

Short Communication

STUDIES ON OCCURRENCE AND SURGICAL MANAGEMENT OF OCULAR FIBROSARCOMA IN BUFFALOES

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ABSTRACT: Medical records of past eight years (2015-23) were investigated to study the occurrence and surgical management of ocular growths in buffaloes. The overall occurrence of ocular fibro sarcoma was found to be 0.8% (15/1753). The buffaloes were of 21 to 49 months age with growths protruding through the palpebral fissure. Growths were greyish white/pinkish nodules of 4-7mm size attached at the corneal-limbal-scleral-conjunctival junction of eye. Animals were experiencing varying degree of pain, epiphora and vision impairment due to difficult eyelid closure. Xylazine sedation (0.01mg/kg) and retrobulbar nerve block was used for surgical resection of the growth. In majority of the cases, growths were found adhered to limbus areas with a very fine fibrous attachment. Histopathological studies confirmed that cases were of fibrosarcoma. Surgical removal of ocular fibrosarcoma was successful and reoccurrence was not observed in any of the case on follow-up for 4 to 12 months.

Keywords: Buffaloes, Fibrosarcoma, Ocular, Surgical management.

Ocular neoplastic growths like squamous cell carcinoma complex, leiomyoma and the orbital infiltration associated with lymphosarcoma [1, 2] has been reported in India [3]. Prolonged exposure to sunlight (ultraviolet light), mechanical irritations, injuries and burns can lead to their development in animals [4]. These growths are generally located at limbus, third eyelid, upper and lower eyelid margins [5]. Squamous cell carcinomas are most common tumors (62%) followed by papillomas (26%) [6]. Neurofibromas originate from endoneural and perineural connective tissues are fairly common but reported mainly in cattle and dogs [7]. Occurrence of ocular neurofibromas in buffaloes has also been reported [8]. Detailed reports on large number of buffaloes, their surgical management and follow-ups are scarce. Hence, the present study was carried out to find out the clinical and histopathological characteristics and outcomes of surgical interventions in buffaloes.

The study

A total of 1753 adult buffaloes presented with various ailments at Referred Veterinary polyclinic of ICAR-IVRI, Izatnagar from January 2015 to January 2023 formed the subject of study. Among them, 71 animals were found to have various ocular affections. Ocular growths protruding through the palpebral fissure were observed in 15 animals (Table 1). All the animals were aged between 21 to 49 months age. Growths were located at different positions of corneal-limbal-sclera-conjunctival junction (Fig. 1A, 1D, 1G and 1J). All the animals were apparently healthy with normal vision, mild corneal opacity, pain and varied degree of epiphora. The animals were restrained in trevis for detailed clinical examinations. After taking owners consent, surgical excision was planned. Animals were sedated with xylazine hydrochloride (Inj. Xylaxin, Indian Immunologicals Limited) @ 0.01mg/kg intramuscularly. Retrobulbar nerve block was given

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for local analgesia using 2% lignocaine hydrochloride (Inj. Lox, Neon Laboratories Limited). Eyes were thoroughly rinsed with diluted betadine solution for aseptic preparation. Growths were fixed between fingers or with nylon stay suture to locate the adhered part and was removed either with BP Blade or scissors. Removal of maximum part of tumour tissue was assured in each case (Fig. 1H, 1I, 1K, 1L). Adrenaline soaked swabs were used to check local bleeding, if any. Growths were stored in formalin saline and sent for histopathology. Postoperatively, moxifloxacin (Moxtec, Tecnex Pharma) and flurbiprofen (Flur, Allergan India Ltd) eye drops were prescribed for 5-7 days. In addition ceftriaxone (Inj. Intacef-4 gm, Intas Pharmaceuticals Ltd.) @ 10 mg/kg BW IV, BID and meloxicam (Inj. Melonex, Intas Pharmaceuticals Ltd.) @ 0.2mg/IM OD for 5 days were administered. All the animals showed adequate response to the surgical treatment adopted without any subsequent recurrence and recovered uneventfully. The biopsy tissue samples were collected in 10 per cent neutral buffered formalin for histopathological

examination. Paraffin embedded tissues sections of 4-6 μ m were made and stained for hematoxylin and eosin (H&E) and Masson's trichrome using previously described methods [9].

