Bilateral Entropion Surgery in a Kıvırcık Breed Ram

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SUMMARY

The purpose of this report is to document a rare case of acquired entropion in a ram without a history of trauma. Entropion can be either congenital or acquired. The case involves a 1-year-old Kıvırcık breed ram weighing 26.6 kg, showing signs of purulent discharge in both eyes for a duration of 15 days. After a comprehensive general clinical assessment, a detailed ocular examination was conducted whose outcomes can be summarized as follows: Positive ocular reflexes, such as pupillary light and palpebral, were noted during the examination. Schirmer tear tests (STT) yielded readings of 10 mm/min and 12 mm/min for the right and left eyes, respectively. Intraocular pressure (IOP) measurements were taken for both eyes and recorded as 12 mmHg for the right and 13 mmHg for the left eye. Fluorescein tests exhibited positive results. While IOP and STT values fell within normal ranges, the presence of purulent discharge and corneal damage was evident. Both eyes were diagnosed with the bilateral entropion of the upper and lower eyelids. Surgical intervention was performed under general anaesthesia, utilizing a combination of xylazine hydrochloride and ketamine hydrochloride. The Hotz-Celsus method was employed to correct the bilateral entropion. Excess skin was excised elliptically 1-2 mm from the eyelid margin. It was then intradermal sutured with 4-0 absorbable suture material and the wound was closed using intradermal sutures. Post-operatively, subconjunctival antibiotics (ofloxacin) and subcutaneous meloxicam were administered. A long-term follow-up was carried out for 4.5 months and the post-operative evaluations were particularly conducted on days 2, 4 and 135. The use of intradermal sutures and subconjunctival antibiotic injections, instead of eye drops, facilitated straightforward post-operative follow-up. Owners may overlook entropion in cases of abnormal discharge and corneal lesions due to ocular pain and blepharospasm. Although severe entropion can potentially lead to corneal ulcer, complete perforation and panophthalmitis, it is also possible to conduct a successful and lasting corrective treatment via permanent surgical intervention, as presented in this case report.

KEY WORDS

Eyelid diseases, ocular surgery, ophthalmology, small ruminant.

INTRODUCTION

Eye diseases are prevalent among ruminants and require careful attention. Ophthalmic disorders can induce discomfort and pain in livestock, leading to adverse outcomes including reduced well-being, diminished appetite, weight loss, and decreased productivity (1, 2, 3). One such condition is entropion, where the eyelids turn inward towards the eye, causing irritation of the cornea by eyelashes or periocular hair. This can result in symptoms like epiphora, photophobia, conjunctivitis and blepharospasm. Without proper intervention, entropion can potentially give rise to secondary complications such as corneal ulcers, keratitis, and eventually blindness. While it is more common on the lower eyelids, it can occasionally manifest in the lateral canthus or upper eyelid region. Cases of entropion have been documented across various species including dogs, cats, goats, sheep, horses, pigs, rabbits, camels, and even humans (4, 5, 6, 7, 8, 9, 10). Entropion can either be congenital or acquired, with congenital cases being frequent in lambs. Secondary entropion can arise from factors like severe dehydration, trauma, weight loss, old age, retrobulbar fat loss, microphthalmia, or painful corneal-conjunctival conditions. Typically, secondary entropion is unilateral and affects either the upper or lower eyelid (4, 11, 12). In the case presented here, unlike previously reported instances, an unusual scenario was observed: an adult ram displaying secondary bilateral entropion affecting both upper and lower eyelids. The significance of this case lies in the rarity of the severe acquired entropion in small ruminants, which underscores the importance of raising awareness about such occurrences.

CASE PRESENTATION

The study involves a 1-year-old Kıvırcık breed ram weighing 26.6 kg, exhibiting purulent discharge in both eyes for a span of 15 days. No abnormalities were detected during the gener-

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al clinical examination of the patient. The general eye examination included assessments of pupillary light reflex, palpebral reflex, STT, IOP (Figure 1) and Fluorescein test (Figure 2) (Table 1). To measure the STT, a strip (Akschirmer Tear Test, Devine Meditech, India) was placed in the lower conjunctival sac of one eye, and the extent of tear wetting was measured up to 1 minute. IOP was gauged using the TonoVet™ rebound tonometer. Corneal lesions were detected using fluorescein sodium ophthalmic strips (Fluorescein Sodium Strip, ERC Health, Turkey). Excess fluorescein was rinsed with sterile saline to prevent false positives and the cornea was examined under cobalt blue light.

