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Histopathological and immunohistochemical investigation of mammary tumors in female cats in Northeast Algeria

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DZ: Data curation; Formal analysis; Writing — review & editing.
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Cancer is a leading cause of feline mortality globally. This study focuses on delineating mammary gland tumor prevalence and anatomopathological characteristics in cats from northeastern Algeria. Encompassing the period from January 2021 to March 2022, the research included 50 cats from Constantine and Annaba provinces, revealing an overall 20% feline mammary tumors (FMT) prevalence. Siamese cats exhibited a higher rate compared to crossbred cats, with a mean age of positively diagnosed cats at 9±0.3 years. Histopathological classification identified 20% of tumors as malignant, specifically squamous cell carcinoma, cribriform carcinoma, and comedocarcinoma. In conclusion, further epidemiological investigations are essential to understand the risk factors in the initiation and progression of these health issues. In contrast to canine species, FMTs are less diverse, predominantly simple malignant tumors. Benign FMTs are infrequent, and the existence of complex and mixed tumors in felines remains unclear. This study selected three FMT types for immunohistochemical analyses, revealing unusual histological characteristics. A set of three malignant tumors exhibited an epithelial/myoepithelial population, with consistent myoepithelial immunohistochemical signatures. All Grade I malignant tumors resulted in subjects surviving one-year post-diagnosis. Morphologically, we propose categorizing them as feline ductal/canalicular adenoma/carcinoma and feline intracanalicular papillary adenoma/carcinoma, respectively. These findings contribute novel insights to FMT classification and are valuable for prognostic studies.

Key words: mammary tumors, female cat, Northeast Algeria, histopathological investigation, immunohistochemical analysis

Introduction

Breast tumors are common in women as well as in wild and domestic mammals. This type of tumor is frequently encountered in female cats [7].

Mammary tumors represent at least one-third of all tumors found in cats. They are generally found in older animals, with an average age of around 10 years for affected animals. Unspayed or late-spayed females are mostly affected. These tumors are rarer in males and young animals [11].

It is known that if a female cat is always fertile, she is more likely to develop these types of tumors. However, it is not known until when spaying decreases the risks of occurrence. Spaying as early as possible gives her a better chance of remaining free from these tumors. Hormones formerly used to suppress heat cycles are a risk factor and predispose to pathological changes conducive to the development of breast tumors [28].

Unfortunately, more than 80% of breast tumors in cats are malignant at the time of diagnosis [29].

In Algeria, there is limited data on the size of the feline population. However, the number of domestic cats kept as pets, as well as stray cats, is assumed to be expanding over the years. Consequently, little information on many health problems encountered in these animals, particularly regarding neoplasms, is available. In this survey, we attempt to describe the prevalence of mammary gland tumors in cats in northeastern Algeria. We will also try to shed light on the mechanisms at the heart of the genesis of this type of cancer and propose guidelines for dealing with breast tumors in female cats [10].

From an epidemiological standpoint, breast tumors are recognized to be less prevalent in the feline species than in the canine species [19]. They seem to represent 5% to 14% of tumors in the feline population according to several studies [10, 11]. Our study represents an incidence of 20% of breast tumors in female cats.

Mammary tumors are the third leading cause of cancer in female cats after skin tumors and lymphomas. Most of the time, these tumors are malignant (85% of cases). Finally, we consider the role of breed, age, reproductive life, estrogen, and progesterone, which seem to favor the development of these tumors. Contraception with synthetic progestagens is a risk factor, as well as diet (fats, fibers, and vitamins), viruses, but also the surgical technique practiced, lactation, and surgical technique. However, further studies are necessary. Nevertheless, we can establish a prevention plan and guidelines for dealing with breast tumors in female cats today [6].

Regarding racial influence, it seems that certain breeds are suspected of being more at risk, such as Siamese and Oriental breeds [3, 7]. Researchers in this field add that this trend is due to the popularity of these breeds but also to the hormonal burden of medications frequently used for contraceptive purposes. These small and medium-sized breeds are often monitored by their owners, allowing for early detection of nodules [2, 5].

Various studies on the impact of age on the development of breast tumors have shown that the incidence increases with age, with the highest frequency found between 9 and 10 years. Most often, these tumor processes concern older, unspayed female cats. The risk of developing these tumors does indeed increase with age. Generally, before 5 years old, the most commonly diagnosed tumors are benign, and after 6 years old, the incidence of malignant tumors increases [8].

Regarding gender influence, females are almost exclusively affected by this type of tumor. However, studies have shown that 1% of these tumors are observed in males [11].

Next, we study the influence of hormonal factors. The development of tumors is influenced by exposure to hormones produced by the ovaries (estrogens and progesterone). According to a study conducted by Lana et al. (2007) [19], the risk of female cats developing breast tumors can be reduced if they are spayed before the age of 2. This benefit is even more pronounced before the age of 6 months and one year (reduction of 91% and 86% of the risk, respectively). However, spaying does not completely eliminate this risk.

Hormones used to prevent or interrupt heat cycles in cats (the “pills”) significantly increase the risk of tumors, more than threefold in females and also in males. Tumors typically appear as nodules or masses in or near the mammary glands, often affecting multiple glands simultaneously. Their size varies with age and growth speed, and they can become inflamed, ulcerated, or infected over time. Regular palpation of the mammary glands is crucial for early detection and treatment. Malignant tumors may spread through lymph nodes to the lungs, pleura, and liver, with bone metastases being rare [14].

