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UNIVERSITY OF LOUISVILLE

LIPOMATA OF THE UTERUS

A Dissertation

Submitted to the Faculty

Of the Graduate School of the University of Louisville

In Partial Fulfillment of the

Requirements for the Degree

Of Master of Science

Department of Pathology

By

DeLou Perrin Hall

Year

1940

NAME OF STUDENT: DeLou Perrin Hall

TITLE OF THESIS: Lipomata of the Uterus

APPROVED BY READING COMMITTEE COMPOSED OF THE
FOLLOWING MEMBERS:

Harold Gordon

A. J. Miller

NAME OF DIRECTOR: _____

DATE: Mar 13, 1940

P R E F A C E

In the writing of this thesis I have spent many happy hours in search of literature relative to Lipomata of the Uterus, the task has been enjoyable because of the ever stimulating influence of the Professor of Pathology in the University of Louisville, Dr. A. James Miller, to whom I am grateful. To my associate and erstwhile Professor of Surgery, Dr. J. Garland Sherrill, whose profound wisdom has been a "Lamp unto my feet and a light unto my path," my sincere thanks. In research or study of any subject one must have congenial help at his own fireside, this has been extended abundantly by my wife, Minnie Louise Hall, whose criticism has always been constructive.

Louisville,
Kentucky

D. P. H.

LIPOMATA OF THE UTERUS

LIPOMATA OF THE UTERUS

Many benign tumors occur in uterine tissue, leiomyomata, adenomyomata, angiomata, hemangio-endotheliomata, lipomyomata and lipomata, the first are the most frequent, presenting in about forty per cent of women reaching the age of fifty, the last are so infrequent as to be pathological curiosities.

"Leiomyomata may be found in any position where there is preexisting smooth muscle, but are particularly frequent in the uterus. They also occur in the stomach, the intestinal tract, the skin, the bladder, in the prostate and not infrequently in the cortex of the kidney. Although sometimes single, they are usually multiple and vary in size from small tumors of a few millimeters in diameter to large tumors which in the uterus may attain a weight of several kilograms. As a rule, however, the larger tumors are not pure leiomyomata, since a sufficient amount of connective tissue is included to justify the name of fibromyoma or myofibroma. The tumors are sharply defined and almost always encapsulated. They are more or less firm, depending in part upon the amount of connective tissue and in part upon the secondary degenerative changes. The color is likely to be somewhat darker than that of the surrounding muscle. They cut with considerable resistance and show a cut surface which exhibits the same "watered

silk" markings due to whorls of muscle tissue, as seen in the fibroma. The cut surface is softer than that in the fibroma, bulges, and is of the pale red color of muscle. The fibromyoma is often pearly gray in color. Microscopically, the essential cell is the smooth muscle cell, which, in the tumor, is likely to show a somewhat rounded, instead of the normal sharp pointed, end. The cytoplasm is acidophilic and not striated. The nuclei are elongated cylindrical rods, of the so-called sausage form, with rounded ends. Myoglia fibrils can be demonstrated in the cell cuticle by special methods. The cells are arranged in whorls and thus may appear in longitudinal, oblique, or transverse section, in all of which the acidophilic cytoplasm is striking. The character of the cells can usually be made out by ordinary staining methods, but in case of doubt the van Gieson or Mallory connective tissue stain may be employed. In the smaller, pure myomata there is practically no connective tissue fibrils, very poor in cells, can be demonstrated, and as age increases, the amount of connective tissue may be rich. Not infrequently, the connective tissue cells are the seat of edema. The tumors, as a rule, are poorly vascularized. Larger vessels are carried in the denser connective tissue septa. The blood vessels may, however, be fairly rich and the seat of some dilatation; as a consequence, hemorrhage into the tumor may result. The lymph vessels may also be

the seat of extreme and extensive dilatation.

Degeneration of various kinds is common in the leiomyomata. Hyalin is frequent as are also fatty degeneration and hydropic infiltration. Calcification, necrosis and inflammation are also observed. Cyst formation may follow necrosis or hemorrhage.

