

Case Report

Surgical Management with Histopathology of Peripheral Odontogenic Fibroma in a Calf: A Case Report

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Abstract | Peripheral odontogenic fibroma is a rare, benign odontogenic tumor that arises from the gingiva or alveolar mucosa. This case report describes the surgical management and histopathological features of peripheral odontogenic fibroma in a calf. A 15-day-old crossbred female calf was presented with a firm, non-ulcerated gingival mass in the lower incisor region. Surgical excision was performed under sedation and local anesthesia, and the excised tissue was used for histopathological examination. The histopathology revealed non-keratinized stratified squamous epithelium with dense infiltration of chronic inflammatory cells, mainly lymphocytes, along with proliferating connective tissue components including endothelial and fibroblastic cells. Postoperative recovery was uneventful, and no recurrence was observed at follow-up. This report suggests that early surgical excision may be an effective management option for peripheral odontogenic fibroma in calves.

Editor | Muhammad Abubakar, National Veterinary Laboratories, Park Road, Islamabad, Pakistan.

Received | May 21, 2025; **Accepted** | September 03, 2025; **Published** | November 08, 2025

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Citation | Akter, M.A., M.R. Huq, M.A. Kobir, M.M. Alam, M.R. Alam. 2025. Surgical management with histopathology of peripheral odontogenic fibroma in a calf: A Case Report. *Veterinary Sciences: Research and Reviews*, 11(2): 219-222.

DOI | <https://dx.doi.org/10.17582/journal.vsr/2025/11.2.219.222>

Keywords | Calf, Fibroma, Histopathology, Surgical management



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Introduction

Peripheral odontogenic fibroma (POF) is a benign neoplasm arising from the odontogenic tissue, characterized by the proliferation of fibrous connective tissue with varying degrees of odontogenic epithelial components (Kauffman and Hargis, 2018). In calves, POF typically presents as a well-defined mass in the oral cavity, often associated with the gums or the alveolar bone. Due to its slow-growing nature

and localized behavior, POF is often an incidental finding unless it interferes with mastication, causes secondary infection, or leads to displacement of adjacent teeth (Head *et al.*, 2002). Although POF is a relatively rare condition in veterinary practice, its occurrence can significantly impact the health, welfare, and performance of affected animals (Dyer and McCarthy, 2019).

Clinically, POF manifests as a firm, non-ulcerated,

and often well-demarcated gingival mass. It may vary in size and is usually covered by normal or slightly hyperplastic mucosa (Rajendra and Sinha, 2017; Rajanikanth *et al.*, 2012). Diagnosis usually involves a combination of clinical examination and histopathological evaluation to confirm the nature of the lesion and rule out other potential conditions. The differential diagnosis of oral fibrous lesions in cattle includes fibromatous epulis, ossifying fibroma, and other reactive gingival proliferations, making histopathological examination essential for a definitive diagnosis (Kahn, 2010).

Surgical management is the primary treatment for POF, aiming to remove the tumor completely while preserving surrounding healthy tissue. This approach not only alleviates clinical signs but also minimizes the risk of recurrence. A thorough understanding of the histopathological features and surgical techniques associated with POF is essential for veterinarians in providing effective care for affected calves. This case report presents the surgical management and histopathological findings of peripheral odontogenic fibroma in a calf, highlighting the importance of early recognition and intervention in veterinary practice.

Case presentation

Case history: A 15-day-old cross-bred female calf weighing 21 kg with a history of swelling mass on the lower incisor teeth was presented to the Veterinary Teaching Hospital (VTH), Bangladesh Agricultural University, Mymensingh. The owner reported that the mass had been noticed 1 week earlier, initially as a small swelling on the gingiva, which gradually increased in size. The calf exhibited difficulty in prehension and mastication, leading to reduced feed intake and mild weight loss.

