CYTOMORPHOLOGICAL ASPECTS IN GENITAL SYSTEM LESIONS OF BITCH

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Abstract

The current paper presents some cytomorphological aspects in different lesions of the bitch genitalia system, together with their significance for diagnosis. The study was conducted between April 2016 and April 2017 (one year) on 24 bitches with genital lesions. Of the 24 studied cases, six (25%) exclusively exhibited ovarian lesions, four (16.7%) only uterine lesions, four (16.7%) vaginal lesions, while in 10 cases (41.6%) both ovarian and uterine lesions were diagnosed. The sampling for the vaginal lesions was performed both preoperative, through fine needle aspiration (FNA) and impression, and postoperative through abrasive cytology. The uterine and ovarian lesions were sampled after the ovariohysterectomy, through exfoliative and abrasive cytology. The smears were Romanowsky stained and microscopically examined with an immersion objective. The ovarian lesions were tumoral (n=3) and cystic (n=3), the uterine lesions were represented by cystic endometrial hyperplasia-pyometra complex, the vaginal lesions were tumoral – two fibromas and two transmissible venereal tumors (TVT), and the bitches that exhibited both ovarian and uterine pathologies, the uterine lesions were represented by cystic endometrial hyperplasia (CEH)-pyometra complex and the ovarian were represented by cystic ovariopathy (n=8) and tumors (n=2).The cytological examination was of maximum relevance for the tumoral lesions. For the cystic pathology it made the difference between degenerative lesions and cystic tumors. In CEH-pyometra complex, the cytological aspects were very diverse, in correlation with the evolutionary phase of the pathological process and the reactivity of the organism.

Key words: genitalia system, bitch, cytomorphological aspects.

INTRODUCTION

The genital system lesions are frequently involved in bitch infertility (Zubair, 2014). Pyometra is the most frequent lesion of the genital system in bitches, one in four females being affected before the age of 10 years (Baithalu, 2010; Smith, 2006).

Although cytology is a diagnosis option for pyometra, the cytology of the vaginal smear is rarely conducted, diagnosis being usually based on clinical and imaging examinations (Sfartz, 2016). In case of ovarian and vaginal lesions, the accuracy of cytology is over 90%, most often these lesions being diagnosed using cytology (Raskin, 2010; Sforna, 2003). Cytopathological diagnosis helps both diagnosis and differential diagnosis between neoplastic and non-neoplastic lesions (Beker, 2002).

MATERIALS AND METHODS

The study was conducted between April 2016 and April 2017 (one year) on 24 bitches with genital lesions. Of the 24 studied cases, six (25%) exclusively exhibited ovarian lesions, four (16.7%) only uterine lesions, four (16.7%) vaginal lesions, while in 10 cases (41.6%) both ovarian and uterine lesions were diagnosed.

The sampling for the vaginal lesions was performed both preoperative, through fine needle aspiration (FNA) and impression, and postoperative through abrasive cytology.

The uterine and ovarian lesions were sampled after the ovariohysterectomy, through exfoliative and abrasive cytology. The smears were Romanowsky stained and microscopically examined with an immersion objective.

RESULTS AND DISCUSSIONS

The following table is a synthetic presentation of the studied cases.

Although among the breeds in our study there are some prone to pyometra (Chow Chow, Golden Retriever) (Baithalu, 2010), we can not speak about breed predisposition.

