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CHAPTER FIFTEEN

THE BODY OF THE UTERUS

INFLAMMATIONS (ENDOMETRITIS, METRITIS; SYPHILIS): HYPERPLASIA OF THE ENDOMETRIUM; POLYPS

RICHARD W. TELINDE, M.D.

ENDOMETRITIS

Definition.—Endometritis, as the term is used in this chapter, signifies an inflammation of the mucous membrane lining of the body of the uterus brought about by the presence of microorganisms or their toxic products. In the past, the term has been applied, very loosely, both clinically and pathologically, to a number of endometrial conditions which today we recognize as being non-inflammatory in character. Clinically, the diagnosis was often made upon the presence of leukorrhoea which was thought to have its origin in the infected endometrium. With our present more exact knowledge of uterine pathology we now recognize this symptom as usually indicating infection of the cervix rather than of the body of the uterus. Various types of so-called endometritis have been described, such as glandular, fungoid, hyperplastic and atrophic, but the work of Hitschmann and Adler on the menstrual cycle of the endometrium has clearly proved that some of these types of “endometritis” are really only phases in the normal menstrual cycle. Cullen’s description and interpretation of hyperplasia of the endometrium has removed it from the vague group of conditions formerly classed as “endometritis.” As long ago as 1898 he stated that endometritis cannot be positively diagnosed without the aid of the microscope. The present chapter has been written from this point of view, the same criteria being applied to the diagnosis of inflammation of the endometrium as to that of tissues elsewhere in the body.

Incidence.—When these criteria are applied to the diagnosis of endometritis, the condition is a comparatively rare one. Emmet

warned against the diagnosis of chronic endometritis and maintained that infection, when present, was chiefly secondary to lesions of other pelvic organs. In 1898, Cullen reported that he had found endometritis 49 times in 1800 pathological specimens examined in the gynaecological laboratory of the Johns Hopkins Hospital over a period of four years. In 995 endometria removed for various conditions Norris discovered 208 cases of endometritis. A. H. Curtis, in summing up the result of his careful histologic and bacteriologic work which he reported in 1918, states: "This bacteriologic and histologic study revealed that the body of the uterus, above the level of the internal os, rarely yields evidence of chronic infection. It appeared that infection of the uterus commonly called chronic endometritis is practically to be ruled out as a clinical entity." Acute endometritis, on the other hand, may often be recognized clinically, particularly when it occurs, as is usually the case, as the result of an abortion or during the puerperium. In such cases, however, it is often only part of a more general pelvic infection involving the myometrium, parametrium and pelvic peritoneum. When there is a long-standing history of bleeding following pregnancy suggesting retained placental tissue, chronic endometritis may also be suspected as a complication of this condition. But the diagnosis of chronic endometritis as a clinical entity independent of pregnancy, based upon a history of increased menstrual flow or leucorrhoea, with a pelvis found to be normal on bimanual examination, is not justifiable. The reason for this view will become apparent when we consider in detail the pathological findings, for usually the endometritis is only part of some other pelvic disease and the symptoms are either wholly or partially dependent upon the accompanying condition.

Etiology.—**PREDISPOSING CAUSES.**—From a clinical point of view the cases may be conveniently divided into two groups, those independent of pregnancy, and the puerperal or post-abortal group.

(A) *Endometritis independent of pregnancy.*

1. Gonococcal endometritis. Norris classified 62.3 per cent of his 1924 cases (tuberculous excluded) as gonococcal, when judged clinically. This figure, however, included 6 cases of gonococcal origin occurring during the puerperium.

2. Tuberculous endometritis. Fourteen of Norris's 206 cases of endometritis were tuberculous in origin. Although a few authentic cases of tuberculous endometritis as a primary pelvic focus have been described, the condition is usually secondary to tubal tuberculosis. Simmonds found the uterus involved in 74 per cent of his cases of tuberculous salpingitis, and Menge in 60 per cent. Greenberg in a review of 200 cases of tuberculous salpingitis from the Johns Hopkins Hospital found the uterus implicated in 45 per cent. Of Greenberg's 90 cases of tuberculosis of the uterus, the endometrium was involved in 86 and the myometrium in 12 cases.