Previous studies have reported the normal range of STT values in sheep as 10.6-26.2 mm/min (13, 14, 15, 16). In this case report, STT values were found to fall within the normal range (12 mm in the left eye and 10 mm in the right eye). Similarly, the normal range of IOP in sheep was reported as 10.6-17.7 mmHg in previous studies (13, 17, 18). On the other hand, the IOP measurements of this study were measured as 13 mmHg and 12 mmHg in the left and right eyes, respectively. These readings also fell within the normal range.

Both eyes of the patient were diagnosed with entropion affecting not only the upper but also the lower eyelids, which led to the decision of performing a surgery. After shaving the upper and lower eyelids of the patient, the area was prepped in adherence to aseptic and antiseptic guidelines. The patient was anesthetized using xylazine hydrochloride (Xylasin Bio 2%, 0.22 mg/kg, intramuscular, Bioveta Plc. Komenskeho, Czech Republic) and ketamine hydrochloride (Keta-Control, 11 mg/kg, intramuscular, Mefar İlaç Sanayii A.Ş., Istanbul, Turkey). In veterinary anesthesia, a combination of ketamine and 2-agonists is commonly used (19, 20, 21). In the presented study, general anesthesia was induced using a combination of xylazine and ketamine, which led to a smooth anesthetic induction. No signs of ruminal tympany or regurgitation were noted during or after anesthesia and no adverse effect was observed.

In the Hotz-Celsus procedure, the thin elliptical segments of both skin and the orbicularis oculi muscle are excised from the eyelid. In accordance with the Hotz-Celsus method, the skin piece to be taken from the distal of the lower eyelid rima palpebrarum was determined with hemostatic forceps, and the excess skin was excised elliptically 1-2 mm from the eyelid margin. It was then intradermal sutured (simple continuous pattern) with 4-0 (PGLA, Pegelak, Hannover, Germany) absorbable suture material. Unlike other reports that suggest a simple interrupted suture (22), an intradermal suture was used to prevent wound area damage and maintain sutural integrity. A comparable procedure was replicated on both the upper and lower eyelids of both eyes.

Subconjunctival antibiotics (ofloxacin, 0.5 ml for both eyes, Exocin 0.3% eye drops, Allergan Pharmaceuticals, Mayo, Ireland) were administered to both eyes. To prevent eye itching, meloxicam (Bavet Meloxicam, 0.5 mg/kg, subcutaneous, Arion Pharmaceuticals, Istanbul, Turkey) was prescribed for a span of 3 days. In post-operative assessments, it was observed that there was no discharge from the patient's eyes, and the entropion had significantly improved. Post-operative evaluations were conducted on days 2, 4 (Figure 4 and 5) and 135 (Figure 6). Total duration of follow-up was 4.5 months.

Figure 1 - Measurement of intraocular pressure was performed on the eye. Additionally, notable observations included purulent discharge and corneal opacity.

Figure 2 - The fluorescein examination under cobalt blue light of a slit-lamp. The central spot of the cornea was stained by the dye and appeared green.

Table 1 - Ophthalmologic examination results.

Test	Right	Left
Pupillary light reflex	Positive	
Palpebral reflex	Positive	
Fluorescein test	Positive	
STT	10 mm/min	12 mm/min
IOP	12 mmHg	13 mmHg

