Artykuł przeglądowy *Review*

Tumors of the reproductive system of bitches – based on the description of selected own clinical cases and literature data

PIOTR BRODZKI[1], KAROLINA WOLNIACZYK[2], KATARZYNA GŁODKOWSKA[2], NIKODEM BRODZKI[2]

[1]Department and Clinic of Animal Reproduction, Faculty of Veterinary Medicine,
[2]Students of the Faculty of Veterinary Medicine, University of Life Sciences in Lublin, 20-612 Lublin, Poland

Received 19.01.2023 Accepted 08.03.2023

Brodzki P., Wolniaczyk K., Głodkowska K., Brodzki N.

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Summary

Tumors of the reproductive system in bitches can affect any of its anatomical structures. The predominant lesions are those appearing in the vagina and vulva, accounting for about 2.4-3% of all tumors in bitches, followed by ovarian tumors – 0.5-1.2%, while uterine tumors are rare and it is difficult to even estimate their incidence. The most common type of ovarian tumor is granulosa cell tumor (GCT), which originates from the granulosa cells of the Graff follicle. In the uterus, vagina and vulva, the most common is smooth-cell myoma (*leiomyoma*), along with its malignant types (*leiomyosarcoma*, *rhabdomyosarcoma*), derived from mesenchymal tissue. Diagnosis of these lesions is mainly based on a detailed clinical examination, vaginoscopy, imaging tests (ultrasound, X-ray, CT) and evaluation of sex hormone levels. However, accurate differentiation of tumors is possible only by histopathological examination. The most effective method of treatment is the surgical removal of diagnosed tumors. The paper presents our own clinical cases of tumors of different parts of the reproductive system in bitches: ovarian tumors (GCT); uterine tumors (*leyomyoma*); and tumors of the vagina and vulva (*fibromyoma*, *leyomyoma*). Moreover, the numerous illustrations included in the paper, documenting the mentioned cases, are a valuable addition to the publication.

Keywords: bitches, reproductive system, tumors, diagnosis, therapy

Diseases occurring within the reproductive system of bitches often pose immensely interesting clinical and research material, and the problems which concern the organs of the reproductive system have two common features: they appear suddenly (or are late-noticed by the owners) and they mostly require rapid surgical intervention. Good examples of diseases that are characterized by exactly such a clinical picture and dynamic course, are tumors of the bitches' reproductive system. This type of situation occurs especially in the case of vaginal tumors, which are the most common lesions of the reproductive system in this animal species. The abundant bleeding which often accompanies the disease, or the appearance of a tumor mass protruding from the vulva, prompt the concerned owner to visit the veterinary clinic immediately, and the veterinarian to intervene quickly (48). However, the process of tumorigenesis can involve all anatomical parts of the reproductive system: ovaries, uterus, vaginas and vulvas. Cases of tumors in the reproductive system are all the more interesting because nowadays they are encountered rarely and what's more, their number is successively decreasing as a result of the routine spaying of bitches, which is often performed at a very young age (48, 49). Spaying can be treated as prophylactic, aimed not only at the elimination of tumors, but also the other diseases which affect ovaries and uterus (26). In addition, inhibition of the hormonal activity of the ovaries (by their removal) prevents the occurrence of hormone-dependent tumors in other parts of the body for example in the mammary gland (5). According to the literature data, among the tumors of the female genital organs, the lesions which appear in the vagina and vulva, accounting for 2.3-4% of all tumors in bitches, are the dominant ones. They are followed by the ovarian tumors, which constitute 0.5-1.2%, while

the uterine lesions are rare and their prevalence is difficult to estimate. What is more, their detection is often incidental (48, 49).

Ovarian tumors

The neoplastic lesions, which will be discussed as the first, are related to the ovaries. Ovarian tumors can be divided into four main groups, based on their origin:

1) epithelial neoplasms – these neoplastic lesions originate from the epithelium, which covers the ovaries from the outside, from the subsurface epithelial structures and from the epithelium of the rete ovarii as well. This type of tumors includes adenomas (adenoma), papillary carcinomas (carcinoma) and their cystic forms – cystic adenomas (cystadenoma) or cystic adenocarcinomas (cystadenocarcinoma) (3, 48). It is worth emphasizing the current studies conducted on women have confirmed, that some of the ovarian tumors classified as the epithelial-originated ones, derive not only from the epithelium of the ovary, but also, for example, from the epithelium of the fallopian tube (it has been established that a large percentage of serous carcinomas have their origin precisely in the epithelium of this organ) or from the endometrium, which takes place for example during the endometriosis, when the endometrium (as a result of its migration) enters the ovary surface. Endometrial and clear cell carcinomas are likely to originate from this type of disease (32);

2) germ cell tumors – these tumors originate from the germ cells of the gonad parenchyma. We include in this group: proliferative neoplasms (dysgerminomas, gonadocytomas) and teratomas, including malignant undifferentiated teratomas (teratocarcinomas);

