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LIPOLEIOMYOMA OF THE UTERUS IN A WOMAN OF REPRODUCTIVE AGE (clinical case)

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Key words: *lipoleiomyoma, leiomyoma, mesenchymoma, uterus, ovarian dermoid cyst, laparoscopy*
Ключові слова: *ліполейоміома, лейоміома, мезенхімома, матка, дермоїдна кіста яєчника, лапароскопія*

Abstract. Lipoleiomyoma of the uterus in a woman of reproductive age (clinical case). Talash V.V., Palyokha Ya.V., Gromova A.M., Talash V.V., Martynenko V.B., Prylutska N.O., Mityunina N.I. *Uterine lipoleiomyoma is one of the variants of uterine leiomyoma, which is histologically represented by the presence of mature fat and smooth muscle cells. The relevance of the coverage of this clinical case is determined by the extreme rarity of the development of uterine lipoleiomyoma in women of reproductive age. The purpose of this work was to record this clinical case in the world statistics of lipoleiomyoma, to evaluate methods of diagnosis and differential diagnosis, to determine the role of early diagnosis of uterine lipoleioma in the subsequent tactics and scope of surgical treatment. Data from the medical records of a 41-year-old inpatient were analyzed. In addition to the generally accepted clinical and biochemical methods of blood and urine examination, electrocardiogram, ultrasound examination of the pelvic organs, the level of ovarian tumor markers in the blood (CA 125, HE4 and the ROMA index) was determined. The diagnosis of the disease was based on the data of pathohistological and immunohistochemical studies. Based on the results of a review of the medical literature, analysis of articles obtained as a result of a search of PubMed, SCOPUS, Web of Science, MedScape databases, the current state of the problem is highlighted, literary data related to the incidence, features of the clinical course, diagnosis and treatment of uterine lipoleiomyoma are summarized. The clinical case presented in the article demonstrates an incidental finding of a uterine lipoleiomyoma in a woman of reproductive age, measuring 30x25x20 cm, originated subserously from the body and cervix of the uterus, in the area of its isthmus. Under this condition, it occupied the entire Douglas space, the area of the sacro-uterine ligaments and the parietal peritoneum, intimately adjacent to the sigmoid and rectum, to the ureters and iliac vessels. The peculiarity of this clinical case is that sonographically uterine lipoleiomyoma was hidden under the "mask" of a dermoid cyst of the right ovary. Macroscopically, it differed from a typical lipoleiomyoma by the purple-bluish color of its outer surface and soot-colored, fine-lobed spongy structure on the section. The diagnosis of uterine lipoleiomyoma was verified only on the basis of pathohistological and immunohistochemical research. Microscopically, the lipoleiomyoma had a mesenchymal structure with a pronounced vascular component and consisted of mitotically inactive bundles of smooth muscle cells and mature adipocytes. Immunohistochemically, a positive reaction for caldesmon, desmin, smooth muscle actin alpha of tumor cells and for S.100 (DAKO, polyclonal) fatty cells was detected, which confirmed the hypothesis of direct transformation of smooth muscle cells existing in the leiomyoma of the uterus into fatty cells. This clinical case should complement the global statistical indicators of diagnosis of uterine lipoleiomyoma in women of reproductive age. Lipoleiomyoma should be considered as the primary diagnosis in case of detection of a large uterine tumor in women with excess body weight and be removed immediately after diagnosis, otherwise it is impossible to exclude its malignancy. For the planned diagnosis of neoplasms of the female genital organs, preference should be given to non-invasive research methods: magnetic resonance or computer tomography with contrast enhancement. The problem of these tumors lies in their unpredictable histogenesis, the unexpected presence of fat in the microscopic structure, and in the visual similarity to sarcomas. Verification of the diagnosis is carried out on the basis of pathohistological and immunohistochemical studies of the tumor preparation.*

Uterine lipoleioma can have a purplie-bluish color and develop by a broad base from the body and cervix of the uterus, as a result of "lipomatous" metaplasia of the uterine leiomyoma existing in a woman. Regular preventive examinations of women of all ages are crucial for timely detection of this rare neoplasm.

