

Case Report



A Surgical Management and Histopathological Study of an Extensive Perianal Sebaceous Gland Adenitis in a Jersey Crossbred Cow

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ABSTRACT

Introduction: Sebaceous gland adenitis is a rare condition found in large ruminants, eluding diagnosis and potentially progressing into neoplastic states if left untreated. The aim of the current study was to indicate the benefits of surgical excision of sebaceous gland adenitis in a Jersey crossbred cow.

Case report: A 6-year-old Jersey crossbred cow weighing 300 kg was admitted to the Teaching Veterinary Clinical Complex, Mannuthy, Thrissur, Kerala, India, in December 2022 with a soft tissue mass in the right vulval lip. Initially observed as a small skin bump, the condition had progressively worsened over 2 months, becoming an extensive mass contaminated with external debris and live maggots. Palpation revealed the mass to be firm without eliciting pain. The physiological parameters, such as rectal temperature, heart rate, and respiratory rate were within normal limits. The hematological and serum biochemical parameters were normal. The mass was resected surgically, and the vulval lip was reconstructed. Postoperatively, the cow received a 5-day course of enrofloxacin (Enro, India) at a dosage of 5 mg/kg body weight, along with 3 days of intramuscular meloxicam at a dosage of 0.2 mg/kg body weight and topical application of antiseptic ointment (Lorexane, India). The animal had an uneventful recovery after 2 weeks. Histopathological analysis confirmed the diagnosis as sebaceous gland hyperplasia and chronic adenitis.

Conclusion: This study demonstrated that timely diagnosis and excision of the vulval tissue mass resulted in a complete recovery and preserved the animal's value. Chronic sebaceous gland adenitis may have a tendency to transform into a benign tumorous condition. The early presentation of the animal and successful surgical intervention prevented this transformation of sebaceous gland adenitis to a benign or malignant condition.

1. Introduction

Sebaceous glands represent a type of glandular structure characterized as simple, branched, or compound alveolar glands. Their ducts typically open into hair follicles except at some mucocutaneous junctions, where the glands open on the

surface of the skin. The secretion process of these glands, termed holocrine secretion, involves the release of cellular contents along with the secretory product¹. These glands are distributed mainly in the eyelid margin, glans penis, lips, and

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vulva². Sebaceous adenitis is a specific inflammation that targets the sebaceous gland, leading to alopecia and epidermal and follicular hyperkeratosis¹. This condition generally has an idiopathic aetiology³. Sebaceous hyperplasia is a commonly reported condition in dogs but rarely reported in cattle. It externally appeared as a wart or cauliflower-like tissue and sometimes ulcerated due to external injuries⁴. Hyperplasia of the sebaceous gland is usually seen in long-standing pruritic and inflammatory disease conditions of the skin⁵. The skin lesions are predominant among the clinical signs, compared to other signs⁶. Sebaceous hyperplasia usually does not extend below the hair follicle bulbs. There is no change in the normal morphology of the sebaceous gland except for the increase in size and number of lobules⁷. Microscopical differentiation between sebaceous gland hyperplasia and sebaceous adenomas is a complex process⁸. In the present study, the mass was presented in the vulval region instead of the regular location. Excessive cell divisions within the sebaceous gland cause externally visible growth in the skin⁹. Surgical excision is the treatment of choice in severe cases.

The aim of the current study was to indicate the benefit of surgical excision of sebaceous gland adenitis in a Jersey crossbred cow.

2. Case report

A 6-year-old Jersey crossbred cow weighing 300 kg was presented to Teaching Veterinary Clinical Complex, Mannuthy, Thrissur, Kerala, India, in December 2022 with a soft tissue swelling in the right vulval lips (Figure 1). The swelling gradually increased in size over 2 months. The animal appeared normal without showing any other clinical signs except the mass in the vulval lip. The animal was treated at the nearby veterinary hospital with topical analgesic ointment (Pain-O-Vet, India) for a week, but no improvement was reported. On clinical examination, the physiological parameters, such as rectal temperature, respiratory rate, and heart rate, appeared normal. The hematological parameters, such as erythrocyte count ($5-10 \times 10^6/\mu\text{l}$), leucocyte count ($4-12 \times 10^3/\mu\text{l}$), hemoglobin

(8-15 g/dl), hematocrit (24-46%), and platelet count ($50-750 \times 10^3/\mu\text{l}$), were within the normal limits¹⁰. The mass exhibited contamination from feces, external debris, and an infestation of live maggots. The surface of the mass was irregular and ulcerated. The mass was hard in consistency and firmly attached to the underlying skin. Clinically, the animal appeared normal, with normal feeding and voiding habits, and it was decided to manage the condition surgically after the repulsion of maggots.