3) sex cord stromal tumors – these lesions are the pathologies originating from the stroma of the female gonad and from the sex cords as well. This group, as well as the structures and cells undergoing the cyclic changes on the ovary, is the most diverse which can also undergo neoplastic processes. Tumors belonging to this group can derive from: cells of the granular layer of the ovarian follicle (granulosa cell tumor, folliculoma), theca cells (thecoma, theca cell tumor), cells of the corpus luteum (luteoma), supporting cells of the ovary (Sertoli cell tumor of the ovary, sertoliomaovarii) and interstitial cells of the ovary (Leydig cell tumor, interstitial cell tumor). Tumors which are part of this histological group have the ability to produce sex hormones. The secreted hormones can be varied, depending on which underlying tissue has undergone the proliferation process (granulosa cells – estrogen, inhibin and anti-Mullerian hormone; lutein cells – progesterone; interstitial cells – testosterone). Entering into the animals' blood these hormones can affect the reproductive system, causing disruption of the ovarian cycle, induce the appearance of the general symptoms in the form of hyperestrogenization (characterized by estrous symptoms, hormonal alopecia and even bone marrow suppression) and also hyperadrenocorticism of ovarian origin, which can be manifested as polyuria, increased thirst and a visibly enlarged liver (3, 10, 33, 56);

4) sex cord stromal tumor – the histological origin of lesions belonging to this group is difficult to determine unequivocally. They represent a very narrow group of tumors with heterogeneous histological structure. Among the above-mentioned groups of tumors, the most common are epithelial tumors, which constitute 40-80% and zygomatic tumors which are accounted for 34-50% of all of the ovarian tumors (14, 22, 44, 48, 58). Neoplastic lesions of the ovaries are observed in bitches of all ages, but mostly they affect the older individuals, averaging about 8-10 years of age (9, 20, 22, 44, 58).

The most common type of ovarian tumor in bitches is granulosa cell tumor: GCT (syn. granulosa-theca cell tumor, gynoblastoma, granulosa cell carcinoma), derived from the granulosa cells of the Graff's follicle (35, 42). Literature data indicate that this type of tumor can constitute more than 50% of all cases of ovarian tumors in bitches (18, 19). The course of GCT is characterized by increased production of sex hormones, mainly estrogen and α-inhibin, produced by the neoplastically transformed cells of the granular layer of the ovarian follicle (10, 33, 56). Hormonal changes which are the results of the GCT are often associated with the hyperestrogenization and the external signs of estrus that are characteristic for this condition (51, 60). What is more, in the tumor may additionally develop cancerous lutein tissue producing progesterone, which weakens or even inhibits the symptoms associated with estrogenization, but in turn increases the degenerative and inflammatory processes of the uterus, often leading to pyometra (18, 51, 60).

GCT is mostly diagnosed during a detailed examination of the female reproductive system associated with the occurrence of non-specific clinical symptoms such as an abnormal estrous cycle (prolonged estrus), a pathological discharge from the genital tract and in some advanced cases, a change in the symmetry of the abdominal integuments. Unusual symptoms may also include loss of appetite, vomiting, weight loss and symmetrical alopecia on both sides of the back (19, 30, 60).

Diagnostics of GCT is based on ultrasound and X-ray examinations of the abdominal cavity which can show a typical, polycystic lesion on the ovary and frequently occurring, concomitant lesions in the uterus, i.e. enlargement and filling of its horns with liquid contents (presumably inflammatory secretion).

The increase of the concentration of sex hormones, which is usually observed in the course of this disease, may facilitate the diagnosis of GCT, therefore determination of the level of estradiol and progesterone in the blood serum is also recommended. The treatment of choice for GCT, as well as for the other ovarian tumors, is ovariohysterectomy. Satisfactory treatment

results were also obtained with direct administration of cisplatin into the abdominal cavity (14, 38). In addition, trial of chemotherapy has been done to cure the Transmisible Veneral Tumors (TVT), but no treatment regimen has been developed till today (6, 14).

Own case report. An 8-year-old, mixed-breed female with a body weight of 25 kg was admitted to the Department of Animal Reproduction of the Faculty of Veterinary Medicine of the University of Life Sciences in Lublin. The owner consulted with a veterinarian because he observed the animal's deteriorating mood, lethargy, decreased appetite, slightly increased thirst, and the presence of purulent discharge from the genital tract. These symptoms persisted with gradual intensification for a few days. The owner confirmed that the local male dogs have been interested in the bitch for a long time, as was the case when the patient was in heat. The bitch had never given birth. The animal was regularly dewormed and basic vaccinations were administered.

Clinical examination of the reproductive system showed swelling of the vulva and the presence of a small amount of purulent discharge. During the vaginoscopy, hyperemia of the mucous membrane of the vaginal vestibule and vagina was observed, which was additionally covered with purulent secretion flowing from the partially opened cervix. Abdominal ultrasonography showed enlarged uterine horns (diameter 40 mm) with non-echogenic content and a significantly enlarged, polycystic left ovary. Hematology showed leukocytosis (L-20000 x109/) with a shift to the left, while biochemistry showed a slight increase of liver enzymes (AST-72 U/l, ALT-64 U/l). Based on the clinical examinations and after the consultation with the owner of the animal, the dog underwent surgery to remove the uterus and ovaries. Ovariohysterectomy and postoperative procedures were performed in a routine way and were uneventful (27). During the procedure, significantly enlarged uterine horns and nodular changes on the left ovary were found (Fig. 1). The left ovary measured 7 × 9 cm (Fig. 2 and 3), was sent for histopathological examination. On the basis of the microscopic image, cells characteristic for granular mesothelioma were found in the structure of the tumor (Call-Exner bodies), this tumor was classified as GCT (granulosa cell tumor). Four months after the surgery, a control radiological examination was performed and did not show any metastases of the tumor. The literature data and own observations maintain that the most effective method of GCT treatment in bitches is ovariohysterectomy (6, 51), which was confirmed in this case. The course of the disease in bitches is usually mild (60). Sometimes there are metastases to internal organs (e.g. to liver, kidneys, lungs, lymph nodes), but these types of situations constitute only 10-20% of all GCT cases (4, 6, 24, 36, 51). In the case of metastasis, surgery alone is not sufficient. Additional treatment consists mainly of immunotherapy, the expected effect of which depends on the age and general condition of the patient. The literature data show that chemotherapy in the treatment of GCT in bitches has not been effectively developed so far (6, 24, 36).

