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Endometriosis of the ovary

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ENDOMETRIOSIS OF THE OVARY,

Senior Thesis

University of Nebraska
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1934

Charles W. Ihle

INTRODUCTION

HISTORICAL SKETCH

THEORIES OF ORIGIN

PATHOLOGY

CLINICAL PICTURE AND SYMPTOMATOLOGY

DIAGNOSIS

TREATMENT

SUMMARY

CASE HISTORIES

BIBLIOGRAPHY

480564

ENDOMETRIOSIS OF THE OVARY

INTRODUCTION

The term "endometriosis", as first applied by Sampson, refers to a pathological condition occurring in the female characterized by one or more deposits of endometrial-like tissue growing in an abnormal location. (12)

To the individual lesions resulting from this pathological process, endometriosis, several synonymous terms have been applied. (11) Of these synonyms endometrioma is the one most widely accepted and employed, others are; endometrial adenoma, adenomyoma, chocolate cysts, Sampson's tumours, endometrial transplants, hemorrhagic perforating cysts, ectopic Mullerianoma (1) and tarry cysts.

The distribution of endometriomata in the female body is remarkably extensive. During recent years the distribution has come to include the following: uterus (sub-mucous, interstitial or subperitoneal), cervix, broad ligament, round ligament, groin, labium majus, utero-sacral ligament, Fallopian tube, ovary, peritoneum of Douglas' pouch, rectum, rectovaginal septum, sigmoid colon, small bowel, ileo-caecal valve, appendix, hernial sac, great omentum, mesentery of small intestine, gland of mesentery of ileum, bladder, gall bladder, stomach, umbilicus, ureter, rectus

abdominis muscle, laparotomy scars (28) and lymph nodes.(13)

The incidence of endometriosis bears a very obvious relationship to the appearance of Sampson's classical description of the condition in 1921 (41). Between the years 1898, when Russell reported the first case of ovarian endometriosis, (41) and 1921 when Norris (37) observed and reported a case there were only three cases recorded. However Sampson (42) writing in 1921 reported having seen during one year fourteen cases in the course of 178 pelvic operations. Sampson again writing on the subject of endometriosis in 1922 (43) believed from his observations that next to leiomyoma endometriosis is the most frequent pathological condition occurring in pelves of women between thirty years of age and the menopause. Donald (9) reported ten cases of adenomyoma of the rectovaginal space seven of which were associated with tarry cysts of the ovary. In 1923 Judd and Foulds of the Mayo Clinic (23) reported that 494 patients with adenomyoma had been operated on and in 464 cases adenomyomata were found in the ovary, uterus, Fallopian tubes and uterine ligaments. Llewellyn (32) in 1926 stated that endometriosis of the ovary is seen in 10% of all gynecological intraperitoneal pelvic operations. In 1933 Green-Armytag remarking upon the occurrence of endo-

metriosis states that he has observed endometriosis in 8.9 % of 1,000 abdominal operations.

HISTORICAL SKETCH

Endometriosis of the uterus was first described in 1860 by Rokitansky. (40) In 1895 von Recklinghausen studied these tumours and advanced his theory of origin from remnants of the Wolffian body. Cullen (7) in 1896 described endometriosis of the round ligament and also showed that the generally recognized endometriosis of the uterus was due to invasion of the uterine wall by the mucosa. Cullen (8) writing in 1908 found, after reviewing the literature up to 1884, that Shroeder, Herr, and Gresskoff had collected 100 cases of endometriosis. In 1898 Russell (41) was the first worker in America to describe the finding of endometrium in an ovary. It seems that from this time until about the third decade of the twentieth century endometriosis of the ovary was not frequently recognized. During the year 1919 Norris (37) reported finding a well developed endometrium in an ovary. During this year Casler (5) reported that actual menstruation occurred from the aberrant endometrium in an ovary. In 1921 Sampson published the first of a large series of interesting and instructive articles on aberrant endometrium. Sampson is generally con-

sidered responsible for the recognition of endometriosis as a clinical entity. (42) In 1922 Janney (22) described six cases of ovarian endometriosis. Four were found in ovaries macroscopically normal and two were associated with tumours in the affected ovary.

