Surgical Management of Eye Tumours in Buffaloes: Report of 16 Cases

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Abstract
The present communication reports the surgical excision of ocular neoplastic growths in 16 cases of buffaloes of two to nine years of age. Tumours were removed surgically, using standard procedures and examined grossly and microscopically. Most of the ocular neoplasms diagnosed were leiomyoma, mostly attached to the limbus of eyeball and palpebral conjunctiva. On histopathology of the removed masses 11 cases were of leomyoma two cases were of fibro-leomyoma and three cases were of squamous cell carcinoma.

Keywords: Buffalo, Eye, Leomyoma, Carcinoma, Tumours.

1. Introduction
In the past decade, ocular neoplastic growths are being found as one of the leading reasons for loss of vision in buffaloes in India. The most frequent ophthalmic neoplasms in buffaloes are the squamous cell carcinoma complex, leiomyoma and the orbital infiltration associated with lymphosarcoma (Radostits et al., 2000; Dubielzig, 2002). Tumours are found less frequently in animals which are often slaughtered for food at relatively early age than in domestic pets which often survive upto older age, and in laboratory animals which are often under close observation for long periods. Bovine ocular squamous cell carcinoma (OSCC), also called “Cancer eye”, represents one of the most economically important neoplasm in large animals. The economic impact includes carcass condemnations, production losses, treatment expenditure and management costs. Ocular squamous cell carcinoma (OSCC) in animals is a primary neoplasm of epithelial origin that may occur in different ocular and periocular tissues, especially the epithelial surfaces of conjunctiva, corneoscleral junction, nictitating membrane, and cornea and the eyelid skin. The etiology of the disease is multifactorial. Prolonged exposure to sunlight (ultraviolet light) also seems to be a driving force for the disease (Anderson et al., 1991). Leiomyoma is a rare, benign smooth muscle tumor representing 2.3% to 14.5% of all primary iris tumors. It may involve the sphincter and dilator muscles of the iris, ciliary muscle of the ciliary body. Leiomyoma is usually well-circumscribed and has a tendency for slow growth. Although degeneration may occur within its substance, resulting in hemorrhage and local necrosis, spread by continuity, contiguity, or metastasis has not been recorded. The prognosis for vision depends on the location and size of the tumor and is usually excellent.

The tumour in all species develops through a series of premalignant stages, called epidermal plaques and papillomas, before proceeding over months or years to carcinoma in situ and to invasive carcinoma (Wilcock, 1993). Russell et al. (1956); Monlux et al. (1957) reported the sites of a combined total of more than 1000 ocular carcinomas and benign precursor lesions. Approximately 75% were on the bulbar conjunctiva and cornea (90% at the limbus and 10% on the cornea) and the remaining 25% were found in the conjunctiva of the eyelids, membrana nictitans and the skin of the eyelids. Lymphosarcoma and hemangiendothelioma of the eye have been also reported in cattle. However, the occurrence of these eye tumours is uncommon to rare (Wilcock, 1993). There are very few reports regarding the tumours of buffalo eye as well as outcomes of the surgical interventions. So, the aim of the present study was to determine the type and pathological characteristics and outcomes of surgical interventions in neoplastic growths of the ocular surface of buffaloes reported to TVCC, Hisar.

2. Materials and Methods

2.1 Animals
Sixteen cases of she-buffaloes of two to nine years of age were reported with growths of different sizes on eyeball and adnexa causing excessive lacrimation and difficulty in vision. The most common site of the attachment of mass was cornea and sclera. Animals had normal appetite and normal clinical parameters.

