

CLINICAL REPORT

Congenital Subcutaneous Hemangiosarcoma on the Ventral Cervical Region in a Young Calf

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ARTICLE INFO	ABSTRACT
Article History: Received: 26 August 2025 Revised: 13 December 2025 Accepted: 24 December 2025 Keywords: Neonatal neoplasia Congenital tumors Carcinoma Ruminants	Congenital neoplasms in calves are uncommon. Hemangiosarcoma, a vascular endothelial tumor, is more common in adult dogs, but rare reports in ruminants predominantly are documented in adult cattle viscera or stillborn calves. The present report is a case of congenital subcutaneous hemangiosarcoma in a live neonatal calf, emphasizing diagnostic and therapeutic strategies. A 40-day-old male calf presented with a large (15 × 17 × 10 cm), firm subcutaneous mass in the ventral cervical region that was evident since birth. Clinical signs included mild fever, tachycardia, anemia, leukocytosis, and rumen acidosis. Also, concurrent mild prognathism was noted. Ultrasonography revealed heterogeneous hypoechoic tissue with anechoic vascular structures and hyperechoic foci. Fine-needle aspiration yielded only blood, prompting surgical biopsy under local anesthesia. Histopathology revealed unencapsulated, blood-filled channels lined by pleomorphic endothelial cells with atypia, mitoses, hemorrhage, necrosis, thrombosis, and intravascular invasion, confirming hemangiosarcoma. Surgical resection was deemed high risk due to the extensive vascularity, size, and adjacency to vital cervical structures. Conservative care (anti-inflammatory drugs, antibiotics, dietary adjustments) was considered. Three months of follow-up showed enlargement of the mass and impaired growth of the calf. To the best of our knowledge, the present case is the first report of congenital subcutaneous hemangiosarcoma in a live calf. Survival without surgical intervention suggests the potential for a less aggressive behavior of this tumor in the neonate calf, whereas the prognosis in the adult cow has been grave. Further research into the etiology, behavior, diagnosis, and management of congenital vascular neoplasms in calves is warranted.

Introduction

Congenital neoplasms in calves are rare, occurring at a significantly lower rate than in adults.¹ Their etiology remains poorly understood, though genetic factors are considered more influential than environmental ones like infection or toxicity. Clinical manifestations vary depending on the tumor type and location, potentially leading to abortion, dystocia, neonatal death, or, in some cases, survival for a limited period.^{1,2} Neonatal tumors in calves are predominantly mesenchymal, including

malignant lymphoma, congenital bovine leukosis, mesothelioma, and vascular neoplasms such as hemangiosarcoma.¹⁻⁴

Hemangiosarcoma, a malignant tumor of vascular endothelial cells, is more commonly reported in dogs and occasionally in horses and cattle.⁵⁻⁷ In cattle, it typically affects adults, often involving visceral organs like the liver, spleen or genital tract.^{5,8,9} Congenital presentations of hemangiosarcoma are extremely rare, with only two documented cases in stillborn calves,^{10,11}

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and a single reported neonatal calf with a gingival mass.¹² Present report describes a rare case of congenital subcutaneous hemangiosarcoma in a neonatal calf, detailing its diagnostic approach and management.

Case Description

A 40-day-old male calf was referred to the Veterinary Teaching Hospital of Razi University (Kermanshah, Iran) with an obvious subcutaneous mass under the pharynx, covered with natural skin and hair (Figure 1). The calf was standing, alert, and exhibited normal suckling and milk consumption. The owner reported no history of trauma but mild ruminal bloat and diarrhea were noted.

Physical Examination Findings

Physical examination revealed a body temperature of 40 °C, heart rate of 140 beats per minute, respiratory rate of 38 breaths per minute, and capillary refill time of 3 seconds. Mild prognathism was observed (Figure 2), not impairing suckling, with no other congenital anomalies detected. Palpation identified a firm, non-painful, sessile mass measuring 15 × 17 × 10 cm attached firmly on the ventral aspect of proximal cervical region. The skin of the mass was undamaged and the regional lymph nodes were not enlarged, and no other pathology was found.

