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Surgical Excision as Treatment for Lipoma in Domestic Cats: A Case Report

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ABSTRACT

Lipomas are benign tumors derived from mature adipocyte tissue and are common in domestic animals, although less frequently reported in cats than in dogs. This case report aims to describe the results of hematological and cytological examinations (fine needle aspiration biopsy/FNAB) and the surgical removal of a lipoma in a female domestic cat with a mass in the hypogastric region. Hematological examination revealed mild leukocytosis and lymphocytosis, indicating a mild chronic inflammatory process, and thrombocytopenia, suspected to be related to local consumption or sampling artifact. Cytological examination of FNAB showed a predominance of small-nucleated adipocytes with cytoplasm containing large fat vacuoles, without pleomorphism or mitotic activity, accompanied by a few inflammatory cells such as lymphocytes and macrophages, thus supporting the impression of a benign lipoma. Surgical procedure was performed through total excision with a longitudinal incision along the mass, followed by layered wound closure using absorbable and non-absorbable sutures to minimize dead space formation. Postoperative results showed good wound healing without significant complications. These findings are consistent with previous reports that lipomas in cats have a good prognosis if complete excision is performed. In conclusion, the diagnosis of lipoma can be confirmed through clinical examination and FNAB, while surgical excision remains an effective and safe definitive treatment option to prevent recurrence.

Key words: Adipocyte tissue; Domestic cat; Fine needle aspiration biopsy; Lipoma; Tumor; Surgical excision.

INTRODUCTION

Lipomas are benign tumors derived from mature adipocytes and belong to the group of mesenchymal neoplasms that grow abnormally in the subcutaneous, subserosal, or submucosal tissues (Novanti et al. 2023). In domestic animals such as dogs and cats, lipomas typically appear as single, soft to rubbery, painless masses that often grow slowly without causing significant clinical symptoms unless they compress or disrupt the function of surrounding organs (Vigneshwaran et al. 2020; Kataria et al. 2021; Uddin 2023).

Lipomatous tumors as among the most frequently diagnosed benign mesenchymal neoplasms in veterinary practice, although their incidence in feline's remains considerably lower compared to dogs (Mridha et al. 2022). In felines, lipomas are generally slow-growing, well-encapsulated, and composed of mature adipocytes with minimal cellular atypia (Burkhardt et al. 2023). The tumor usually presents as a soft, movable, and non-painful mass under the skin, often discovered incidentally during physical examination (Gower et al. 2015).

The diagnosis of lipoma in cats is primarily based on a combination of clinical, cytological, and histopathological findings (Ji et al. 2024). Clinically, lipomas usually present as soft, non-painful, and slow-growing subcutaneous masses that are freely movable over underlying tissues (Baez et al. 2004). They are most often located on the trunk, shoulder, or proximal limbs, although infiltrative or internal variants may occur less frequently. While clinical characteristics are often suggestive, confirmation requires cytological or histological evaluation (Rickyawan et al. 2021).

Fine needle aspiration biopsy (FNAB) is a simple and minimally invasive diagnostic tool commonly used as the first step (Kabak et al. 2011). Cytological smears typically reveal clusters of mature adipocytes with clear cytoplasmic vacuoles due to lipid dissolution, eccentric small nuclei, and an absence of cellular atypia or mitotic activity (Sugiyama et al. 2022). Although FNAB results are usually diagnostic, differentiation between a simple lipoma and a low-grade liposarcoma may be difficult in some cases, especially if the sample is poorly cellular or contaminated with connective tissue (Burkhardt et al. 2023).

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Complementary examinations, such as ultrasonography, can also help determine the size of the mass and surrounding tissue involvement before surgery (Kearney and Kamm 2024). The main indications for surgery or total excision include rapid mass growth, functional impairment, the risk of secondary trauma, or aesthetic reasons (Boyer et al. 2015).

