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Surgical and palliative management of a mammary carcinoma in a 9-year-old German shepherd

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Abstract
Canine mammary gland tumours (CMTs) are among the most frequently encountered neoplasms in intact female dogs, with nearly 50% demonstrating malignant behaviour. This case report delineates the clinical, diagnostic, surgical, and therapeutic management of a 9-year-old intact female German shepherd diagnosed with a bleeding, ulcerated mammary carcinoma with radiographically suspected pulmonary metastasis. Given the progression and clinical deterioration, a palliative unilateral mastectomy was undertaken. This report underscores the clinical relevance of palliative surgical intervention in advanced-stage-appearing disease and advocates for evidence-based, individualized oncological care in veterinary practice.

Keywords: Canine, mammary, tumours, vincristine, veterinary practice

Introduction
Canine mammary tumours represent approximately 50–70% of all neoplasms in sexually intact female dogs, with malignancy rates approximating 50%, depending on hormonal status, breed, and age [1, 2]. Certain breeds, including German Shepherds, Poodles, and Spaniels, demonstrate an increased predisposition to mammary neoplasia [3]. The incidence is highest in dogs over the age of seven years [4]. Surgical excision remains the cornerstone of treatment for localized disease [5], while chemotherapy is considered for systemic or high-grade disease variants [6].
This report initially classified the case as stage IV mammary carcinoma per the TNM classification, characterized by suspected distant metastases to the lungs [7]. However, histopathologic findings later revised the staging, emphasizing the importance of accurate tissue diagnosis in oncologic management [12].

Case Presentation
A 9-year-old intact female German shepherd presented with a progressively enlarging mass located on the caudal abdominal mammary chain. A preliminary diagnosis had been established one month earlier, and the dog was treated with vincristine at 0.7 mg/m² administered intravenously weekly for three consecutive weeks. Despite this treatment, the mass demonstrated continued growth, ulceration, and persistent haemorrhage.

Clinical findings and diagnostics
On physical examination, a large, ulcerated, and nodular mass involving the fourth and fifth mammary glands was identified, with surrounding erythema, necrosis, and localized oedema. Hematologic analysis revealed anaemia (Hb: 8.1 g/dl), leucocytosis (TLC: 34.7 × 10^3/µl), and thrombocytopenia (Platelets: 280 × 10^3/µl), suggestive of systemic inflammation and neoplastic burden [8]. Thoracic radiography demonstrated multiple coalescing pulmonary nodules consistent with suspected metastatic dissemination [9].

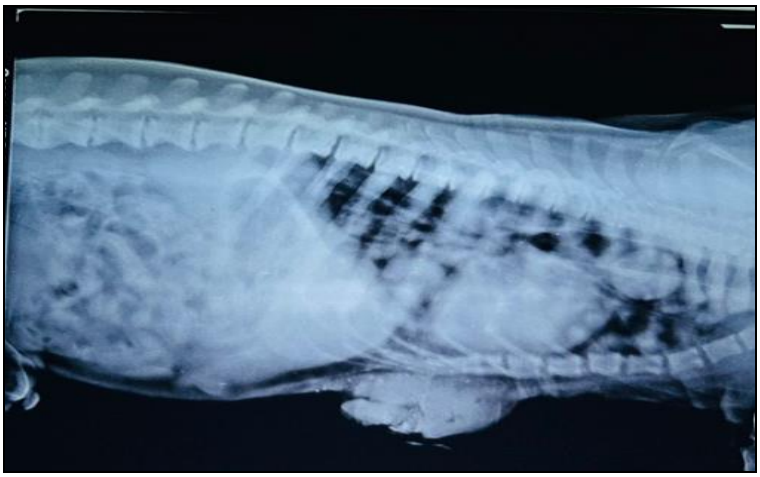

Fig 1: Clinical presentation showing an ulcerated mammary carcinoma in a 9-year-old German shepherd.

Differential Diagnoses

Based on clinical, haematological, and imaging data, differential diagnoses included: Inflammatory mammary carcinoma [10], Cutaneous hemangiosarcoma [16], High-grade mast cell tumour [9], Histiocytic sarcoma [11], Benign mammary adenoma or mixed mammary tumour [12]. Definitive diagnosis required histopathological confirmation.