The animal was fasted for 48 hours before the surgery. The intravenous standing stun was attained chemically with a combination of butorphanol tartrate (Butodol-2, India), xylazine hydrochloride (Xylaxin, India), and ketamine hydrochloride (Zokent, India) at the doses of 0.02 mg/kg, 0.02 mg/kg, and 0.05 mg/kg body weight respectively, as a cocktail¹¹. Tail movement was controlled and local anesthesia was done through the anterior caudal epidural administration of 2% lignocaine hydrochloride (Xylocaine 2%, India) at a dose rate of 0.2 mg/kg¹². The surgical site was prepared for aseptic surgery¹³. Surgery was performed in a standing position. Using surgical diathermy, the mass was meticulously excised, ensuring that the inner vaginal wall remained unaffected (Figure 2). The bleeding vessels were cauterized, and the branch of the vaginal artery was ligated using polyglactin 910 size 1. Muscles and subcutaneous tissues were closed according to the standard manner to avoid dead space. The vulval lip was reconstructed (Figure 3). The wound closed in a horizontal mattress pattern using nylon. Postoperatively, the cow was treated with the antibiotic enrofloxacin (Enro, India) at a dosage of 5 mg/kg body weight for 5 days and meloxicam at a dosage of 0.2 mg/kg body weight for 3 days intramuscularly along with antiseptic ointment (Lorexane, India) topically¹⁴.

The excised mass was fixed in 10 percent neutral buffered formalin for 3 days. Subsequently, the cut tissue section underwent an overnight washing process, followed by dehydration by progressively increasing concentrations of alcohol. The tissue was then cleared using xylene before being immersed in molten paraffin wax.

The procedure was followed by embedding the tissue into paraffin blocks.



Figure 1. A 6-year-old Jersey crossbred cow with a swelling in the right vulval lips, India, 2022



Figure 2. The resected vulval mass in a 6-year-old Jersey crossbred cow, India, 2022



Figure 3. The reconstructed vulval lip in a 6-year-old Jersey crossbred cow, India, 2022

The prepared paraffin block was sectioned using a microtome (Leica, Germany) to 5 µm thickness. Prepared slides were stained using routine hematoxylin and eosin staining technique¹⁵ and were examined under the light microscope (DM 2000 Leica, Germany).

2.1. Histopathological study

The sutures were removed on day 10 post-operative. The animal experienced an uneventful recovery after 2 weeks. The excised mass was greyish-yellow in color with a firm consistency. The histopathology of the excisional biopsy sample revealed hyperplasia of the sebaceous gland, which was observed as numerous lobules of acinar cells with undifferentiated basaloid germinative cells in the periphery, while the central area was formed by mature sebocytes⁵. The examination revealed the fibrous tissue proliferation and infiltration of the mixed population of inflammatory cells, suggestive of chronic inflammation. Glandular acini showed cystic degeneration, but cellular atypia and mitotic figures were not observed⁴.

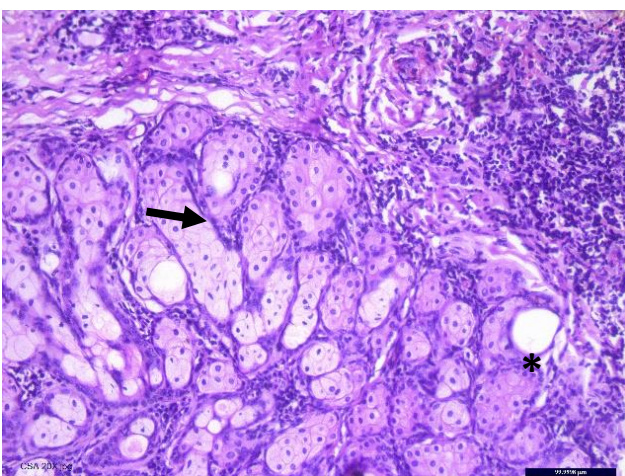


Figure 4. Sebaceous gland - glandular acini in a 6-year-old Jersey crossbred cow showing cystic degeneration (asterisk), multifocal infiltration of inflammatory cells (arrow) predominated by mononuclear cells and fibrous tissue proliferation encapsulating the acini. H and E staining, x20.

