

A massive cutaneous squamous cell carcinoma in the mammary region of a male Pitbull dog: a clinical report

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Article Info	Abstract
Article history: Received: 09 November 2025 Accepted: 11 July 2026 Available online: 15 October 2026	Cutaneous squamous cell carcinoma (CSCC) is a clinically significant skin neoplasm in dogs, typically arising in areas exposed to chronic ultraviolet light. This report described a 10-year-old intact male Pitbull dog weighing 33.00 kg that presented with a large, ulcerated, necrotic and hemorrhagic mass in the inguinal mammary region. Initial hematological evaluation revealed marked leukocytosis with segmented neutrophilia, severe toxic changes along with degenerated neutrophils observed in fine needle aspiration of the mass. Following a course of antibiotic therapy to control the severe infection, the mass was surgically excised using electrosurgery. The preoperative thoracic radiographs ruled out pulmonary metastasis. Histopathological examination confirmed the diagnosis of CSCC. Despite complete initial removal, tumor recurrence was noted seven months postoperatively. The owner declined further chemotherapy and surgical intervention. This report detailed the clinical case of a massive, CSCC located in the ventral abdominal/inguinal mammary region of a male Pitbull dog. Although CSCC is a common neoplasm in canines, this case was distinguished by its extreme size, secondary infection and atypical anatomical presentation in a male dog. The report highlighted the unique clinical challenges associated with managing an unusually severe manifestation of a common tumor and provided a comprehensive overview of the surgical, radiological and histopathological findings.
Keywords: Cutaneous tumor Dog Electrosurgery Squamous cell carcinoma	

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Introduction

Squamous cell carcinoma (SCC) or cutaneous SCC (CSCC) is a malignant neoplasm of epidermal keratinocytes, often associated with chronic irritation, ultraviolet (UV) exposure on lightly pigmented skin, papilloma virus infection, previous trauma and changes in protein expression.¹⁻³ In dogs, SCC can develop in multiple anatomical locations, most commonly affecting the oral cavity and skin. In contrast, occurrences in the mammary glands, nasal cavity, lungs and urinary bladder are comparatively rare.⁴ Dermal SCC typically exhibits local invasiveness with metastasis rates that can vary. The overall prognosis is primarily influenced by the tumor anatomical site and the severity or spread of the disease.⁵

The primary treatment for this neoplasm is surgical excision along with chemotherapy recommended in metastatic cases. Radiotherapy and electrochemotherapy are the most commonly reported treatment

modalities in the literature.⁶ The SCC lesions exhibited a wide range of sizes and shapes appearing as round, oval, irregular or cauliflower-like masses with rough surfaces that varied in color from pink to light brown often accompanied by superficial necrosis and ulceration features consistent with previous reports.⁷ This report underscored a massive CSCC in a 10-year-old male Pitbull dog located in the mammary region. There are no comprehensive reports documenting the largest size of SCC in dogs, yet the size and location of the tumor described in this case represented an exceptionally large neoplastic mass in this species and anatomical site.

Case Description

A 10-year-old, intact male Pitbull weighing 33.00 kg was referred with a history of a progressively enlarging ulcerative mass in the caudal ventral abdomen adjacent to the mammary line. The mass was located in the ventral

