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## FELINE MAMMARY FIBROEPITHELIAL HYPERPLASIA IN A PREGNANT PERSIAN CAT: A CASE REPORT

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### ABSTRACT

A one-year-old pregnant Persian cat was presented to the outpatient medicine unit of university veterinary hospital, Kokkala, Thrissur, Kerala, with the complaint of sudden onset swelling of the mammary glands. Physical examination of mammary glands showed severely affected right and left inguinal mammary gland. On mammary ultrasonography, enlarged inguinal mammary lobes were visualized as a well-circumscribed solid mass of granular, slightly hyperechoic texture, with regularly delimited margins. Based on the history, clinical signs and ultrasonographic imaging the case was diagnosed as feline mammary fibroepithelial hyperplasia (FMFH), mammary ultrasonography. The animal was conservatively treated with amoxicillin-clavulanate (@12.5 mg/kg orally 12-hour interval); topical daily massage of Aloe vera emollient gel. Animal showed an uneventful recovery and kitted three live kittens.

**Keywords:** Feline mammary fibroepithelial hyperplasia (FMFH), Mammary ultrasonography, Amoxicillin-clavulanate, Aloe vera

### Introduction

Feline mammary fibroepithelial hyperplasia (FMFH), also known as feline mammary hypertrophy, mammary fibroadenomatous hyperplasia (MFH), mammary hyperplasia or fibroadenoma complex was first described by Allen in 1973 (Payan-Carreira, 2013; Mayayo *et al.*, 2018). It's a rapid onset, benign, progesterone-associated fibroglandular proliferation of ductal epithelium and stroma of the mammary gland resulting in enlargement of one or more mammary glands without covering peripheral lymph nodes (Vitasek and Dendisova, 2006; Ucmak *et al.*, 2011). It is hypothesised that progesterone is the important trigger for the development of FMFH, whether the source is endogenous or externally applied

synthetic progestins (Kucukbekir *et al.*, 2020; de-Melo *et al.*, 2020). The prevalence of this mammary condition tends to be lower in areas where most cats are neutered prepubertally (Voorwald *et al.*, 2021). There are two basic types of hyperplasia of the feline mammary gland i.e., lobular hyperplasia and fibroepithelial hyperplasia. Lobular hyperplasia is seen as palpable masses in one or more mammary glands in intact cats one to 14-year-old (Memon, 2016). A majority of the affected cats affected with fibroepithelial hyperplasia are either young, cycling, pregnant or pseudopregnant queens in the age group of 13 weeks to two years old (Memon, 2016; Mayayo *et al.*, 2018).

### CASE HISTORY AND OBSERVATIONS

A one-year-old pregnant Persian cat (Fig. 1. A.) was presented to outpatient medicine unit of university veterinary hospital (UVH), Kakkala, Thrissur, Kerala with the complaint of sudden onset swelling on the mammary gland. According to the patient's owner, 30 days prior to the consultation, the cat was crossed with a male Persian cat. Physical examination revealed pendulous, severely affected glands, which were firm, hyperaemic and warm to touch with prominent dilated veins (Fig. 1. B). There was a diffuse homogenous enlargement of both inguinal glands ( $I_1$ ,  $I_2$ )

ranging from 9 to 12 cm in diameter. The mammary skin was markedly stretched and had a thin, fragile appearance, with gangrenous changes and necrosis (Fig. 1. C.). On clinical examination, all the vital parameters were in the normal range. Mild signs of discomfort were evident during mammary gland palpation.

#### Fig. 1.

- 1 A. The pregnant Persian cat
- 1 B. Pendulous enlarged inguinal ( $I_1$ ,  $I_2$ ) mammary glands
- 1 C. Bilaterally symmetrical glands, firm in consistency with gangrenous changes





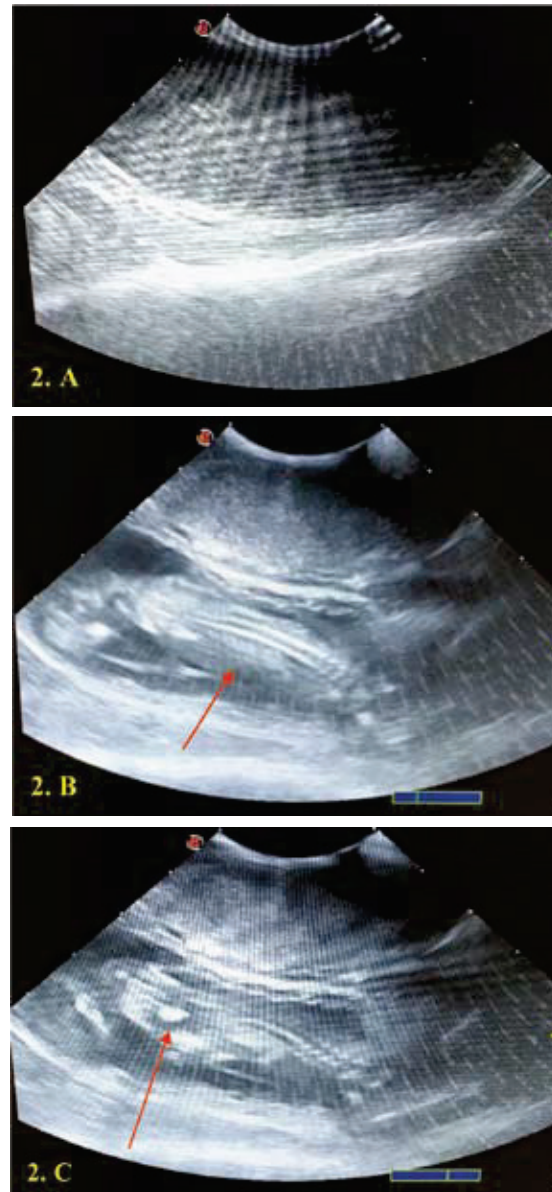
A complete blood count (CBC) and a serum biochemistry panel, were performed prior to clinical treatment. The hematologic parameters were in normal range except a mild anaemia ( $4.93 \times 10^{12}$  RBCs/L) with a low haemocrit value (32.5 per cent) and low haemoglobin concentration (10.6 g/dL). The serum biochemical analysis showed no alterations. On mammary ultrasonography, enlarged inguinal mammary lobes were visualized as a well-circumscribed solid mass of granular, slightly hyperechoic texture, with regularly delimited margins (Fig. 2. A) characteristic of benign lesions and a live, viable foetus of approximate foetal age thirty was found within the gestational sac (Fig. 2. B & C). Colour doppler ultrasonography of the gland revealed peripheral and weak vascularization in the enlarged mammary tissues.