THEORIES OF ORIGIN

There have been numerous theories concerning the origin of aberrant endometrium. For the sake of simplicity King (29) has divided the various theories into three broad classes; those from embryonal tissues, Postembryonal tissues and those due to postembryonal displacement of endometrium. The first group includes the Wolffian and Mullerian theories, the second group includes the serosal and lymphatic endothelium theory and the third group includes displacements of endometrium via the Fallopian tubes, veins and lymphatics.

Von Recklinghausen made an exhaustive study of the material available at that time and in 1895 concluded that the origin of endometriomata was remnants of the Wolffian ducts. (33) This theory received some support from such men as Ernst, Pick and Schickele. In 1896 Cullen (7) studying material similar to that studied by von Recklinghausen came to the conclusion that the endometriosis observed in the uterus was due to invasion of the uterine wall by its

mucosa, hence the term "mucosal theory of Cullen." He also concluded that endometriomata in other locations were due to remnants of Mueller's ducts. (7) Other supporters of this theory were⁽²⁾ Babes, Diesterweg, Kassman, Russell, Carter, Norris, and Janney. Bell in 1922 favored the theory of aberrant Mullerian ducts in all cases except those of direct contact with uterine mucosa. Blair (3) also favored the Mullerian theory.

Ivanoff in 1898 advanced the theory of metaplasia of the peritoneal mesothelium. Meyer supported this theory and believed that there must be pre-existing inflammation and the tumour resulted from the healing process "running riot." Pick also accepted it as did other German writers,⁽²⁴⁾ Lauche, von Oettenger, Cordua, Ballin, Stubler, and Haeuber. Walz (50) describes the coelomic basal cell as bipotent, meaning that it is capable of forming two types of cells, serous epithelial cells and endometrial cells which according to his thought remain differentiated as such. These two types of cells have a common origin but develop along two entirely different lines of differentiation according to the principles which direct such processes, that is, the principle of physiological specialization and adaptation to environment and function. Walz believes that it

is very unlikely that a serosal cell would by metaplasia become converted into an endometrial cell and thus explain the origin of the endometrial glands in a tumour located on the peritoneum. Walz believes that the only logical explanation is to assume that basal coelomic epithelial cells scattered in the serous epithelium have remained during post-natal life in a primitive state and in response to some stimulus still unknown have differentiated into endometrial cells. Nicholson (36) accepted the serosal theory of origin of these tumours, pointing out what he thought was an important observation, namely, that wherever an endometrial tumour is found there is always peritoneum or some of its derivatives in close proximity. Novak also advocates this theory of origin of ectopic endometrium. His contributions will be discussed more completely in connection with its chronological relation to Sampson's theory. To complete the discussion of theories of origin from post-embryonal tissues mention must be made of Schiller's theory of metaplasia of the endothelial lining of lymph spaces. In 1927 Schmitz⁽⁴⁷⁾ reported a case of ovarian endometriosis with coincident endometrioma in the inguinal canal. The growth in the inguinal canal being extraperitoneal he believed eliminated the possibility of implan-

tation. To his mind two possibilities existed either embryonic cells lying dormant had taken on higher form of differentiation or there was a metaplasia of the endothelial cells lining the finer capillaries and lymphatics. Careful study of the microscopic specimen convinced him that the metaplasia concept was more correct than the differentiation of embryonal rests.

There are two theories to be considered in the discussion of postembryonal displacements of endometrium as the source of endometriomata in the various positions in the female pelvis. In 1921 Sampson erected his admirable milestone in the progress of gynecology. According to Sampson the uterine or tubal epithelium occasionally escapes, during menstruation, into the peritoneal cavity through the Fallopian tubes. These bits of endometrium may pass through the tubes as a result of a "retrograde menstruation" especially in cases where the natural outflow of the menstrual discharge is obstructed as in stenotic cervix and similar conditions. Sampson also believed that the manipulation incident to a curettage might force bits of endometrium into the tubes and hence out into the peritoneal cavity. The endometrium becomes implanted where it is deposited and begins to grow and infiltrate. These small

islands of endometrial tissue respond to the same hormonal factors which control menstruation and the menopause in the normally located endometrium. Especially in the ovary this periodic ectopic menstrual phenomena may give rise to large accumulations of menstrual blood which due to its appearance and consistency has given the cyst its characteristic name, chocolate cysts of the ovary. Because these lesions were so frequently found in the ovary in Sampson's early cases he concluded that the regurgitated material evidently first established itself on the ovary and finding a receptive soil grew to form the characteristic chocolate cysts which, when the pressure of the retained menstrual blood became great enough, ruptured and disseminated the contents according to the laws of gravity. In this manner the secondary implants were more widely distributed than the original lesion and even seem to have more invasive potentialities. These observations led Sampson to conclude that the ovary acted as a "hot-bed or incubator." Sampson summarized the evidence in support of his theory in the following quotation: (44)

"1. Their structure (implanted lesions) and function is the same as the uterine mucosa.