Clinical examination

During the clinical examination, a well-defined, firm mass was noted on the lower incisor teeth, and it was not attached to the adjacent bone. There was mild inflammation of the surrounding gingiva, but no signs of necrosis were noted. Upon examination, the calf appeared generally healthy, with a body condition score within the normal range. There were no signs of systemic illness, such as fever or lethargy.

Treatment: Surgical excision is considered the most effective treatment for this type of fibroma.

Anesthesia: The calf was sedated with Atropine sulphate (Atrovet®, Techno Drugs Limited, Narsingdi, Bangladesh) at 0.04 mg/kg body weight (intramuscularly) and Xylazine hydrochloride (Xyla®, Interchemie Werken, Holland) at 0.06 mg/kg body weight (intravenously). Local infiltration analgesia was administered around the base of the mass using 2% Lidocaine hydrochloride (Lidocaine Plus®, Techno Drugs Ltd., Narsingdi, Bangladesh).

Surgical procedure: The gingival mass was excised using an electrosurgical device, which simultaneously minimized bleeding. Additional hemostasis was achieved with tincture ferric perchloride, followed by the application of sterile gauze.

Postoperative care: Following surgery, the calf received broad-spectrum antibiotic (Ceftriaxone @1 mg/kg BW, i/m for 7 days) and an anti-inflammatory drug (Tolfenamic acid @ 3 mg/kg BW, i/m for 3 days). The owner was advised to monitor the surgical site for any discharge or inflammation. The calf recovered uneventfully with only minor scarring, and no recurrence was observed during the three-month follow-up period.

Histopathological examination

Representative histopathology samples were taken from epulis and fixed for 48 hours in 10% formalin. The embedding was performed followed by processing in alcohol as outlined in Ashraf *et al.* (2019). The histological examination revealed that non-keratinized stratified squamous epithelium covered almost all over the lesions. Beneath the epithelium, huge numbers of chronic inflammatory cells, i.e. primarily lymphocytes, were infiltrated by the tissue, prompting the growth of ulcers (Figure 1A, B). There were components of connective tissue that included endothelial and fibroblastic cell growth (Figure 2A, B). Abundant and various-sized blood vessels were also evident.

Discussion

Diagnosis of POF typically involves a combination of clinical examination and histopathological evaluation. Histopathological analysis is critical for confirming the diagnosis, as it distinguishes POF from other oral lesions, such as gingival hyperplasia or more aggressive tumors (Jubb and Kennedy, 2002).

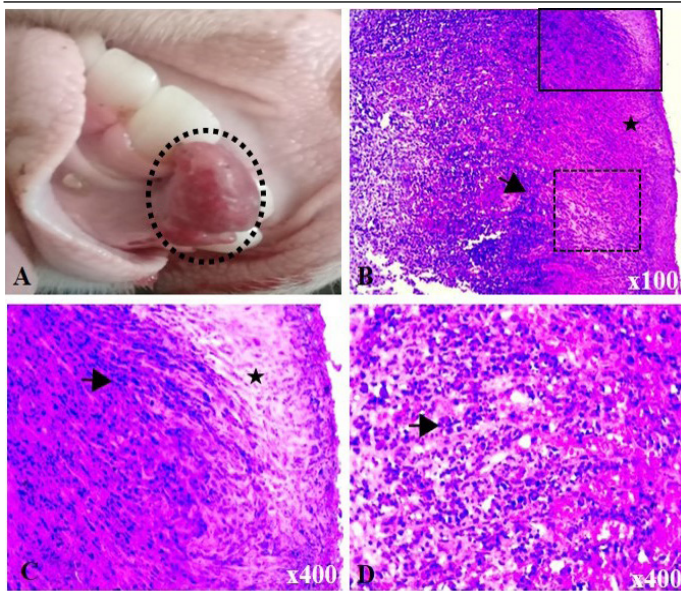


Figure 1: Case of epulis in calf. A: Epulis (In situ) during observation, (dotted circle). B: Histopathological alterations (H & E) overlaid with non-keratinized stratified squamous epithelium (SSE). Underneath SSE there was the array of fibrous connective tissues (asterisks), ulceration, and massive inflammatory cellular infiltration (arrows). C and D showing the higher magnification of rectangular and square area of B. H & E= Hematoxylin and eosin stains