Table 1. Presentation of genital lesion cases in bitch

Case No.	Breed	Age	Lesion location	Cytopathological diagnosis
1.	Maltese	14 years	Ovary	Malignant epithelial tumor – ovarian carcinoma
2.	Collie	11 years	Ovary	Malignant epithelial tumor – ovarian carcinoma
3.	Mixed breed	10 years	Ovary	Malignant epithelial tumor–carcinoma or granulosa tumor
4.	Amstaff	9 years	Ovary	Cystic ovariopathy
5.	Shar-pei	10 years	Ovary	Cystic ovariopathy
6.	Caniche	11 years	Ovary	Cystic ovariopathy
7.	Pekingese	16 years	Uterus	CEH-pyometra complex
8.	Caniche	14 years	Uterus	CEH-pyometra complex
9.	Maltese	9 years	Uterus	CEH-pyometra complex
10.	Chow-chow	7 years	Uterus	CEH-pyometra complex
11.	Mixed breed	9 years	Ovary and uterus	Ovarian carcinoma and CEH-pyometra complex
12.	Cocker	10 years	Ovary and uterus	Ovarian carcinoma and CEH-pyometra complex
13.	Mixed breed	7 years	Ovary and uterus	Cystic ovariopathy and CEH-pyometra complex
14.	Golden Retr.	11 years	Ovary and uterus	Cystic ovariopathy and CEH-pyometra complex
15.	Boxer	8 years	Ovary and uterus	Cystic ovariopathy and CEH-pyometra complex
16.	Pekingese	14 years	Ovary and uterus	Cystic ovariopathy and CEH-pyometra complex
17.	Shar-pei	10 years	Ovary and uterus	Cystic ovariopathy and CEH-pyometra complex
18.	Mixed breed	8 years	Ovary and uterus	Cystic ovariopathy and CEH-pyometra complex
19.	Bichon	9 years	Ovary and uterus	Cystic ovariopathy and CEH-pyometra complex
20.	Mixed breed	10 years	Ovary and uterus	Cystic ovariopathy and CEH-pyometra complex
21.	Poodle	15 years	Vagina	Benign mesenchymal tumor - fibroma
22.	Mixed breed	11 years	Vagina	Benign mesenchymal tumor - fibroma
23.	Mixed breed	8 years	Vagina	Round cell tumor – TVT
24.	Bichon	9 years	Vagina	Round cell tumor - TVT

Typically, pyometra is a condition of middle-aged or old bitches. The average age reported in profile literature is 7-8 years (Jubb, 1993), in our case being 10.8 years.

The ovarian lesions were tumoral (n=3) and cystic (n=3), the uterine lesions were represented by cystic endometrial hyperplasia-pyometra complex, the vaginal lesions were tumoral – two fibromas and two transmissible venereal tumors (TVT), and for the bitches that exhibited both ovarian and uterine pathologies, the uterine lesions were represented by cystic endometrial hyperplasia-pyometra complex and the ovarian were represented by cystic ovariopathy (n=8) and tumors (n=2).

Macroscopy

Neoplastic ovaries appear enlarged, with a polynodular aspect, pink-grey color and high consistency (Figure 1).

Polycystic ovaries are enlarged, with uneven surface and numerous cystic structures of different sizes, thin transparent wall and aqueous or citrine liquid content (Figure 2, 3).
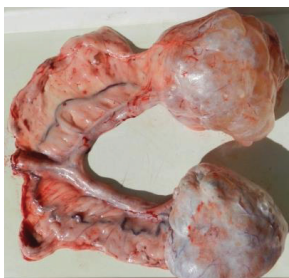

Figure 1. Bilateral ovarian tumor

Figure 2. Cystic ovariopathy

Figure 3. Cystic ovariopathy and pyometra

The uterus with pyometra is distended, and sectioning will exhibit yellow-gray-brown pus of viscous consistency (Figures 3, 4).
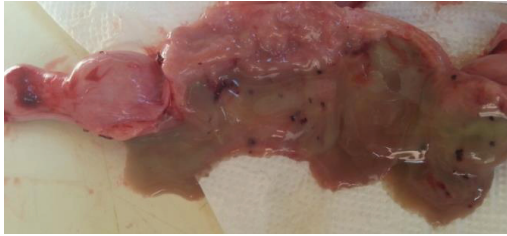
The vaginal masses, diagnosed as fibromas, are enlarged, with uneven surface, polynodular aspect, whitish color and high consistency (Figure 5, 6).

