İstanbul Üniversitesi
Veteriner Fakültesi Dergisi

Journal of the Faculty of
Veterinary Medicine Istanbul University

*İstanbul Üniv. Vet. Fak. Derg. / J. Fac. Vet. Med. Istanbul Univ., 41 (1), 109-112, 2015*
*doi: 10.16988/iuvfd.2015.71535*

***Olgu Sunumu*** ***Case Report***

# Secondary Inflammatory Mammary Carcinoma in a Cat? Clinical and Cytological Findings

*Tuğba Seval Fatma TOYDEMİR[1]*, Özge ERDOĞAN[2], Esra KARAÇAM[1], Gülay YÜZBAŞIOĞLU ÖZTÜRK[2], İsmail KIRŞAN[1]*

[1]*Istanbul University, Faculty of Veterinary Medicine, Department of Gynecology and Obstetrics, Avcılar, Istanbul, Turkey*
[2]*Istanbul University, Faculty of Veterinary Medicine, Department of Pathology, Avcılar, Istanbul, Turkey*

****Sorumlu Yazar / Corresponding Author:***

*Tuğba Seval Fatma TOYDEMIR*
*e-mail: sevaltoydemir@yahoo.com*

***Geliş Tarihi / Received:***
24 April 2014

***Kabul Tarihi / Accepted:***
15 June 2014

***Anahtar Kelimeler:***
Kedi, kedigiller, mastektomi, inflammatorik meme karsinoması, sitoloji

***Key Words:***
Cat, feline, mastectomy, inflammatory mammary carcinoma, cytology

**Abstract**

A case of secondary feline mammary tumor described and discussed with its clinical features similar to inflammatory mammary carcinoma (IMC) in this paper. In cats, there were only very few cases of IMC reported until now. A 14-year-old, longhaired female cat was presented to the clinic for the rapid onset of erythema, local pain and warmth of the inguinal region, with a mild exudative haemorrhagic-ulcereted lesion in association with a good-defined underlying mass. The cat had bilateral mastectomy surgery four years ago. Cytological findings were highly associated with inflammatory mammary carcinoma. Due to diffuse pulmonary metastases of the cat surgery could not be suggested as a treatment. In conclusion 1) feline IMC could be useful as an animal model of human inflammatory breast cancer 2) mammary cancer patients should be approached cautiously after even bilaterally performed mastectomy surgeries.

**Özet**

**Bir Kedide Sekonder Inflamatorik Meme Karsinomu? Klinik ve Sitolojik Bulgular**

Bu yayında sekonder olarak ortaya çıkmış bir meme tümörü vakası tanımlanmış ve inflamatorik meme karsinomuna (İMK) benzer klinik özellikleri tartışılmıştır. Kedilerde şimdiye kadar oldukça az sayıda İMK tanımlanmıştır. 14 yaşında, uzun tüylü, dişi bir kedi inguinal bölgesinde hızlı gelişen ağrılı, eritramatöz ve ısı artışı olan, hafif eksudatif ve hemorajik-ülseratif lezyonlu, alt dokudan iyi sınırlanmış bir kitle nedeniyle kliniğe getirilmiştir. Kedi dört sene önce bilateral mastektomi operasyonu geçirmiştir. Elde edilen sitolojik bulgular inflamatorik meme karsinomuyla yüksek oranda bağlantılı bulunmuştur. Diffüz pulmoner metastazlarından ötürü kedinin cerrahi operasyon geçirmesi önerilmemiştir. Sonuç olarak 1) kedilerdeki İMK insanlardaki için güzel bir hayvan modeli oluşturabilir 2) meme kanseri hastaları bilateral yapılan mastektomi operasyonlarından sonra bile dikkatli ele alınmalıdır.

## Introduction

Mammary tumors are seen very common in dogs and cats, and the majority of these tumors in cats are highly malignant (Munson and Moresco, 2007) and it is the third common neoplasm (17%) in cats after skin tumors and lymphomas (Zappulli et al., 2005). Inflammatory mammary carcinoma (IMC) is a special type of locally advanced mammary cancer and it is associated with aggressive behavior and poor prognosis in women and dogs. In cats, there have been only very few cases of IMC reported until now.