Results and discussion

Ocular neoplastic growths are leading causes for loss of vision in animals. Squamous cell carcinoma complex and leiomyoma are most common ophthalmic tumors in buffaloes [1, 2]. The etiology of the disease is multifactorial like but prolonged exposure to sunlight is a driving force for the disease [4]. Leiomyoma is a rare, benign smooth muscle tumor representing 2.3% to 14.5% of all primary iris tumors. Occurrence of ocular fibrosarcoma in our study was 0.8%. Kohlir and Mashadi (2008) reported that squamous cell carcinomas were the most common tumour (62%) followed by papillomas (26%).

A summary of patient's details and clinical features of ocular surface growths in all the cases is given in table 1. The buffaloes of our study were of 21 to 49

Table 1. A summary of patients' details and clinical features of ocular surface growths.

Case	Age (Months)	Sex	Right/Left eye	Location	Symptoms	Duration of symptoms (months)	Clinical features	Follow-up after surgery
1	28	Female	Right	Limbal	Epiphora	2	Grayish white nodule	6 months
2	21	Female	Right	Limbal	Pain, epiphora	1.5	Pink oval vascular nodule	5month
3	29	Female	Left	Corneo-limbal	Epiphora, FB sensation	1.5	Pink oval Nodule	8months
4	48	Female	Left	Limbal	Pain, epiphora	6	Grayish white nodule	Not done*
5	37	Female	Left	Limbal	Pain, epiphora	5	Pink oval Nodule	Not done*
6	49	Female	Left	Limbal	Pain, epiphora	12	pink oval Nodule	
7	26	Female	Right	Corneo-limbal	Pain, epiphora	5	pink oval Nodule	Not done*
8	34	Female	Right	Limbal	Pain, epiphora	4	pink oval Nodule	5
9	47	Female	left	Limbal	Pain, epiphora	8	Grayish white nodule	4
10	43	Female	Left	Limbal	Pain, epiphora	9	pink oval Nodule	12
11	39	Female	Left	Limbal	Pain, epiphora	7	Grayish white nodule	15
12	35	Female	Right	Limbal	Pain, epiphora	6	Grayish white nodule	
13	38	Female	Right	Corneo-limbal	Irritation, FB sensation,	7	Grayish white nodule	11 months
14	42	Female	Left	Corneo-limbal	Irritation, FB sensation,	9	Grayish white nodule	
					Epiphora			
15	26 months	Female	left	Sclero-limbal	Epiphora, mild corneal cloudiness near attachment	6 months	Grayish nodule	Six months (no reoccurrence)

*Sold out at different days post-surgery.



Fig. 1. Photographs of animals with growth on eyes taken before operation (A, D, G and J) and after operation (B, E, I and L). [Surgical removal of the growths (H and K) and collected growths (C and F) sent for histopathological examinations].

months age which is similar to the findings of Sharma *et al* [3], that a wide range of 2 to 9 year old animals are having ocular growths. In contrary, Bhume *et al*. [10] reported that the average age of cattle with ocular squamous cell carcinoma is eight years and hardly seen in cattle younger than three years. In our study, we did not find any seasonal variance in the occurrence of growths. Sharma *et al*. [3] reported higher occurrence of ocular neoplasm in summer due to greater exposure to sunlight which is a predisposing factor in initiation

of the tumor. Xylazine and retrobulbar nerve block produced adequate sedation and anesthesia for painless surgical resection of the growths in all the cases of present study. Kumar and Sharif [11] and Sharma *et al*. [3] have also used Xylazine sedation and Peterson nerve block for surgical removal of ocular tumors.