Differentiating liposarcomas from lipomas is often challenging due to their clinical and cytological similarities. Well-differentiated subtypes, which are characteristically composed of more than 75% adipose tissue, are particularly prone to being misdiagnosed as lipomas when evaluated using FNA cytology (Baez et al. 2004). Additionally, the rarity of liposarcomas further complicates the diagnostic process. Therefore, histological examination through biopsy is essential for a definitive diagnosis. These diagnostic challenges were evident in the present case, where histopathological examination revealed that the plaque-like mass was a lipoma, while the subjacent mass overlaid by the plaque-like mass was confirmed to be a well-differentiated liposarcoma (Kransdorf et al. 2022).

Several techniques have been applied to lipoma excision, such as conventional excision with an elliptical incision, punch enucleation and minimally invasive methods like liposuction and mesotherapy, although conventional excision remains the standard option for domestic animals (Boyer et al. 2015; Kataria et al. 2021). Important factors to consider during surgery include the type of anesthesia, hemostasis techniques, and management of dead space to reduce the risk of postoperative complications such as seroma or infection (Vigneshwaran et al. 2020). Therefore, this case report aims to describe the clinical presentation, diagnostic approach, and surgical excision of a lipoma in a domestic cat, highlighting the importance of timely diagnosis and the effectiveness of surgical management.

Case Description

Signalment and anamnesis

The patient was a female domestic cat named Ceri, weighing 4.16kg, presented to the Veterinary Teaching Hospital of Hasanuddin University with complaints of flu and diarrhea. Upon thorough physical examination, a well-defined, soft mass was palpated in the hypogastric abdominal region.

The owner additionally reported that the cat had shown mild lethargy and a gradual reduction in appetite over the past month, although body weight remained relatively stable. The cat was maintained on a commercial dry diet with ad libitum access to clean drinking water and was allowed free roaming within the household yard, which increased its potential exposure to environmental pathogens. Preventive healthcare was adequately maintained, as the cat had a documented history of regular deworming and routine vaccinations appropriate for its age. No previous history of surgery, chronic illness, or exposure to toxins was reported.

Clinical examination

Clinical assessment involved a systematic evaluation of the mass through inspection and palpation to determine its location, size, consistency, mobility, and margins, as recommended for subcutaneous swellings in small animals. The mass was characterized as soft, well-circumscribed, and freely movable, suggesting a benign subcutaneous lesion. To further investigate the patient's systemic health status, blood samples were obtained aseptically from the cephalic vein and collected into EDTA-coated tubes. A complete hematological profile was performed using an automated hematology analyzer, following standard protocols for small animal diagnostic evaluation.

Physiological examination showed a rectal temperature of 38.7°C, which was within the normal feline reference range of 38.1–39.2°C. The pulse and heart rates were measured at 145 beats per minute, falling within the expected range of 140–220 beats per minute. Capillary refill time was observed at less than 2 seconds, and skin turgor normalized in under 3 seconds, indicating an adequate hydration status.

Diagnostic assessment

Hematology

A complete blood count (CBC) was performed to assess the systemic health status of the patient and to detect potential hematological alterations associated with the presence of the subcutaneous mass. Blood samples were aseptically collected from the cephalic vein using a sterile needle and transferred into EDTA-coated tubes to prevent coagulation. Analysis was carried out with an automated hematology analyzer, providing quantitative data on red blood cells, white blood cells, hemoglobin concentration, hematocrit, platelet count and differential leukocyte values.

The CBC served as a critical diagnostic tool to identify underlying inflammatory, infectious, or hematopoietic conditions that might complicate the clinical presentation. In small animal practice, hematological parameters are routinely employed to evaluate general health status, monitor systemic responses to localized lesions, and guide clinical decision-making (Novanti et al. 2023). In this case, the results of the hematological evaluation provided supporting evidence for the interpretation of cytological findings and for the determination of an appropriate therapeutic plan.

The hematology results (Table 1) indicated a mild chronic inflammatory process associated with the mass.

Cytological findings (FNAB)

Cytological analysis of the mass obtained via fine needle aspiration biopsy (FNAB) showed numerous adipocytes with large cytoplasmic vacuoles and small peripheral nuclei. The cells were arranged loosely without signs of pleomorphism or mitotic figures. A few inflammatory cells, including lymphocytes and macrophages, were also observed. These findings were consistent with a benign lipoma (Fig. 1a, 1b and 1c).