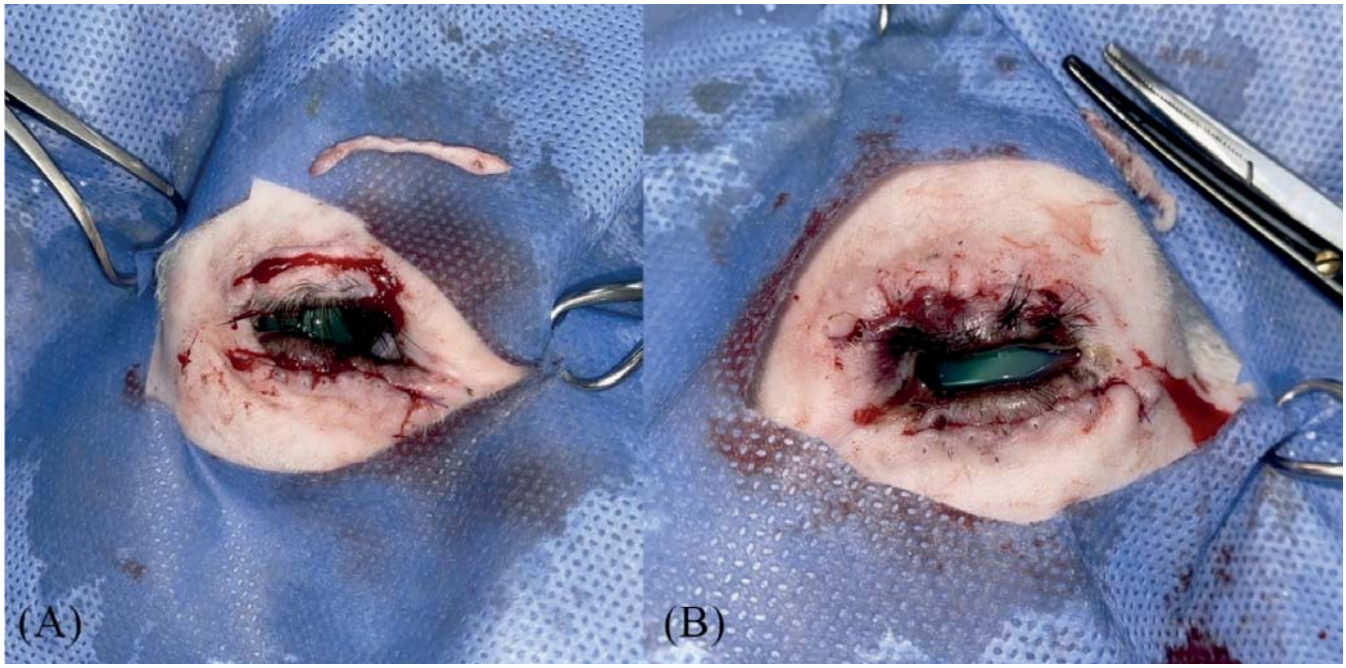

Figure 3 - Perioperative views of the right (A) and left (B) eye.

Figure 4 - 2 days after the surgery, (A) right eye, (B) left eye.

DISCUSSION

Entropion can arise due to various factors such as inflammation, infection, aging, and congenital anomalies. It is notably common in lambs, where it might be present from birth due to anatomical or genetic factors. Dehydration or microphthalmia can also contribute to its occurrence in newborns. In older age groups, entropion might develop as a secondary result of blepharospasm caused by eye pain or eyelid scarring. This condition has been reported globally in sheep, with a prevalence range of 1.1% to 80%. Acquired or secondary entropion can be triggered by various factors, some of which can be listed as trauma, severe dehydration, emaciation, aging-related retrobulbar fat loss, microphthalmia, phthisis bulbi, or painful corneal/conjunctival conditions. Acquired entropion is typically unilateral and may affect either the upper or the lower eyelid, and it can affect animals of any age (4). In the presented study, the patient was a 1-year-old ram and clinical signs became apparent within the last 15 days. Entropion was suspected as the cause of the corneal damage and purulent discharge. Notably, the patient was an adult and exhibited below-normal body weight (23, 24) which suggested that the condition might be secondary to retrobulbar fat loss.

Methods such as injecting sterile liquid paraffin between the skin and conjunctiva of the affected eyelid to create swelling and reposition the eyelid or using stitches or metal wound clips to address the folding have been attempted. However, these methods carry the risk of damaging delicate ocular structures