"2. They occur in women and not in men, and develop

during their menstrual life.

"3. Occasionally blood may be observed escaping through the lumen of the fimbriated ends of the tubes of women operated upon during menstruation. The microscopical examination of this blood may show epithelial cells and even fragments of endometrial stroma.

"4. They are often found in different stages of development in the same individual, thus suggesting repeated implantations from the original source or from other endometrial foci in the pelvis, such as uterine mucosa implanted in the surface of the pelvic structures or the rupture of an endometrial hematoma.

"5. The relation of some of them to other ectopic endometrial foci in the pelvis is such as to indicate that either they arose from material escaping from the latter, or that both had a common origin.

"6. The tubes are usually patent and even though the tubes are occluded, the implantations could have occurred before they became closed.

"7. The histiologic study of the tissue from many cases of pelvic peritonitis of bacterial origin failed to demonstrate this as a cause of these lesions.

"8. The endometrial deposits are usually multiple and

scattered, suggesting that the chemical irritation of the menstrual blood alone was not responsible for them.

"9. Similar growths have been observed in the scar of the abdominal incision of women who have had pelvic operations in which it was possible to have contaminated the field of operation with uterine or tubal tissue, as the result of a Caesarean section or manipulation of the uterus and tubes.

"10. Jacobson has produced lesions similar in many respects by the autotransplantation of bits of the uterine mucosa of the rabbit into the peritoneal cavity.

Sampson's theory was accepted by many of the gynecological authorities in both England and America but to a lesser extent in Germany where Meyers' convincing work on epithelial heterotopy in the serosa still held sway. In America Emil Novak took a very firm stand against the implantation theory of Sampson. About in 1915 Sampson (45) was carrying out some experiments to determine and study the shape of the uterine cavity. In the course of his experiments, which involved the injection of opaque material into the uterine cavity, he noticed some of the injection mass had escaped from the severed uterine and ovarian veins. Further study along this line led Sampson to con-

clude that at times fragments of endometrial tissue are disseminated into the venous circulation during menstruation, both from the uterine mucosa and also from the endometrium lining an ectopic focus and as a result of this phenomenon metastatic or embolic endometriosis arises from the implantation of these emboli in nearby veins.

In 1924 Novak published his observations on the lymphatic origin of misplaced endometrial tissue and at the same time criticized the implantation theory because he believed it explained only the origin of peritoneal lesions and did not account for extraperitoneal lesions. In 1925 Sampson (46) made the following statements concerning the criticisms:

"1. The implantation theory was presented only for the explanation of the origin of peritoneal lesions and the conditions resulting from them.

"2. More than one channel is employed in the dissemination of cancer and the same might apply to the dissemination of endometrial tissue.

In 1926 Novak (38) published an article stating several of his objections to Sampson's theory. Novak does not believe that menstrual blood regurgitates through the tubes frequently enough to account for endometriosis,

having never seen this during his operative work. In 1932 Parker (39) observed that sperm pass up the Fallopian tube not by their own motility but due to the muscle activity of the tube forming successive temporary compartments through the length of the tube. This was demonstrated to be true for non-viable, non-motile particles as well as living sperm, hence he believes that the observations substantiate Sampson's theory.

Jacobson (19) (20) (21) carried out some experimental studies of autotransplantation of endometrial tissue in rabbits and monkeys which have aided materially in substantiating Sampson's implantation theory. Further experimental evidence for the implantation theory was discovered in Hesseberg's (16) work in 1918 with the homotransplantation of the uterus. Nicholson (36) joins with Novak in the contention that since Jacobson was using fresh curettings in his experiments they did not offer proof of Sampson's theory. Cron and Gey (6) experimentally demonstrated that endometrium in the menstrual discharge could be grown in a plasmatic medium of heterogenous embryonic extract.