Our work aims to conduct a histopathological study of the lesion aspects, interpret them, and correlate them with clinical data to specify the diagnosis, revealing the cancerous nature of a mammary tumor, and assess prognosis to judge therapeutic effects.

The histopathological and immunohistochemical study of mammary cancer in female cats involves a set of procedures and techniques that the sample undergoes before being examined under a microscope in the pathology laboratory of the Constantine University Hospital (CHU). This examination aims to confirm the diagnosis by tracking the spread of the disease, specifying its location, staging, and histological type.

Materials

Animals

The study took place over 14 months, from January 2021 to March 2022, involving 50 ill female cats from two provinces in northeastern Algeria, Constantine and Annaba. Out of the 50 suspected female cats with feline mammary tumors, 10 were registered and presented at the Veterinary Clinical Service of the Institute of Veterinary Sciences — Mentouri Brothers University of Constantine 1, Algeria. Information related to breed, age, reproductive history, and the use of any type of exogenous hormones was collected.

During the consultation, the animals were examined, and their overall health status was assessed (body weight and temperature, heart and respiratory rates, mucous membrane color, size, and consistency of lymph nodes). We checked the location of the mammary tumor(s) on the mammary chain and palpated the other mammary glands to detect any potential tumor involvement, including the consistency, sensitivity, color of the mammary gland affected by the tumor, ulceration, nipple swelling, and fluid discharge. We also assessed the adherence of the tumor to underlying tissues and, finally, the size of the tumor. Among these female cats, we selected some mammary lesions (fig. 1–4).

Laboratory materials

The histopathological examination encompasses a series of processes and techniques that a specimen

undergoes before being analyzed under a microscope in the pathology laboratory of the University Hospital of Constantine. In our study, we utilized the following materials: instruments for specimen collection, reagents for preparing histological sections, and equipment for the production of histological slides.

Methods

The diagnostic suspicion arises from the palpation of one or several nodules/masses located on or around the mammary glands. It is especially strong if your feline is female, older, and has been spayed late. However, not all mammary masses are necessarily tumors; other conditions may exist, such as cysts or fibroadenomatosis.

It is important to make this differential diagnosis because the treatment and prognosis differ radically among these various diseases. For example, surgical removal is not advised for fibroadenomatosis, whereas it is the treatment of choice for mammary tumors [12].

The confirmation of the diagnosis will be done through histological analysis, and the determination of prognosis will be carried out through immunohistochemical studies [9].

Histological analysis is typically performed after the removal of the tumor. It allows for a definitive diagnosis, further refines the prognosis, and, if necessary, adjusts the therapeutic plan. Histological analysis classifies tumors as benign or malignant and helps determine the specific type of the tumor to better predict its biological behavior.

Finally, histological analysis assesses the margins of excision to ensure that all local tumor cells have been removed.

Fig. 1. Largemass (balloon) with an ulcerated, inflamed appearance, and soft consistency of Crossbred race

Fig. 2. Inflamed and adherent nodule of Siamese breed

Fig. 3. Large inflamed mass, soft and mobile consistency, invading the mammary chain of Siamese breed

Fig. 4. Small cystic-looking nodule of Crossbred race

The immunohistochemistry technique involves a comprehensive review of histological characteristics and the available specimens preserved in paraffin. We present the results concerning the use of an immunohistochemical method for detecting carcinomas in feline mammary oncology, specifying whether its application enhances the assessment of cancer-related mortality risk in our patients. The immunohistochemical data allow us to define an immunophenotype based on the expression of estrogen receptors (ER), progesterone receptors (PR), and P40 antibodies, which are selectively expressed in squamous cell carcinoma, as well as P63 protein, a marker that aids in the diagnosis of squamous cell carcinoma.

After general anesthesia, mastectomy of all tumor-bearing glands was performed using routine surgical techniques. We selected some operative specimens taken from mammary glands in sick dogs, identified in figures 5–8.

Next, tissue samples were obtained from the largest tumor lesion and fixed in 10% buffered formalin for 2 days, and then embedded in paraffin. Sections were cut at 3–4 μm and stained with hematoxylin and eosin for histological analyses.

Immunohistochemical analyses (IHC) were performed on selected samples using this method to detect antigens in tissue sections [30]. Samples are exposed to labeled antibodies directed against epitopes of the target antigen, specifically hormone receptors. It is possible to directly visualize the labeling using a marker such as a fluorescent dye, an enzyme, or a radioactive tracer (direct technique). It is also possible to indirectly visualize the labeling using a secondary antibody with the marker directed against the initially used antibody (indirect technique). Immunohistochemical marking of tumor markers is not commonly used in veterinary medicine.

Fig. 5. Small tumor masses whitish-yellowish, altered by necrosis and hemorrhage

Fig. 6. Whitish-yellowish tumor masses with a polypoid appearance altered by hemorrhage

Fig. 7. Tumoral mass with a nodular white-yellowish appearance, altered by fat

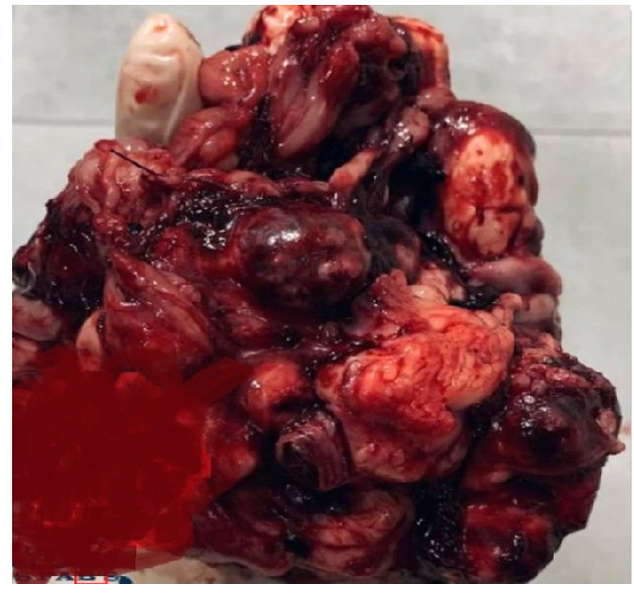

Fig. 8. Ulcerated and budding tumor mass, whitish-yellowish, altered by necrosis and hemorrhage