The combination of leiomyoma and fibroma is very common, particularly as the fibromyomata of the uterus. These tumors are soft in the early stages but may become very dense from the amount of connective tissue present. Histologically, connective tissue may be in fairly dense bands throughout the tumor, or as is more commonly the case, closely intermingled with the muscle cells. There also occurs, more particularly in the uterus, a combination of myoma with adenoma, the so-called adenomyoma. This tumor is likely to appear in the posterior wall of the uterus and is not characteristic grossly. Microscopically, glands similar to those of the endometrium are found, intermingled with the muscle tissue and cells, which resemble those of the tunica propria of the endometrium. Sometimes, the tumors are richly provided with lymphatic vessels which may multiply and dilate to form the lymphangiomyoma. The same is true of blood vessels which help to form the hemangiomyoma. Malignant change is uncommon."¹(Karsner)

"Adenomyoma forms a distinct class of uterine tumors.

It is composed of glandular elements embedded in fibromyomatous tissues. Occasionally, the growth is diagnosed prior to operation because of distinctive symptomatology and clinical findings. Adenomyoma may be found in any part of the uterus, the tubes, ovaries, round ligament, or rectovaginal septum. While the female pelvic organs contain most of these tumors, they have been observed in other parts of the body, bowel, stomach, gall-bladder, kidneys, etc."²(Lynch)

"In the absence of definite etiology, investigators have confined their studies to the origin of the epithelium. The majority believe that the tumor is a true adenoma, and is composed essentially of epithelium, and that the muscular elements are secondary. Others believe that it differs from an ordinary fibroid only in that there is a secondary extension of glandular tissue from the endometrium into the fibroid mass. Von Recklinghausen recognized two types of tumors classed according to the origin of the epithelium. He based his opinion on the examination of 34 uterine and tubal adenomyomata. In one he considered that the epithelial elements were derived from portions of the original wolffian bodies which were pinched off in early fetal life and after remaining long dormant developed into the glandular structures. This type, he believed, was situated in the periphery of the uterus and in the tube. In the other type, the glandular elements arose from

the uterine mucosa. He considered that the latter cases were rare, since he could demonstrate a connection between the uterine mucosa and the glandular spaces of the tumor in but a single instance. He studied 23 uterine tumors. In the great majority of the larger growths, he found a characteristic arrangement of the glandular tissue. There was one main canal, into one side of which ran many subsidiary tubules which radiated outward like the sticks of a fan. The tubules were close together like those of a kidney. There were also numerous cystic dilatations in the secondary tubules which, since they were situated in the periphery, presented as a medullary zone. The whole picture suggested the possibility that the epithelial elements originated from the wolffian bodies, a view which was strengthened by the fact that nearly all such cases were found near the tube and on the posterior surface of the uterine wall; in other words, near the site of the wolffian bodies. Von Recklinghausen's theory was presently adopted by Pick, Breus, Voigt, Pfannenstiel, Kronig and others.

In marked contrast to this theory is Cullen's view that the epithelial elements are derived from the glands of the endometrium. This observer, in 1903, presented a monograph based upon the study of 22 cases, all of which were studied by serial sections. In nearly all the cases, the glands of the tumor were found to be continuous with

those of the endometrium. The epithelium of the tumor resembled that of the uterine glands and often presented areas of blood which suggested that these detached islets of uterine mucosa carried on the menstrual function. In 1908, Cullen presented an extensive monograph based upon a study of 56 cases of diffuse adenomyomata of the uterus. The continuity of epithelium between endometrium and tumor was demonstrated by serial sections in 55 of 56 cases. Cullen's hypothesis appeared strengthened by the case reported by Whitridge Williams in which the uterus of a woman dying shortly after labor contained decidual areas in the glands of diffuse adenomyoma. Similar findings in an adenomyoma complicated by tubal pregnancy was observed by Cullen."³(Lynch)