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abdominal region, involving the caudal abdominal and inguinal mammary glands and overlying unpigmented skin. It was a firm and multilobulated lesion with widespread areas of ulceration and hemorrhage. Its surface was markedly irregular, featuring distinct erythematous and necrotic regions (Fig. 1). The patient had a history of ear cropping surgery and chronic allergic skin disease. The previous veterinarian had prescribed cefixime and prednisolone to manage the patient chronic allergic skin condition. Complete blood count revealed normal hematocrit, leukocytosis and neutrophilia. Total serum protein was elevated at 9.40 g dL^{-1} which might reflect chronic inflammation or immune response commonly associated with neoplastic conditions. Fine-needle aspiration of the mass yielded a purulent sample rich in degenerated neutrophils and exhibiting highly toxic changes, suggesting a severe local infection. Intensive antibiotic therapy was initiated using oral suspension of cefixime (Farabi Pharmaceutical Co., Isfahan, Iran) at a dose of 10.00 mg kg^{-1} body weight, administered orally every 12 hr for 1 month. During this period, white blood cell count was decreased by approximately 50.00%. The local infection and hemorrhage subsided significantly. After adequate control of inflammation, surgical intervention was considered feasible. Before the operation, lateral and ventrodorsal thoracic radiographs (Mobile Drive AR 30; SMAM, Muggio, Italy) were performed to evaluate for potential metastasis, which yielded negative findings. The cardiac silhouette was within normal limits on both projections. Assessment of the pulmonary parenchyma did not reveal any distinct nodules, masses or abnormal opacities indicative of metastatic disease. The lungs were well inflated, displaying a normal vascular pattern and there was no radiographic evidence of pleural effusion, pneumothorax or mediastinal displacement. Thoracic spondylosis involving T5 - T6 and T8 - T10 was identified and incidental calcification of the costal cartilages was also noted (Fig. 2).



Fig. 1. Clinical appearance of the mass in ventral abdominal region (arrow). Its surface was irregular, displaying erythematous and necrotic patches.

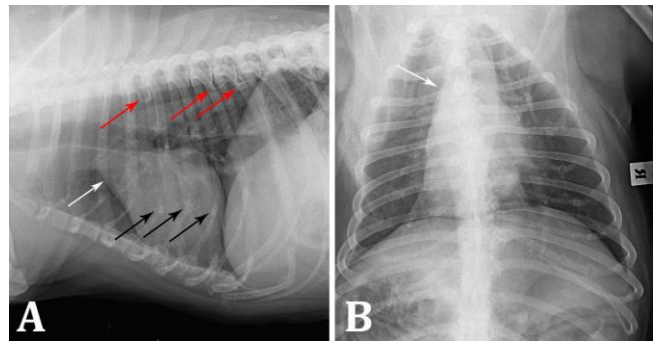


Fig. 2. A) Left lateral and B) Ventrodorsal radiographs in a 10-year-old male Pitbull with caudal ventral abdomen mass. The cardiac size appears within normal limits, but loss of the heart cranial waist silhouette and bulging of the cardiac margin in the position of the aorta in both views is seen, indicating aortic enlargement (white arrow). However, the main arteries and veins of the pulmonary lobes are seen to be of normal size. No nodules, masses, or abnormal opacities suggestive of metastatic spread are not observed in pulmonary parenchyma. Some calcification (black arrows) is visible in costal cartilage and spondylosis (red arrows) between T5 - T6 and T8 - T10.

Surgical procedure. The patient underwent aseptic surgical preparation and was initially sedated with intramuscular administration of 0.05 mg kg^{-1} acepromazine (Alfasan, Woerden, Netherlands). Then, general anesthesia was induced via intravenous injection of 5.00 mg kg^{-1} ketamine (Alfasan) combined with diazepam (0.30 mg kg^{-1} ; Caspian Tamin, Tehran, Iran). Following induction, the patient was intubated and anesthesia was maintained using 1.00% isoflurane (Baxter, Deerfield, USA) inhalation. The tumor was resected using electrosurgical dissection (Pars Mahya Tajhiz Gostar, Tehran, Iran) through the skin and subcutaneous tissue, achieving 1.00 cm surgical margins via a regional mastectomy technique. Then, a 2-0 Dexon suture (Supa, Tehran, Iran) was used to eliminate the dead space using a walking pattern. Subcutaneous closure was performed using the 2-0 absorbable sutures (Supa) in a continuous subcuticular pattern. Skin closure was achieved with 0 Nylon sutures (Supa) using a cruciate pattern. The mass was irregular, firm, ulcerated and hemorrhagic with a multilobulated surface. The size of the tumor measured $16.00 \times 10.00 \times 7.00 \text{ cm}$ (Fig. 3A).