The tumoral nature, i.e., the type of mammary tumor, is a major prognostic factor. The prognosis will be influenced by the clinical stage: the presence of metastases and large-sized tumors. It will also depend on the histological grade; the higher the grade, the darker the prognosis. Finally, the breed also seems to influence the prognosis, with pure breeds, especially Siamese, appearing to have a worse prognosis.

The first-line treatment is surgical. Due to the high frequency of malignant mammary tumors in cats, the entire mammary chain (removal of all four mammary glands on the side of the tumor with a wide margin) is almost systematically removed. The possibility of tumor recurrence in other mammary glands is not negligible. This wide excision maximizes the chances of obtaining margins free of tumor cells.

In the case of mammary tumors on both mammary chains of your cat, the ideal approach is to remove both mammary chains, one after the other, with a two-week interval [18].

The statistical analysis was performed using *GraphPad Instat Prism 6.04* statistical software *(GraphPad Software, Inc.*, San Diego, CA, USA, 2014).

Data analysis was conducted using descriptive statistics. The distribution of ages and tumor sizes was assessed using ANOVA tests (followed by Tukey's *post hoc*) to compare age and tumor size disparities among different breeds. Chi-square trend analyses were used to evaluate associations between the presence of mammary tumors, breed, and age group. The difference was considered statistically significant at $P<0.05$.

During the study period, a total of 50 female cats were enrolled. Not all of them were spayed, and none received hormonal treatment. They exclusively belonged to two breeds: Siameseand crossbred.

Results

Histological Results

Based on clinical criteria such as rapid progression, tumor size, or local ulceration, it is nearly impossible to differentiate benign mammary tumors from malignant ones solely on clinical presentation. Thus, histological analysis of the entire mass after excision serves as the gold standard supplementary examination. Most other potential tests exhibit very poor sensitivity or specificity in distinguishing malignant tumors. Histological analysis provides predictable behavior and helps to definitively determine if the mass is indeed related to mammary tissue when clinical examination is inconclusive. It can also identify cutaneous or subcutaneous tumors (such as mast cell tumors, lipomas, etc.) or certain rare tumor types like mast cell tumors or mammary lymphomas, as well as malignant mammary tumors.

Malignancy is histologically recognized in 85% to 95% of feline mammary tumors; however, benign lesions can occur. Most malignant feline mammary lesions are simple epithelial tumors, although sarcomas and other non-epithelial tumor types, such as mast cell tumors or lymphomas, may occasionally arise. The majority of feline mammary carcinomas (FMC) develop from the luminal epithelium of ducts and alveoli. Mixed tumors involving both luminal and myoepithelial cells are rare. Feline mammary carcinomas can be of tubular, solid, cribriform, or anaplastic types. Less common forms include lipid-rich carcinoma, mucinous carcinoma, spindle cell carcinoma, and squamous or epidermoid differentiation carcinoma. Inflammatory mammary carcinoma has been reported but occurs much less frequently than in dogs.

Benign mammary lesions are significantly less common in female cats than malignant lesions and constitute an important factor in the differential diagnosis of feline mammary gland masses. Benign mammary lesions in female cats include both neoplastic and non-neoplastic lesions. The former encompasses ductal papillomas, simple and complex adenomas, fibroepithelial tumors, and benign mixed tumors.

The histological aspect of these mammary lesions is described in the figures 9–19.

Immunohistochemistry results

The interpretation of immunostaining analyses relies on both the intensity and quality of membranous marking and determining the percentage of marked cells in relation to the overall carcinoma cell population in the invasive contingent. It also involves assessing the average intensity of this marking [4]. The scale used for interpretation is as follows: 0 = absence of marking; 1 = weak marking visible only at high magnification; 2= medium-intensity marking noticeable at low magnification; 3 = strong-intensity marking appearing very clearly even at low magnification [17].

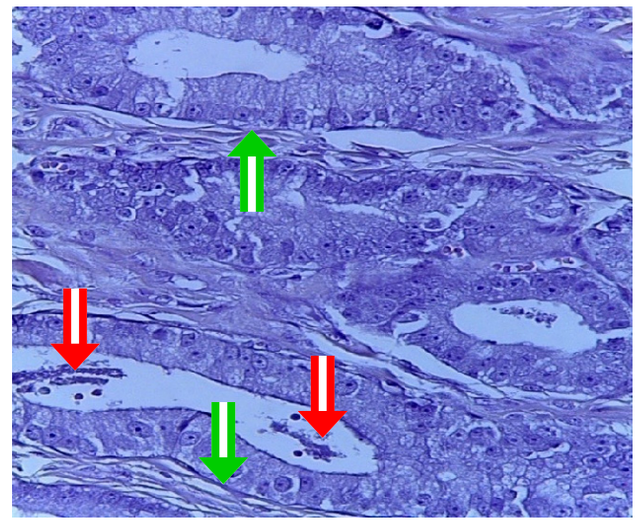

Fig. 9. Histopathological appearance of a tubular carcinoma. The lumen of certain glands is filled with mucus. An infiltrative carcinomatous proliferation forms a glandular structure of variable size and shape, with lumens filled with secretion (red arrow). The tumor cells are cylindrical and polygonal, with abundant eosinophilic, vacuolated cytoplasm and voluminous, centrally located, hyperchromatic nuclei that exhibit moderate mitotic activity (green arrow). X40 HE