2.2 Surgical Intervention
The animal was restrained in a trevis with its head secured to one side with a halte. The para-ocular surgical sites were clipped and aseptically prepared. In
all cases the buffaloes were sedated with xylazine hydrochloride @0.07mg/kg intravenously. Local analgesia was achieved with Peterson’s nerve block and auriculo-palpebral nerve block using 2% lignocaine hydrochloride. The growths smaller in size were twisted on its base or removed with help of scissors. The neoplastic growth at conjunctiva was protruded out with the help of eyelid retractor and was excised out as much as possible. The eye was flushed with normal saline and gentamycin solution. On bleeding, if any, site was touched with adrenalin swab. In two cases where whole eye was involved, extirpation of the eyeball was performed. The eyelids were sutured together with simple continuous pattern by non-absorbable suture material (silk size 2) with the ends of the suture left long (to form loop like-appearance) to minimize contamination of the surgical field and help the surgeon during dissection. An incision was made through the skin of both upper and lower lids (5 - 10) mm from the lid margins. These incisions met beyond the medial and lateral canthus. Care was taken not to damage the branches of the angular vein adjacent to the medial canthus. Then blunt dissection followed to separate the ocular muscles and other attachments from the bony orbit, once this had been achieved, curved hemostat was introduced to grasp the optic nerve. The eyeball was removed by introducing curved scissors infront of the hemostat to cut it. Bleeding was carefully arrest either with hemostat if it is minor or via ligation of the bleeder with fine dissolvable suture material such (cat gut 3-0). In one case bleeding was controlled by forceful packing of the orbit with gauze for a short time. Sterile gauze soaked in eye ointment (tetracycline) introduced to full the orbital cavity and this was changed (2 to 3) times after 48 hours. The upper and lower eyelids were restitched by interrupted horizontal mattress pattern with non-absorbable suture. In post operative care the eye was instilled with Neosporine-H eye ointment and sub-conjunctival injection of gentamycin and dexamethasone along with antibiotics, antihistamines and anti-inflammatory for 5 days.

2.3 Histopathological Examination

The whole tumor mass was removed and examined grossly then cut into pieces and fixed in (10%) neutral buffer formalin. The tissue specimens were processed in a tissue processor, paraffin blocks were made; (5 - 6) μm thick sections were cut with a microtome and stained with Hematoxylin and Eosin dyes (10 x). Then stained slides were examined under light microscope. Microscopically, degree of differentiation, type of growth pattern of neoplastic cells, cellular characteristics of parenchyma, mitotic index, necrosis and haemorrhages, invasion to stroma, vessels and lymphatics and host inflammatory responses, degree of the malignancy and anaplasia were recorded. All tumours were histologically classified with regard to microscopic features, especially according to the degree of differentiation.

3. Results

Macroscopically, the lesions were papillomatous growths of varying size with fleshy, sometimes crumbly masses that attached to the limbus/cornea/sclera or conjunctiva with a narrow to wide base. The lesions varied in size from a few millimetres to several centimetres, many of which had a nodular or cauliflower like appearance. On histopathology of the removed masses in eleven cases were leomyoma showing spindle shaped smooth muscle cells and ribbon shaped nucleus having rounded ends, two cases were fibro-leomyoma showing neoplastic fibroblasts and smooth muscle cells with collagen fibers arranged in whorls or interlacing bundles and three cases were of squamous cell carcinoma. The major surgical complications were...
hemorrhage into the orbit obscuring the surgical field in cases of extirpation of eyeball. This problem was anticipated and largely overcome by care in dissection within the orbit, avoiding trauma to intra orbital soft tissue and special attention to the ligation or crushing of the optic nerve and forceful packing of the orbit with guaze for a short time. All the cases recovered initially but there was recurrence of growth in limbus region in six cases reported after six to eight months of treatment.

4. Discussion
In this study, age range of the affected animals was (2 to 9) years. High percent of the tumors were observed in the age (5 to 8) years. The tumors were not common in animals younger than three years and no animal was of less than one year of age. Bhume et al. (1992) found that the average age of cattle with ocular squamous cell carcinoma is eight years and the tumors are less common in cattle younger than five years and rare and hardly ever seen in cattle younger than three years. Majority of cases were reported during summer season. Despite the fact that incidence of cows ocular neoplasms varies geographically in India, this may be attributed to greater exposure to sunlight in warm and dry areas which considered as a predisposing factor in initiation of the tumor. This contention supported by the findings of Den-Otter et al. (1995), who observed ocular squamous cell carcinoma in Simmental cattle, and exposure to intense solar radiation has been proposed as the cause, especially when cattle are kept in a sunny and warm climate. Krol et al. (1998) found that the season was important in progression of lesions and occurrence of new lesions of ocular tumors, and these were highest during summer and lowest during winter. There is a significant association between increasing risks of developing eye tumor and increasing levels of actinic radiation, and cattle exposed to high levels of radiation with longest hours of sunlight per year develop the disease at younger ages (Sastry and Rao, 2005; Sivaseelan et al., 2008).

5. Conclusion
On the basis of present study, it was concluded that the surgical excision of the eye growth was effective for management of leiomyoma, fibro-leiomyoma and squamous cell carcinoma. No reoccurrence was observed in all the cases.

References