Реферат. Ліполейоміома матки в жінки репродуктивного віку (клінічний випадок). Талаш В.В., Пальоха Я.В., Громова А.М., Талаш В.В., Мартиненко В.Б., Прилуцька Н.О., Мітюніна Н.І. *Ліполейоміома матки – один з варіантів лейоміоми матки, яка гістологічно представлена наявністю зрілих жирових і гладком'язових клітин. Актуальність висвітлення цього клінічного випадку визначається надзвичайною рідкісністю розвитку ліполейоміоми матки в жінок репродуктивного віку. Метою цієї роботи було зафіксувати такий клінічний випадок у світовій статистиці ліполейоміоми, оцінити методи діагностики, диференціальної діагностики, визначити роль ранньої діагностики ліполейоми матки в подальшій тактиці та у визначенні об'єму оперативного лікування. Проаналізовано дані медичної документації стаціонарної хворої 41-річного віку. Окрім загальноприйнятих клінічних та біохімічних методів дослідження крові та сечі, електрокардіограми, ультразвукового обстеження органів малого тазу, визначали рівень онкомаркерів яєчників у крові (CA 125, HE4 та індекс ROMA). Діагноз захворювання базувався на даних патогістологічного та імуногістохімічного досліджень. За результатами огляду медичної літератури, аналізу статей, отриманих у результаті пошуку баз даних PubMed, SCOPUS, Web of Science, MedScape, висвітлено сучасний стан проблеми, узагальнено літературні дані, що стосуються захворюваності, особливостей клінічного перебігу, діагностики та лікування ліполейоміоми матки. Наведений у статті клінічний випадок демонструє випадкову знахідку ліполейоміоми матки в жінки репродуктивного віку, розмірами 30х25х20 см, яка розпочинала свій ріст субсерозно з тіла та шийки матки, у ділянці її перешийку. За цієї умови вона займала весь дугласів простір, зону крижово-маткових зв'язок і парієтальної очеревини, інтимно прилягаючи до сигмоподібної та прямої кишки, до сечоводів і здухвинних судин. Особливістю цього клінічного випадку є те, що сонографічно ліполейоміома матки ховалась під «маскою» дермоїдної кісти правого яєчника. Макроскопічно вона відрізнялась від типової ліполейоміоми багряно-ціанотичним кольором її зовнішньої поверхні та брудно-бурим кольором і дрібночасточковою губчастою структурою на розрізі. Діагноз ліполейоміоми матки був верифікований лише на підставі патогістологічного та імуногістохімічного дослідження. Мікроскопічно ліполейоміома мала будову мезенхімоми з вираженим судинним компонентом і складалась з мітотично неактивних пучків гладком'язових клітин і зрілих адипоцитів. Імуногістохімічно виявлялась позитивна реакція на кальдесмон, десмін, гладком'язовий актин альфа пухлинних клітин і на S.100 (DAKO, поліклональні) жирових клітин, що підтверджувало гіпотезу про пряме перетворення гладком'язових клітин наявної у хворої лейоміоми матки в жирові клітини. Цей клінічний випадок має доповнити світові статистичні показники діагностики ліполейоміоми матки в жінок репродуктивного віку. Ліполейоміому слід розглядати як первинний діагноз у разі виявлення великої пухлини матки в жінок з надмірною масою тіла та видаляти її відразу після встановлення діагнозу, оскільки інакше неможливо виключити її злоякісність. Для планової діагностики новоутворень жіночих статевих органів перевага повинна надаватись неінвазивним методам дослідження: магнітно-резонансній або комп'ютерній томографії з контрастним підсиленням. Проблема, пов'язана з цими пухлинами, полягає в їхньому непередбачуваному гістогенезі, неочікуваній наявності жиру в мікроскопічній будові та у візуальній схожості з саркомами. Верифікація діагнозу проводиться на підставі патогістологічного та імуногістохімічного досліджень препарату пухлини. Ліполейома матки може мати багряно-ціанотичний колір та розвиватись широкою основою з тіла та шийки матки внаслідок ліпоматозної метаплазії наявної в жінки лейоміоми матки. Регулярні профілактичні огляди жінок усіх вікових періодів мають вирішальне значення для своєчасного виявлення цього рідкісного новоутворення.*

Uterine lipoleiomyoma (LLM) is one of the least described and rare variant of uterine leiomyoma (LM) [1]. According to the literature, the frequency of LLM varies from 0.28 to 0.8% [2]. It is noteworthy that it is most often diagnosed in peri- and menopausal women, and the prevalence of this pathology increases with age from 50 to 75 years [3, 4].

Questions about the etiology and pathogenesis of LLM of the uterus have not been reliably investigated until now [5, 6].