Recently King (30) has suggested that perhaps the diagnosis of endometriosis has been made too frequently and on

insufficient grounds since he has been able to demonstrate a luteal nature for cysts of this kind and advances the theory that possibly endometrial cysts of the ovary are luteal in origin.

Macroscopically it is not possible to differentiate between endometrial cysts and tarry luteal cysts. It has been observed that hemorrhage occurs into the cavity of many corpus luteum cysts and as the blood becomes old it assumes a chocolate or tarry consistency very similar to that observed in a true endometrial cyst. Of these tarry luteal cysts there are three types, the tarry corpus luteum cyst, the tarry granulosa luteal cyst and the tarry theca luteal cyst. Tarry luteal cysts may also form adhesions to neighboring structures and thus further grossly resemble endometrial cysts. As a basis for his contention King emphasizes also the microscopical resemblance between the tarry luteal cysts and endometrial cysts.

Both the tarry luteal cysts and the endometrial cysts have epithelial linings. This varies from flattened cells of an endothelial-like type to tall columnar cells. It has been observed that epithelium arising in luteal cysts stains more intensely with haematoxylin than do the structures surrounding while epithelium not arising in luteal

cysts stains more nearly to the same degree as the neighboring cells. The epithelial cells found in the lining of luteal cysts remarkably resemble endometrial gland cells and may require careful study to make the differentiation. Another difficulty may arise in that the epithelial cells are often first seen in the numerous crypts in the wall of a luteal cyst and if these happen to be cut transversely may give the appearance of endometrial glands and it is only by careful study that the true state of affairs may be recognized. The types of cells and manner in which they form "glands" King believes to render the tarry luteal cyst and the endometrial cyst indistinguishable. In typical examples of the two cysts the stroma underlying the epithelium may be a distinguishing feature. The endometrial cysts possessing a stroma like that of the uterus, the luteal cyst possessing a stroma of round and spindle cells which contain large pigmented cells and many dilated veins. If, however atypical forms occur they may so closely resemble one another that they are indistinguishable.

Large phagocytic cells have been observed in the cysts of both types. The cells are larger than luteal cells and contain many pigmented granules.

There seems to be a distinguishing feature between the

two types of cyst which remains even after the cells have disappeared and this is the fact that in luteal cysts the fibrous tissue is arranged in a characteristic manner between the cells and it becomes hyalinized. In the same article King also points out that confusing physiological changes may be observed in both cysts. Bleeding occurs into endometrial cysts at menstruation and hemorrhage also takes place into luteal cysts during or immediately after menstruation. This King believes has also been a source of error in diagnosing endometriosis. King (52), Brakeman (4), and Shaw (48) have observed that the rupture of a tarry luteal cyst with the discharge of its contents into the peritoneal cavity may give rise to secondary endometrial growths much the same as observed in the case of rupture of an endometrial cyst. King summarizes his findings in the following words:

"1. Endometrial cysts of the ovary and tarry luteal cysts possess many features in common.

"2. They are indistinguishable macroscopically.

"3. Microscopically, diagnosis requires careful study, since (1) the epithelium in both cases may be similar; (2) the subjacent stroma in the luteal cyst may closely resemble that of the endometrial glands; (3) gland spaces

may be seen in both; (4) pseudo-xanthomatous cells occur in both; (5) the characteristic structure of the luteal cyst may not be apparent in all parts of the wall so that a thorough study in doubtful cases is essential.

"4. Their similarity extends to their physiology and complications.

"5. Tarry luteal cysts sometimes rupture into the peritoneal cavity, thus producing secondary blood cysts and a severe inflammatory reaction similar to that produced by "endometrial" cysts. In 1932 King (31) presented the case report of blood cysts showing periodic bleedings and glandular development which were found in an ovary which had been transplanted into the abdominal wall after a salpingo-oophorectomy. The cyst closely resembled an endometrial cyst showing clinical evidence of periodic bleedings into the cavities. Although this isolated instance does not prove the etiology of endometrial cysts nevertheless it emphasizes the fact that the diagnosis of endometrial cyst can be made only after very detailed study.

After reviewing the numerous theories we must still confess that much has been done and much is yet to be done. We can only hope that interest in further study does not wane for much good work may go alack for want of a little

more.

