and is changed to hemosiderin, which may be seen free in the stroma or in large phagocytic cells.

Gross Pathology of Ovarian and Intraperitoneal Endometriosis:

Ovarian lesions may vary in size from small, superficial, purple or red areas on the surface to large cysts of several centimeters. Usually multiple, show various stages of development. Usually bilateral. Perforation occurs readily causing adhesions of various structures to the site of implantation.

Larger hematmata usually have origin deep in the ovary. These perforate, the ovary becomes adherent to the parietal peritoneum. posterior broad

ligament, uterus and intestines. Adhesions seal off the perforation which is usually reopened at operation, with the escape of chocolate fluid. Pelvic organs are usually densely matted together and in the line of cleavage, secondary red or blue endometrial cysts are found. There is often extensive adenomatous involvement of adjacent structures, simulating malignancy (especially in sigmoid and small intestine).

Invasion of the cul de sac and then the posterior vaginal septum is common; invasion of the anterior cul de sac to the bladder is seen also. Endometriosis of the appendix has been reported (Sampson, et al).

Malignant change can occur. Many adenocarcinomata of the ovary resemble adenocarcinoma of the corpus. Adenocarcinoma and benign endometriosis have been found in the same patient with no evidence of uterine adenocarcinoma.

Adenomyoma (endometriosis) of rectovaginal septum:

Vaginal septum:

These may be free in the septum; adherent to posterior cervix and anterior rectum; or involving broad ligaments in a dense pelvic mass that cannot be liberated. Usual picture is a diffuse nodular thickening involving the cervix, vault and anterior rectal wall, although the rectal mucous membrane is rarely involved (differential from rectal carcinoma). The vagina, however, may be perforated and show red or blue indurated cysts which may discharge blood at the menses.

Rarer forms:

1. Round ligament: First described by Cullen in 1896. Rare. 34 cases up to 1926. Usually small.

Symptoms: Increase in size with pain and tenderness at menses. May discharge blood at menses.

2. Umbilicus: Rare. 30 cases.

Symptoms: as above.

3. Laparotomy scars: rare. Interval of 6 weeks to 21 years after operation, usually after uterine operations and ventrofixation.

4. Post-salpingectomy endometriosis: seen as sprouts growing out of tubal mucosa.

Clinical Aspects:

Varied, depending on location, extent, neighboring structures and complicating pathology (myomata and adhesions, etc.).

Lesion is suspected when there is the occurrence of exaggeration of pain with the menses:

1. Age: 25 to menopause; 75% between 30 and 50 years.
2. Sterility: absolute or relative. May be long interval since last child.
3. Abnormal menstruation, usually menorrhagia. (50% show this.)
4. Myomata frequent.
5. Acquired dysmenorrhea is suggestive (50%).
6. Dyspareunia (50%).
7. Sacral and lumbosacral backache.
8. Intermittent lower abdominal pain with increased discomfort at menses.
9. Pain in rectum or bladder related to menstrual period.
10. Objective findings vary. Typical cases show densely adherent adnexa on one or both sides, firm and blending with the uterus. Uterus commonly adherent and posterior.

Nodulations in Cul de sac on Rectal Palpitation:

Treatment:

Ovarian function causes symptoms and lack of function causes atrophy of lesions. The choice of therapy is usually between surgery (excision or bilateral ovariectomy) and irradiation. Many patients are in the middle of their child's bearing period. Therefore, it seems wise to err if need be on the side of conservatism.

Smaller tumors can be excised completely.

Larger adherent lesions demand more radical treatment.

With marked involvement of the bowel bilateral ovariectomy or x-ray is necessary after which gradual regression of the lesions takes place.

Occasionally, the lesions do not regress but have a malignant potentiality.

As a general rule, surgery is the procedure of choice; irradiation is rarely resorted to.

In lesions of the rectovaginal septum, small nodules may be excised. However, there is always danger of rectovaginal fistulae resulting. If large and there is associated pelvic pathology, bilateral ovariectomy is done as a rule. Irradiation may be used, usually in the form of a sterilizing dose of x-ray to the ovaries, while some cases react well to radium implants directly into the lesion.

- In lesions of the umbilicus and in laparotomy scars, wide excision is advised.

Summary:

1. "Endometriosis" is a term introduced by Sampson to include a variety of adenomatous lesions of the female with histological and functional characteristics of endometrium.

2. The commoner locations of the lesions are:

- (a) Ovaries ("Perforating chocolate cysts"),
- (b) Uterus (adenomyomata of the uterus), and
- (c) Rectovaginal septum.

Rare locations are: Umbilicus, round ligament and at the site of old laparotomy scars.

3. Sampson finds the lesion in a fairly high percentage of cases subjected

to laparotomy.

4. The two most common theories of origin are:

- (a) Sampson's "Implantation Theory" which is based on the idea that blood may be regurgitated through the tubes during menstruation and some of the glandular structures are implanted on the ovary and peritoneal surfaces.
- (b) The "Serosal Theory" which is upheld strongly by Novak in this country. He reasons that under the influence of some endocrine factor the developmental potentialities of peritoneum or germinal epithelium are stimulated to form endometrium or tubal epithelium.

5. Grossly, in typical cases, the pelvic organs are bound down by adhesions. The uterus is usually enlarged and bound down in retroversion. Bilateral, densely adherent chocolate cysts of the ovary are present. There may or may not be diffuse reddish-blue transplants on various peritoneal surfaces.

6. Microscopically, the lining of the cysts have a glandular epithelium and stroma simulating that of the endometrium.

7. The lesions may become larger and painful during menstruating; and occasionally they discharge blood at the menstrual period. In most instances, symptoms disappear with the cessation of ovarian function (e.g. at the menopause).