Lipoma of the uterus as a pure lipoma is of extreme rarity. Even mixed tumors containing fatty elements, while occurring more often than the pure lipoma, are by no means frequent. When the number of lipomas in all the fatty structures of the body and the perhaps greater frequency of tumors of the uterus is considered, the rare occurrence of true lipoma in the uterus is striking. The reason for this occurrence seems to lie in the very limited amount of fatty tissue in the uterine structure where it only appears in extremely small amount about the blood vessels. The clinical importance of lipoma is not of the greatest moment but the number of reported cases is so small that

each case may add to the bulk of our knowledge and its study may help the solution of the problem of the cause and pathogenesis of tumor growth. The specimen on which this study is based being the third to be reported in Anglo-American literature.

"The lipoma, a tumor composed of fat tissue, is of common occurrence. It is usually derived from pre-existing fat tissue, although certain instances occur in which it seems probable that connective tissue may undergo metaplasia to form fat. The most common situation is in the subcutaneous tissue, particularly of the neck and upper parts of the trunk. Nevertheless, such tumors may appear in synovial membranes, along nerve trunks, within the cranial cavity, in the kidneys and other viscera, including the heart. They are sometime multiple and may even show symmetrical disposition in the body. As a rule of moderate size, they may become extremely large and pedunculated. Excessive growth of fat around the kidneys may form very large perirenal lipoma, and sometimes the whole neck is involved from the face to the shoulders to produce the lipoma annulare colli. Grossly, the small lipomata may have only one lobule but as a rule, the tumor is a well defined multilobulated tumor, easily removed from the surrounding tissue but with only a thin fibrous capsule. It is soft, elastic in consistence and of the same color as normal fat, except in those instances

where a rich admixture of cells of fibrous or other tissues tends to make the color lighter than that of normal fat. It cuts with ease and greases the knife, the cut surface being soft, bulging and greasy. Microscopically, the characteristic cell is the large signet ring cell of adult fat tissue. Certain authorities maintain that the cells of lipoma are larger than those of normal fat tissue, but this is not supported in our experience. Sometimes, embryonal types of fat cells are observed, the cytoplasm studded with small vacuoles and with centrally placed round nucleus. Such cells are likely to be found in the margins of rapidly growing tumors. The septa dividing the tumor into lobules may be of fairly dense connective tissue and support the blood vessels of the tumor. Capillaries between the fat cells are not frequently observed; nevertheless, blood vessels may be fairly numerous and dilated. The same is true of lymphatic vessels. Mucoid degeneration, necrosis, and calcification may occur. In retrogressing tumors, adema may appear, as is the case with fat atrophy in other situations.

The lipoma can usually be completely removed so as to prevent recurrence. Tendency to recurrence is especially notable in the retroperitoneal lipoma, even though the primary tumor shows no gross or microscopic evidence of malignancy. The damage done by a lipoma depends largely upon its location. Thus, pressure upon important organs

as the brain by intracranial lipoma, pressure upon important tubes, such as the esophagus or intestinal canal, and pressure upon nerves may be of serious consequence. Lipoid degeneration and the deposition of the pigmented lipoid of xanthoma may be observed.

The lipoma is not infrequently combined with fibroma to form a fibrolipoma. Other combinations may also appear. Lipoma may constitute a very large part of certain teratoid tumors such as those which occur in connection with spina bifida. Lipoma may also be combined with sarcoma, more especially in retroperitoneal situations.

Chemically, the fat of the lipoma does not differ from normal fat in constitution or lipase content, but for some reason the fat is not utilized by the organism, and may even accumulate in increasing amounts in spite of progressive emaciation of the subject."⁴(Karsner)