## Case

A 14-year-old, longhaired female cat was presented to the clinic for the rapid onset of erythema, local pain, oedema and warmth of the inguinal region, with a mild exudative haemorrhagic-ulcereted lesion in association with a good-defined underlying mass-3.2 cm×1.5 cm in size (Figure 1). When clinical signs of tumors were

detected, the cat had a slight decrease in appetite and weight loss, and the mass had been noticed two weeks ago when the cat licked the inguinal area so often but no other complaints were noted apart by the owner from those described under clinical signs. At physical examination, the inguinal lymph nodes were enlarged and weight loss, dehydration and dyspnea were also noticed. Diffuse pulmonary metastases of the patient found by chest x-rays (three projections, Figure 2), but complete blood cell counts (CBC) and biochemistry panel showed almost normal results at the time of tumor occurrence (Table 1). According to CBC, only decreased level of the platelet count was found. Unfortunately abdominal ultrasonography of the patient was not available at the time of the diagnostic evaluation.

**Table 1.** CBC and biochemistry of the cat upon arrival.

**Tablo 1.** Kedinin kliniğe getirildiğindeki hemogram ve biyokimya değerleri.

| Parameter | Reference Ranges | Value |
|---|---|---|
| RBC | 6.0-10.0 µL | 7.05 |
| HGB | 9.5-15 g/dl | 10.1 |
| HCT | 29-45 % | 32 |
| WBC | 5.5 -19.5 µL | 11.6 |
| PLT | 150-600 µL | **138** |
| MCV | 41-54 | 45 |
| MCH | 13.3-17.5 pg | 14 |
| MCHC | 31-36 % | 32 |
| ALT | 28-76 IU/L | 38 |
| AST | 5-55 IU/L | 34 |
| UREA | 15-34 mg/dl | 34 |
| CREATININE | 0.8-2.3 mg/dl | **0.6** |
| GLUCOSE | 70-150 mg/dl | 106 |
| CHOLESTEROL | 82-218 | 117 |
| GGT | 1.8-12.0 | 3 |

Previously, four years ago, the cat had been brought to our clinic with a left caudoabdominal mammary mass. Bilaterally mastectomy surgery due to a presumed malignant mammary tumor had been performed and the mass had been diagnosed cribriform carcinoma by histopathological examination (Figure 3). The cat had been spayed due to pyometra one year after the mammary surgery.

**Figure 1.** Inguinal area of the cat with the noticeable ulcereted lesion.

**Şekil 1.** Kedinin inguinal bölgesinde gözle görülür ülserli lezyon.

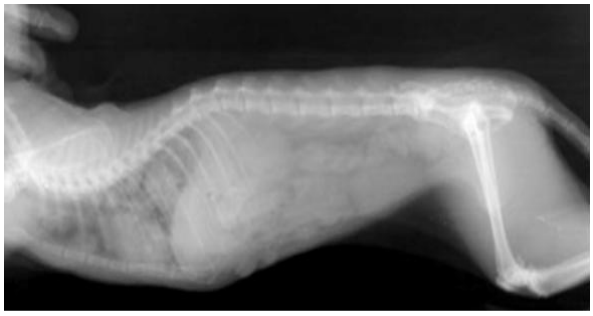

**Figure 2.** Diffuse pulmonary metastases of the cat on the lateral radiographic view.

**Şekil 2.** Kedinin lateral radyografisinde görülen diffüz pulmoner metastaz.

A riding-smear prepared from the ulcerated lesion and by cytological investigation an epithelial malignant tumor was diagnosed. Cytology showed an atypical malignant epithelial cell proliferation of glandular formation, with a high number of inflammatory infiltrate (macrophages and neutrophils) and debris material (Figures 4 and 5). Cytological findings were highly associated with inflammatory mammary carcinoma. Due to diffuse pulmonary metastases of the patient found by chest x-rays surgery could not performed.