Figure 4. Uterus. Pyometra

Figure 5, 6. Vaginal masses

Cytology

In case of ovarian tumors, hypercellularity and monomorphism of grouped epithelial cells were noted. Tumor cells are of medium or large size, high and variable N/C ratio, anisocytosis, anisocariosis, prominent nucleoli, variable in number and size, and unevenly distributed chromatin (Figure 7, 8)
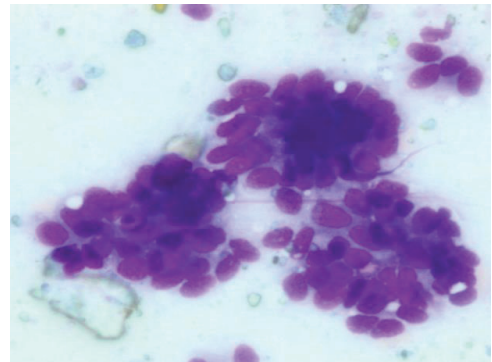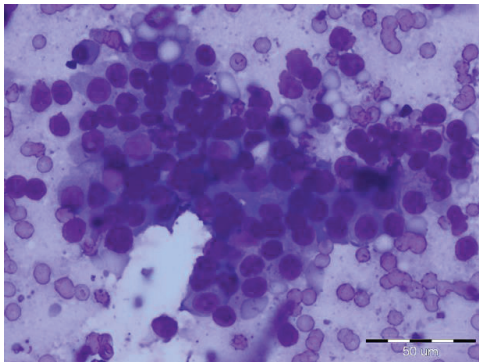

Figure 7, 8. Ovary. Monomorphic population of grouped epithelial cells, with moderate anisocytosis and anisocariosis, high and variable N/C ratio, prominent nucleoli. Malignant epithelial tumor – supposed ovarian carcinoma. M-G.G. staining, x400.

In cystic endometrial hyperplasia-pyometra complex, the aspects were very diverse, in correlation with the evolutionary phase of the pathological process and the reactivity of the organism.

Three cytomorphological patterns were generally noted:

One indicating endometrial hyperplasia. The cells are large, prismatic, with a brush border, vacuolated cytoplasm and a hyperchromic nucleus, pyknotic, basal or central. Mitoses are typical and common. In the background of the smear there are rare non-degenerated neutron-phils, detritus and erythrocytes (Figure 9, 10).
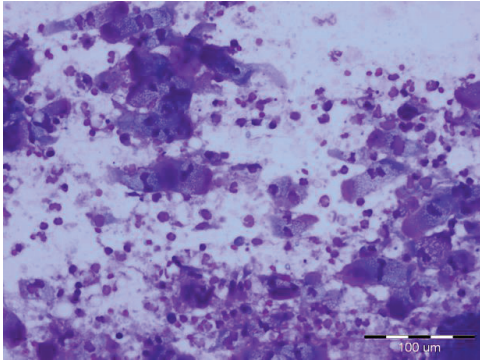
Figure 9. Uterus. Large endometrial cells, prismatic, with vacuolated cytoplasm and hyperchromic pyknotic nucleus. The background of the smear exhibits non-degenerated neutrophils, detritus and erythrocytes. Endometrial cystic glandular hyperplasia. M-G.G. staining, x200.
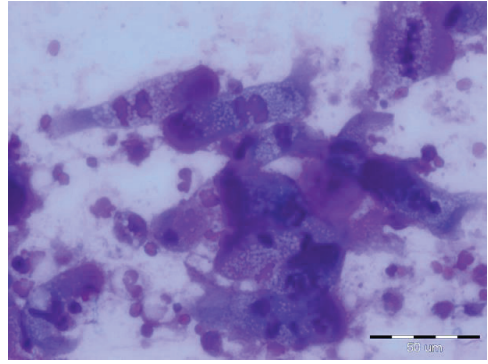

Figure 10. Uterus. Endometrial cells exhibit a vacuolated cytoplasm and a hyperchromic pyknotic nucleus. Mitoses are frequent. Endometrial cystic glandular hyperplasia. M-G.G. staining, x400.