Histopathologic results. Histopathological examination revealed features consistent with a well-differentiated SCC. At low magnification (Fig. 3B), irregular invasive nests and cords of atypical squamous epithelial cells extended into the underlying connective tissue. Prominent keratin pearl formation was observed within tumor islands, indicating squamous differentiation. At higher magnification (Fig. 3C), concentric keratinization was evident surrounded by malignant squamous cells exhibiting nuclear pleomorphism, hyperchromasia and an increased nuclear-to-cytoplasmic ratio. Mitotic figures

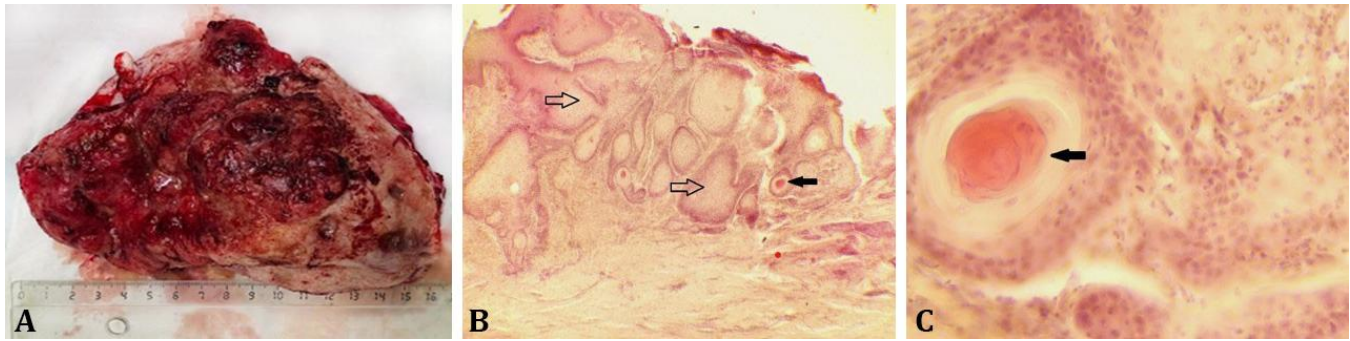


Fig. 3. A) Gross morphology of the mass following surgical resection. It presents as a large, firm and lobulated mass with multiple areas of ulceration and hemorrhage. Microscopic view of cutaneous squamous cell carcinoma in a dog. Histopathological examination reveals feature consistent with a well-differentiated squamous cell carcinoma. **B)** Abnormal squamous cells with invasion into deeper layer (blank arrow) and keratin pearl (fill arrow). Irregular invasive nests and cords of atypical squamous epithelial cells extend into the underlying connective tissue. Prominent keratin pearl formation is observed within tumor islands, indicating squamous differentiation. **C)** A closer view of keratin pearls, which are the main characteristic of this tumor, concentric keratinization is evident, surrounded by malignant squamous cells exhibiting nuclear pleomorphism, hyperchromasia and an increased nuclear-to-cytoplasmic ratio. Mitotic figures are present among tumor cells, reflecting active cellular proliferation. These findings confirm invasive growth, abnormal keratinization and cytological atypia characteristic of well-differentiated squamous cell carcinoma (Hematoxylin and Eosin staining, A: 40.00 ×, B: 400 ×).

were present among tumor cells, reflecting active cellular proliferation. These findings confirmed invasive growth, abnormal keratinization and cytological atypia characteristic of well-differentiated SCC.

Follow-up and outcome. The postoperative period was uneventful and the surgical site healed without complication. Following a 7-month period of good clinical condition, the mass recurred locally. The capacity for this rapid regrowth was provided by the tumor aggressive phenotype, as evidenced by its high mitotic rate and infiltrative growth pattern. The owner declined further treatment, including chemotherapy or reoperation.