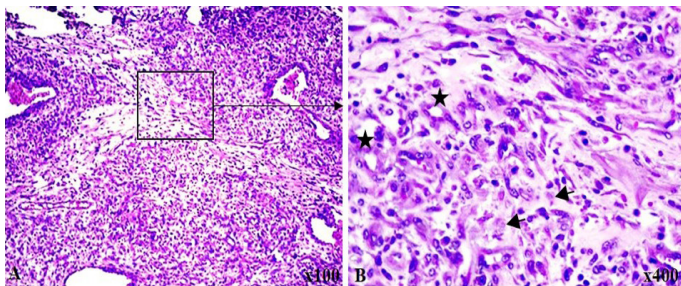


Figure 2: A-B Histopathology (H & E) of epulis exhibited marked fibrosis with the proliferation of fibroblasts (arrows) and endothelial cells with spindle shaped nuclei along with numerous and various sizes of blood vessels (asterisks). H & E= Hematoxylin and eosin stain.

The clinical signs associated with POF in calves often include oral swelling, difficulty in eating, and increased salivation, as noted in the presented case. These symptoms can lead to significant weight loss and decreased feed intake, which ultimately impact on the calf's overall health and productivity (Kauffman and Hargis, 2018). The pathogenesis of POF is not entirely understood, but it is believed to develop from remnants of odontogenic epithelium during tooth development, leading to the proliferation of fibrous tissue (Dyer and McCarthy, 2019).

Surgical excision is the primary treatment for POF, and complete removal of the tumor is essential to minimize the risk of recurrence. Studies indicate that the recurrence rate for POF is relatively low when the tumor is excised completely, which reinforces the importance of meticulous surgical technique (Kahn, 2010), which is similar to this finding. Post-operative care, including pain management and monitoring for complications, is crucial for ensuring a successful recovery. As observed in the case discussed, calves can often return to normal feeding patterns following surgery, leading to improved health outcomes (Kauffman and Hargis, 2018). The overall prognosis for calves diagnosed with POF is generally favorable, with most cases resolving completely after surgical intervention (Dyer and McCarthy, 2019).

The histological findings are in accordance with Tajima (2009), who found that there was minimal infiltration of inflammatory cells and dilated blood vessels into the odontogenic fibroma, which was predominantly composed of proliferating fibroblasts and collagen fibers. The most trustworthy circumstance to form a differential diagnosis is this evidence (Dabholkar *et al.*, 2008; Shimoyama *et al.*, 2005). We concur with these authors that the collagenous fibroma is an uncommon, non-inflammatory phenomenon.

Conclusions

In conclusion, peripheral odontogenic fibroma is a benign but impactful condition that can affect the oral health of calves. With proper diagnosis, surgical management, and post-operative care, veterinarians can effectively treat this condition, ensuring better health and productivity for bovine patients.

Acknowledgement

The authors would like to acknowledge the Veterinary Teaching Hospital (VTH), Bangladesh Agricultural University (BAU).

Novelty Statement

The novelty of this study lies in reporting a rare occurrence of peripheral odontogenic fibroma which is scarcely described in veterinary literature. This case contributes valuable clinical and histopathological insights into the condition and demonstrates that early surgical excision can be an effective treatment approach with favorable prognosis.

Author's Contribution

MAA, MRH and MMA received, diagnosed the case and managed surgically in the Veterinary Teaching Hospital, BAU.

MAA performed histopathology.

MAA, MMA, and MAK observed the histopathological findings.

MAA and MAK prepared the manuscript.

MMA and MRA critically evaluated the prepared manuscript for publication.

Generative AI and AI-assisted technology statement

The authors declare that no generative AI or AI -assisted technologies were used in the writing or editing of this manuscript.

Conflict of interest

The authors have declared no conflict of interest.

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