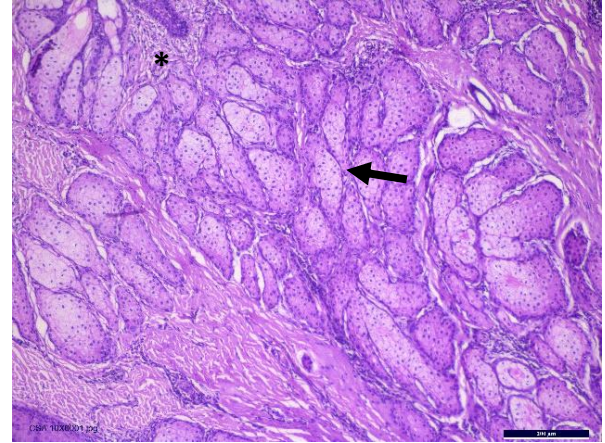


Figure 5. Hyperplasia of the sebaceous gland (arrow) with infiltrating fibrous tissue proliferation (asterisk) in a 6-year-old Jersey crossbred cow. H and E staining, 100X.

3. Discussion

Hyperplasia of the sebaceous gland combined with chronic inflammation is a rare condition reported in large ruminants. In case of hyperplasia, numerous well-differentiated lobules are associated with dilated ducts, and the periphery of these lobules contains one or more layers of germinative cells¹⁶. In other animal species, there are reports of adenitis, as in the case of a 7-year-old Arabian gelding. The cutaneous lesion with sebaceous adenitis revealed lymphoid infiltration and destruction of sebaceous ducts with subsequent complete loss of the sebaceous gland¹⁷.

The lesions reported in dogs with sebaceous adenitis included tegument dyskeratosis with psoriasiform and ptiliasiform scaling, comedones, alopecia and hypotrichosis, follicular cylinders, and dry hair¹⁸. The condition was also reported in humans due to idiopathic etiology in the labia minora³. In the initial stages, the condition appeared like small, tender papules or nodules sometimes, it may discharge pus also¹⁹. In humans, the mild cases were treated with medical management, such as oral administration of levofloxacin and minocycline¹. In the present study, surgical management was preferred due to the extensive nature of the lesion.

Sebaceous adenitis is thought to be resulting from cell-mediated immune response, but the pathogenesis behind the scaling and alopecia is yet to be elaborated¹. The possible mechanism behind the sebaceous gland hyperplasia during inflammation is through the release of cytokines such as transforming growth factor (TGF) α , TGF β , interleukin (IL)-1 and IL-3, which function as promoters for the growth, increased mitotic activity or increased function of sebocytes⁵. Accumulation of lymphocytes around the sebaceous glands or ducts are seen in the early phase of inflammation while the fully developed sebaceous adenitis is characterized by infiltration of lymphocytes, neutrophils, and macrophages that efface sebaceous glands¹.

In many cases, the hyperplasia of sebaceous glands becomes neoplastic conditions of a benign or malignant

nature. Matovelo et al.²⁰ reported a case of sebaceous gland carcinoma of the perineum and vulva in a Friesian cow in which the histopathologic observations revealed irregularly shaped extensions of densely packed epithelial cells that were poorly defined and haphazardly infiltrating the dermis.

Surgical interventions in ruminants necessitate a cautious approach as they produce copious amounts of saliva during general anesthesia. The presence of protective laryngeal and pharyngeal reflexes usually depend on the drugs used in the chemical restraint procedure. In ruminants, the recumbent position during surgery causes tympany and regurgitation. To avoid such issues, the standing position is preferred in most cases. The intravenous standing stun dose of the drugs includes xylazine (0.02–0.0275 mg/kg), butorphanol (0.02–0.1 mg/kg), and ketamine (0.05–0.1 mg/kg), which are administered as a combination¹¹. Intramuscular standing stun could be also useful during ruminant surgery. The combination of xylazine at a dose of 0.02 mg/kg, butorphanol at a dose of 0.01 mg/kg, and ketamine at a dose of 0.04 mg/kg body weight through intramuscular route could provide a sufficient period of standing stun for the surgical management of ocular dermoid in a Holstein Friesian heifer²¹.

4. Conclusion

Sebaceous gland adenitis is a rare condition in ruminants. Successful surgical management of chronic vulval sebaceous gland adenitis in a cow without any complications was reported here. The chronic inflammation and hyperplasia of the gland have evolved into an external protruding mass of tissue. The timely presentation and surgical removal of the affected gland have saved the animal from pain and suffering, which would have turned out to be a neoplastic transformation if left untreated.

Declarations

Competing interests

None.

Authors' contribution

All authors conceived and designed the paper. Deny Jennes and Sudheesh S. Nair attended the case and wrote the first draft. Aravind Koovalamnikarthil Unni and Prasanna Krishnan. Subhadra performed the histopathology of the sample and confirmed the condition. John Martin Kurisinkal Dominic contributed to the discussion. All authors read and critically revised the manuscript and approved it for the final publication in the journal.

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Availability of data and materials

The manuscript contains all datasets generated and/or analyzed in the current study.

Ethical considerations

Ethical issues (including plagiarism, consent to publish, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancy) have been checked by all the authors.

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