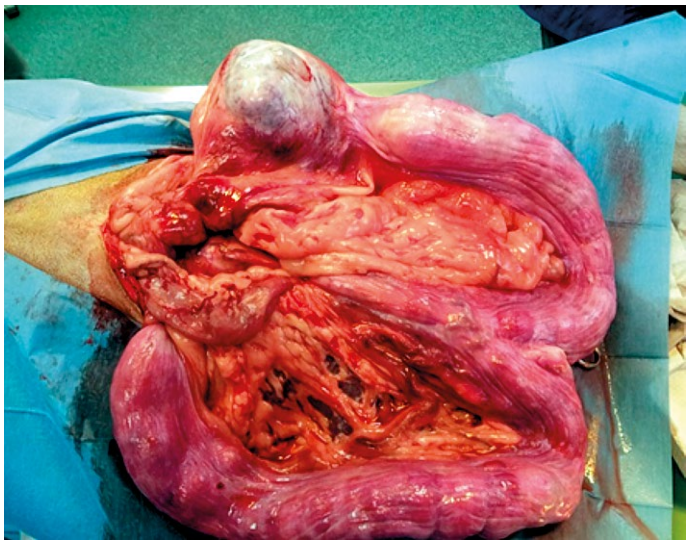

Fig. 1. Visible enlarged uterus and left ovary

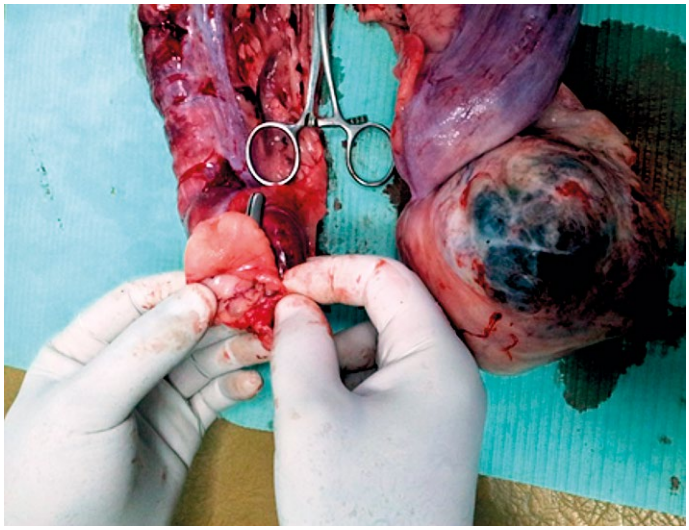

Fig. 2. Normal sized ovary on the left and GCT on the right ovary

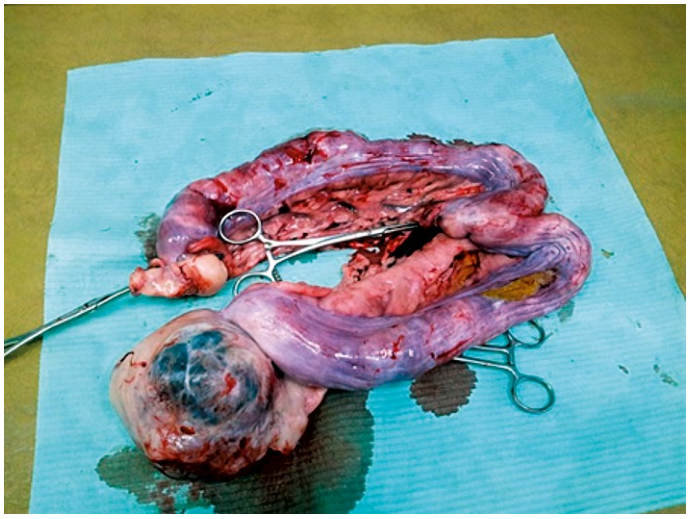

Fig. 3. Isolated altered organs: ovaries and uterus

Uterine tumors

Uterine neoplasms occur rarely, therefore they are sporadically described in the literature. Due to the fact that the uterus is composed of many tissues originating from different germ layers, each of which can undergo proliferation, different histological types of tumors are encountered in this organ. The pathologies which derive from the epithelium, represent mostly carcinomas, as well as adenocarcinomas and squamous cell carcinomas (2, 12, 37, 45, 48). Lesions originating from the mesenchymal tissue (muscle, vascular, adipose and other connective tissues) are the most commonly diagnosed benign leiomyomas, but their malignant types: leiomyosarcoma and rhabdomyosarcomas, are also frequent. Haemangiosarcomas, fibromas and fibrosarcomas, lipomas and myxomas may occur in the uterus as well. Uterine tumors originating from different tissues at the same time, constituting a combination (conglomerate) of multiple types of tumors, e.g. angiolipoleiomyoma, are also described in the literature (7, 25, 39, 48, 53).