The FNAB findings were highly characteristic of a lipoma, indicated by adipocytes with small nuclei and large fat vacuoles that appeared empty due to staining techniques, without any features of malignancy such as pleomorphism or mitotic activity (Rickyawan et al. 2021). The presence of a few inflammatory cells supported the suspicion of a mild inflammatory reaction around the tumor. Overall, these findings are consistent with the characteristics of lipoma as a benign adipose tissue tumor commonly observed in adult to geriatric cats, which is generally managed through surgical excision as the definitive treatment (Novanti et al. 2023; Kearney et al. 2024).

Table 1: Hematological findings of the cat patient

Parameters	Result	Reference Range	Interpretation
WBC	19.6×10^9/L	5.5 – 19.5	Mild leukocytosis
Lymph#	7.7×10^9/L	0.8 – 7.0	Lymphocytosis
Mid#	0.7×10^9/L	0.0 – 1.9	Within normal range
Gran#	11.2×10^9/L	2.1 – 15.0	Within normal range
Lymph%	39.3%	12.0 – 45.0	Normal
Mid%	3.6%	2.0 – 9.0	Normal
Gran%	57.1%	35.0 – 85.0	Normal
RBC	6.16×10^{12}/L	4.60 – 10.00	Normal
HGB	10.3g/dL	9.3 – 15.3	Slightly low-normal
HCT	34.2%	28.0 – 49.0	Normal
MCV	55.6fL	39.0 – 52.0	Slightly increased
MCH	16.7pg	13.0 – 21.0	Normal
MCHC	301g/L	300 – 380	Normal
RDW-CV	17.4%	14.0 – 18.0	Normal
RDW-SD	30.8fL	20.0 – 80.0	Normal
PLT	74×10^9/L	100 – 514	Thrombocytopenia
MPV	8.7fL	5.0 – 11.8	Normal
PDW	9.1 fL	5.0 – 20.0	Normal
PCT	0.064%	0.100 – 0.500	Low
P-LCC	37×10^9/L	-	-
P-LCR	51.0%	10.0 – 70.0	Normal
EOS%	2.8	-	Normal

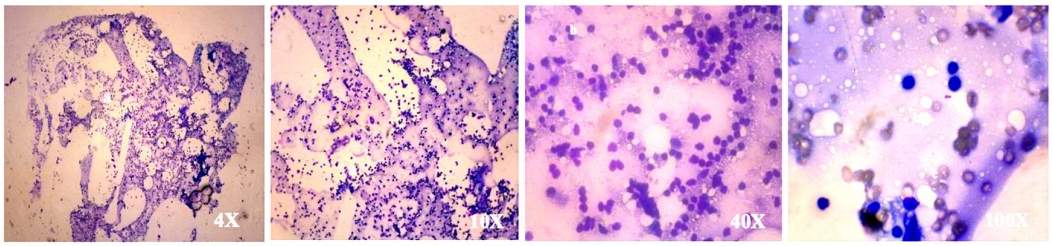

Fig. 1: Microscopic findings of FNAB examination. (1a) inflammatory cells; (1b) fat vacuoles; (1c) blood cells.

Diagnosis and prognosis

Based on the anamnesis, physical examination and further diagnostic evaluations, the cat was diagnosed with lipoma. The prognosis for this case was considered fausta. The prognosis for lipomas in cats is generally considered excellent when complete surgical excision is achieved. Recurrence is rare provided that the tumor is removed with adequate margins, as residual adipose tissue can serve as a nidus for regrowth. Unlike infiltrative or liposarcomatous variants, which may demonstrate aggressive local behavior and a guarded prognosis, simple subcutaneous lipomas typically remain well-encapsulated and do not metastasize.

Surgical procedure

The surgical removal of the hypogastric lipoma was performed under general anesthesia following standard aseptic preparation. The patient was positioned in dorsal recumbency to provide optimal access to the abdominal region. A longitudinal skin incision was made directly over the mass, extending along its margins to ensure complete exposure. Blunt and sharp dissection techniques were employed to separate the lipomatous tissue from the surrounding subcutaneous structures carefully. Hemostasis was maintained through vessel ligation and the application of epinephrine to visible bleeding sites, thereby minimizing intraoperative blood loss.