3. Syphilitic endometritis. This condition is so rare that it is merely mentioned here for the sake of completeness.

4. Endometritis associated with tumor formation. Submucous fibroids, carcinoma of the body of the uterus or of the cervix, and uterine polyps are frequently responsible for infection of the endometrium.

5. Endometritis dependent upon recent intra-uterine instrumentation. That intra-uterine instrumentation done under non-sterile conditions for criminal abortion gives rise to endometritis is an obvious and long recognized fact. Curtis's recent work on the bacteriology of the endometrium has shown that, even after instrumentation with supposed surgical asepsis, the endometrium frequently showed evidence of infection histologically and was not sterile on culture.

(B) *Puerperal or post-abortion endometritis.*—This group forms a large proportion of the cases of endometritis. In Norris's 208 cases of endometritis 12 were of puerperal origin. In the average clinic in which both obstetrical and gynaecological cases are seen, the proportion of the puerperal and post-abortion cases would undoubtedly be greater than is shown by Norris's figures. Six of his 12 cases were associated with and probably dependent upon the presence of the gonococcus. The streptococcus is also frequently the infecting organism and less frequently the staphylococcus, colon bacillus, and saprophytic organisms.

BACTERIOLOGY.—So far as the etiology from a bacteriological point of view is concerned, except for pregnancy and the puerperium, very little work had been done upon the bacteriology of the endometrium until the recent investigations of Arthur Curtis. Burnam studied uterine scrapings bacteriologically and decided that the few bacteria

found were not the cause of endometritis. If we consider the probability of infection from the cervix in culturing curettings, it is obvious that it would not be trustworthy to draw conclusions as to the bacteriology of the endometrium. Winter, from a series of cultures in 30 cases, concluded that the normal uterine cavity was sterile. Wertheim succeeded in growing the gonococcus in 8 out of 10 cases in which he considered there was "undoubted gonorrhoea." Menge concluded from a bacteriological study of 95 cases of normal and diseased uteri that the normal uterine cavity was sterile. He recovered the gonococcus in two of this series and in two found histological tuberculosis.

Curtis's thorough investigation of the subject made in 1918 is so fundamental that it will be given in some detail. His material consisted of 118 cases of all conditions except those associated with pregnancy. The uterus having been removed at the operating table, the point of amputation of the cervix and the peritoneal surface of the uterus were cauterized and the uterus opened. A large part of the endometrium was excised under sterile precautions and ground in a mortar, after which it was planted on suitable media. The cases were first divided into the parous and nulliparous, and each of these divisions subdivided into those with negative histories and those with histories or operative evidence of infection.

There were 26 cases of nulliparous women with no history or operative findings suggesting infection. In 23 of these the cultures and tissues were normal. Streptococci were isolated from the endometrium and fibroids of one case. In two cases a curettage had been done eight and six days, respectively, before hysterectomy. Both of these showed mixed growth in cultures and histological evidences of endometritis.

There were 13 nulliparae with histories of pelvic infection. Twelve of these cases proved to be sterile to culture. One case yielded gonococci on culture of the endometrium. Curtis considered from the history of this patient that he was dealing with a recurrent gonococcal infection, but the possibility of reinfection during this period must be considered. Nine of the cases were normal histologically; one showed slight cellular infiltration, one showed tuberculosis, and in one there was an invasion by polymorphonuclear leukocytes and plasma cells.

There were 47 parous women with no history of pelvic infection. From two of these positive cultures were obtained. One of these had been subjected to a dilatation and exploration preliminary to operation. Cultures from this case yielded colonies of Doederlein's bacilli, gram-negative bacilli and staphylococci. Microscopically, there was

no evidence of endometritis. The other woman had had much prolonged uterine bleeding and showed a growth of an anaërobic streptococcus and histological evidence of endometritis. Of the 45 cases without growth, in 10 there was some histological evidence of endometritis. Among the 45 cases without growth there were 3 with slight round-cell infiltration, 4 with plasma-cell infiltration, and 3 with some polymorphonuclear cell increase in the presence of uterine bleeding.