### TREATMENT AND DISCUSSION

Fibroepithelial mammary hyperplasia was diagnosed based on the patient's young age, history of pregnancy,

**Fig 2.**

- 2 A. Ultrasonography of mammary glands with a homogeneous glandular structure with scant fluid accumulation and regular margins, characteristic of benign lesions,
- 2. B. Live, viable foetus of approximate gestational age of 30 days,
- 2. C. Foetal heart beat is noticed



clinical signs in more than one gland and ultrasonographic imaging. Owner gave their consent to conservative treatment to

preserve fertility and the integrity of the mammary glands. Therefore, the inflamed and ulcerated glands was treated with amoxicillin-clavulanic acid @ 12.5 mg/kg orally at 12-hour interval for seven days and conservatively with oral dietary supplement containing bromelain, trypsin, rutoside and serratiopeptidase (Tab. Deep TBR and Tab. Bidanzen Forte) was given once a day for the ten days. The enlarged glands were massaged twice daily with an emollient gel based on *Aloe vera*. After the treatment the animal had shown an uneventful recovery and kitted three live kittens after thirty days from the date of presentation.

Feline mammary fibroepithelial hyperplasia (FMFH) is a growth disturbance in cats characterized by the reversible, rapid, non-neoplastic proliferation of the mammary gland and (Voorwald *et al.*, 2021). Mastitis may occur secondary to FMFH in queens (Vaisu *et al.*, 2023). Although the exact pathogenesis of fibroepithelial hyperplasia in cats remains unclear, it is proposed that the interaction of progesterone or synthetic progestins with progesterone receptors on stromal and epithelial cells stimulates local growth hormone expression, leading to the development and growth of mammary gland (Kucukbekir *et al.*, 2020; Marino *et al.*, 2021; Voorwald *et al.*, 2021). In cases where multiple lesions develop,

asymmetrical lesions are more frequently found in non-pregnant females, while females being pregnant tend to develop more homogeneous swellings of the mammary glands (Payen-Carreira, 2013). The mammary glands were bilaterally enlarged, and no milk secretion was detected (Marino *et al.*, 2021). Systemic effects of the disease include anaemia, pale mucous membranes, high fever, tachycardia, lethargy and anorexia (Ucmak *et al.*, 2011; Kucukbekir *et al.*, 2020). The diagnosis is made based on the history, age of the animal and rapid growth of the mammary glands. de-Melo *et al.* (2020) opined that even though progesterone is associated with FMFH pathogenesis, serum progesterone concentration can't be used as a sensitive diagnostic marker. Biopsies are the most acceptable method of confirmatory diagnosis of mammary fibroepithelial hyperplasia, but Payan-Carreira (2013) suggested mammary ultrasonography as a diagnostic tool for FMFH. Ultrasound examination of the mammary gland and doppler can be used to evaluate the structure and vascularization of the enlarged gland (Marino *et al.*, 2021).

The most suitable therapeutic approach should be selected according to each patient and clinical presentation (Voorwald *et al.*, 2021). Spontaneous and complete regression of the

extended mammary glands are usually reported due to luteolysis, ovariectomy, ovariohysterectomy, spontaneous abortion or parturition (MacDougall, 2003; Ucmak *et al.*, 2011). Aglepristone, a progesterone receptor blocker is the first-line drug to treat FMFH in non-pregnant and progestin-treated cats. There are no therapeutic schedules to treat FAC in pregnant female cats without compromising fertility, lactation, and litters (Marino *et al.*, 2021). A broad-spectrum antibiotic amoxicillin-clavulanic acid was orally administered at a dose of 20 mg/kg twice daily (morning and evening) for two weeks to treat incidental infections related to the presence of necrosis and ulceration of the glands (Mayayo *et al.*, 2018).

In this case the animal was conservatively treated with daily topical massage of *Aloe vera* gel considering its antioxidant, anti-inflammatory, antimicrobial and anti-oedema pharmacological property (Marino *et al.*, 2021; Kula and Ucmak, 2022). Dietary supplement of trypsin, bromelain, serratiopeptidase and rutoside facilitated the entry of antibiotics to the tissues, reduction of pain, swelling and inflammation with less side effects. Ovariohysterectomy (OVH) is a good treatment option for FMFH when there is no interest in breeding the queen (de-Melo *et al.*, 2020). Mastectomy is a

difficult procedure to perform and is the last treatment option to be considered in non-responsive lesions or when the mammary gland presents extensive necrotic changes. Ulcers, necrosis, and mastitis are the main risk of FMFH and affect the complete involution of the gland also after therapy (Marino *et al.*, 2021).

## CONCLUSION

Feline mammary fibroepithelial hyperplasia (FMFH) was diagnosed in a thirty days pregnant Persian cat based on the history, clinical signs, mammary ultrasonography and conservatively treated with antibiotics and topical emollients without compromising the fertility, lactation and litters.

## CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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