After complete excision of the mass, attention was directed to eliminating potential dead space by performing layered wound closure. The subcutaneous tissue was sutured with absorbable chromic catgut (3/0) using a simple continuous or simple interrupted pattern, while the skin was closed with non-absorbable silk (3/0) using simple interrupted sutures. This approach was intended to reduce the risk of postoperative complications such as seroma or hematoma.

(Fig. 2A, 2B, 2C, 2D, 2E and 2F) illustrates the surgical procedure, including preoperative preparation, incision, mass excision, layered closure, and postoperative wound management. The surgical outcome was favorable, with no intraoperative complications and satisfactory healing observed during follow-up.

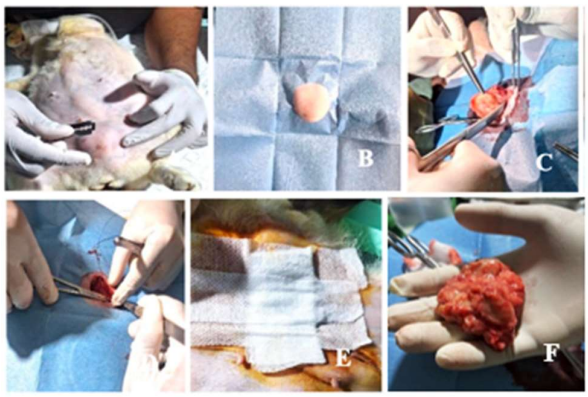

Fig. 2: Surgical procedure for lipoma removal. (2A) Clipping of the surgical site; (2B) Placement of drapes; (2C) Incision and excision of the lipoma; (2D) Suturing of the incision site; (2E) Postoperative bandaging; (2F) Excised lipoma.

Table 2: Postoperative wound healing timeline

Postoperative Day	Observation	Interpretation
Days 1–3	Mild erythema, slight oedema	Normal acute inflammatory phase
Days 4–7	Oedema subsided, and granulation tissue formed	Healing progression
Days 8–10	Wound dry, scar tissue developing, no infection	Reparative phase
Day 14	Complete closure, thin scar, no complications	Excellent prognosis

Postoperative outcomes

Postoperative management included intramuscular administration of amoxicillin LA every 48 hours for 14 days and dexamethasone every 48 hours to reduce inflammation. The wound was also treated topically with povidone iodine and antibiotic ointment.

On days 1–3, mild erythema and edema were observed at the surgical site, consistent with the acute inflammatory phase of wound healing. By days 4–7, edema had subsided, and healthy granulation tissue was evident. By days 8–10, the wound appeared dry, with scar formation and no signs of infection. By day 14, the wound had healed completely with only a thin scar and without complications such as seroma, hematoma, or wound dehiscence (Table 2).

DISCUSSION

Lipomas are benign mesenchymal tumors originating from mature adipocytes and are commonly reported in dogs but less frequently in cats. The lower prevalence in cats has been attributed to species-specific metabolic differences and lower rates of obesity compared to dogs (Novanti et al. 2023; Kearney and Kamm 2024). In this report, a middle-aged female domestic cat presented with a subcutaneous hypogastric mass. The signalment is consistent with earlier studies indicating that lipomas in cats tend to occur in females, particularly those with a history of sterilization or increased body weight, factors believed to be associated with altered lipid metabolism (Vigneshwaran et al. 2020; Kataria et al. 2021).

The hematological results demonstrated mild leukocytosis accompanied by lymphocytosis, findings that suggest a low-grade chronic inflammatory response. Such alterations may reflect the body's reaction to chronic irritation by the mass, which is in agreement with previous reports of hematological changes in animals with benign adipose tumors (Boyer et al. 2015; Uddin 2023). Thrombocytopenia observed in this case was considered non-specific, possibly due to local platelet consumption at the tumor site or technical artifacts during sampling. Importantly, no severe systemic abnormalities were noted, which further supports the benign nature of the tumor.