Uterine lipoleiomyoma, usually benign, is usually asymptomatic for a long time, but symptoms of compressive, hemorrhagic, anemic and other syndromes may develop over time, or as an incidental finding of a palpable mass in the projection of the pelvic organs [7, 8, 9, 10].

Modern diagnosis of LLM of the uterus is based on the data of ultrasound examination (USE) of the pelvic organs (PO), magnetic resonance imaging (MRI), computer tomography (CT) with contrast, hysteroscopy and/or diagnostic laparoscopy [11, 12, 13]. However, the diagnosis is confirmed by the data of pathohistological and/or immunohistochemical studies [14].

For the most part, LLM of the uterus histologically consists of mature adipocytes and smooth muscle cells [15].

The main methods of treating LLM of the uterus are drug treatment, uterine artery embolization, focused ultrasound ablation, interventional radiology, and surgical treatment [16]. After surgical treatment, the prognosis is usually favorable, but there are separate reports of recurrences of uterine LLM [17, 18].

Given the rarity of the development of uterine LLM, we present our own clinical case of an accidental finding of a symptomatic giant uterine LLM in a woman of reproductive age, which began its growth subserously, from the body and cervix of the uterus, in the area of its isthmus.

MATERIALS AND METHODS OF RESEARCH

The data of the medical records of a 41-year-old inpatient are analyzed and an indicative clinical case of the development of uterine lipoleiomyoma, which started its growth from the body and cervix in the area of her isthmus subserosally, is given.

In addition to the generally accepted clinical and biochemical methods of blood and urine examination, electrocardiogram, ultrasound examination of the pelvic organs, the level of ovarian tumor markers in the blood (CA 125, HE4 and the ROMA index) was determined [11]. The diagnosis of the disease was based on the data of pathohistological and immunohistochemical studies [14].

Based on the results of a review of the medical literature, analysis of articles obtained as a result of a search of PubMed, SCOPUS, Web of Science, MedScape databases for the period from 1994 to 2023, using a combination of terms: "lipoleiomyoma, leiomyoma, mesenchymoma, uterus, ovarian dermoid cyst, laparoscopy» the current state of the problem, was highlighted, literature data related to the incidence, features of the clinical course, diagnosis and treatment of LLM of the uterus were summarized [8, 10].

Written informed consent from the patient for the publication of her clinical history was obtained. The materials of the scientific work meet the requirements of the Tokyo Declaration of the World Medical Association, the International Recommendations of the Helsinki Declaration on Human Rights, the Council of Europe Convention on Human Rights and Biomedicine, the Laws of Ukraine, the orders of the Ministry of Health of Ukraine, the Code of Ethics of a Doctor of Ukraine and the Code of Ethics of a Scientist of Ukraine (Excerpt from the minutes of the commission meeting on ethical issues and biomedical ethics of PSMU No. 224 dated 22.02.2024).

The purpose of this work was to record this clinical case of the development of LLM of the uterus in a woman of reproductive age in the world statistics, to highlight the methods of diagnosis and differential diagnosis, to determine the role of early diagnosis of LLM of the uterus in the subsequent tactics and extent of surgical treatment.

Clinical case. Patient B., born in 1981, was hospitalized on 04/19/2023 in the gynecology department of communal enterprise “Perinatal center of 2nd level of the Poltava city council” as an emergency with complaints of pain in the lower abdomen, more on the right side, which worsened when walking and when changing body position.

Anamnesis: the patient's current symptoms appeared on April 13, 2023 and lasted for 6 days. On April 13, 2023, she was examined by a gynecologist at her place of residence. During the ultrasound of pelvic organs, on the right, outside the uterus, a rounded mass measuring 295.4x200.0x250.0 mm with signs of a typical dermoid cyst of the right ovary was detected. O-RADS 2. Tested for ovarian tumor markers: CA 125, HE4 and ROMA index. The results of these studies showed no risk of developing ovarian cancer (33.6 units/ml; 49.2 pmol/l and 7.53%, respectively).

On April 19, 2023, due to increased abdominal pain, the patient was hospitalized to the gynecology department.

During the initial examination: general condition is relatively satisfactory. Body temperature is 36.4 C, heart rate is 78 per/minute, blood pressure is 120/85 mm Hg. Respiratory rate 18 per/min. The tongue is moist, clean. Abdomen is tense, painful on palpation in the lower parts, more on the right. Symptoms of peritoneal irritation are positive. Physiological bowel movements are normal. No pathology was detected in other organs and systems of the woman's body. Mammary glands of a soft-elastic consistency without induration, painless on palpation. There was no discharge from the nipples.