Uterine tumors in bitches are very rarely encountered in clinical practice, mainly due to the large-scale sterilization of a large population of animals at a young age. On the other hand, in entire bitches, uterine tumors are mostly diagnosed incidentally, during scheduled spaying in middle-aged (or older) animals or when the other abdominal procedures are performed. However, it is worth mentioning that in the literature there are reports of cases of uterine tumors in young, few months' old bitches (34). Tumors located within the uterus are not a major problem in individuals of this species, especially benign lesions, the presence of which practically do not give any clinical symptoms. Of course, the appearance of some manifestation is possible, which is usually related to the large size of the tumor or the settlement of a smaller lesion in a localization, that may disrupt the functioning of the reproductive system or other organs through pressure, e.g. by causing the difficulty to urinate, which prompts to diagnosis (31, 37).

Among of all neoplasms which can possibly occur within this organ, leiomyoma is the most common in bitches accounting for (together with its malignant types, leiomyosarcoma and rhabdomyosarcoma) up to 90% of all mesenchymal tumors present in the uterus. Other types of tumors (listed above) are diagnosed occasionally (31, 48).

Myoma appears mainly in older, unsterilized animals around 10 years of age (37, 49). It is classified as a benign tumor originating from smooth muscles. It is characterized by slow growth, non-invasiveness and the fact that it does not metastasize.

It may occur as multiple lumps in different layers of the uterine wall (submucosa, subserosa, and myometrium) or, less commonly, as a single tumor located around the horns, body, or cervix. It develops very rarely in the bladder neck or urethra, but such cases have only been described in women (15, 40). Uterine myoma may grow asymptomatically for a long time; however, non-specific and poorly expressed clinical symptoms may occur, being mostly the result of other, accompanying lesions in the reproductive system, for instance the inflammation of the uterus and emerging of various natured discharge from the genital tract. There may also occur ovarian cycle disorders (e.g. no estrus), non-specific bleedings, and in the case of large tumors – enlargement of the abdominal integuments (31, 37).

In case of absence of typical symptoms and unknown etiology, uterine fibroids are often detected accidentally during imaging diagnostics related to other disease entities. A very good diagnostic method of this disease is ultrasonography, which makes it possible to visualize the structure, echogenicity, topography and size of the tumor. Radiological examination may reveal a change in the form of a shadow with saturation of soft tissues. The use of more advanced methods, such as computed tomography or magnetic resonance imaging, is usually not needed, but they can be used in the case of the pelvic location of the lesion, when the availability of the previously mentioned methods is limited. These examinations enable assessing the exact topography of the tumor and thanks to this, to plan the appropriate surgical procedure (17, 31, 37).

In case of the situation, when it is impossible to determine the origin of the lesion, which takes place with very large-sized tumors, it is necessary to perform the diagnostic laparotomy with the possible simultaneous removal of the uterus and ovaries. It is currently the method of choice when it comes to the treatment of uterine tumors. Removal of the affected organ leads to a cure (37).

Own case report. The owner brought a crossbreed female, estimated to be a 10 years old, to the Department of Animal Reproduction at the University of Life Sciences in Lublin for a planned ovariohisterectomy. The animal had not been sterilized, as the previous owner had not taken care of it. However, for the new owner, the occurrence of heats, followed by lactomania, became a nuisance and led him to decide to have the bitch sterilized. In addition, apart from heats, the owner has recently observed the appearance of a blood-like scanty discharges from the vagina. Presurgical clinical examination of the animal showed no abnormalities, and the results of the ordered blood morphology and biochemistry were within the physiological norms (57).

The bitch underwent surgical removal of the ovaries and uterus in a routine way and was uneventful (27). During the procedure, it turned out that in the right horn there was a large neoplastic lesion, approx. 7 × 5 cm and a smaller one 2 × 2 cm in the area of bifurcation of the uterine horns (Fig. 4, 5). The procedure did not differ from a standard ovariohysterectomy, excepting a slightly widened incision of the abdominal integu-

Fig. 4. Isolated organs: enlarged uterus with a large tumor on the right horn and a smaller one near the bifurcation of the uterine horns

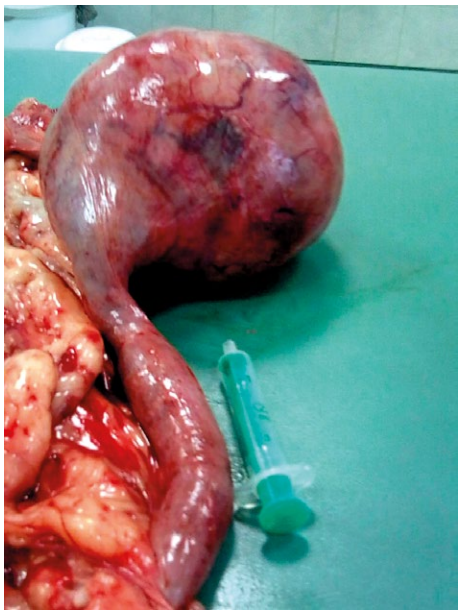

Fig. 5. Uterine tumor, leyomyoma – larger lesions from a close up

Fig. 6. Larger tumor when isolated in cross-section

ments to enable the extraction of the revealed tumor. The removed tumor (Fig. 6) was sent for histopathological examination. On the basis of the microscopic image, the characteristic cells of leiomyoma were found in the structure of the tumor. The post operation recovery was uneventful.