PATHOLOGY

To lend continuity to the discussion of the pathology of endometriosis a brief description of the life history of an endometrial cyst of the ovary will be given. The very earliest stage when the primary deposition of the endometrium on the surface of the ovary occurs may be so small as not to be visible to the naked eye. It seems that the epithelial elements have no connection with the ovarian germinal epithelium. The bit of misplaced endometrium then begins to invade the subjacent ovarian stroma. The visibility of this process depends upon the size of the endometrial fragment, if it is large and the invasion is occurring over a relatively wide area a small blood-filled excavation may be visible. As this process of invasion progresses there may occur a menstrual period with the result that a small space beneath the ovarian surface may be filled with menstrual blood and these are recognized as small hemorrhagic points on the surface of the ovary. As the process of invasion progresses the implant may increase in glands and stroma and the pent-up menstrual blood may extravasate into the surrounding stroma cells and give the appearance of a loose spindle-celled matrix. With the

continued collection of blood the endometrium gradually loses its activity and the ovary by this time may have become a distended sac containing old menstrual blood. About this time if the ovary is sectioned a chocolate coloured "seam" is visible running down from the ovarian surface into the ovary itself. Due to continued increase in the fluid content this chocolate coloured "seam" may be dilated and distended into a cavity and ultimately the ovary is a distended sac the walls of which are formed by thinned-out and compressed ovarian stroma.

Grossly the smaller cysts appear small red or purple colored bodies on the surface of the ovary. The depth of color depends upon the age of the cyst or the particular time of the menstrual cycle when observed. The average size for ovarian cysts varies from two to four centimeters in diameter although Sampson (42) has observed one nine centimeters in diameter. The cysts may be either unilateral or bilateral but are usually bilateral and multiple. The cysts, when multiple usually show different stages of development, suggesting that implantations have occurred at varying times. When viewed grossly most of the lesions are surrounded by adhesions or are closely adherent to the nearby pelvic structures. Even the small

cysts perforate and become adherent to the surrounding structures. In forming adhesions the perforation becomes sealed off and when at operation, an attempt is made to free the ovary this perforated site is again opened and the contents spilled about in the pelvis. In cases of ovarian endometriosis the affected ovary most commonly becomes adherent to the side wall of the pelvis, the posterior leaf of the broad ligament, the uterus or the intestine at the site of perforation. In the planes of cleavage between the adherent structures secondary small cysts may be found. The endometrial mass possesses very active powers of penetration invading deeply into the ovarian substance or other tissue on which it may become implanted.

If the surface of a sectioned ovary is examined there may be small pits and small cystic slits in addition to the larger cysts or the whole ovary may be an unrecognizable structure due to the disorganization caused by the hemorrhage. Occasionally several small cysts may burst into one another giving the cyst a multilocular appearance. The inside of a cyst may in some instances have a rough, brown appearance due to absorption of pigment from the hemorrhages. In other cysts the lining may be smooth and

gray with or without areas of brown pigmentation or red elevated areas due to hemorrhage in the wall of the cyst.

Microscopically the epithelium may be a single layer of low cuboidal or cylindrical epithelial cells with darkly staining, centrally located nuclei. In some, cilia can be demonstrated. In a typical chocolate cyst the stroma is composed of loosely packed round cells and fibrous tissue the structure being very similar to that of the stroma underlying uterine mucosa. In some sections there may be a few smooth muscle cells. If there has been a recent menstrual period microscopic evidence of hemorrhage may be seen in the wall of the cyst. In large ovarian cysts where the collection of menstrual blood is quite prominent the epithelium may become compressed and undergo atrophy from the pressure of the accumulated blood. In some areas the mucosa may be cast off during the menstrual reaction and thus contributes to the contents of the cyst. In the areas left bare of epithelium the wall consists of hyalinized fibrous tissue which may be colored by absorption of hemosiderin. Sampson chose to arrange the cysts he had studied into three histological groups:

"1. A cyst in which a portion, usually the deeper, is lined by a wavy pigmented "luteal" membrane in various

stages of regression; while another portion of the cyst, often toward the site of perforation, is lined by epithelium, low, cuboidal or columnar, resting on a vascular, cellular stroma sometimes containing glandlike structures resembling uterine glands. In this stroma one finds evidence of recent and also of old hemorrhage. The epithelial portion of the cyst strongly suggests misplaced, atypical endometrial tissue both in structure and in function, namely, the evidence of periodic hemorrhage (menstruation). At the junction of the epithelial layer with the "luteal" layer the epithelium can be seen flattened and riding up over the retrogressing "luteal" membrane. With the retrogression of the "luteal" layer and the advance of the epithelial lining, the cyst may gradually become completely lined by epithelium of the endometrial type.