Hematological Assay

A venous blood sample was taken from the jugular

vein and sent to the laboratory for hematological tests. Hematological analysis indicated mild anemia (hematocrit 25%) and leukocytosis (WBC 10,000/ μ l) with increased total protein (9.2 g/dl) and fibrinogen (950 mg/dl). Complete hematology findings are presented in Table 1. By introducing a ruminal tube, a small amount of gas was evacuated and the pH of the rumen contents sample was fairly acidic (pH = 4.5).

Ultrasonography

Transcutaneous ultrasonography with a 5 MHz curvilinear probe performed to recognize the mass structure. On B-mode ultrasound, the mass showed multiple irregular, anechoic tubular structures (representing blood vessels) in a heterogeneous hypoechoic matrix. Unclear borders and scattered hyperechoic foci (possibly thrombosis/fibrosis) were observed (Figure 3).

Table 1. Results of venous blood analysis.

Index	Result	Normal range
Hematocrit	25%	24-46%
WBC	10,000/ μ l	4000-12000/ μ l
Neutrophil	48%	30-60%
Band cell	4%*	0-2%
Lymphocyte	46%	20-60%
Monocytes	2%	1-6%
Eosinophil	1%	0-5%
Total protein	9.2 g/dl*	5.5-7.5 g/dl
Fibrinogen	950 mg/dl*	100-400 mg/dl



Figure 1. Lateral photograph of the cervical the mass .



Figure 2. Prognathism appearance of mouth from the front view.



Figure 3. Transcutaneous ultrasonographic features of the mass. Multiple irregular, anechoic tubular structures (blood vessels) in a heterogeneous hypoechoic matrix with unclear borders and scattered hyperechoic foci.

Sampling and Histopathological Examination

Multiple fine needle aspiration (FNA) was attempted to obtain a cytological sample but yielded only bloody samples or blood ranging from a few drops to even 10 ml. These findings further supported the vascular nature of the mass, and indeed, a common challenge with fragile, blood-filled vascular structure. Given the inconclusiveness of FNA findings, surgical biopsy was performed under local anesthesia (2% lidocaine). A 1-cm incision was made over the mass, and several 0.5-cm tissue samples were removed and fixed in 10% neutral buffered formalin for histopathological examination. Tissue samples were sectioned at 5 μ m thickness in paraffin-embedded tissue and stained with hematoxylin and eosin (H&E). Microscopic examination of the subcutaneous cervical mass revealed an un-encapsulated, poorly demarcated, infiltrative neoplasm composed of irregular, variably sized, blood-filled vascular channels

supported by a fibrovascular stroma. These vascular spaces were lined by plump, pleomorphic endothelial cells exhibiting nuclear atypia, anisokaryosis, hyperchromasia, and occasional mitotic figures. Multifocal areas of hemorrhage, necrosis, and thrombosis were evident within the neoplastic tissue. Importantly, clusters of neoplastic endothelial cells were observed within the lumina of vascular channels (intravascular invasion), confirming the malignant nature of the tumor and indicating a high metastatic potential. Perivascular infiltration of mononuclear inflammatory cells (lymphocytes and plasma cells) together with fibroplasia was also present (Figure 4). Collectively, these features are consistent with a diagnosis of subcutaneous hemangiosarcoma.

Treatment and Outcome

Given the mass's size, vascularity, and proximity to critical vital structures, surgical resection was considered high-risk. Chemotherapy and radiation were not viable treatment options due to limited availability and the absence of established protocols for neonatal cattle raised as feed livestock. After consultation with the owner, a conservative management approach was adopted, focusing on supportive care and close monitoring. The calf was prescribed a short course of supportive therapy, (flunixin meglumine, 1.1 mg/kg IM once daily for 3 days; penicilline-streptomycine 10 mg/kg IM once daily for 3 days) to manage potential inflammation, discomfort and prevent possible secondary infections. Additionally, nutritional adjustments (increasing frequency and decreasing volume of milk meal) and oral sodium bicarbonate were recommended for ruminal drinkers management, which improvement in clinical signs was observed after 48 hours.