The uterus has long been recognized as a frequent site of the development of neoplasms. Ellis,⁵1906, mentions the study of 13,824 patients of both sexes treated in four large London hospitals because of primary new growths. Of these patients, 9,227 were women, and 28.7 per cent, or 2,649 suffered from tumor of the uterus. Ellis in the same report states that Gurlt in 13,971 tumors analyzed at a Vienna hospital, found 4,115 or 29 per cent to be uterine in location. No mention is made of a lipoma in the series of Williams. In Williams⁶ series, which may be

considered as fairly representative, a total of 2,649 cases are recorded: Cancer 1,571; Myoma 883; Non Myomatous polyps 191; Sarcoma 2; Cystoma 2. Nor in fact does Ellis leave one to conclude that Gurlt's report shows a case. Seydel,⁷ quoted by Ellis, found only four cases of true lipoma of the uterus reported up to 1903, and only one of the four compared in size and location with the specimen reported by Ellis (Jefferson Medical College, Department of Pathology.) He states that two of Seydel's cases were tiny cervical polyps and the third was a subserous growth the size of a cherrystone. There were, in addition to these four cases of lipoma, on record two of lipomyoma and four of lipo-fibromyoma. Still one other case in Lebert's Atlas is designated simply as adipose tissue. Seydel accepts only these eleven cases as authentic lipomatous tumors of the uterus, rejecting three cases cited by Knox⁸ because they were not examined microscopically. However, at least two of these latter cases appear from their gross description to have been lipomas or lipofibromas. Yet from the reason given, Seydel appears justified in their exclusion from his list.

Ley described a tumor of the uterus, 12 centimeters in diameter, composed of closely set nodules 1-3 centimeters in diameter, some of which had yellow strands running through them. Microscopically there were fatty envelopes filled with fat globules separated by narrow

strands of collagen fibers and muscle. Ley considered the tumor a fatty metamorphosis of fibrous stroma rather than a fibromyolipoma. His figures represent the diffuse fat as composing about one-half of the total tissues. Ley also referred to a lipoma or fibrolipoma placed in the museum of St. Bartholomew's Hospital by Sir James Paget, but without microscopic sections.⁹

Ellis gives the list of Seydel's cases and states that he has verified all but two which he made no attempt to trace. Cases mentioned by Ellis:

Lebert - 1857, Atlas of Pathological Anatomy, pictures a uterus containing adipose tissue. In 1880 Stroinski reported finding a small polyp in the anterior lip of the cervix of a woman of twenty-eight who had been sterile probably because the growth acted as a valve to the cervical canal. Orth,¹⁰ in 1893 merely mentions an almond sized cervical polyp which proved to be a lipoma. Brunnings¹¹ reported in 1899 a case of lipomyoma the size of a child's head in the anterior wall of the uterus in a woman fifty-five years. The tumor was interstitial in location. Franque,¹² in 1901, reported a lipo-fibromyoma in a woman of fifty-four. Knox, in the same year described in detail a lipomyoma 10 x 13 x 10 cm. in size, located interstitially in the posterior uterine wall of a woman of sixty-two. The symptoms and the findings led to the diagnosis of myoma. Further study showed the true nature

of the growth. Merkel¹³ also in 1901 reported two cases; one was an interstitial lipoma the size of a billiard ball, located near the right oviduct; the other was a fibrolipoma the size of an orange, occupying the right half of the uterus in a patient of sixty-three. Jacobson¹⁴ in 1902 described a lipo-fibromyoma in a patient sixty-eight years of age. The tumor was 8 cm. in diameter and was located in the right anterior wall of the uterus. In 1903 Seydel found a walnut sized uterine lipo-fibromyoma in a woman aged fifty-eight. It was an interstitial growth of the fundus. In commenting on Seydel's case Meyer¹⁵ reports in the same paper a lipoma the size of a cherry-stone in a patient of forty-two. The nodule was subserosal in the fundus. The three cases mentioned by Knox but not accepted by Seydel follow:

Lobstein¹⁶ (quoted by Meckel¹⁷) in 1803 recorded a fatty tumor enlarging the uterus to the size of an eight months pregnancy. Seegar,¹⁸ 1853, reported a case in a widow aged fifty-three, a fibro-lipomatous tumor the size of a child's head, protruded externally and was removed by ligation of the pedicle.