**Treatment and follow-up**

According to the therapeutic protocols for IMC, surgery is not a first choice approach in the treatment. Additionally, in our case, the presence of diffuse pulmonary metastases were eliminated the probability of surgery as a treatment. Only palliative treatment with anti-inflammatories (piroxicam) was offered but

the owner did not accept any of the treatment. The clinical condition of the cat worsened a few weeks after the diagnosis, and died within two months. Necropsy was not under consent of the owner and could not be performed.

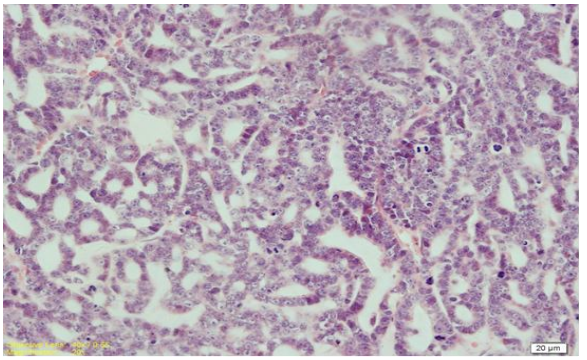

**Figure 3.** Cribriform carcinoma, Hematoxylin & Eosin stain.

**Şekil 3.** Kribriform karsinoma, Hematoksilen & Eosin boyama.

## Discussion

Two clinical forms of IMC are described in women and dogs: primary IMC, without a previous history of mammary tumor and with or without a palpable mammary mass, and secondary IMC, which occurs after the surgical excision of a previous mammary tumor (Souza et al., 2009). Only one primary and three cases of secondary feline mammary IC have been described until now. Feline IMCs were generally reported as a secondary tumor and previously it has been found frequent association of inflammatory reaction with surgical suture rejection (Millanta et al., 2012; Pérez-Alenza et al., 2004). Because clinical diagnoses of IMC in dogs and cats and inflammatory breast cancer (IBC) in women can be confirmed by the neoplastic emboli in dermal lymphatic vessels histopathologically and steroid receptor positivity (Pérez-Alenza et al., 2004), it is not fully confirmed that this cat had secondary IMC.

Inflammatory mammary carcinomas make metastases especially to the urinary bladder and reproductive tract, whereas less frequently metastases to the lungs, liver, kidneys and brain in dogs (Clemente et al., 2010; Kim et al., 2013). In cats, metastases were found mostly in the lungs and liver at necropsies (Millanta et al., 2012; Pérez-Alenza et al., 2004). In the present case metastases were evident in the lungs by chest x-rays. In a previous paper (Pérez-Alenza et al., 2004), secondary IMC were seen in cats 1-4 months after the mastectomies performed due to malignant mammary tumors. Our case can be differentiated from the previous cases as metastases were seen four years later after the total mastectomy operation. In addition to this, the cat in our case was longhaired breed that was in contrast with the previous cases (one Siamese, and three oriental shorthaired) (Millanta et al., 2012; Pérez-Alenza et al., 2004).