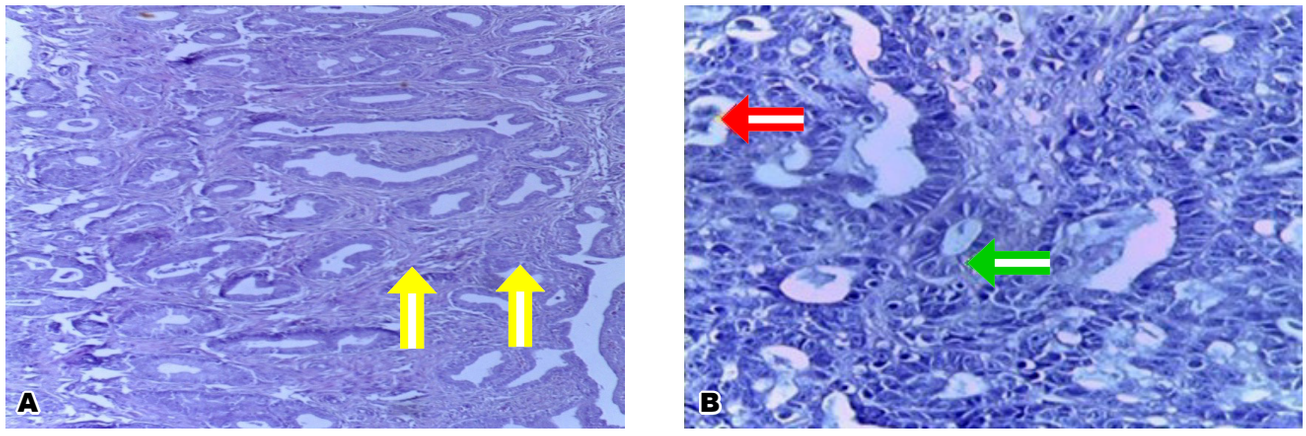

Fig. 10. Histopathological appearance of a typical tubular carcinoma. Mammary parenchyma shows a carcinomatous proliferation (red arrow) forming pseudo-glandular and tubular structures (yellow arrow) of variable shape and size, centered around tumor mucous secretions. These structures are lined by cuboidal to cylindrical cells (green arrow) with reduced eosinophilic cytoplasm and large, irregular, hyperchromatic nuclei, some of which are nucleolated, exhibiting mitotic activity. X10HE (A), X40HE (B)

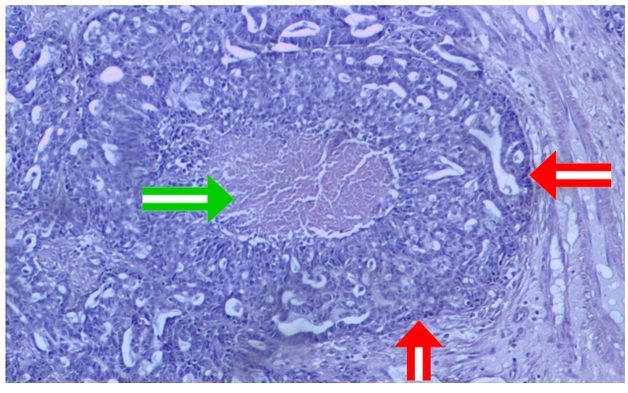

Fig. 11. Histopathological appearance of a typical comedocarcinoma, non-tubular. The lumen of certain glands is filled with necrosis. The mammary parenchyma exhibits an infiltrative carcinomatous proliferation forming lobules of variable size and shape (red arrow) composed of polygonal tumor cells with poorly defined cytoplasm and centrally located, vesicular (chromatin) rounded nuclei. Moderate mitotic activity is centered around the necrosis (green arrow). HEX10

The IHC results show that cribriform carcinomas exhibit positive immunostaining for ER (estrogen receptor) and negative immunostaining for P63 and PR (progesterone receptor).

Prevalence and distribution of Feline Mammary Tumors (FMT)

The overall prevalence of Feline Mammary Tumors (FMT) in the entire studied canine population was 20%. No breed effect (X^2 P=0.54) on the frequency of FMT was recorded, although a high rate was documented in Siamese cats (60%) compared to crossbred cats (40%). The average age of animals diagnosed with mammary tumors was 9±0.3 years, and those aged over 9 years were most affected by this issue. There was no difference in the age of patients regarding their breed (ANOVA P=0.95).