Gynecological status. The external genitalia are properly developed. Hairiness by female type. Examination in speculum: mucous membrane of the vagina is pale pink, the cervix is clean, cylindrical in shape. The size of the vaginal part is 3 cm. The external oriffice is closed. The uterus is in anteflexion, dense, mobile, painless on palpation, not enlarged. Left appendages are unchanged, painless on palpation. In the area of the right appendager – mass of a soft-elastic consistency, 30x20x25 cm in size, palpable, painful on palpation. Back vaginal vault is with a mass. Palpation of the vaults is painful. Banki’s, Promtov’s symptom – sharply positive. Vagina discharges are moderate, mucous in nature. On digital rectal examination, the mucous membrane is smooth, not fused with the underlying tissues.

Menstruation is painless, regular. Last menstruation from April 1 to 6, 2023.

On the basis of the patient's complaints, data of the history of disease, bimanual examination, objective and additional methods of examination, a preliminary diagnosis was established: Dermoid cyst of the right ovary, nutritional disorder?

No significant changes were found in the results of blood count urine and electrocardiogram tests. PO ultrasound data confirmed the presence of a dermoid cyst of the right ovary, similar to the previous study.

Considering the urgent situation, it was expedient to surgically remove it.

After preoperative preparation, a lower-middle laparotomy under endotracheal anesthesia was performed. By inspection of the organs of the abdominal cavity, it was established that the fallopian tubes and ovaries are macroscopically normal, and outside the uterus, mainly on the right, a well-defined purple-bluish mass 30x25x20 cm in size is visualized (Fig. 1).

This giant mass was attached to the body and cervix of the uterus by a wide base, in the area of its isthmus (Fig. 2), occupying the entire Douglas space, the area of the sacro-uterine ligaments.

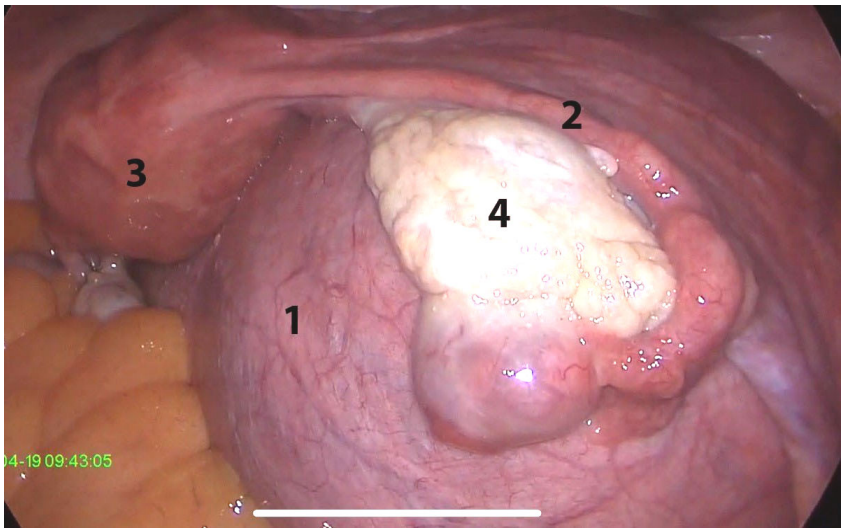

Fig. 1 Ratio of the tumor size and patient's pelvic organs
1 – mass originating from the uterus into the abdominal cavity;
2 – right fallopian tube; 3 – uterus; 4 – right ovary