"2. This second group may represent a later or even an earlier, stage of the preceding. The cyst is lined by epithelium, low, cuboidal or columnar, often with a narrow underlying, vascular stroma with occasional glandlike structures, most evident about the site of perforation. The entire cyst is like the epithelial portion of the cyst of the first group.

"3. In this group it is difficult to recognize a cyst

of the endometrial type. The cyst wall is composed of ovarian tissue which lacks a vascular stroma and in places may also lack a definite epithelial lining.

SYMPTOMATOLOGY AND CLINICAL PICTURE

The symptoms caused by other lesions than ovarian lesions are often of very great importance in making a diagnosis of ovarian endometriosis, for this reason it will be necessary to consider other localizations of endometriomata in relation to symptomatology.

The subjective symptoms according to Keene (24) are dependent upon several factors, chief among which are the extent of the lesion, particularly invasion of adjacent structures, and the nature of the complicating pathology. This is particularly well illustrated in another article by Keene (26) in 1925 when he reported two cases where a preoperative diagnosis of ovarian endometriosis was made by a cystoscopic examination prompted by bladder symptoms. The observation of isolated symptoms evaluated as individual symptoms does not materially aid in diagnosis, the whole symptom-complex must be considered. The most important subjective components of this symptom-complex will, be discussed in the following paragraph.

The age is usually between twenty-five and the meno-

pause. Meigs (35) observed a case in a girl of twenty years and Jackson (18) observed a chocolate cyst in a girl of twelve years who also had a congenital atresia of the vaginal canal. This case not only exemplifies an unusual age incident but also demonstrates a factor which was mentioned early in the discussion of the frequency of endometriosis in presence of obstruction to the normal outflow of the menstrual discharge.

Dougal (11) is of the opinion that early endometriosis produces few symptoms for which it can be held responsible and concludes from his own experience that endometriosis was entirely responsible for the symptoms in only 65% of the cases and partly responsible in 8.7% of cases while fibroid tumours caused the symptoms leading to operation in 21%.

Sterility either of the absolute or relative type has been observed to be a very common finding. Again Dougal found that 75% of the parous women had not been pregnant for five years and 50% had not been pregnant for ten years. Even after the influence that fibroids may have has been deducted sterility is still a very important symptom. Some abnormality of menstruation is frequently noted, this is usually a menorrhagia. Keene and Kimbrough (27) in a study

of 118 cases found that in 75% of the cases complaining of menorrhagia there were associated uterine lesions, in most instances uterine myomata. Thus it is only in a small percentage that the menorrhagia is due to ovarian involvement.

Dysmenorrhea has also been commonly observed in these patients. Donald (10) observed dysmenorrhea in 70% of his patients, being of the acquired type in 50% of the cases. A history of acquired or increasing dysmenorrhea, the pain being premenstrual or during the first day or two of the flow is always suggestive of endometriosis. Acute dyspareunia has been considered a rather constant symptom by most observers although in many cases the examiner does not inquire as to this finding in all cases thus making the statistics rather incomplete. Low sacral backache is also a frequent symptom. Keene and Kimbrough (27) found this present in 28% of 40 cases and dyspareunia as mentioned in the previous paragraph in 57% of the same series of cases. As to the frequency with which intermenstrual symptoms are present various writers disagree. Goodwin (2) has described the pain as a grinding pelvic pain and if there is present intermenstrual pain or discomfort, it is increased in severity during the menstrual periods.

Bladder or rectal discomfort during the menstrual periods is suggestive, as stated before, and usually indicates only in an indirect manner that ovarian endometriosis exists.