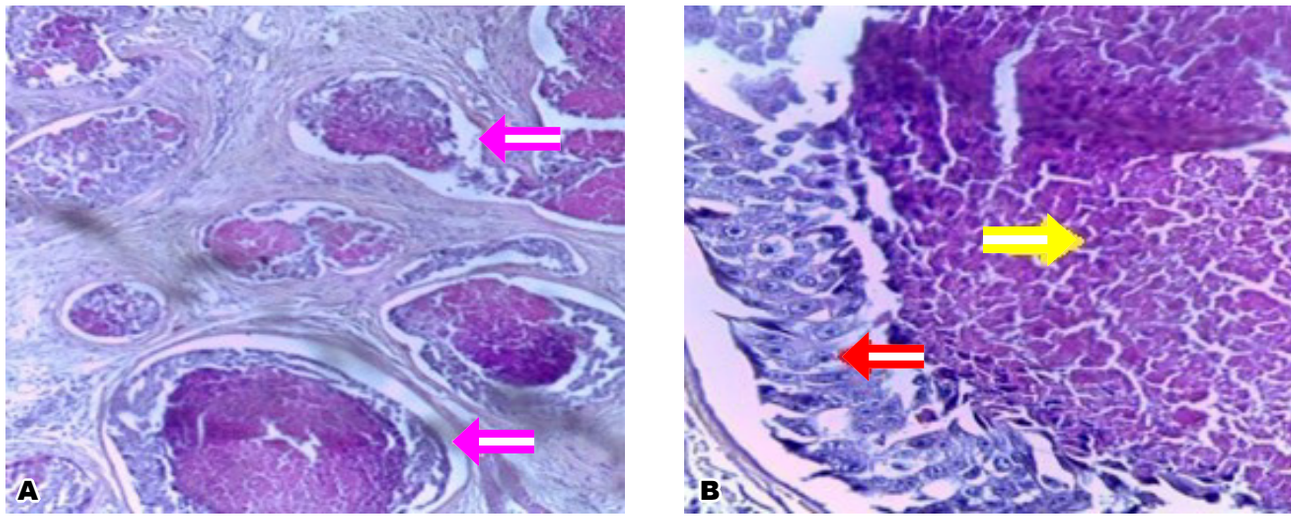

Fig. 12. Histopathological appearance of a comedocarcinoma (large cells**)**. The infiltrative carcinomatous proliferation forms tubular canal-like structures of variable shape and size (pink arrow), with tumor cells that are cylindrical in shape, featuring abundant eosinophilic cytoplasm and large hyperchromatic nuclei (red arrow) exhibiting moderate mitotic activity. In some areas, there are solid tumor foci organized into clusters, centered around necrosis within the tumor lobules (yellow arrow). X10 HE (A), X40 HE (B)

Histopathological Analysis

Adequate histological samples were obtained from all mammary tumors. The distribution and frequencies of the different types are summarized in the table 2. According to histopathological classification, 10 out of 50 (20%) tumors were diagnosed as malignant, with no significant difference (X^2 P=0.54) between their occurrence rates. The malignant neoplasms included squamous cell carcinoma and tubular carcinoma, while comedocarcinoma and cribriform carcinoma were less frequent lesions. Table 2 shows no significant difference based on age (P=0.9) or breed (P=0.68).

Table 1. Distribution of the sampled feline population and its characteristics

Province	Breed	Animals	Positive (%)		Age (years) Mean±SEM
Constantine	Siamese	35	10	6/10 (60)	8,833±0,47726
Annaba	Crossbred	15		4/10 (40)	9,25±0,47871
P value (ANOVA)			0,57162		

Table 2. Type of mammary tumors

Type of mammary tumor	Number	Type of lesions	Percentage (%)
Malignant tumor	3/10	Squamous Cell	30
	3/10	Tubular Carcinoma	30
	2/10	Comedocarcinoma	20
	2/10	Cribriform carcinoma	20

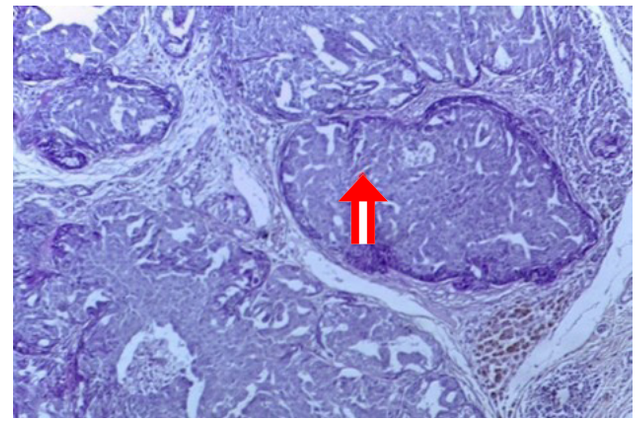

Fig. 13. Histopathological appearance of a cribriform mammary carcinoma. Cribriform carcinoma is rare and is characterized by the proliferation of a population of neoplastic epithelial cells, leading to the formation of a sieve-like arrangement (red arrow). The lumens created are often very small and round, surrounded by bridges of neoplastic cells. The neoplastic epithelial cells vary in shape from elongated to polygonal. X10HE