8. Treatment may be by surgery or by irradiation depending largely on the character of the lesion and the age of the patient.

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5. Novak, E.
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Am. J. Obst. & Gyn. 22: 826, 1931.
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Perforated hemorrhagic cysts of ovary.
Arch. Surg. 3: 245, 1921

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Am. J. Obst. & Gyn. 4: 451, 1922.

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S.G.O. 38, 287, 1924.

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Am. J. Path. 3: 93, 1927.

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III. STAFF MEETING

Date: January 10, 1935

Place: Recreation Room,
Nurses' Hall

Time: 12:15 to 1:35

Attendance: 105

Program: Anemias of Childhood

Discussion: L. G. Rigler
I. McQuarrie
H. S. Diehl
A. B. Jones
I. Pass
Richard Johnson
R. E. Fahr

Theme:

The congenital anomalies were demonstrated (x-ray). The features of Cooley's anemia were discussed. We had one case here. Unusual forms are also encountered. We have one which has had more than 100 transfusions. The picture suggests toxic anemia but the patient did not respond to removal of infectious foci. In the blood smear, the anemia is aplastic. Punctures of the bone marrow show good normal blood formation. It apparently represents a variety in which the "escape mechanism" is defective. There is no evidence of excessive blood destruction. A common variety in children has been described today (with the infectious form leading in frequency). There was agreement with the references from the literature. It would appear that extra iron could be added to the diet of children, especially during the "milk" period. Cooley's anemia is an erythroblastic type and undoubtedly has been included by some observers under the von Jaksch form.

There is a form of anemia in adult women in the late decades with psychic disturbances and dysphagia (hypochromatic type). Acid is usually absent in the stomach and the red count may not be very low. There is usually a past history of menstrual difficulty and the group is iron responsive. Many secondary anemias now respond to therapy but there may be temporary improvement on iron which cannot be maintained. Certain cases show nail changes and have enlarged spleen. The esophageal obstruction is real and cornification is observed. Passing a sound is often helpful.

Chlorosis was discussed in detail. It is not seen much today. Young women

who were weak, nervous and of peculiar appearance with palpitating hearts were common at one time. The face was swollen, they had scanty menses, and severe constipation. The cells were markedly hypochromatic and social distinction was not significant. The condition could be reversed in 4 or 5 weeks and cures were permanent. In the last 20 years (G.E.H.) has seen none of it. The proper administration of iron was the answer to the remarkable results obtained.

Gertrude Gunn
Librarian

IV. TODAY

Leonard Adam Lang prepared the staff meeting reports for today. Born in Duluth, Minnesota, graduate of Cathedral High School, premedic - St. Thomas College, Medicine - University of Minnesota, Internship - Minneapolis General Hospital, for the past 5 years a graduate student in Obstetrics and Gynecology, he is now an instructor in his department.

V. MOVIES

Title: "Pond Insects"

By ERPI - One Reel

VI. GOSSIP

Helen Ulrich, Secretary to H. L. Dunn, Director of the Hospital, spent two years as secretary in the Funchow Hospital, China, before coming to Minnesota. Her Chinese experience has been of great value to her here. Wedding bells will soon ring for Reynold Adolph Jensen of Sleepy Eye according to the local Winchells. Mrs. Roy Chapman Ainsworth, wife of intern Roy Chapman Ainsworth, is the daughter of Wisconsin's famed food expert Hart. . . On the witness stand last week, the handsome gentleman's reply to the prosecutor's question about his marital state in the affirmative brought groans from the female members of

the court's audience. Health Service Physician George Hauser is reported to have the largest feet of our staff. The size is not really known although this is a matter of small concern to the "Genial George". William Thomas Peyton played football at St. John's University when long hair was really necessary for a football player. This may account for his tonsorial problem (still living in the past). The position he played was end and according to all reports he was good. Angus Cameron of Minot, North Dakota, formerly a member of our surgical department, was a hospital visitor last week. Harold S. Diehl has been elected Secretary of the American Student Health Service Association in which he was very active as an early president. In the survey conducted by one of the subcommittees on the Cost of Medical Care, our Health Service was compared with Yale, Michigan and Oregon State---much to our credit. An unusual character was encountered the other day in an Irish locomotive engineer who teaches skating to youngsters as an avocation. Although a bachelor, he opined that one woman was worth 20 men when you were in trouble, also that women, especially the modern ones, were a great institution as they took your mind off your more serious troubles. There is a physician in Minneapolis who promises to do many unusual things for you if you consult him, who has the unusual name "Hygiene Zettel". At one time Minneapolis was famous for its physician named "Dr. Bill Doctor". The only physician in the American Medical Association directory who does not have a given name is "Gatwood,

_____, a prominent Chicago surgeon. Leo George Rigler won a prize in Memphis with his radiological exhibit but as yet does not know what it is. For the third successive year we maintained our 72% "+" autopsy percentage (exclusive of stillbirths). Note:

1932	Deaths	390	Autopsies	282	72%
1933	"	399	"	285	71%
1934	"	420	"	306	73%

According to a recent survey our hospital is second in the United States in the large series group. . . . The next Sigma Xi lecture will be given January 25th, by Dr. George A. Thiel, subject: "The relation of human activities to depletion of our water resources." The next

Next lecture is January 20th, by
Dr. Willie S. Lawson, "Clinical and
experimental tuberculous pleurisy with
effusion.".....Speaking of meetings,
the Minneapolis Surgical Society program
last Thursday, supplied by our staff,
was very successful and well attended.
Congratulations!