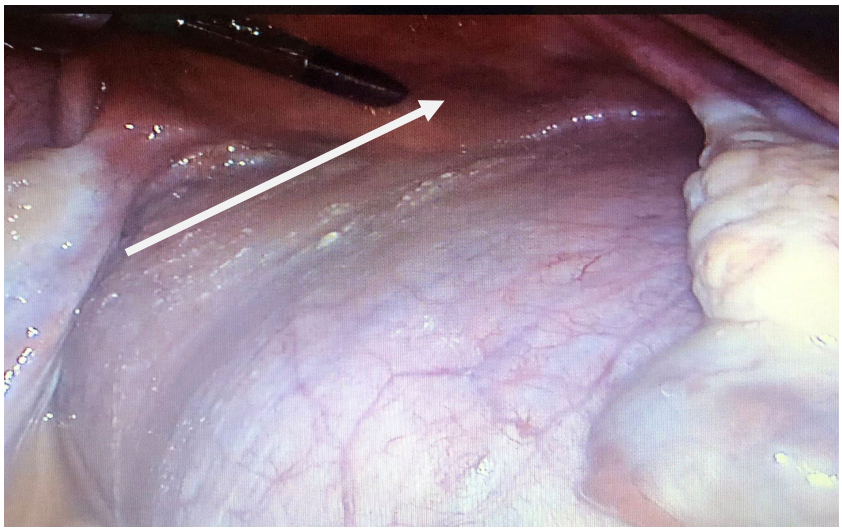

Fig. 2. Photograph of the tumor revealed on a pelvic examination.
The arrow indicates the place of attachment of the tumor to the body and cervix

In addition, this tumor was intimately adjacent to the rectum, ureters and iliac vessels. All this indicated a high probability of malignancy and resembled a sarcoma in appearance. Therefore, an oncologist was called to the operating room.

Taking into account the localization of the tumor pedicle and the probability of its malignancy, a decision was made to extirpate the uterus with appendages. For this purpose, the tumor was separated from the neighboring organs by blunt and sharp methods,

clamps were applied to the pedicle and the tumor was cut off. Further, a typical extirpation of the uterus with appendages was performed.

Obtained macropreparations: uterus of normal size (5x4x3 cm), pink in color; cervix – 6x4x3 cm; ovaries: right, 4x3 cm in size and left – 3x2 cm, rounded; fallopian tubes: the right, 12x1x1 cm in size and the left – 12x0.5x0.5 cm, of a normal shape, mass – 30x25x20 cm in size, purple-bluish in color (Fig. 3), soft-elastic consistency with a smooth outer surface. Macropreparations were immersed in a 10% solution of neutral formalin for further pathohistological and immunohistochemical studies.

Clinical diagnosis was established: nodular leiomyoma of the uterus with a subserous location of the node (type 7). Malignancy?

After surgery, the patient was prescribed adequate anti-anemic, antibacterial and analgesic therapy according to existing protocols. The course of the postoperative period was without complications. The patient was discharged home in satisfactory condition on day 6 after surgery.

Pathological and histological examination from 04/26/2023. Macro- and microscopic description of the preparations: fallopian tubes – 6 mm in diameter (d), ovaries of a yellowish color, one – 4x2x1 cm in size, on a section with cysts (1.5 cm in d), another – 3.5x2x1.5 cm – with a cyst of 2 cm in d. The body of the uterus is dense, in the cut form – 8x5x3.5 cm. The endometrium is pink. In the thickness of the uterus, several nodes up to 1 cm in d. The cervix – 6x4x3 cm in size, smooth, the cervical canal is without pathology. Separately – a mass 30x25x20 cm in size, soot-colored in cross-section, with fine-lobed spongy structure (Fig. 3).

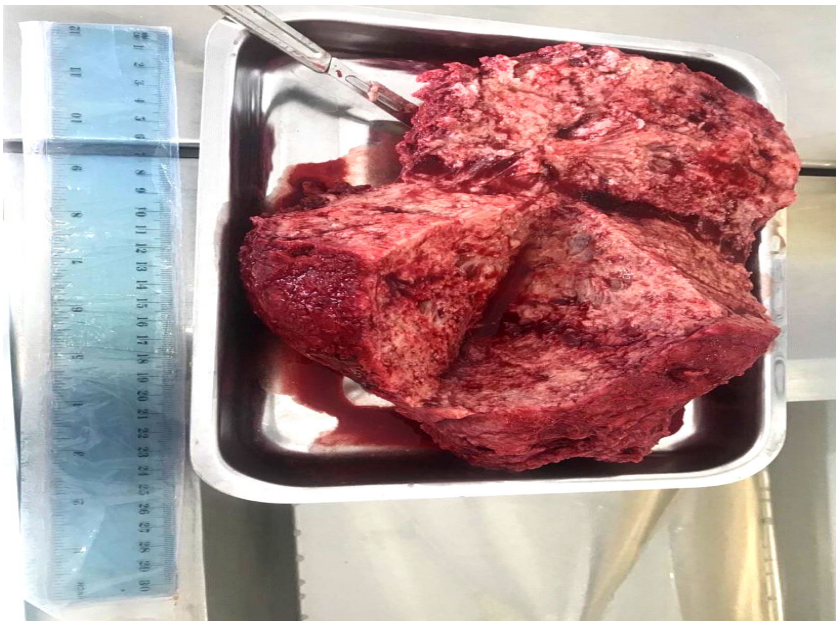

Fig. 3. Macropreparation of uterine tumor on a section

Pathological and histological conclusion dated 04/26/2023. Ovaries: serous cysts. Hemorrhage in the corpus luteum. Fallopian tubes of normal histological structure. Simple endometrial hyperplasia. Uterine leiomyoma. Cervix with cysts. Separately – a mass that has the structure of a mesenchymoma with a predominance of a vascular component.