Discussion

The CSCC is considered a significant neoplastic condition in dogs, accounting for approximately 3.90 to 10.40% of all canine skin tumors with incidence rates varying based on geographic region regarding solar UV exposure.³ It represents one of the most common skin neoplasms in dogs in tropical countries and its development is attributed to multiple contributing factors including contact with physical and chemical agents, UV light exposure and infection with papillomavirus. Among these, the most widely accepted cause of SCC is prolonged exposure to UV light.^{6,8} A pivotal case report by Callan et al. described a dog that developed multiple epidermal hamartomas and SCCs in situ following chronic immunosuppressive therapy with prednisone and cyclosporine for immune-mediated anemia.⁹ The peak occurrence of these tumors in dogs is reported between 6 and 13 years of age.^{9,10} The breed susceptibility of Pitbulls to CSCC is well-documented and appears multifactorial. Phenotypically, this predisposition is largely attributed to their short, sparse hair coat and the presence of lightly pigmented or

non-pigmented skin, particularly on the ventral abdomen—factors that collectively confer minimal protection against UV radiation.^{6,11} In addition, breeds such as Whippets, Italian Greyhounds, Staffordshire Terriers, Bull Terriers, Dalmatians, Beagles, Boxers and Pointers have previously been associated with the development of actinic-related tumors. These breeds are therefore considered predisposed to cutaneous neoplastic changes induced by chronic solar exposure.^{3,11} Differential diagnoses for CSCC include several epithelial and mesenchymal neoplasms particularly basal cell carcinoma, keratoacanthoma, amelanotic malignant melanoma, mast cell tumor, fibrosarcoma, sebaceous and apocrine gland carcinomas, and epitheliotropic lymphoma.⁴ Several treatment modalities have been documented to achieve effective local disease control and improve the quality of life in feline CSCC. Whereas, cryosurgery, radiotherapy (either external beam or brachytherapy), photodynamic therapy, electrochemotherapy and localized cytotoxic drug administration have been reported as effective alternative or adjunctive options, particularly for superficial or nonresectable lesions.¹² Among other surgical alternatives, CO₂ laser excision can also be used for similar cutaneous tumors in veterinary medicine, offering precise tissue removal with excellent hemostasis, minimal bleeding and faster healing compared with conventional scalpel surgery. This technique is particularly advantageous for lesions in delicate areas such as the eyelids or nasal planum, providing superior cosmetic and functional outcomes.¹³ The mentioned modalities for cats can also apply to canine CSCC, provided that each case is carefully evaluated with respect to tumor stage, anatomical site, the animal overall health status and the availability of required equipment.¹³ In both species, the choice of treatment should aim to achieve optimal local tumor control while

preserving patient comfort and quality of life.^{12,14} Electrosurgery is another method for the surgical excision of tumors. This technique offers several advantages, including effective hemostasis, reduced intraoperative bleeding and precise excision of the mass with minimal trauma to adjacent tissues, particularly important in infected or vascularized regions.¹⁴ In the present case, tumor excision was also performed using electrosurgical techniques.

This case demonstrated the importance of early detection and consideration of CSCC in the diagnostic approach to chronic, ulcerative skin masses, particularly in middle-aged and old dogs with non-pigmented skin. Given the possible genetic predisposition to cutaneous neoplasia and chronic allergic dermatitis, neutering should be considered to prevent passing such susceptibility to offspring in susceptible breeds. Also, continued monitoring and long-term follow-up are essential for detecting recurrence or metastasis in affected dogs.^{15,16} The successful use of electrosurgery in this instance highlighted its clinical utility for excising large, infected and vascular tumors with precision and minimal hemorrhage. Moreover, the presence of allergic skin disease in this case raised the potential for a link between dermatologic hypersensitivity and SCC susceptibility, warranting further study. Adjunctive therapies including chemotherapy, radiotherapy, or electrochemotherapy were discussed with the owner but were declined due to financial considerations and the initial perception of complete surgical removal. The absence of such treatment might have played a role in the tumor recurrence at seven months.

Acknowledgments

Not applicable.

Conflict of interest

The Authors declare no conflict of interest.

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