Another pattern indicates an acute septic inflammation, in which neutrophils predominate, non-degenerated and degenerated, and bacteria are present in the smear background and in cytoplasm of the phagocytes (Figure 12).
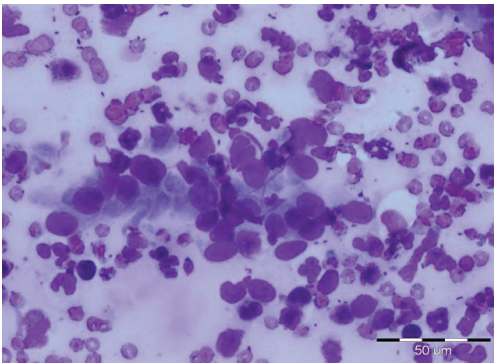

Figure 12. Uterus. Endometrial cells are rare and reactive. Bacteria are present in the background of the smear and within the cytoplasm of phagocytes. Acute septic inflammation - pyometra. M-G.G. staining, x400.
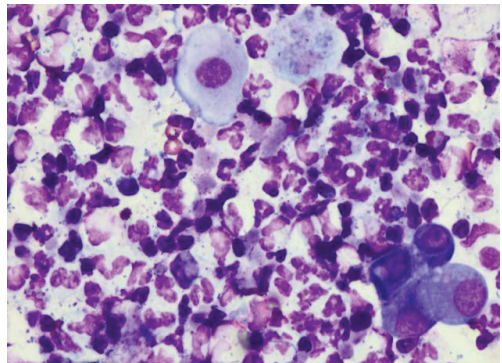

Figure 13. Vaginal smear. In the open cervix pyometra, in addition to parabasal, intermediate, superficial and anuclear local cells, a large number of degenerated neutrophils and bacteria can be noticed. M-G.G. staining, x400.

In the case of the open cervix pyometra, vaginal smears contain many degenerated neutrophils and bacteria (Figure 13).
The third pattern indicates a chronically septic inflammatory process. Local cells are rare and degenerate or absent as a result of endometrial necrosis. First, inflammatory cellularity is mononuclear, with numerous macrophages and rare plasma cells, while numerous bacteria are present in the background of the smear and within the cytoplasm of the phagocytes (Figure 14). Subsequently, the plasma cells dominate and the microbial flora is poorly represented. (Figure 15).
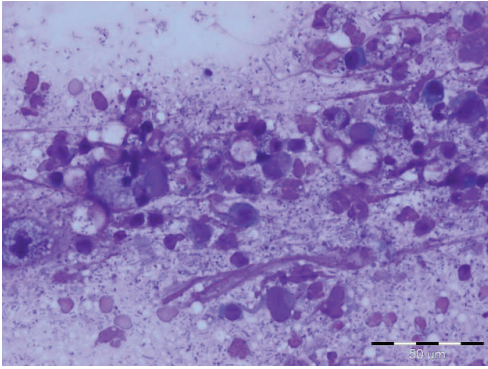
Fig. 14. Uterus. Local cells are rare and degenerate. Inflammatory cellularity is mononuclear, and in the background of the smear and within the cytoplasm of the phagocytes numerous bacteria may be found. M-G.G. staining, x400.
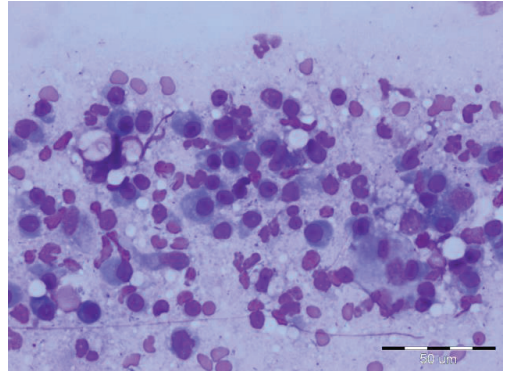
Fig. 15. Uterus. Inflammatory cellularity is mononuclear, with numerous plasma cells. M-G.G. staining, x400.