For further verification of the diagnosis, a histochemical and immunohistochemical study was performed.

Microscopic description from 01.05.2023: in tumor preparations, a mass is revealed, which is represented by bundles of short spindle-shaped cells located around vessels with hyalinized walls. The cells have a moderate amount of eosinophilic cytoplasm, the nuclei are slightly elongated, and contain fine granular chromatin. Between the bundles of these cells there is a cluster of fat cells with a normal histological structure. No signs of cytological atypia and mitotic figures.

According to the data of the immunohistochemical study from 01.05.2023: general cytokeratins (DAKO, clone AE1/AE3) – negative reaction, S.100 (DAKO, polyclonal) – negative reaction in tumor cells, positive reaction in fat cells; Desmin (DAKO, clone D33) – a positive reaction in tumor cells; Caldesmon (high molecular weight) (DAKO, clone h-CD) – a positive reaction in tumor cells: Smooth muscle actin alpha (DAKO, clone 1A4) – a positive reaction in tumor

cells; Melan A (DAKO, clone A103) – negative reaction Immature melanosomes (DAKO, clone NMV-45) – negative: STAT6 (Cell Marque, clone EP325) – negative: Ki-67 (DAKO, clone MIV-1) – positive reaction approx. in 1% of tumor cells.

RESULTS AND DISCUSSION

The literature reports that uterine LLM predominantly occurs in women of peri- or menopausal age. There are only isolated reports of this pathology developing in women of reproductive age. Various lipid metabolism disorders, obesity, diabetes mellitus, hypothyroidism, and estrogen deficiency lead to 'lipomatous' metaplasia of an existing uterine LM due to disrupted intracellular lipid storage [4]. In our case, uterine LLM developed in a woman of reproductive age. It can be assumed that the patient's excess body weight may have triggered the 'lipomatous' metaplasia of existing uterine LM.

Uterine lipoleiomyoma typically develops in the body of the uterus (90.7%) or in the cervix (6.5%) [2, 7]. When it develops in the uterine body, it is usually located intramurally, submucosally, and less commonly subserously [18]. At the same time, isolated reports in the medical literature describe atypical extrauterine localization of LLM: between the uterosacral ligaments, in the broad ligament of the uterus, in the retroperitoneal space, in the fallopian tubes, ovaries, mammary glands, on the anterior abdominal wall, in the inguinal canal, and in areas of the genitourinary system [3, 19, 20].

As for uterine LLM originating from the cervix, as of 2022, according to our data, only thirty-two clinical cases had been described in the medical literature [17]. It should be noted that we found no reports of its simultaneous development from both the body and cervix of the uterus. This giant tumor began its growth subserously, with a broad base from both the body and cervix of the uterus, in the area of the isthmus, which highlights the relevance of the described clinical case (Fig. 2).

Uterine lipoleiomyoma is a benign tumor with different clinical manifestations. According to the data of the medical scientific literature, LLM of the uterus, like LM of the uterus, progresses asymptomatically for a long time and rarely reaches giant sizes. Under this condition, it is possible to detect a palpable mass in the small pelvis. With the growth of LLM of the uterus, symptoms of pain, hemorrhagic or compression syndromes, dysmenorrhea with anemia, urinary disorders, constipation, infertility may occur [1, 21]. Therefore, it can be assumed that in this clinical case, LLM of the uterus arose long before the appearance of the pain syndrome. This is also confirmed by the fact that the woman did not undergo professional examination by a gynecologist in the last 10 years. In addition, there are reports that over time, LLM of the uterus can become malignant - transform into liposarcoma or lipoleiomyosarcoma [22].

The nature of the clinical manifestations of LLM of the uterus, in general, depends on the location of its nodes relative to the uterine cavity, their number, size, and blood supply. At the same time, the majority of LLM of the uterus is an incidental postoperative finding. Under this condition, the diagnosis was established based on the results of pathohistological, histochemical and immunocytochemical studies of preparations of removed tumors [23], which is clearly shown in this clinical case.