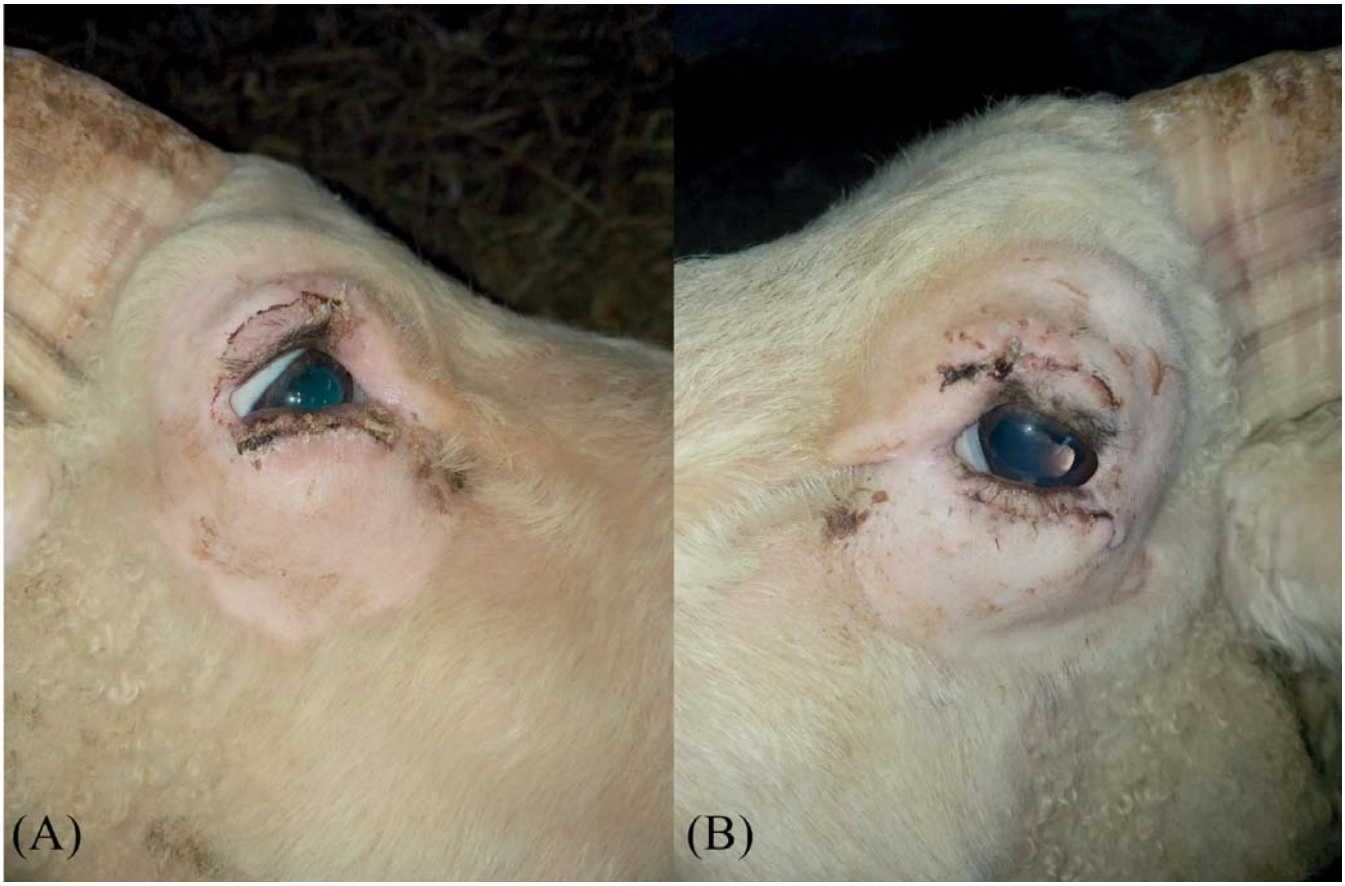

Figure 5 - 4 days after the surgery, (A) right eye, (B) left eye.

Figure 6 - 4.5 months after the surgery, (A) right eye, (B) left eye.

(12). Non-surgical treatments of entropion such as injection of a long-acting antibiotic bleb into the palpebral skin to affect out-turning or even injection of air in the same area are for a short-lasting effect. In large animals, injections of procaine penicillin G and liquid paraffin have been tested but are not favoured due to the potential for complications like fistula, abscess, and granuloma formation. Subepidermal hyaluronic acid injections have shown positive outcomes in dogs (25). Early surgical intervention is crucial to prevent corneal damage and potential blindness. In this study, surgical treatment was chosen, and the patient's complete recovery was observed during follow-up.

Surgery stands as a definitive treatment method for entropion. Various techniques have been described in the literature, including Hotz-Celsus, lateral canthal closure, fornix-based suture placement, medial canthal Y to V-plasty, stellate rhytidectomy, the Stades method, and combinations thereof (26). A modified Hotz-Celsus method has also been described, employing a CO_2 laser and omitting the use of stitches, demonstrated in two cats and two dogs (25). Researchers reported the surgical treatment outcomes of entropion using Hotz-Celsus technique gave an overall success rate of 94.2-99.21% (27, 28). Consequently, this technique was preferred because of its high success rate. Removing excess skin that causes entropion with the Hotz-Celsus technique provides permanent treatment. It is worthwhile to note that no post-operative complications or recurrence were observed.

CONCLUSION

Entropion is a condition that can rapidly be diagnosed and treated. Often, owners become aware of entropion when they observe signs such as epiphora, purulent discharge, and corneal damage. However, due to blepharospasm, entropion might also be overlooked in patients with signs of epiphora, abnormal discharge, or corneal lesions. It is essential to identify the cause and subsequently determine the most appropriate treatment method for managing entropion. A comprehensive examination can lead to an accurate diagnosis, and with the correct examination and diagnosis, prompt positive results can be achieved through suitable surgical intervention.

Conflict of Interest Statement/Funding

Authors declare that they have no financial interests or personal conflicts that may affect the study in this article.

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