T. Smith¹⁹ in 1861 showed to the Pathological Society of London a specimen from a woman of forty. A pedunculated mass the size of two fists projected from the fundus and proved to be largely firm fibrous tissue. Embedded in it and easily shelled out was a fatty tumor the size of a

pigeon's egg. Ellis states that he has found no cases other than those mentioned and places the undoubted cases of fatty tumors recorded to be eleven. To which he says the three last mentioned should possibly be added, continuing, he says several cases reported by older writers were clearly fatty degeneration of preexisting tumors, usually myomas. Even this change is rare as McDonald states that of 530 cases of uterine fibromyomas reported by Cullingsworth, Scharlich, and Fredrick, only seven showed fatty degeneration. McDonald found no instance in 280 specimens and Noble none in 278.

Ellis's case is based on autopsy findings in a woman of sixty who died in a Philadelphia Hospital July 19, 1906 from cerebral apoplexy. The pathologic diagnosis included fatty heart, arterio-sclerosis, chronic endocarditis, and contracted kidneys. "The uterus exhibited a globular swelling occupying the fundus and anterior portion of the body. This was much softer than is usual in uterine tumors, but was regarded as a soft myoma, with possible degenerative changes in the interior. A median incision through the organ revealed the growth to be a mass of yellow fat showing the lamellar appearance common to many lipomas." "The only suggestion of anything other than adipose tissue in the growth was at one point where an irregular area, slightly more than one centimeter in diameter, in extent appeared calcereous." Under the microscope the tumor showed the structure of a typical lipoma.

Andrews describes "Lipomatosis of the Stroma of a Uterine Fibroid." This tumour was five an a quarter inches in diameter, in the posterior wall of the uterus and bright yellow in colour. He considered the condition one of lipomatosis of the stroma of a fibromyoma of the uterus, not a degeneration, but an infiltration.²⁰

Robert C. Schleussner²¹ reports one case of uterine lipoma because of its rarity and states that in a review of the Index Medicus from 1890 through 1919 he found no cases reported from New York City. The case he records is the first to occur among 14,500 operative specimens examined at the Lenox Hill Hospital. He also states that, with his case included, only seventeen such tumors are on record. In the tumor he reports the fibro muscular strands are barely to be distinguished at the periphery. He takes the view that these fibro muscular strands are remnants of uterine tissue in the process of being pushed aside by the growing fat cells, and classes the growth as a pure lipoma. In our opinion his conclusion is correct. He states, however, that it might be better to follow the lead of Elkins²² and Haythorn and consider this entire group as fatty tumors of the uterus. He also gives a very clear outline of the views of the histogenesis of these growths.

The theories advanced are:

- I. "That they result from a fatty degeneration of the fibrous or muscular

tissue in fibromyoma of the uterus. In support of this theory it has been urged that fatty degeneration has been observed in the muscle cells and the connective tissue of the fatty tumors, and one author believed that he could trace the process in its various stages from beginning fatty degeneration to completed fat cells. This idea is contrary to the present ideas of the specificity of tissue growth. Moreover, some of the tumors have shown no fatty degeneration whatsoever, in the connective or muscular tissue."

II."That the fat cells arise by multiplication of fat cells congenitally misplaced."

III."That the fat cells arise by multiplication of the fat cells brought into the uterus along with the blood vessels. Seydel quotes R. Meyer on this point, the latter stating that he has observed fatty

tissue accompanying blood vessels
into the uterus though never deeply."

The theories of Knox and Meckel are so closely associated that they may be discussed together. Mallory makes the statement that fat cells are perfectly definite cells formed by differentiation from mesenchymal cells and are neither fibroblasts nor derived from fibroblasts. R. Meyer states that embryologically no fat cells occur in the uterus, broad ligaments, or myomata. So that if we accept the views of these two authorities that cell-rest theory in the strict sense, is automatically excluded on the very obvious grounds that if such cells were at no time normally present they could not remain as rests and start to grow at a later time. On the other hand as long as one attempts to interpret these tumors as lipomata, he must grant that they can spring only from lipoblasts and if lipoblasts are not normally present in the uterus during development they can occur only as embryonic displacements and thus Seydel's view becomes the only tenable one.