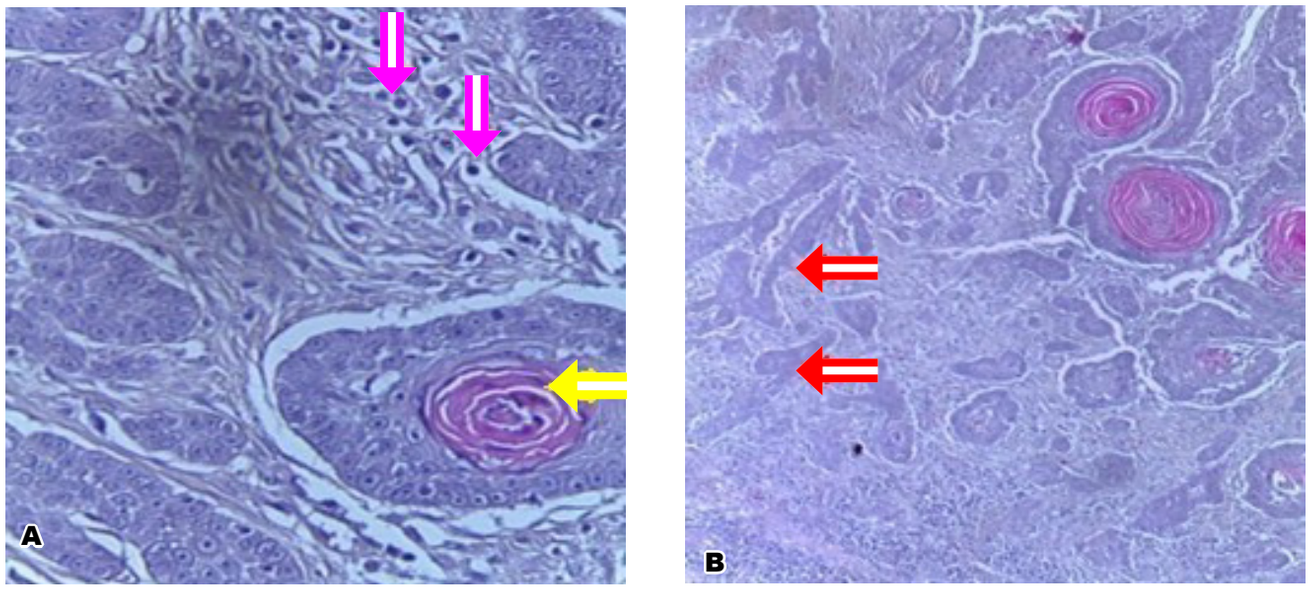

Fig. 14. Histopathological appearance of a squamous cell carcinoma (malpighian metaplasia: presence of keratin). Squamous cell carcinoma is a highly infiltrative trabecular carcinoma composed solely of squamous-type epithelium, developed from Malpighian epithelium and capable of invading Malpighian, paramalpighian, or glandular epithelium (red arrow). The neoplasm arises from squamous cells of ductal epithelial origin, which are part of the skin and mucous membranes that have undergone squamous metaplasia and neoplastic transformation. It is often challenging to differentiate squamous cell carcinoma originating in the mammary gland from that originating in the overlying epidermis and invading the underlying mammary gland. Histologically, the neoplasm resembles that which occurs in the skin. Clusters of polygonal squamous epithelial cells are characterized by light turquoise-blue cytoplasm and large, centrally located nuclei with rounded to polygonal shapes. Significant atypia is present, including anisokaryosis, anisocytosis, and pronounced nucleolation (pink arrow). Furthermore, some tumor cells may synthesize keratin (cornification), leading to the carcinoma being termed mature or keratinizing. This keratinization may involve isolated cells or clusters of cells known as “keratin pearls.” The cytoplasm becomes highly eosinophilic, and the nuclei become pycnotic, accompanied by the formation of lamellar keratin areas (yellow arrow). X40 HE (A), X10HE (B)

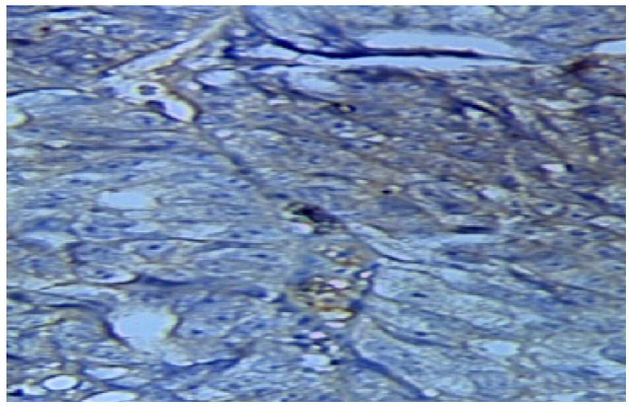

Fig. 15. The absence of staining — negative reaction for P63

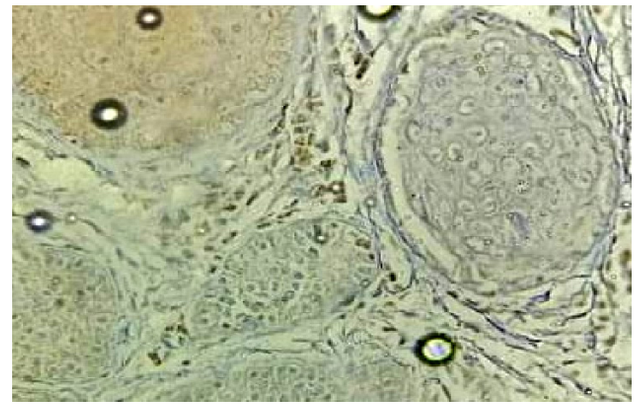

Fig. 16. Brown staining — positive reaction for RE

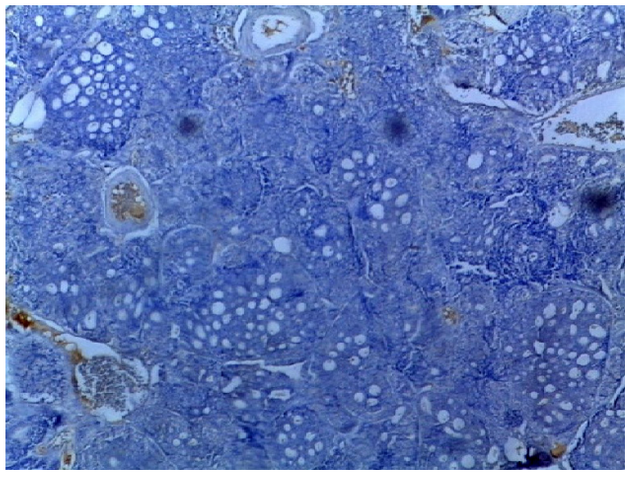

Fig. 17. Absence of negative staining for Receptor Protein (RP)