Lipoleiomyoma of the uterus can be detected during an PO ultrasound. At the same time, it is reported that before surgery it is often diagnosed as uterine fibroids, mature ovarian teratoma, or as malignant neoplasm. As noted in the medical literature, the detection of a highly echogenic, well-defined mass, or a limited hyperechoic one of a membranous nature, which decreases towards the myometrium with little or no blood supply, is a practical diagnostic indicator of the presence of such a tumor. However, it is obvious that it is difficult to distinguish LLM of the uterus from other neoplasms, such as: liposarcoma, leiomyosarcoma, vertebroma, pelvic lipoma, teratoma using this method. CT and MRI of PO with contrast are the most specific for differentiating these tumors [9, 22, 23, 24, 25]. In this clinical case, LLM of the uterus was sonographically perceived as a dermoid cyst of the right ovary, and symptoms of "acute abdomen" as symptoms of malnutrition of this cyst. Other imaging methods were not performed, as the clinical situation required urgent surgical treatment.

Differential diagnosis of uterine LM is usually performed with uterine LM, ovarian dermoid cyst, nonteratomatous lipomatous ovarian tumor, benign pelvic lipoma, liposarcoma, lymphadenopathy, retroperitoneal cystic hamartoma, extrarenal angiomyolipoma, differentiated liposarcoma, and malignant tumors [12, 13, 19]. In this case, differentiation of the detected neoplasm was carried out precisely with LM and uterine sarcoma.

The main methods of treating LLM are pathogenetic and symptomatic drug therapy, uterine artery embolization, MRI-guided focused ultrasound ablation, interventional radiology methods, and surgical treatment [16].

Indications for surgical treatment are: symptomatic LLM of the uterus (with severe pain or hemorrhagic syndrome, with anemia, or in the presence of symptoms of compression of adjacent organs); an increase in the size of the uterus more than 12 weeks of pregnancy, or - rapid growth of the uterus (as per 4-5 weeks of pregnancy in a year or more); the

presence of a submucosal or atypical location of the node, or a subserous node on the leg; signs of impaired nutrition of the node (necrosis) or its infection; suspicion of malignancy, resistance to pathogenetic hormone therapy. Depending on the size of the LLM of the uterus, its localization and the number of nodes, surgical treatment can be carried out in different ways: with the help of traditional or robotic laparoscopy or laparotomy (myomectomy, total hysterectomy, or total hysterectomy with ovariosalpingectomy) [25, 26].

The extent and method of surgical intervention in this case depended on the presence of a large symptomatic subserous nodule on a wide pedicle and the suspicion of its malignancy. The surgical team removed the tumor and extirpated the uterus with appendages.

According to the literature, macroscopically, LLMs have a white-yellow or yellowish color and a soft consistency [21]. Visual analysis of the surface of the removed tumor and its cross-sectional appearance were strikingly different from the typical characteristic of LLM, as it had a purple-bluish color (Fig. 3) on which a pronounced vascular component was clearly visible (Fig. 1). This tumor had a soft-elastic consistency. Given the unusual color and consistency of uterine LLM, a clinical diagnosis of uterine leiomyoma with a subserous location of the node was established. According to the classification of the International Federation of Gynecology and Obstetrics – FIGO, this type of localization is of type 7. Since this tumor occupied the entire Douglas space, the area of the sacro-uterine ligaments, being intimately adjacent to the sigmoid colon and rectum, ureters and ileum the malignancy was suspected.

The complex histogenesis of these tumors and the diagnosis are confirmed by the data of histopathological and immunocytochemical studies [6].

Now there is evidence that LLM results from genetic disorders (high mobility group protein A2 (HMGA2) gene) and chromosomal rearrangements (chromosomal translocations in 12q15, especially t(12;14) and rearrangements of chromosomes 7, 8, 10, 11, 12 and 14 [5] The possibility of the development of LLM of the uterus due to the direct transformation of immature mesenchymal or smooth muscle cells into adipocytes is not excluded. Under this condition, localized or diffuse mature adipose tissue can form in the leiomyoma or in the myometrium [27] The role of pathological effects of exogenous or iatrogenic factors that contribute to the manifestation of LLM cannot be excluded [28, 29].

As a result of pathohistological studies, the removed tumor was of mesenchymal origin, which indicates that it has a pathogenetic origin similar to typical LM [15], uterine hemangioma [27].