Surgical Management

Preanesthetic used were Atropine and xylazine and induction done using ketamine and diazepam and maintained with isoflurane. A unilateral radical mastectomy was conducted. Intraoperatively, the tumour was found to infiltrate the subcutaneous tissues, with zones of necrosis necessitating wide-margin excision and debridement.

Wound closure was accomplished using a three-layer technique in a routine manner [14].

Fig 2: Intraoperative image during unilateral radical mastectomy with wide-margin excision.

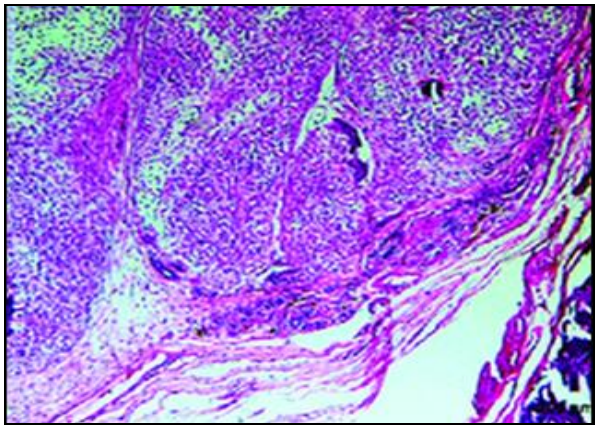

Fig 3: Resected mammary mass demonstrating nodular, necrotic, and infiltrative features.

Histopathology

Microscopic evaluation revealed a moderately differentiated simple tubular carcinoma characterized by moderate anisocytosis, anisokaryosis, mitotic figures, and focal necrosis. Importantly, no vascular or lymphatic invasion was observed. These features support a guarded but better prognosis than initially assumed [12, 16].

Postoperative Care and Management

The postoperative therapeutic regimen included:-

Meloxicam (Melonex 1.5 ml, I/M, once daily): For analgesia and anti-inflammatory effect [13], Tranexamic Acid (Tranexa 500 mg, P/O): Utilized to control postoperative bleeding [14], Cefquinome Injection @ 3 mg/kg bwt: Administered to support immune modulation through vitamin and antioxidant supplementation, Ranitidine Syrup (Rantac): An H2 receptor antagonist employed to mitigate NSAID-induced gastric irritation, Multistar Pet Syrup: Supplemented essential vitamins and minerals to promote recovery, Mupirocin Cream & A3-Mag Spray: Topical agents to prevent bacterial colonization and support wound healing, Regular antiseptic dressing: Facilitated exudate management and granulation tissue formation [15].

The patient recovered uneventfully with no complications during the follow-up period. Appetite and wound healing all showed marked improvement over 10 days.

Discussion

Canine mammary carcinomas are often aggressive, exhibiting hematogenous metastasis to the lungs, liver, and bones [16, 11]. In this case, suspected pulmonary metastasis prompted

palliative intent, though histopathology later suggested a less aggressive phenotype.

Vincristine, a mitotic spindle inhibitor, is predominantly used for hematologic malignancies. Its utility in mammary carcinoma remains off-label and limited when employed as monotherapy [17, 18]. In this context, surgical excision effectively reduced tumour burden and improved quality of life [19]. Although curative potential is limited in stage IV disease, palliative resection alleviates symptoms such as pain, bleeding, and necrosis [20, 21]. The absence of histologic metastasis in this case offers cautious optimism regarding the prognosis.

Prognostic Considerations

Prognosis in CMTs depends on multiple variables:-

- **Tumour size (>5 cm):** Associated with reduced survival [11].
- **Histologic grade:** Moderately differentiated tumours carry intermediate risk [12].
- **Surgical margins:** Negative margins significantly reduce local recurrence [14].
- **Distant metastasis:** Histologically absent in this case, improving prognosis [9].
- **Hormonal status:** Intact females show higher rates of multicentricity and recurrence [1].

Conclusion

This case exemplifies the clinical utility of palliative mastectomy in a geriatric canine patient with suspected mammary carcinoma. Surgical intervention significantly improved the patient's quality of life. Histopathological findings revised the diagnosis to a non-metastatic moderately differentiated carcinoma, reinforcing the importance of tissue confirmation. The report advocates for prompt diagnosis, breed-specific surveillance, and a multimodal treatment paradigm tailored to individual clinical scenarios. Ethical considerations, client expectations, and evidence-based decision-making must be integrated into the management of advanced oncologic conditions in veterinary practice.

Conflict of Interest: Not available

Financial Support: Not available

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