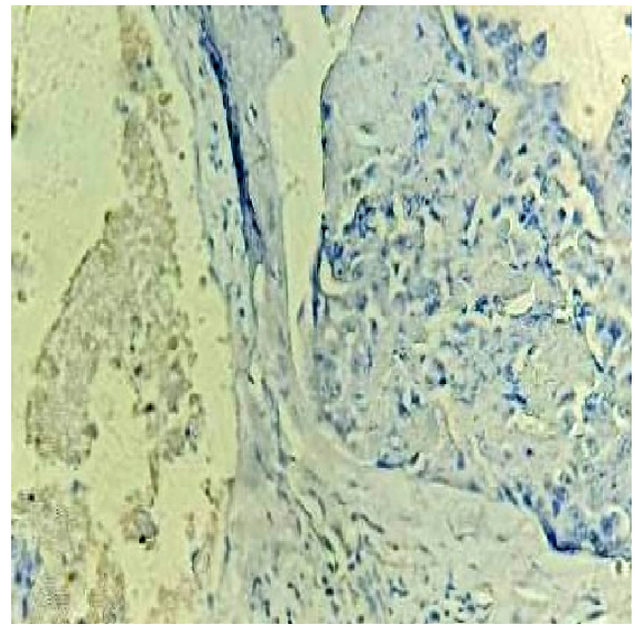

Fig. 18. Absence of negative staining for RE

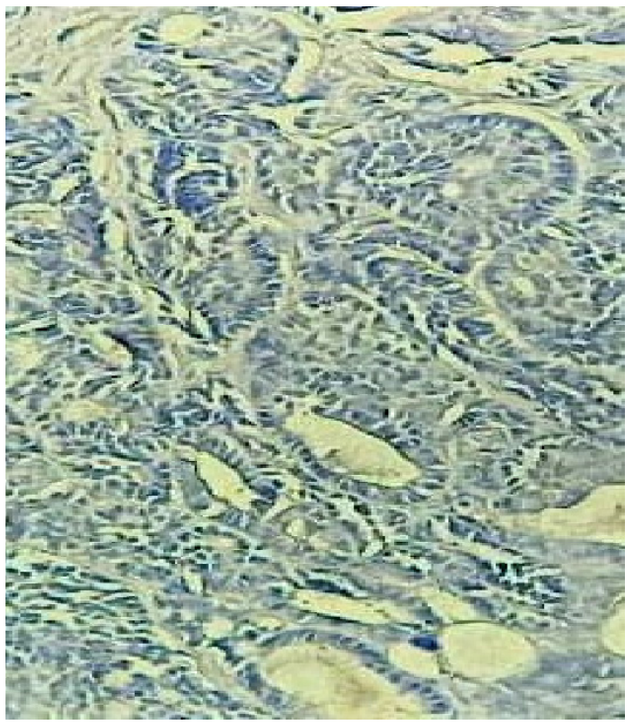

Fig. 19. Absence of negative staining for P40

Discussion

Breast tumors are the third most common type of tumor in female cats, with over 80% of cases being malignant [13]. They occur spontaneously, similar to women and female dogs [15]. They affect cats between 10 and 12 years old but can also develop in younger cats [16].

Results from clinical examination and histopathological analysis showed that the cat presented in this study has malignant feline mammary tumors. Approximately 20% of mammary masses in cats are of neoplastic origin [20]. A recent study [21] recommended important guidelines for prognosis studies in veterinary oncology, emphasizing the need to standardize mammary tumor diagnoses [31]. In this context, this study provides new information related to FMT classification, aiding prognosis studies and a better understanding of mammary tumor histogenesis.

Clinically, our case exhibited anorexia and significant, rapid swelling in the mammary region. According to [19], feline mammary tumors are clinically characterized by significantly enlarged, highly inflamed, and firm mammary glands. In 87% of cases, only the last mammary glands are hypertrophied. Lesions can eventually ulcerate and become very painful. General condition is rarely affected, but the cat may show tachycardia, lethargy, and sometimes anorexia.

In our case, we did not observe ulcerations on the mammary glands because the time between the appearance of mammary masses and the clinical examination was short. Loukopoulos et al. (2007) [22] reported that, generally, at the time of a late diagnosis of mammary tumor in a cat, the tumor is ulcerated and already metastasized.

Histologically, we observed neoplastic proliferation of the stroma and mammary epithelium. In the study by Mills et al. (2015) [26], immunohistochemical labeling, an indicator of mammary cell proliferation, showed a very high proliferation index in epithelial and stromal cells, especially in malignant tumors.

Histological analysis is usually performed after tumor removal, providing a definitive diagnosis and classifying tumors as benign or malignant [21]. We describe 10 neoplastic lesions in the mammary gland in cats with morphological characteristics not detailed in the most recent WHO classification. Using both histological analysis and immunohistochemistry, three different histological types were identified.