The extension along the vessels and nerves is very unlikely both because of the thick capsule and because of the constant findings of the larger vessels near the centers of connective tissue bundles and not in the fatty areas.²³

The histogenesis of fatty tumors of the uterus has been variously interpreted by different authors. This has led to considerable confusion and as a result these tumors

have been variously named as; lipomata, lipomyomata, fatty tumors of the uterus, and lipomatosis of the stroma of a uterine fibromyoma. The more recent authors who have discussed the histogenesis of these tumors seems to think that the bulk of the evidence in their case was on the side of the lipoblastic displacement theory advanced by Seydl. Cohnheim's embryonic cell rest theory has also been advanced. Others have thought that the fat came from the ingrowth of true fat tissue along the blood vessels and nerves. Lastly the muscles and connective tissue cells were thought to have taken up fat in the globular form, thus becoming true fat tissue.²⁴

The tumor in Schleussner's case was roughly globular in shape and about five inches in diameter. Its growth had distorted the uterus so that its original position could not be made out except that it involved the body of the uterus and occupied an intramural position. Its color was pale yellow. A delicate connective tissue frame work was present and formed a very inconspicuous part of the picture. Under the microscope the greater part of the tumor was made up of mature fat cells arranged in bundles of varying sizes and separated by strands of connective tissue in various stages of hyaline degeneration.

"Hyaline degeneration is used here loosely to designate those changes in myomas and their vessels wherein the connective tissue and muscle fibres lose their specific

structure and tinctorial reaction. They do not stain a deep red with acid fuchsin as does hyaline in some situations, nor do they stain orange with picric acid. In myomas the structures named may be disposed as homogeneous structureless areas, as fine fibrin-like bundles or as heavy columns like keloid. With this introduction it is apparent that the term "hyaline" is used here as a symbol to designate conditions observed in slides without any attempt to define it exactly."²⁵(Hertzler)

"The earliest changes in hyaline degeneration are usually found in the vessel wall and in the tissues immediately adjacent. Sometimes these degenerated vessels are found in groups of greater numbers than one finds in a non-degenerated tumor. The wall may be well preserved, however, as well as the neighboring tissue while the more remote areas may show the more extensive degenerative changes. In such areas there is evidence that more centralward the changes are primarily vascular. The hyaloid area may be very faintly staining showing nothing or only a fibrillar structure. Other areas show heavy bundles of keloid-like fibres. This is the type which most commonly shows well-preserved nuclei adjacent to the degenerated areas, and in some areas one gets the impression that here is the point of origin of malignant myomas."²⁶(Hertzler)

In the interior of myomas one sometimes finds canary yellow areas which give the impression of fatty degeneration.

On section we see nothing but the usual evidence of hyaline degeneration without the presence of lipoid cells. In some cases fatty degeneration may occur or an entire tumor may be so formed. The problem presents itself if these should be called fatty degeneration of lipoma of the uterus. I have seen none of them. These cannot be diagnosed from gross inspection alone. If exact methods of examination be applied to these tumors their number will decrease. The proven cases are few.²⁷

Ewing²⁸ in his, "Neoplastic Diseases", mentions a case of polypoid lipoma observed by Orth, also two cases of intramural uterine lipomas reported by Merkel, while lipomatous areas of mixed tumors of the uterus are mentioned by Gerlach. Pollack²⁹ thought (Ewing) his intrauterine lipoma originated from a portion of omentum protruding into a wound of the uterus.

According to Bailey and Miller fat tissue develops from embryonic connective tissue cells. The fat replaces to a great extent the cytoplasm in many of these embryonic cells. These cells first appear in the axilla and groin of the fetus about the thirteenth week. Fat is formed in other places at later periods and even during adult life, but the mode of development is always the same. The whole question as to the origin of these fat cells depends upon whether fat cells develop from any embryonic connective tissue cells or whether they develop from specially differentiated embryonic connective tissue cells. According

to Bailey this question has not been definitely settled.³⁰

Dr. Fred B. Lund³¹ reported to the New England Surgical Society, 1933, an unusual case of uterine tumor complicated by gall stones. A supra-vaginal hysterectomy removed a large blue fluctuating, freely movable uterus about the size of a four months pregnancy. The gross report by Dr. F. B. Mallory follows:

Gross specimen uterus amputated through cervix: as received, the uterus has been opened and retracted away from a perfectly encapsulated intramural globular tumor mass 14 cm. in diameter. Cut surface is uniform, yellow, greasy, and resembles adult fat, "Diagnosis Lipoma of Uterus."