There were 36 parous patients with a history of pelvic infection. Of these 9 showed growth. In 4 of these the organism was a gonococcus and there was histological evidence of subacute endometritis. These patients had all been exposed to reinfection regularly. Another woman who denied exposure for six months gave a positive culture from the tube and uterine cavity. Two cases with histories of long standing infections yielded, respectively, a streptococcus and a diplococcus from the endometrium and the tubes. Ten of the sterile endometria were microscopically normal and the other 13 had varying degrees of infiltration of round, polymorphonuclear and plasma cells.

The above work was done on endometria in cases not associated with pregnancy. It is to be noted that the gonococcus was the organism most frequently obtained. Streptococci and diplococci were less commonly found, but apparently live longer in the tissues than the Neisser organism. The endometria of nulliparae without a history of infection were almost constantly sterile. This was also the case in parous women without a history of infection, and the possibility of infection was but slightly increased by pregnancies. From these studies Curtis concluded: "Patients with a history of chronic infection, from whose endometrium bacteria are obtainable, almost all have salpingitis with equally good growth. Pyometra and recent exploration of the uterus excepted, the endometrium almost never shows bacteria unless there is also infection of adjacent pelvic tissues. Chronic endometritis, *per se*, with bacteria in smears or cultures, is practically to be ruled out as a clinical entity."

Pathology.—Inasmuch as we have divided the cases clinically into two groups, those independent of pregnancy and those occurring during the puerperium or post-abortal period, the pathological and clinical discussion of the two groups will be taken up separately.

ENDOMETRITIS INDEPENDENT OF PREGNANCY.—*Gross Pathology.*—The diagnosis of endometritis is essentially a microscopical one and

for that reason our chief concern is the histopathology. Inasmuch, however, as endometritis is often dependent upon and part of pelvic disease elsewhere, we shall deal briefly with the gross pathology not only of the endometrium itself but also of the accompanying conditions.

In the *gonococcal* cases the endometritis is only part of the general gonococcal pelvic infection and practically always associated with gonorrhoea of the tubes. Curtis invariably found diseased tubes in cases in which he isolated gonococci from the endometrium. Theoretically, there must be a stage in the ascent of the gonococcal infection from the cervix to the tubes in which the endometrium is involved before the level of the tubes is reached, but for obvious reasons our pathological material to prove this point is lacking. Every worker in gynaecological pathology is familiar with the typical appearance of the gonococcal tubes, varying in their appearance in the very early stage, when they are only slightly enlarged, reddened and oedematous, to the later stage with the large sausage-like pus tubes and even later the smaller adherent chronically infected tubes. Upon section of the uterus and examination of the endometrium, in the more acute cases the surface is sometimes covered with a scanty purulent secretion and the endometrium is thickened and looks oedematous. More often, however, even in the presence of large pus tubes, one is often struck by the perfectly normal appearance of the endometrium. In the cases associated with chronic adnexal disease, in gross appearance the endometrium usually looks perfectly normal, but may appear red and granular. The normal appearance may be confirmed on microscopical examination, but often the cases which microscopically show evidence of infection give no indication of the condition grossly. The uterus may be covered with adhesions owing to its proximity to the diseased adnexa. In the chronic stage no other change may be detected in the uterus, but in the acute and subacute stage of the disease the uterus may be slightly enlarged and oedematous. Not infrequently at the cornu are found inflammatory nodules, which on section may prove to be small abscesses.

Tuberculous endometritis is almost invariably secondary to tuberculosis of the tubes. Grossly, the serosa of the uterus and the tubes may be studded with small gray tubercles. The tubes may be thickened in a nodular fashion and the fimbriated ends are often patent. In other cases there is nothing characteristic about the tubes to distinguish them from those infected with gonorrhoea. Upon section of

the uterus the mucosa of the cavity may show no departure from normal, and when there is evidence of disease, there is often nothing to distinguish it grossly from chronic endometritis of some other origin. Occasionally, caseation may be noted grossly in the endometrium and myometrium. When the disease is apparent grossly, the process almost invariably is seen to diminish as it passes from the fundus downward.