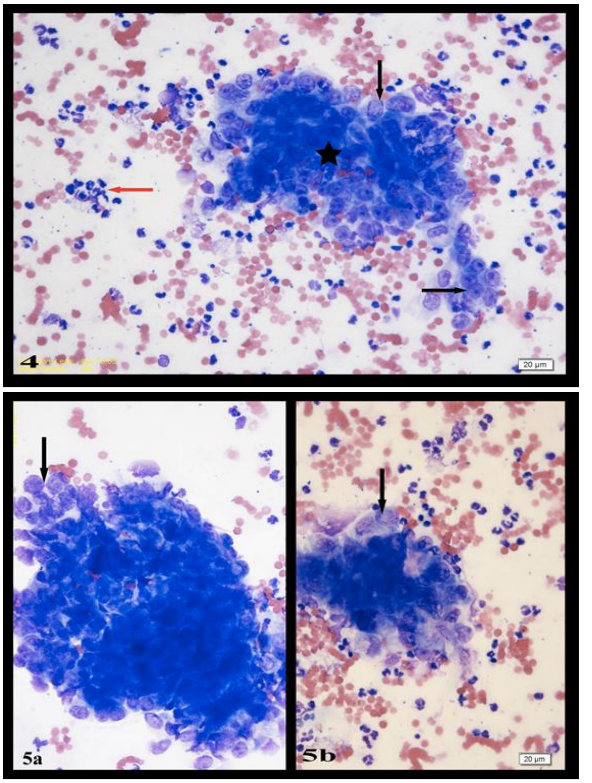


**Figure 4 and Figure 5 a-b.** Cluster of epithelial cells (star) with anisocytosis, anisokaryosis, variable nuclear chromatin patterns (black arrows) and a high number of inflammatory cells (red arrow). May-Grünwald-Giemsa stain.

**Şekil 4 ve Şekil 5 a-b.** Anizositozis ve anizokaryozis gösteren çekirdekleri değişken şekillerde kromatin içerikli (siyah oklar) epitelyal hücre topluluğu (yıldız) ve yüksek sayıda inflamatorik hücreler (kırmızı ok). May-Grünwald-Giemsa boyama.

It is not very well known because of the limited cases in cats but it was shown with the previous papers that intact cats may be more prone to IMC. In our case, the cat was spayed at the age of eleven because of pyometra, three years before the suspected IMC lesion. This finding is in accordance with the previous studies

that found IMC lesions in intact or cats that receive an ovariohysterectomy as an adult (Kim et al., 2013; Pérez-Alenza et al., 2001; Pérez-Alenza et al., 2004).

Naturally occurring tumors in pets has drawn much attention in these days as spontaneous models for human cancer and research opportunity for comparative oncology (Zappulli et al., 2005). Breast cancer in women partially understood with its risk factors and pathogenesis and as mammary cancers in cats and dogs are spontaneous and they share the same environment with human, these pets are thought to be a valuable model for studying the breast cancer (Munson and Moresco, 2007).

As a conclusion, feline IMC could be useful as an animal model of human inflammatory breast cancer and these findings indicate that mammary cancer patients should be approached cautiously after even bilaterally performed mastectomy operations.

**REFERENCES**

**Clemente, M., Pérez-Alenza, M.D., Peña**, **L., 2010.** Metastasis of canine inflammatory versus non-inflammatory mammary tumours. Journal of Comparative Pathology 143, 157-163.

**Kim, J.H., Im, K.S., Kim, N.H., Chon, S.K., Doster, A.R., Sur, J.H., 2013.** Inflammatory mammary carcinoma with metastasis to the brain and distant organs in a spayed Shih Tzu dog. Journal of Veterinary Diagnostic Investigation 23, 1079-1082.

**Millanta, F., Verin, R., Asproni, P., Gianetti, G., Poli, A., 2012**. A case of feline primary inflammatory mammary carcinoma: clinicopathological and immuno-histochemical findings. Journal of Feline Medicine and Surgery 14, 420-423.

**Munson, L., Moresco, A., 2007.** Comparative pathology of mammary gland cancers in domestic and wild animals. Breast Disease 28, 7-21.

**Pérez-Alenza, M.D., Jiménez, A., Nieto, A.I., Peña, L., 2004**. First description of feline inflammatory mammary carcinoma: clinicopathological and immuno-histochemical characteristcs of three cases. Breast Cancer Research 6, 300-307.

**Pérez-Alenza, M.D., Tabanera, E., Peña, L., 2001.** Inflammatory mammary carcinoma in dogs: 33 cases (1995-1999). Journal of American Veterinary Medical Association 219, 1110-1114.

**Souza, C.H., Toledo-Piza, E., Amorin, R., Barboza, A., Tobias, K.M., 2009**. Inflammatory mammary carcinoma in 12 dogs: Clinical features, cyclooxygenase-2 expression, and response to piroxicam treatment. Canadian Veterinary Journal 50, 506-510.

**Zappulli, V., De Zan, G., Cardazzo, B., Bargelloni, L., Castagnaro, M., 2005.** Feline mammary tumours in comparative oncology. Journal of Dairy Research 72, 98-106.