Our results are discussed according to the old classification by Misdorp et al., (1999) [27] and the recent classification by Zappulli et al. (2013) [33]. The former is primarily based on morphological criteria and is inspired by the classification of breast cancers in women, including only cats and dogs. The latter was proposed as part of the classification of tumors in animals and brings together various tumors and dysplasias of the mammary gland in female dogs. This latter classification has been adopted by veterinary pathologists as it provides them with the main morphological criteria.

Results from histopathological examinations of our samples show that out of 50 suspected tumors, 10 tumors are malignant, accounting for 20%, including 3 squamous cell carcinomas, 5 tubular carcinomas, and 2 cribriform carcinomas. FMTs are generally aggressive carcinomas (80% to 90%) with a poor prognosis. The recent classification of FMT published by the World Health Organization (WHO) is based on morphological criteria, distinguishing non-invasive in situ carcinomas, infiltrating carcinomas, and simple carcinomas of various histological subtypes, similar to human breast cancer classification (HBC). The most common type is an aggressive infiltrating carcinoma [32].

Among benign/dysplastic lesions, there is a high incidence in cats of a specific subtype classified as fibroadenoma/fibroadenomatous change, while other adenomas and canalicular papillomas are rare [28]. Compared to canine mammary tumors (CMT), FMTs are much less heterogeneous, with a marked predominance of simple neoplasms composed only of luminal epithelium. The existence of complex cells and mixed tumors in the feline species has not been precisely documented. Mixed benign and malignant tumors are rarely reported in cats by some authors [21, 29], and more recently, complex feline mammary carcinomas have been described [23].

The role of myoepithelial cells in CMT has been discussed, and their presence in complex and mixed tumors is associated with less aggressive biological behavior. Morphological features of myoepithelial components in complex and mixed CMTs are well characterized and can be easily recognized in standard hematoxylin and eosin (HE) sections. In canine tumors, it is often a reactive/benign component even though subtypes of CMT with malignant myoepithelium have been reported (malignant carcinoma and myoepithelioma; malignant myoepithelioma) [24, 25].

Several studies [1, 29] have investigated the immunohistochemical profile of myoepithelial cells, indicating a progressive differentiation from basal/undifferentiated cells to well-differentiated myoepithelial cells capable of undergoing osseous/metaplastic transformation in canine mixed tumors [9, 15]. Well-established immunohistochemical staining of canine mammary myoepithelial cells includes the expression of cytokeratins (CK5_6 and CK14), calponin, p63, vimentin, and ER/PR, P40.

The presence of myoepithelial-like cells in FMTs has sometimes been described based on immunohistochemical staining. However, to date, the few studies [8, 9] describing feline mammary carcinomas with immunohistochemical signs of myoepithelial differentiation found a better prognosis compared to more common simple tumors. A few new categories have been added, such as ductal and intraductal tumors and papillary carcinomas and malignant myoepitheliomas.

Accurate and standardized morphological classification of neoplastic lesions is essential to aid prognosis and comparison between studies [27, 33].

Feline mammary tumors are typically aggressive and malignant carcinomas. This study emphasizes the clinical and anatomical-pathological characteristics of mammary tumors in a 10-month-old local breed cat. Clinically, these malignant tumors are marked by the sudden onset and rapid development of masses in the mammary glands, particularly during the first heat cycle.

The findings underscore the importance of histopathological examination in veterinary oncology. Confirming suspected tumors and determining their nature and characteristics is essential, as reliable methods for identifying tumors at the clinical diagnosis stage are often lacking. Consequently, treatment frequently begins before the tumor's nature is established, typically involving the early surgical removal of the affected mammary tissue.

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Патогістологічне та імуногістохімічне дослідження пухлин молочної залози кішок у північно-східному Алжирі

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Рак лідирує серед причин смертності котячих у всьому світі. Це дослідження зосереджене на окресленні поширеності пухлин молочної залози та анатомопатологічних характеристик у котів з північно-східного Алжиру. Дослідження тривало з січня 2021 р. по березень 2022 р. та охопило 50 котів із провінцій Константина і Аннаба, виявивши загальну поширеність пухлин молочної залози у кішок на рівні 20%. У сіамських кішок показник був вищим, ніж у помісних тварин, середній вік кішок з позитивним діагнозом становив 9±0,3 року. Гістопатологічна класифікація визначила 20% пухлин як злоякісні — зокрема плоскоклітинний рак, крибриформну карциному та комедокарциному. З огляду на це, подальші епідеміологічні дослідження є важливими, щоб зрозуміти фактори ризику появи та прогресування цих проблем зі здоров'ям. На відміну від собак, у кішок пухлини молочної залози менш різноманітні, переважно прості злоякісні; доброякісні виявляють рідко, існування комплексних і змішаних пухлин у котячих залишається невивченим. У цьому дослідженні вибрали три типи пухлин молочної залози кішок для імуногістохімічного аналізу, виявивши нетипові гістологічні характеристики. Набір трьох злоякісних пухлин демонстрував епітеліальну/міоепітеліальну популяцію з відповідними міоепітеліальними імуногістохімічними ознаками. Усі злоякісні пухлини I ступеня призвели до того, що тварини вижили протягом одного року після встановлення діагнозу. Морфологічно ми пропонуємо класифікувати їх як котячу протокову/канальцеву аденому/карциному та котячу інтраканалікулярну папілярну аденому/карциному відповідно. Ці висновки вносять нову інформацію в класифікацію пухлин молочної залози кішок і є цінними для прогностичних досліджень.

Ключові слова: пухлини молочної залози, кішка, північно-східний Алжир, патогістологічне дослідження, імуногістохімічний аналіз

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