A submucous fibroid, particularly if strangulated on an elongated pedicle or hanging down into a cervical canal or vagina, frequently becomes infected. Its endometrial surface, being exposed to the flora of the lower genital tract, is rendered the site of a chronic infection. Often the surfaces of such tumors are bathed in a purulent secretion, or are red and granular and bleed easily on being touched. If the blood supply to the growth is inadequate as a result of the smallness of the pedicle, the tumor, including the endometrial surface, becomes necrotic and sloughing. Endometrial polyps similarly are often infected. Carcinoma of the cervix always, and carcinoma of the body of the uterus, not infrequently, become infected and give rise to infection of the adjacent endometrium. In case the cervical canal is obliterated by a carcinomatous growth or, as occasionally occurs in advanced life, by adhesions and atresia, pyometrium results with, of course, pronounced endometritis.

Histopathology.—The diagnosis of endometritis is usually dependent upon the microscopical examination of the endometrium. The criteria upon which the diagnosis is made are often very fine, and in order to appreciate these slight changes an intimate knowledge of the histology of the endometrium is necessary. For this reason the normal histology will be briefly reviewed here, stress being laid more particularly on the more frequent sources of error.

The work of Hitschmann and Adler, in 1908, has given us a much more complete knowledge of structure. These investigators pointed out that the endometrium is undergoing a constant cyclic change in structure dependent upon the growth and development of the Graafian follicle and corpus luteum. In the post-menstrual stage the glands are straight, narrow and collapsed (Fig. 1). This normal picture has been incorrectly called "atrophic endometritis." Somewhat later in the cycle the glands become gradually larger and more tortuous, presenting the picture which we now recognize as the interval stage (Fig. 2). During the next stage, the pre-menstrual, the glands become still larger and very tortuous so that on section the infolding of the

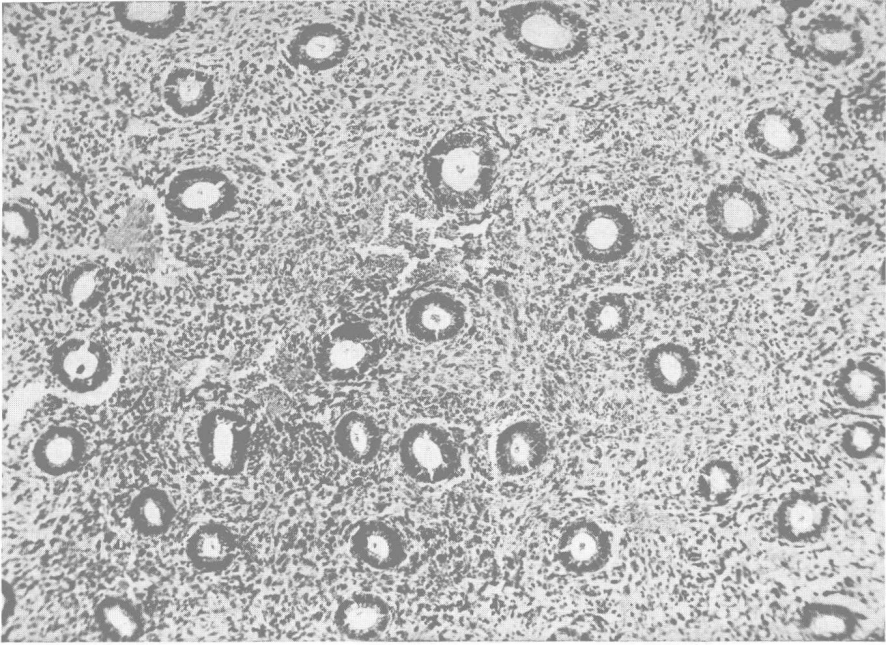


FIG. 1.—Normal endometrium, post-menstrual stage. Note the small round tubular glands.