Arthur A. Humphrey³² and Russell L. Mustard report a fatty growth about the size and shape of a large cherry accompanying and adjacent to, but separated from, an ulcerated carcinoma of the cervix, about an inch above the ulcerated cervix the yellow fatty intra-muscular mass protruded through the surrounding myometrium. Sections through the yellow tissue showed a typical adipose tissue structure which appears quite sharply demarcated from the myometrium. According to the authors, several points of interest present for consideration in this case. First, because of a fifteen year cure of a breast carcinoma with axillary involvement, and second because it may in a measure explain the genesis of lipoma as well as acanthoma in this site. They state that Ewing covers the controversy concerning the origin of this

tumor excellently in his book citing both the exponents of the theory of multicentric origin and those of the metaplasia. He (Ewing) states that a variable histogenesis may occur in adenocanthoma of the cervix but that those in the uterus may be on the basis of metaplasia in almost all instances and do not require heteroplasia of squamous celled structure has been long recognized and is frequently seen in the cecum and elsewhere, the idea that by a similar metaplasia changes from epithelial structure into lipomatous tissue is somewhat remote. It appears more likely that a single heterotopic focus may have carried all of these tissue structures. J. Garland Sherrill³³ has published an excellent report on distinct and multiple uterine tumors. Humphrey and Mustard state their case to be the second lipoma of the uterus reported in the English language.

The following report of a true lipoma of the uterus is added to the Anglo-American literature, the third reported, and the specimen has been the basis of this dissertation on the pathology of lipomata of the uterus:

Mrs. L.T., 63, white, widow,
was admitted to the hospital,
January 18, 1939, with the following history:

Mother of five living children.
Menopause at 45 uneventful. She
had no unusual discharge until one

week ago when a moderate amount of vaginal bleeding suddenly appeared and continued for two days, followed by spotting for five days. Mild cramp-like lower abdominal pains accompanied the bleeding. The past, present, and personal history was not relevant.

Examination showed a well developed and nourished female weighing 159 pounds, cooperates and coordinates well: Hemic component is good; blood pressure systolic 190; diastolic 88; Wasserman negative; urine negative; hemoglobin 84%; color index .9; erythrocytes 4,490,000; leukocytes 9,600; polynuclear neutrophils 70%; lymphocytes 28%; monocytes 2%.

Mouth edentulous. Pupils regular and equal respond to light and accommodation. Heart and lungs reveal no abnormality. The skin, subcutaneous tissues and extremities present no tumors or masses.

The abdomen is obese with poor

tone. No spasticity noted. Liver and spleen are not palpable and no masses are felt in upper or lower quadrants.

A moderately enlarged but smooth cervix presents at the vaginal introitus, a second degree procidentis with a slight blood tinged discharge from the os, but on introduction of a sound into the cervical canal no bleeding is precipitated.

Bimanual palpation disclosed a slight but smooth enlargement of the fundus uteri, which is freely movable without tenderness or presence of adnexal masses.

A diagnosis of possible early carcinoma of the fundus with procidentia is recorded and vaginal hysterectomy recommended.

At operation, January 20, 1939, under subarachnoid anesthesia, the uterus with a round soft intramural fundal tumor was removed by vaginal hysterectomy followed

by plastic repair of cystocele. An uneventful convalescence followed. The patient was discharged from the hospital on the fourteenth postoperative day.

GROSS DESCRIPTION

The uterus measures 11x7x5 cm. and is opened longitudinally on its posterior aspect. Fig. I.