Tumors of the vagina and vulva

The vagina, similarly to the uterus, consists of tissues derived from many germ layers. And so all of the histological types of tumors which were described above in the part "uterine tumors," can occur in this organ. Regardless of the tissue from which vaginal tumors originate, they are most often benign and do not metastasize (14, 48, 54, 55). Leiomyomas, fibromas, as well as infectious venereal tumors, play the most important role in vagina tumors which, according to the literature data, constitute the vast majority of detected lesions. Other types of tumors are very rare, and the malignant ones occur sporadically (48, 53-55). Literature data show that 73 to 94% of vaginal tumors are benign (16, 47). However, other studies have shown that malignant tumors of the vagina can represent a significant percentage (up to nearly 50%) of all studied cases (49). Basically, all of the histological types of skin tumors can occur in the labia area, including mast cell tumors, histiocytic and melanocytic lesions (14). Tumors of the vagina and vulva, as well as the growths of the other areas of the reproductive system, can be found in non-spayed, older, around 10-year-old bitches, and no breed predisposition is observed. The vaginal and vulvar areas are the most common sites of reproductive system tumors and may represent from 2.4 up to 3% of all confirmed tumors in females of this species (14, 48). The etiology of tumors of the discussed area is not fully understood, but it is considered that the most common lesions in the vagina, i.e. myomas, are hormone-dependent, because they are found only in non-spayed bitches and recurrence after surgery occurs only if the bitch does not undergo spaying at the same time. No recurrences have been found after ovariohisterectomy (48, 54). It should be also pointed that a case of a vaginal myoma after sterilization, but with an ovarian remnant, has been described, which confirms the estrogen-dependent myoma theory even more (16, 50, 52). In addition, the occurrence of myomas in many cases (up to one in three females) is associated with the presence of estrogen-producing structures such as ovarian cysts (Fig. 15), GCT (Fig. 16) or hormone-dependent lesions, such as cystic proliferation of the endometrium (Fig. 17), cysts on the outer surface of the uterus (Fig. 18) or the proliferation and enlargement of the mammary gland (14, 16, 59).

Myomas are usually single, rarely multiple lesions, they have various sizes and a tendency to increase. They are located in different areas of the vaginal wall, rarely in the vestibule. These tumors are usually round or oval, of firm or hard consistency, well demarcated from the surrounding tissues, in a connective tissue capsule. The size and consistency may vary, depending on how long the tumor has grown: long-term lesions are larger and harder because they are overgrown with connective tissue. Myomas are usually present in the vaginal cavity and they do not cause any clinical symptoms. This neoplasm is diagnosed only when bleeding occurs due to damage of the blood vessels of the tumor (in the case of smaller lesions), or when tumor reaches a size that causes it to protrude from the vulva, a significant enlargement of the perineal area or

when the previous symptoms are joined by obstructed urination or defecation as a result of pressure from the enlarged tumor mass. A gynecological examination, preferably with a vaginoscopy, is sufficient to confirm the presence of a tumor. Only in the case of deeply located tumors, originating from the cervix, is it necessary to use other imaging tools, like a radiological examination, due to which it is possible to demonstrate the presence and size of the lesion.

Another very typical neoplasm of the vaginal and vulvar area is canine transmissible venereal tumor (CTVT), also known as Sticker's sarcoma/tumor. It is most often observed in young, sexually active bitches and dogs (30). Neoplastic lesions (which are multi-colored – gray, pink and red, single or multiple, small and compact or expanded, often multi-lobed and fragile), are located mainly in the vestibule of the vagina, but they can be also found in the area of the vagina and vulva. Much less frequently, neoplastic lesions are observed outside the organs of the reproductive system; for example, in the oral or nasal cavities. Sometimes the appearance of lesions is accompanied by the discharge of serous-bloody fluid and swelling of tissues (21). In addition, in males dogs we periodically notice either permanently serous-bloody or purulent discharge from the prepuce, which may become swollen. On the surface of the glans penis or prepuce, tumors of various sizes, colors and shapes may appear. Dogs often lick their external genitalia and sometimes, unusual or difficult urination associated with partial closure of the urethral opening can be seen. In both sexes there are usually no noticeable changes in general health, morphology and serum biochemistry do not show significant changes, unless the process of carcinogenesis lasts a long time and is accompanied by secondary infections or metastases (43). Sticker's venereal tumor spreads through mating mainly due to year-round sexually active males (46). A single male dog can transmit tumor cells to as many as 11 to 12 bitches (41). CTVT can also be transmitted by sniffing, licking and biting the damaged skin and mucous membranes (and this is the exact example of situation when neoplastic lesions may appear not only in the organs of the reproductive system, i.e. in the nasal or oral cavity) (1, 30). In most cases, metastases are seen quite rarely, and when they occur, it is most likely that it will take place in the case of immunosuppressed or generally debilitated dogs (41). Metastases in females are most often observed in the uterus, as well as in the inguinal lymph nodes. Occasionally, their presence is also noted within the hairy skin adjacent to the affected organ, as well as in the tonsils, eye, brain, skin, spine, or the organs of chest and the abdominal cavity in patients of both sexes (1, 30).

Clinical examination is highly reliable due to the characteristic appearance of the tumors (cauliflower-like growths). They can be seen with the unaided eye in the area of the vulva, and can also be found during palpation of the vaginal vestibule and vagina. Vaginoscopy is a very good diagnostic method as well. In addition, a cytological examination of a swab taken from the surface of lesions or from washings from the prepuce or vagina, or from material obtained by fine-needle biopsy, is also used (1, 21).