The microscopic structure of LLM is usually represented by bundles of smooth muscle cells, among which varying quantity of adipocytes without signs of cytological atypia and mitotic activity are observed [24]. At the same time, 5 cases have been described where, along with typical cellular elements, spindle-shaped cells with chimeric nuclei and no mitotic activity were found, 2 cases with a large number of mast cells, and 1 case combining these microscopic patterns [26]. This microscopic structure of the tumor most closely corresponded to uterine lipoleiomyoma. The microscopic description of the specimen from the removed tumor, in which clusters of fat cells of normal histological structure were found alongside myometrial formations, confirmed the fact of direct transformation of smooth muscle cells into adipocytes in the patient's uterine leiomyoma. The identification of perivascular areas of immature mesenchymal cells differentiating into adipocytes supports the hypothesis of 'neometaplasia' of the lipomatous component originating from immature perivascular cells. Conversely, data on the multivacuolization of smooth muscle cells and the presence of muscle markers in typical mature adipocytes, detected through immunocytochemical analysis, suggest the direct transformation of smooth muscle cells into adipocytes as a result of progressive disruption of intracellular fat metabolism [30].

Immunoreactivity of tumor cells to desmin, caldesmon, smooth muscle actin alpha, and S-100 in focal adipocytes during immunohistochemical examination, as well as positive staining for smooth muscle actin, desmin, estrogen receptor, and negative staining for HMB-45, confirmed the diagnosis of LLM [30]. At the same time, no signs of malignant changes, obvious mitotic activity (Ki 67 – <1%), or coagulative necrosis were detected in the specimen, indicating its benign nature. Furthermore, the positive reaction of caldesmon, desmin, and smooth muscle actin alpha in tumor cells and the positive reaction for S-100 (DAKO, polyclonal) in fat cells supported the hypothesis of direct transformation of smooth muscle cells into adipocytes. This immunoreactivity of LLM cells in the overweight woman, in our opinion, may support our assumption of the direct transformation of smooth muscle cells in uterine leiomyoma into fat cells [23].

According to medical literature, uterine LLM may be associated with the presence of typical leiomyomas, uterine hemangiomas, vertebral hemangiomas, pelvic lipomas, ovarian cysts, teratomas, and other benign or malignant gynecological tumors and other gynecological pathologies [20]. Histopathological examination of the removed organs revealed

endometrial hyperplasia, uterine body leiomyoma, and cervical cysts, which confirms these data.

Thus, this clinical case demonstrated that uterine LLM is a benign tumor that can originates simultaneously from the body and cervix of the uterus with a broad base and reach large sizes during a prolonged asymptomatic course of the disease in women of reproductive age. Macroscopically, it may have a purple-bluish color and a soft-elastic consistency, while microscopically, it has the structure of a mesenchymoma with a predominance of vascular components. The diagnosis was verified based on the identification in the specimen of mature adipocytes and smooth muscle cells without signs of atypia or mitotic activity during histochemical examination, as well as the immunoreactivity of tumor cells to desmin, caldesmon, smooth muscle actin alpha, and S-100 in focal adipocytes during immunohistochemical analysis.

The prolonged asymptomatic course of the lipoleiomyoma and the patient's irregular visits to the gynecologist led to a delayed diagnosis and increased the extent of the surgical intervention. Since this uterine LLM was mistakenly diagnosed as an ovarian dermoid cyst, we consider it appropriate to highlight the features of this clinical case to accumulate clinical experience in diagnosing, managing patients, and treating these neoplasms.

CONCLUSIONS

1. This clinical case should contribute to the global statistical data on the diagnosis of uterine lipoleiomyoma in women of reproductive age.
2. Lipoleiomyoma should be considered a primary diagnosis in cases of large uterine tumors in overweight women and should be removed immediately after diagnosis, as its malignancy cannot otherwise be excluded.
3. Non-invasive diagnostic methods, such as magnetic resonance imaging or computed tomography with contrast enhancement should be preferred for the planned diagnosis of female genital organ neoplasms.
4. The issue with uterine lipoleiomyoma lies in its unpredictable histogenesis, unexpected presence of fat in its microscopic structure, and visual resemblance to sarcomas.
5. Diagnosis verification is based on histopathological and immunohistochemical examination of the tumor specimen.
6. Uterine lipoleiomyoma may have a purple-bluish color and develop with a broad base from the uterine body and cervix as a result of “lipomatous metaplasia” of an existing uterine leiomyoma.
7. Regular preventive examinations of women of all age groups are crucial for the timely detection of this rare neoplasm.

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