Cytological evaluation using fine needle aspiration biopsy (FNAB) provided a rapid and minimally invasive means of diagnosis. The smear revealed clusters of adipocytes with small nuclei and large cytoplasmic vacuoles, without pleomorphism or mitotic figures. This morphology is characteristic of a benign lipoma and excluded the possibility of liposarcoma or other malignant soft tissue tumors. The presence of occasional inflammatory cells, including lymphocytes and macrophages, was interpreted as a secondary response to the tumor. These findings support previous research emphasizing the high diagnostic value of FNAB in identifying lipomas and distinguishing them from malignant adipose neoplasms (Kataria et al. 2021; Rickyawan et al. 2021).

The surgical approach chosen in this case was a conventional longitudinal excision directly over the mass. This method allowed complete visualization of the tumor and facilitated its total removal, which is essential to minimize the risk of recurrence. The use of both blunt and sharp dissection was appropriate for ensuring atraumatic handling of tissues and minimizing intraoperative bleeding. Hemostasis was achieved through ligation and topical epinephrine application, strategies widely recommended in soft tissue surgery. Layered closure using absorbable sutures for the subcutaneous tissues and non-absorbable sutures for the skin was performed to eliminate dead space and promote optimal healing. These surgical steps align with best-practice recommendations in veterinary surgery and have been shown to improve outcomes in lipoma excision (Novanti et al. 2023; Uddin 2023).

Postoperative monitoring of the patient revealed a favourable healing process. Mild erythema and oedema were evident during the first three days, reflecting the expected acute inflammatory phase of wound healing. By days 4-7, oedema had subsided and healthy granulation tissue developed, and by days eight to ten, scar tissue formation was apparent. By day fourteen, the surgical wound had fully healed without complications such as infection, seroma, hematoma, or wound dehiscence. These outcomes are consistent with prior studies reporting that feline lipomas generally have an excellent prognosis following surgical excision, provided that complete removal is achieved (Vigneshwaran et al. 2020; Kearney and Kamm 2024).

This case highlights several important clinical lessons. First, although lipomas are rare in cats, they should be considered as a differential diagnosis when a soft, well-circumscribed subcutaneous mass is detected, particularly in older or obese patients. Second, FNAB is a highly valuable diagnostic tool for differentiating benign lipomas from malignant adipose tumors, avoiding unnecessary delays in surgical management. Third, meticulous surgical planning, including aseptic preparation, effective hemostasis, and layered closure, is essential to ensure complete excision and optimal healing. Finally, careful postoperative monitoring and appropriate use of antibiotics and anti-inflammatory drugs significantly contribute to successful outcomes and prevention of complications.

Conclusion

This case report highlights the clinical, hematological, and cytological characteristics, as well as the surgical management of a hypogastric lipoma in a domestic cat. Fine-needle aspiration biopsy (FNAB) proved to be a reliable diagnostic tool for confirming the benign nature of the mass, while hematological findings provided supportive evidence of a mild chronic inflammatory response. Complete surgical excision with layered closure was effective in preventing postoperative complications and ensuring optimal wound healing. Consistent with previous reports, the prognosis for feline lipomas remains

excellent following total excision, with a low risk of recurrence. Early diagnosis and timely surgical intervention are therefore recommended as definitive and safe treatment strategies to maintain patient health and quality of life.

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Conflict of Interest: The authors hereby declare that there are no commercial or financial relationships, personal interests, or affiliations that could be construed as a potential conflict of interest in the conduct of this work or the publication of this case report.

Data Availability: All data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethics Statement: This study did not involve any experimental procedures. All examinations and treatments were performed as part of routine clinical care at the Hasanuddin University Veterinary Teaching Hospital in Makassar, Indonesia. Written informed consent from the animal owner was obtained for all procedures and for the use of clinical data and photographs for publication under consent letter no. 036/SP/RSH_UH/XII/2025.

Author's Contribution: MUS designed and supervised the study. SR and DF supported the clinical management and surgical interventions. MZS and ATJEA were responsible for diagnostic imaging and data analysis. WSM and ARU contributed to postoperative care and record keeping. DKS assisted with the literature review and manuscript writing. MUS prepared and finalized the manuscript. All authors reviewed and approved the final version.

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