When the patient's clinical picture and diagnosis indicate Sticker's venereal tumor, treatment is attempted. Chemotherapy with vincristine in combination with ivermectin is currently the most effective method of therapy. Vincristine is administered intravenously at a dose of 0.5 mg/m² of body surface area diluted in 10 ml of 0.9% sodium chloride. Ivermectin is administered subcutaneously at a dose of 0.5 mg/kg body weight. (11). Additionally, radiotherapy and immunotherapy using autovaccine or serum from dogs that have undergone spontaneous remission have been successfully used, as well as surgical removal of the tumor with a margin of healthy tissue if possible, especially in the case of small tumors. Dealing with a large and invasive tumor, surgical removal of the lesion is also attempted; however, the chance of recurrence is high, accounting for 50-68% (8, 13, 28, 29), and the contamination of the operated area with CTVT cells may cause the recurrence of the tumor (23). Furthermore, removal of lesions using electrocautery is also described in the literature, and in the case of small tumors, cryotherapy may be used to remove the neoplastic lesion (1, 21).

Own case report I. The owner came to the Department and Clinic of Animal Reproduction of the Faculty of Veterinary Medicine of the University of Life Sciences in Lublin with an 8-year-old mixed-breed female. The interview did not give any symptoms of disease, but the owner was concerned about the enlargement of the perineum area of an unknown origin. Clinical examination of the reproductive system confirmed a significant enlargement of the described area (Fig. 7) and palpation showed the presence of

Fig. 7. Enlarged perineum as a result of the presence of a vaginal tumor

Fig. 8. Episiotomy, allowing access to the tumor present in the cavity of the vagina

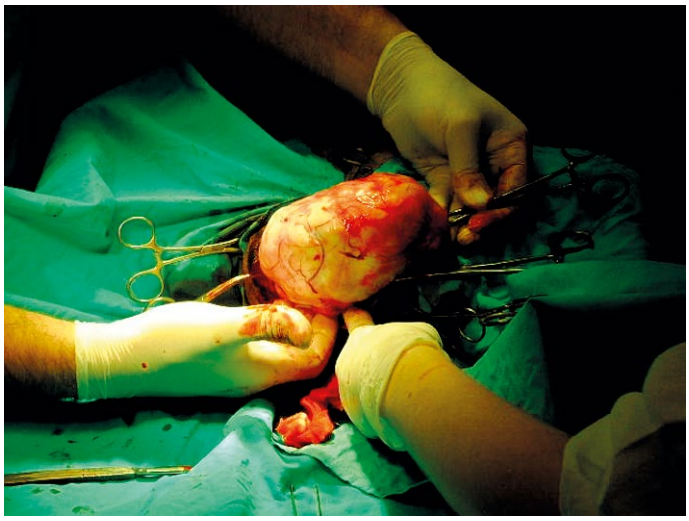

Fig. 9. Enucleation of the tumor and separating it from the surrounding tissues

Fig. 10. Visible catheter inserted into the urethra before and during surgery

Fig. 11. Visible vulva and perineum after the procedure, the skin conjoined by an intradermal suture

a large lesion extending from the lateral wall of the vagina. After consulting with the owner, it was decided to remove the tumor. Initial health checks qualifying for the procedure under general anesthesia were done. The results of haematological and biochemical tests were within reference standards (57). Unfortunately, due to the large size of the tumor, it was decided that an episiotomy was necessary (Fig. 8), which allowed „access" to the tumor, its dissection from the surrounding tissues (Fig. 9) and its removal from the operating field. It should be added that an important element in procedures of this type is the insertion of a catheter, preferably a rigid one (made of metal) into the urethra to avoid its damage or ligation, which can be seen in the photo below (Fig. 10).

After dissecting the tumor from the surrounding tissues, it was removed from the surgical field. The incised tissues of the perineum were approximated: first the vaginal wall, then the subcutaneous tissue and the skin of the perineum (Fig. 11). The procedure was carried out in routine way and was uneventful. There were no complications after the procedure, the bitch recovered.

Own case report II. The owner of a 10-year-old female Golden Retriever noticed that the dog was frequently urinating small amounts of urine, samples of which she collected for the purpose of doing the urinalysis, which did not show any abnormalities. In addition, after some time, minor, sporadic bleeding from the reproductive tract appeared, and the feces were flattened on one-side. These symptoms prompted the owner to seek medical advice. Clinical examination did not show any visible abnormalities and neither did basic gynecological and palpation examinations. The patient underwent X-ray examination, which revealed a large oval tumor in the pelvic cavity, probably originating from the anterior part of the vagina (Fig. 12). The tumor lifted the rectum and narrowed the rectal diameter. Vaginoscopy confirmed that the lesion was located in the deep part of the vagina, near the cervix. Hematological and biochemical tests were performed, the results turned out to be normal (57). It