Objective findings will of course vary with the extent of the associated pathology. For all practical purposes the association of ovarian endometriosis with endometriomata in other locations is so constant that the finding of one condition presupposes the presence of the other. Peritoneal endometriosis may, however, occur without demonstrable ovarian lesions but these are very infrequent. On one or both sides of the uterus there may be slightly tender, densely adherent, semi-solid or firm adnexal masses causing the uterus to be quite firmly fixed in position. By rectal palpation there may be small nodules felt in the culdesac. Occasionally small bluish nodules may be visible in the vagina.

DIAGNOSIS

To make a diagnosis of ovarian endometriosis the whole complex picture of subjective and objective symptoms and signs must be evaluated. This can be best expressed by quoting Keene and Kimbrough (27).

"1. Age; between 25 and the menopause; (2) Sterility,

absolute or relative; (3). abnormal menstruation, usually menorrhagia; (4) dysmenorrhea of the acquired type; (5) dyspareunia; (6) sacral backache; (7) intermenstrual lower abdominal pain with increased discomfort at the time of menstruation; (8) pain in the rectum or bladder which bears a distinct relationship to menstruation.

If bladder or rectal symptoms are present they should be investigated with the proctoscope or cystoscope. In the case of rectal lesions there arises the question as to whether or not a malignancy exists in the rectum. If a normal rectal mucosa is present this is of diagnostic value for endometriomata in this location do not as a rule cause ulceration of the rectal mucosa. Sullivan (49) points out a diagnostic point, namely, that if a persistent and intractable menorrhagia exists it will be aggravated rather than ameliorated by curettage if due to the lesions of endometriosis. A fact of importance in ruling out malignancy is that the patients are usually in good health. The possibility of an inflammatory condition or tuberculous sometimes arises to be ruled out. Green-Armytag(51) suggests the following aid which he has employed in many cases; the injection, intramuscular of 100.C. of sterile milk will in cases of inflammatory condition of the tube

of ovary give rise to two to three degrees elevation in temperature but is not found to be so if the lesion is due to tuberculosis or endometriosis. For the same purpose he calls attention to the fact that in inflammatory lesions the sedimentation time is altered.

TREATMENT

From a therapeutic standpoint there are two large classes into which therapeutic endeavors may be placed, namely, surgery and irradiation.

Surgery may be the removal of endometriomata or oophorectomy either procedure may in turn be conservative or radical.

Irradiation in the form of X-ray is usually employed, not for its effect upon the local growth but for its effect upon the ovarian function. Implantation of radium needles has been used with varying degree of success but the prevailing opinion seems to be that the procedure seems illogical and there is great danger of injury to adjacent tissue, namely, establishing fistulae.

The fact that the age incidence of this affliction falls within the reproductive period makes it doubly desirable to preserve the function if possible. Since the ectopic foci of endometrium are governed by the same hor-

none influence that govern the normal endometrium, the logical mode of attack is to control the responsible hormone at its source.

A brief word as to the prognosis will be a valuable guide in the problem of treatment. While conservatism is desired and advocated by the authorities, in the same breath they caution that the potential seriousness of the condition must not be lost sight of. Probably the most serious form is that of chocolate cyst of the ovary with peritoneal involvement. In prognosticating such a condition the multiplicity of lesions and the degree to which organs are involved must be seriously considered.

It seems quite generally accepted that a conservative course in surgery should be pursued only in early cases where the foci can be excised with cautery, for example, if only one ovary is involved or if there are isolated nodules in the rectovaginal space causing dyspareunia. Dougal (11) reports that 83% of his series of 137 cases received total removal of all uterine and ovarian tissue, the mortality being 0.8%. Maxwell (34) advocates the same principles, conservatism for isolated nodules and radical surgery for the more extensive lesions. Attention is also called to the fact that atrophied endometriomata have the same po-

tentialities for malignancies as senile uterine endometrium. Occasional cases have been reported where in there was no response to castration, these cases, as in those reported by Heaney (14), may be an unrecognized carcinoma rather than an endometrioma.