Follow-up showed that the calf was alive and able to stand for three months after treatment, but the mass had slightly increased in size and the calf was unthrifty compare to his mates.

Long-term prognosis was guarded due to the neoplastic nature of the mass and the potential for metastasis.

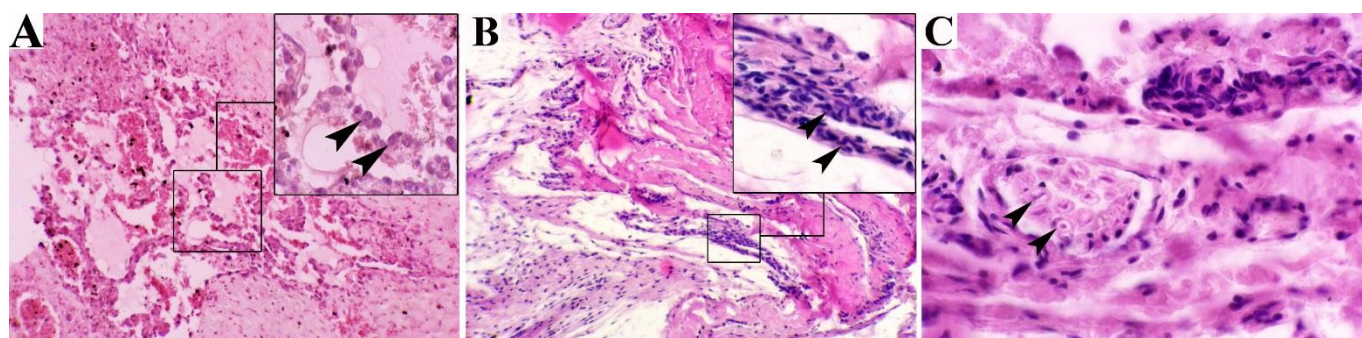


Figure 4. A. Subcutaneous mass in a calf showing irregular, blood-filled vascular channels lined by plump atypical endothelial cells with nuclear pleomorphism and hyperchromasia (arrowheads); B. Proliferating atypical endothelial cells with anisokaryosis (arrowheads) and perivascular infiltration of lymphocytes and plasma cells; C. clusters of neoplastic endothelial cells within the vascular lumen (intravascular invasion) (arrowheads).

Clinical Relevance

Hemangiosarcoma in cattle is rare, typically reported in adults with visceral involvement.^{5,8,9} The presentation of hemangiosarcoma as a subcutaneous lesion in a live neonatal calf is an exceptional clinical finding and suggests a congenital etiology, potentially linked to underlying genetic factors.¹ Prior documentation of hemangiosarcoma in calves is extremely limited, with two reported in stillborn,^{10,11} and only a single report detailing in a two weeks old live calf.¹² In the latter case, the affected calf presented with a gingival mass that had been evident since two weeks of age and showed rapid progression over a period of two months. The gingival hemangiosarcoma was characterized by a gray mass with focal pink areas, keratinization, and an ulcerated surface that covered the teeth and protruded from the oral cavity. Physical examination revealed that the mass was friable and prone to bleeding.¹² However, in the present report, a larger mass was subcutaneous in the ventral cervical region and was covered by healthy skin.