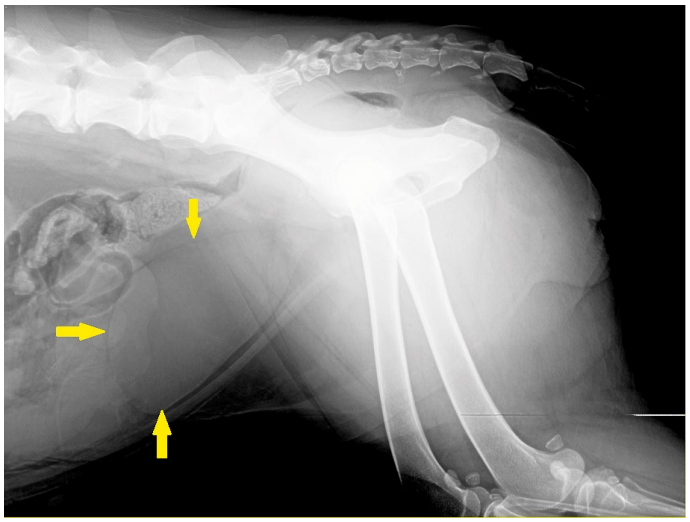

Fig. 12. RTG – visible presence of an oval structure (marked with arrows) in the abdominal cavity

was decided to remove the tumor, which was not easy, because the access to the tumor was difficult: despite the episiotomy, it was impossible to pull the lesion closer to the edges of the wound. After the incision of

Fig. 15. Ovarian cysts, visible on the ovary after incision of the ovarian capsule

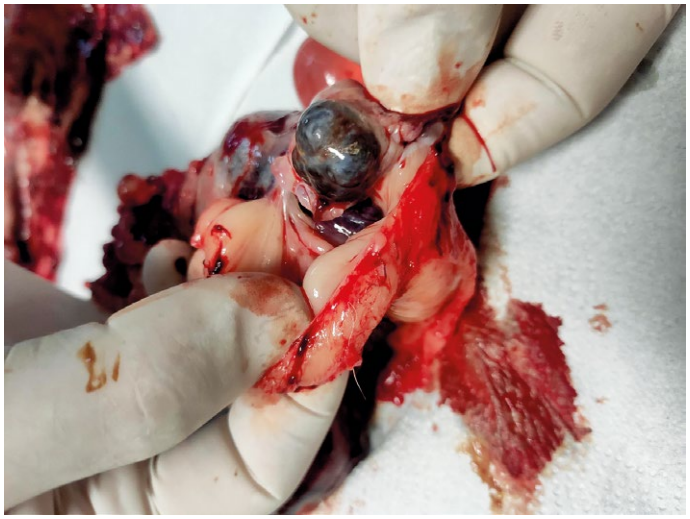

Fig. 16. A developing neoplastic lesion of the ovary (GCT), coexisting with a vaginal tumor