In case of vaginal masses, hypercellularity, spindle cell monomorphism with oval nuclei, uniform in size and shape, and basophilic elongated cytoplasm were found (Figure 16).

In the canine transmissible venereal tumor, the diagnosis was easily established on the basis of the monomorphic population of round cells with abundant basophilic cytoplasm, with intracytoplasmic vacuoles, round nuclei, numerous nucleoli, coarsely distributed chromatin and atypical mitosis.
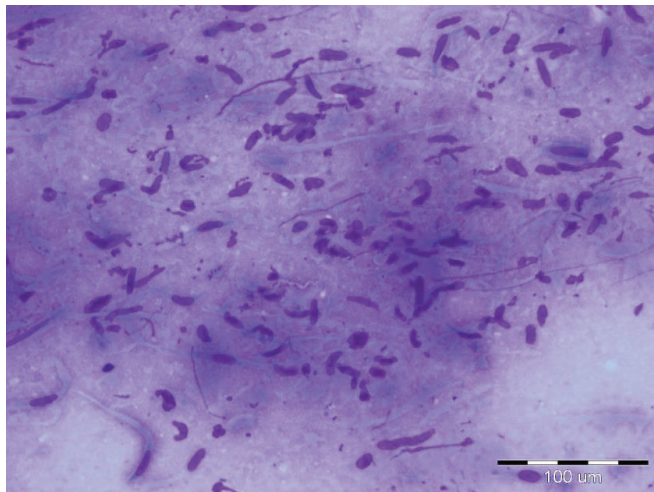

Figure 16. Vaginal mass. Hypercellularity, monomorphism with mesenchymal spindle cells, uniform in shape and size, with oval nuclei, uniform as well. Benign mesenchymal tumor – supposed vaginal fibroma. M-G.G. staining , x200.

The one year-long study of the genital system lesions in bitch aimed the epidemiological and morphological evaluation. An increased incidence of ovarian lesions (16/24) was found, most of them being accidentally identified during neutering, or in females with pyometra. Also noted was the increased incidence of the CEH- pyometra complex, in most cases

associated with ovarian lesions (n = 10), or independently (n = 4). From the analysis of these data, corroborated with the owners' history, it appears that the females had significant hormonal imbalances, mostly induced by contraceptive treatments. The incidence of vaginal lesions was relatively low (4/24), all of them being neoplasms.

The cytological examination was of maximum relevance for ovarian and vaginal tumors. In current practice, cytology testing of genital disorders is not performed through vaginal cytology, although it may capture both the vaginal lesions and the early-stage pyometra. Our study highlights the role of this simple, easy and inexpensive investigation in early detection of genital diseases in bitch and their treatment with the preservation of the reproductive capacity of the females.

CONCLUSIONS

1. Of the 24 studied cases, six (25%) exclusively exhibited ovarian lesions, four (16.7%) only uterine lesions, four (16.7%) vaginal lesions, while in 10 cases (41.6%) both ovarian and uterine lesions were diagnosed.

2. There was no breed predisposition.

3. Females aged 7 to 16 years (with an average of 10.8 years) were affected.

4. The ovarian lesions were tumoral (n = 3) and cystic (n = 3).

5. The uterine lesions were represented by CEH-pyometra complex (n = 4)

6. The vaginal lesions were tumoral (n = 2) and transmissible venereal tumors (n = 2).

7. The bitches that exhibited both ovarian and uterine pathologies, the uterine lesions were represented by CEH-pyometra complex (n=10)

and the ovarian were represented by cystic ovariopathy (n=8) and tumors (n=2)

8. Three cytopathological patterns were identified in the CEH-pyometra complex: endometrial hyperplasia, acute septic inflammation, and chronic plasma cell inflammation.

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