The congenital nature of this lesion is strong, given that the farmer had noticed the mass in the area below the throat since the calf was born. The occurrence of multiple congenital defects in calves is common,¹³ and the association of hemangiosarcoma with brachygnathism as a distinct congenital lesion also confirms the congenital origin of this lesion. The etiology of most neonatal tumors is attributed to genetics,¹ and the present case had no history of dystocia or trauma. However, ovariectomy was reported as a suspected etiology for subcutaneous hemangiosarcoma in a cat.¹⁴ Interestingly, the only previous report of hemangiosarcoma in a live calf was reported in Iran,¹² and the current report was also recorded in Iran. Since both of these cases were in native breeds, this geographical affinity could be a genetic origin in native cattle breeds in Iran or specific environmental conditions.

The differential diagnosis of cervical masses in newborn calves can include branchial cysts in bovine calves,^{15,16} thymus abnormalities such as thymic hyperplasia,^{17,18} thymic neoplasm^{19,20} or thymic cysts,²¹ subepiglottic cyst,²² abscesses,²³ goiter²⁴ or benign vascular tumors such as hemangiomas.

Benign congenital vascular tumors in calves vary in behavior; for example, multiple cutaneous hemangiomas in a two-day-old calf regressed spontaneously,²⁵ while a gingival hemangiosarcoma in a two-month-old calf required surgery.¹² Multifocal hemangiosarcomas have been noted in stillborn calves,^{10,11} which contrasts with the single mass in the live calf in the present report.

The ultrasound findings of a heterogeneous, vascular lesion supported the malignant diagnosis,²⁶ distinguishing it from benign entities like branchial cleft

cysts or abscesses. Diagnosis was challenging due to FNA's limitations with vascular tumors, where blood contamination is common and we had to use surgical biopsy to obtain the sample.²⁷

Therapeutic options for hemangiosarcoma are limited in cattle. Surgery is the choice treatment for non-metastatic non-visceral hemangiosarcoma in dogs, but other methods such as chemotherapy with doxorubicin alone or in combination with other drugs, metronomic-dose chemotherapy, radiotherapy, electrochemotherapy, targeted therapies, photodynamic therapy, antiangiogenic therapy, and even natural products have been considered for the treatment of hemangiosarcoma, but the prognosis is still reported to be poor.⁶ All cases of hemangiosarcoma in adult cattle resulted in euthanasia,^{5,8,9,28} two cases of hemangiosarcoma in stillborn calves,^{10,11} and only one case of gingival hemangiosarcoma in a live calf was operated on, which recurred one month after surgery, and the final outcome of the animal was unknown.¹² In this case, conservative management was elected due to surgical risks and economic constraints, a practical choice given the calf's stability. The three-month survival with slight progression was notable, as hemangiosarcomas often advance rapidly.⁵ This may reflect a less aggressive phenotype in neonatals or a localized form, though the risk of future metastasis persists.

Subcutaneous hemangiosarcoma in cats is known to be more aggressive than the cutaneous form, with a higher likelihood of local recurrence and a poorer prognosis leading to euthanasia or death.²⁹ The median survival time for subcutaneous hemangiosarcoma was reported 1189 days. Dogs with subcutaneous hemangiosarcoma had a better prognosis when treated with adequate local control and adjuvant doxorubicin than those with intramuscular hemangiosarcoma. Younger age and the absence of radiation therapy were also associated with longer survival.³⁰ The survival time of the calf with subcutaneous hemangiosarcoma in the present report was 130 days.

To the best of our knowledge and based on our literature review, this is the first report of congenital subcutaneous hemangiosarcoma in an alive young calf. The calf was managed conservatively, and despite unthrifty and slightly increased in tumor size, it was alive and able to stand for three months after treatment. But after three months, the calf was sold and was not available for further follow-up. The present report highlights the diagnostic and management complexities of this rare congenital tumor by discussing the etiological possibilities of this tumor. It also highlights the clinical and prognostic differences between congenital subcutaneous hemangiosarcoma of the calf and gingival hemangiosarcoma of the calf and visceral

hemangiosarcomas in adult cattle. The 130-day survival of the calf for this malignancy without treatment was an interesting finding and necessitates further research into the behavior of the tumor in calves.

Conflict of Interest

None to declare.

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