Embedded in the muscle of the fundus is a spherical tumor 3.5 cm. in diameter. This mass is under some tension, is well encapsulated and has the color, consistency and trabecular markings of a lipoma. It distorts the cavity of the uterus slightly by pushing the fundus down, but the muscle completely surrounds the mass.

The mucosa is thin except for irregular papillary elevations 3 to 15 m.m. in diameter and 3 to 7 m.m. high. There are innumerable

retention cysts in the mucosa, both in the atrophic portion and the papillary elevations. They vary in size from those barely visible to 3 m.m. in diameter.

The cervix is fissured and scarred. Some of the glands are cystic.

The muscle over the body is 2 cm. thick. Numerous sclerotic arteries protrude from the sectioned surface.

Embedded in the muscle of the anterior wall, just above the internal os, are two hard, spherical encapsulated tumors, each of which is 15m.m. in diameter. These have the appearance of leiomyomas.

MICROSCOPY

Sections of the tumor at the fundus show it to be made up of fat tissue. Fig. II and III. There is a thin fibrous

connective tissue capsule which is continuous with trabeculae extending into the mass. The parenchymal cells are well differentiated fat cells.

The mucosa is atrophic, consistent with senility. The stroma is fibrotic, infiltrated diffusely with lymphocytes and there are numerous hemorrhages, some of which are recent and can be attributed to manipulation but there is some partly disintegrated blood and blood pigment, indicating hemorrhage. The glands are atrophic, many of them distended with secretion and a few are invaded by monocytes. The papillary elevations are similar in structure and inflammatory reaction. Fig. IV and V. The surface epithelium is partly eroded.

Sections of the tumors in the body wall reveal a structure of smooth muscle similar to that of the uterus and a moderate

amount of connective tissue stroma. There are some small, dense deposits of calcium salts about which there is degeneration.

No evidence of malignancy is noted in the tumors or the mucosa.

INTERPRETATION

1. Lipoma, intramuscular, of fundus uteri.
2. Leiomyomas, intramuscular, of corpus uteri.
3. Senile atrophy of mucosa.
4. Polyposis, (papillary adenomas) of mucosa with chronic inflammation and hemorrhage.

CONCLUSION

As to the question of fatty degeneration being the forerunner of lipomata in the uterus due to fatty degeneration occurring in a fibromyoma of the uterus, it is our conviction that this may precede many fibro-lipomyomata but not true lipomata of the uterus.

Lynch³⁴ is definitely of the opinion that the sequence in fibro-lipomyomata is hyaline degeneration in areas which become liquified in the center, lipid is

present from muscle degeneration, the cytoplasm of the cells passing through cloudy swelling and granular degeneration and finally to fatty necrosis.

In any lipoma of the uterus in which one suspects the above origin it would seem plausible to find some of the degenerative changes above enumerated.

The lipoma of the uterus here discussed does not show any of the above changes and we are of the opinion that it is a true lipoma, after a careful study of the literature and specimen, the histogenesis being attributed to multiplication of congenitally misplaced fat cells or multiplication of fat cells brought into the uterus along with the blood vessels.

Fig. I. Photograph of opened uterus, posterior view. The fatty tumor of the fundus protrudes from the sectioned surface. The cornua are elongated. The mucosa is hemorrhagic and papillary.

Fig. II. Photomicrograph of uterine muscle and embedded lipoma. There is some pressure atrophy about the tumor and a cleavage space outside the capsule. Mag. 16. Dia.

Fig. III. Photomicrograph of tumor in the fundus. The fibrous connective tissue capsule, trabeculae and the adult type fat cells are shown. Mag. 120. Dia.

Fig. IV. Photomicrograph of endometrium and a portion of a papillary mass. The endometrium is atrophic and glands are cystic. Mag. 16. Dia.

Fig. V. Photomicrograph of portion of endometrial polyp. The structure is similar to that of the endometrium. The stroma contains lymphocytes and erythrocytes. The glands are distended with secretion. The surface epithelium is denuded. Mag. 120. Dia.

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