Grossly, the excised growths appeared as grayish white or pink oval nodules of 4-7 cm diameter attached to the limbus/cornea/sclera or conjunctiva with a very small base (Fig. 1). Sharma *et al*. [3] also observed

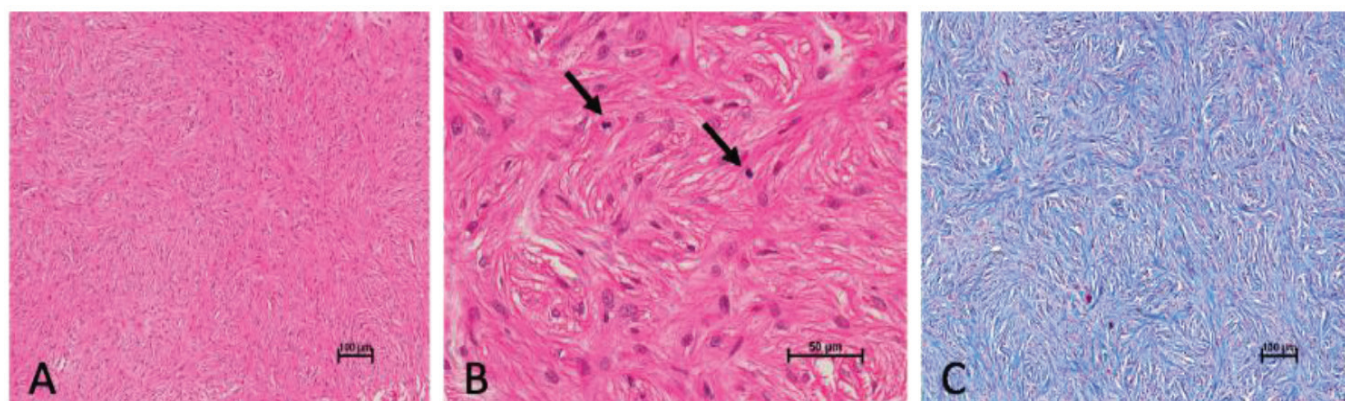


Fig. 2. Tissue biopsy from tumour mass showing neoplastic immature fibroblast arranged in haphazard way in dermis (H&E x100). [A. Higher magnification in showing hyperchromatic nuclei and mitotic figures (arrow) in neoplastic fibroblasts (H&E x400) B. Masson's trichrome staining of tumour tissue section showing extensive fibroblast proliferation and collagen deposition (MST x100) C].

similar type of ocular growths in buffaloes diagnosed with cases of leomyoma, fibro-leomyoma and squamous cell carcinoma. Ocular masses with either a formed encapsulated surface or cauliflower like growth with varying degrees of involvement with the surrounding ocular tissues have been observed in buffaloes. These masses causes discomfort and epiphora, sometimes leads to pain, swelling and troubles with normal vision. Grossly, based on the overt characteristics, they can be benign or may be extensive involving other ocular structures with varying changes in the bony orbit, nearby lymph nodes etc. Histopathology of the growth gives idea about the nature and predilections of different types of ocular tumor in buffaloes. Harikrishna *et al.* [12] observed squamous cell carcinoma in buffaloes, with a reported occurrence of 0.8-1.6% in bovine.

Histopathological examination of biopsy from tumour showed intact epidermis though the dermis had extensive fibroblastic proliferation and was extending into deep dermis. The fibroblasts were fusiform to spindle-shaped with hyperchromatic nuclei and were arranged unevenly in eosinophilic fibrillar collagen matrix. Numerous mitotic figures were also observed, around 4-6 in number in a high-power field (HPF) ($\times 400$). The Masson's trichrome staining also confirmed the fibroblast proliferation and collagen deposition (Fig. 2). On histopathological examination, fibrosarcoma was confirmed. Sharma *et al.* [3] reported that leomyoma cases are having spindle shaped smooth muscle cells and ribbon shaped nucleus having rounded ends, fibro-leomyoma are having neoplastic fibroblasts and smooth muscle cells with collagen fibers arranged in whorls or interlacing bundles.

It is evident that the predilection of fibrosarcoma was limbus whereas that of squamous cell carcinoma is either nictitans or the palpebral conjunctiva or eyelids. Moreover the squamous cell carcinomas showed hyperkeratosis and ulceration [12]. Different stages of development of ocular tumor have been outlined by [13] as plaques, keratinoma, papilloma and carcinoma. Ocular squamous cell carcinoma can lead to hide rejection and economic losses to the farmers. The leading cause of squamous cell carcinoma is given as exposure to excessive sunlight, though many viral [14] or environmental factors can play a role in development. Early diagnosis of ocular tumours can lead to effective surgical management and avoid loss of eye, neoplastic transformation and spread into nearby lymph nodes.

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