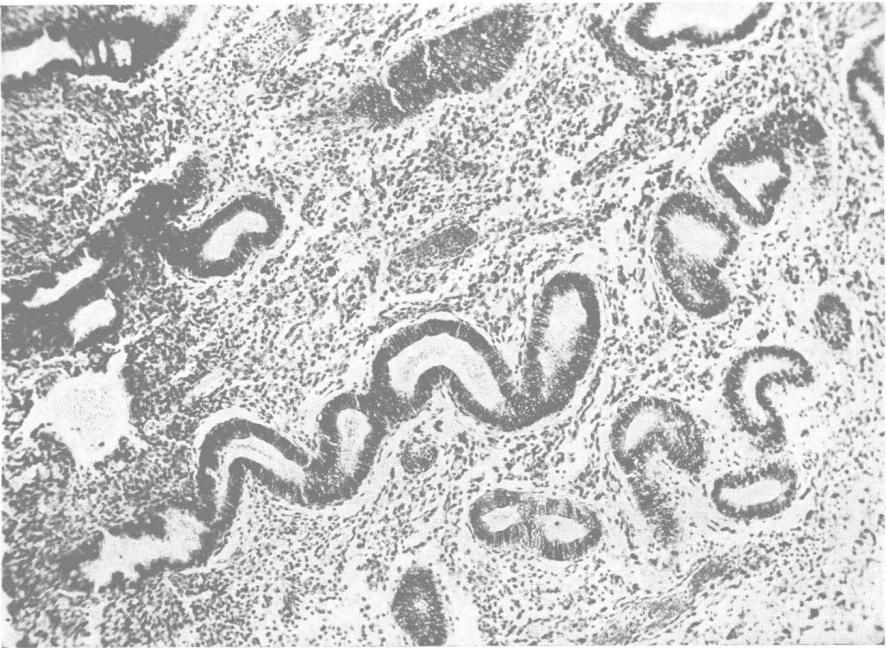


FIG. 2.—Normal endometrium, interval stage. Note that the glands are much more tortuous than in the post-menstrual stage.

lining epithelium forms a very irregular dentate outline (Fig. 3). The condition resembles that of early pregnancy except that the gland changes are not quite so pronounced. The epithelium lining the glands takes on a distinct secretory activity, becoming low and frayed in appearance, and the lumen border of the cells appears to melt away in a pink-staining secretion. It is this picture of pre-menstrual hyper-

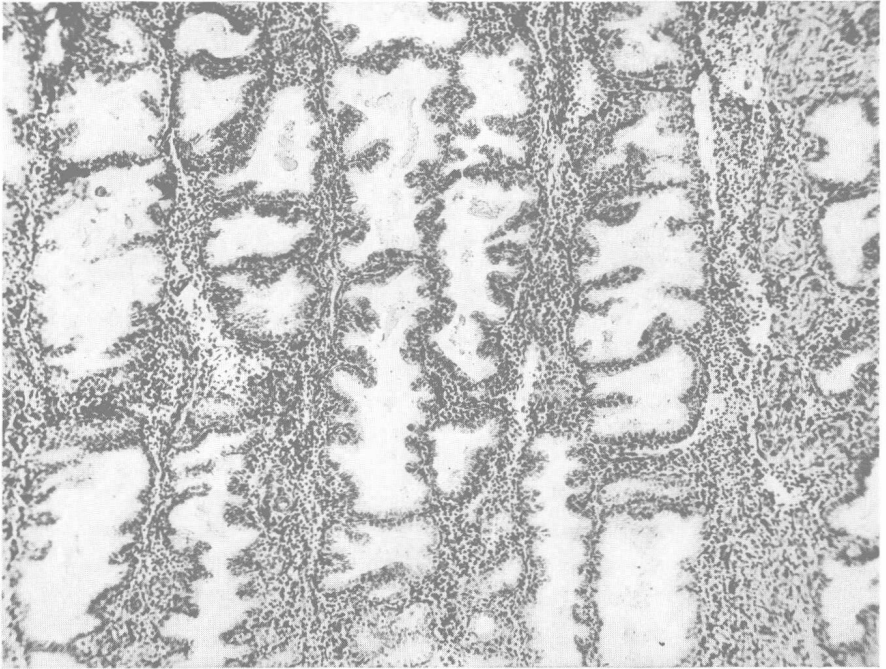


FIG. 3.—Normal endometrium, pre-menstrual stage. Note the increased width of the gland lumina, the dentate outline of the epithelial wall and the presence of secretion in the lumina.

trophy which was formerly incorrectly called “glandular or hypertrophic endometritis.” It obviously is not inflammatory in nature but merely represents a phase in the physiological cycle of the endometrium. Scattered through the endometrium during all of the above stages is a sprinkling of lymphocytes which at times are found collected in aggregations resembling lymph follicles. Very shortly before the onset of menstruation, 24 to 48 hours before the appearance of blood externally, there is an extensive infiltration of the endometrium