SUMMARY

- (1) The accepted terminology is today, endometriosis the resulting lesions endometriomata.
- (2) The etiology is, as yet, not definitely established.
- (3) Endometriosis is not uncommon. From 8.9% to 10% of all intraperitoneal gynecological operations have been reported due to this disease.
- (4) Endometriosis of the ovary (chocolate cyst) with intraperitoneal lesions is the most serious type.
- (5) Symptomatology is a composite picture of the symptoms due to the ovarian lesions and all its invasions of other tissues.
- (6) No one symptom is diagnostic the whole symptom complex must be evaluated.
- (7) Conservative surgery may be used in isolated lesions-preferably cautery.
- (8) Radical surgery, i.e. panhysterectomy, should be considered in extensive lesions as the seriousness depends upon the multiplicity of lesions and extent of invasion.
- (9) X-ray should be used for its effect on ovarian function not the lesion and is dangerous because it may leave unrecognized a carcinoma.
- (10) Radium implanted in the lesions is illogical and may

result in formation of fistulae.

CASE HISTORIES

Case No. I from Keene and Fiddes (28)

"Miss Q., aetatis thirty-six years, suffered from an acute retroflexion and was treated by palliative means over a period of several months. It was associated with dysmenorrhea and menorrhagia. Operation was performed for relief of the condition. An area of hard nodules was found on the posterior wall of the uterus. The left ovary which was cystic, was adherent to the indurated area. A portion of the nodular area was removed for section revealing endometriosis."

Case No. II from Keene and Fiddes (28)

"Miss F., aetatis thirty-seven years, complained of increasing swelling of the lower part of the abdomen for the previous six months, with pain for the last month. The pain was dull in nature in the right hypogastrium passing towards the umbilicus. The menses were regular. At operation a right cystic ovary was removed together with a small myoma and the appendix. Microscopical examination revealed endometrial tissue in the substance of the ovary."

Case No. III from Keene and Fiddes (29)

"Miss H., aetatis thirty-eight years, had had lumbar pain, of insidious onset, for the previous twelve months.

There had also been a slight vaginal discharge off and on for the same period. Metrorrhagia had also been present every fourteen days and there was an excessive amount. On vaginal examination a large fibroid was diagnosed. At operation multiple fibro-myomata were present. There was also present a chocolate cyst of the left ovary. Hysterectomy and removal of the left ovary and tube were performed."

Case No. IV from Schmitz (47)

"Miss S., aged thirty, had noticed a lump in the right inguinal region near the large labial fold, for the past five years. This lump was slowly getting larger and more annoying, to the patient. During her menstrual periods, which were normal in every way, the mass would become tender and slightly larger, and at this time she would also have rather severe pain in the right lower abdomen.

Vaginal examination showed a cystic tender rounded tumor mass in the region of the right ovary, about the size of a small orange. At operation a typical large chocolate cyst of the right ovary was exposed. Right tube and ovary removed, also the inguinal tumor was removed."

Case No. V from Keene (26)

"Mrs. M.E.M., age forty, nullipara. Dilation and

curettage three years ago. Menstruation began at twelve years of age and was normal in quantity and duration with no pain. For the past three years periods have shown a gradual increase in duration and now last seven or eight days, with some increase in quantity. For the past year has suffered from severe dysmenorrhea occurring from second to fourth day of the period. The pain is colicky and situated in central portion of the abdomen.

The chief complaint is pain in the bladder with frequency and urgency of urination occurring only at menstrual periods. Bladder symptoms developed about seven years ago and have gradually increased in severity.

For the past year a similar, though less intense, periodic pain has been felt in the rectum.

Vaginal examination showed a myomatous uterus the size of a three months pregnancy. Bilateral, tender, semisolid adnexal masses each the size of an orange.

Cystoscopic examination, showed the bladder capacity normal; ureteral orifices contracted normally and showed no evidence of infection. Situated about two centimeters posterior to the left orifice and to the left of the median line was an area of intensely red and thickened mucosa about three centimeters in diameter.

Case No. V continued

Within this area were five small vesicles with a distinctly bluish discoloration, no ulceration was present.

Supravaginal hysterectomy, bilateral salpingo-oophorectomy, and appendectomy were performed."

Case No. VI from Goodwin (12)

"Mrs. T.L.P., age thirty-four, married and has one child. Her periods began at fourteen years of age and while there has always been some pain this has been very severe during the past year. The amount of flow has increased. On bimanual examination a mass was felt which seemed to be continuous with the uterus and a diagnosis of fibromyoma of the uterus was made.

Operation revealed a tightly distended cyst of the left ovary and adherent to the posterior surface of the uterus. The right ovary also contained a smaller cyst. Supravaginal hysterectomy, left oophorectomy, bilateral salpingectomy and appendectomy were performed."

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