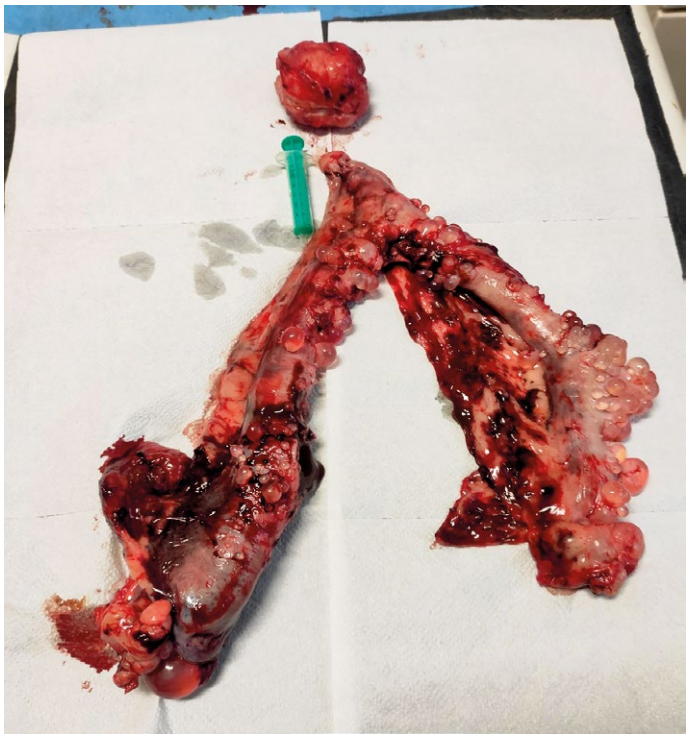

Fig. 13. Removed vaginal tumor and changed uterus with ovaries

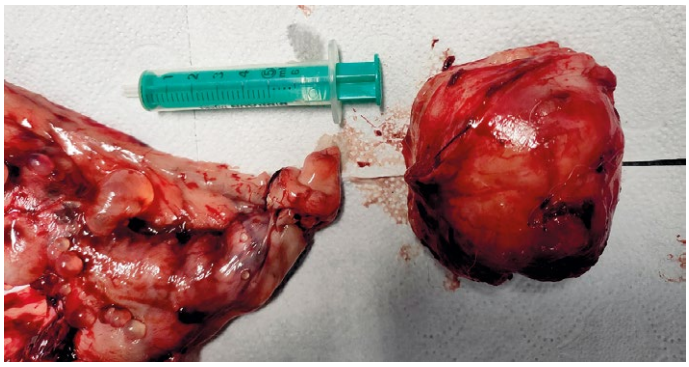

Fig. 14. Close-up of the isolated vaginal tumor

Fig. 17. Cystic lesions of the uterine endometrium accompanying ovarian cysts

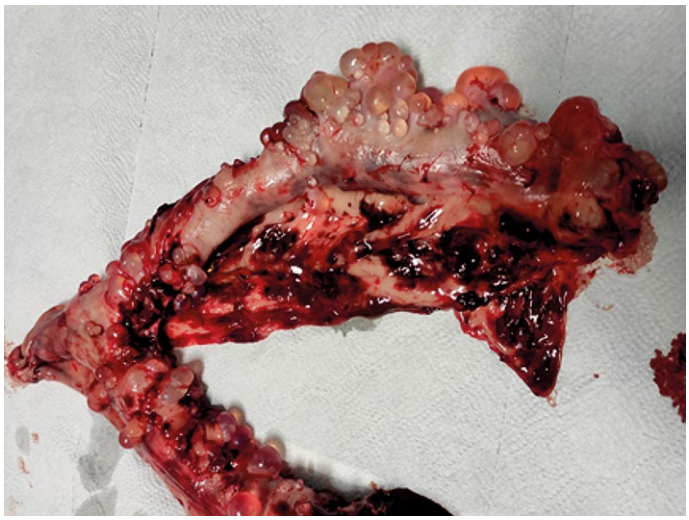

Fig. 18. Cystic lesions on the surface of the uterus

the abdominal integuments and penetration into the peritoneal cavity, the tumor was pushed out from the inside, and at the same time, pulled up from the vaginal' side – it was possible to extract the neoplastic lesion in this way. Next, the lesion was dissected from the surrounding tissues and removed from the operating field (Fig. 13, 14). In addition, the uterus was also enlarged and covered with cysts on the outside (Fig. 18), and a tumor was found on the right ovary (Fig. 16). An ovariohysterectomy was performed in a routine way and was uneventful (27). The tissues of both the vagina and the abdominal wall were then sutured. The removed vaginal tumor and the changed ovary were sent for the histopathological examination. The vaginal tumor turned out to be a fibromyoma, and the ovarian tumor was a GCT. After the medical treatments, the bitch recovered.

Own case report III. The following clinical case concerns an 8-year-old mixed boxer bitch. According to the interview, the animal stayed with an elderly person on a daily basis, who did not provide the appropriate medical and veterinary care to his pet, and did not control its health. The person who decided to report it to the Department and Clinic of Animal Reproduction of the Faculty of Veterinary Medicine of the University of Life Sciences in Lublin was concerned about a large lesion in the vulva area. Clinical examination showed a very large vulvar enlargement, mainly involving the right labia (Fig. 19, 20). A 15 × 10 cm tumor of firm consistency was found. The only treatment in such cases is surgical removal of the lesion, which was planned. Hematological and biochemical tests were performed, the results turned out to be normal (57). The procedure was performed under general anesthesia, in a routine way and was uneventful. First, an incision of the skin surrounding the lesion was made, then it was slowly dissected from the surrounding tissues, ligating larger blood vessels and cauterizing smaller the ones. After removal of the neoplastic lesion (Fig. 21), the remaining tissues were properly sutured: the internal ones with absorbable material and the external ones

Fig. 19. Significant enlargement of the vulva, due to the presence of a tumor in the right labia

Fig. 20. Significantly enlarged right labia pudendi

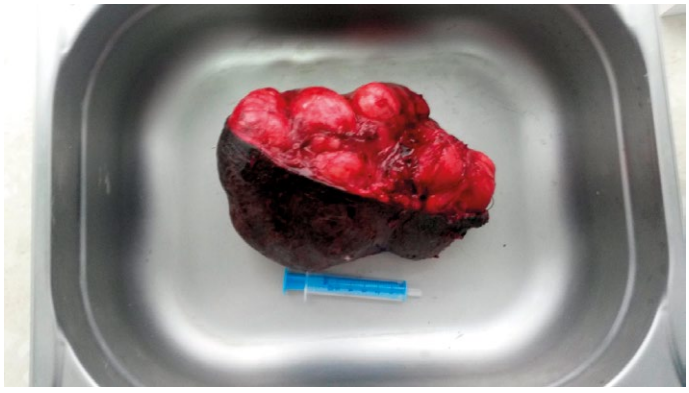

Fig. 21. Tumor after the removal

Fig. 22. The vulva after removal of the tumor and suturing of the postoperative wound

with non-absorbable material (Fig. 22). The tumor was sent for histopathological examination, which confirmed the presence of a leiomyoma. After a successful operation, the dog recovered fully. There was no recurrence a few months after the procedure.

Conclusion

The review presents a chronological list of types of tumors that may occur in the reproductive system in bitches, along with a more detailed descriptions of the lesions that are most often noticeable in given organs. The presence of typical tumors in particular parts of the reproductive system has been extended with the presentation of our own cases, supported by the attached photographic documentation. Symptoms, sufficient to recognize each of the presented lesions, diagnostic methods, short courses of surgical procedures and histopathological diagnoses confirming the affiliation of the removed tumor to the appropriate type (GCT, leyomioma, fibromyoma), are also provided. In the world literature, there are no works describing in such a broad scope simultaneously the most common neoplasms of all reproductive organs in bitches, including presentation of own cases. Available publications describe only single cases, usually involving a single organ. Nowadays, due to the common spaying procedures the appearance of tumors of the reproductive organs is rare. As a result, veterinarians and students of veterinary faculties do not have the opportunity to familiarize themselves with such cases and with basic information about them. Therefore, our work is a valuable supplement to the knowledge and presented to animal owners along with the added photos, can be an important argument in favor of performing prophylactic ovariohysterectomy of their pets. It should be emphasized that the collection of the material presented in this article required several years of work, which significantly increases the value of this study and makes it unique (even more).

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Corresponding author: Piotr Brodzki, DVM, DSc, Univ. Prof., ul. Głęboka 30, 20-612 Lublin, Poland; e-mail: piotr.brodzki@up.lublin.pl, wetdoc@interia.pl