SUCCESSFUL MANAGEMENT OF EYE CANCERS IN DEONI CATTLE: A REVIEW OF 10 CASES

D. Dilipkumar[1] and Manjunath Patil[2]
Department of Veterinary Surgery and Radiology, Veterinary College
Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar-585 401, Karnataka, India

Received: 14.02.2016
Accepted: 13.07.2016

ABSTRACT

A study was conducted in 10 clinical cases of eye cancer in Deoni animals. Out of 10 cases 8 were Deoni bullocks and 2 were Deoni cows. The age of bullocks ranged between 8-10 years where as the age of cows ranged between 5-7 years. The diagnosis was done by history, clinical signs and histopathological examination. Superficial keratectomies followed by cauterisation with 1% silver nitrate solution were done in all cases. After follow up of one year, recurrence was seen in two cases in same operated eye where above surgical treatment was followed. Along with this, administration of autogenous vaccine and BCG vaccine was carried out. No recurrence was seen even after one year.

***Key words*:** Deoni cattle, eye cancer, silver nitrate, autogenous and BCG vaccine

Introduction

Eye cancer is the most common neoplasm in cattle (Radostits *et al.,*1995). Eye cancer is seen in 0.8 to 1.6% of cattle population in United States (Cleaver *et al.,* 1972). In some areas, it is nearly 5% (Moulton, 1961); among the eye tumours, 91% are malignant and most common is the carcinoma (Moulton, 1961; Priester and Mantel, 1971 and Kircher *et al.,* 1974). In some parts of Maharashtra, incidence of eye cancer was found to be 2-8% (Panchbhai *et al.,* 1987).

Cancerous growth of eye may be classified as plaque, papilloma and invasive squamous cell carcinoma (Bhaskar, 2011). Treatment method for eye cancer in food animals in United States include radiation therapy, immunotherapy and electro-thermal therapy (Gelatt and Williams, 1985). These are costly and not possible in Indian field conditions. Surgical excision of the growth followed with cauterisation with 1% silver nitrate (Tyagi and Singh, 1993). However, extensive follow up of the cases was not done. Hence, the present work was taken with the objectives to surgical excision of tumour cauterization with 1% silver nitrate solution and immunotherapy and follow up of these cases up to 1 year.

Materials and Methods

A study was taken in 10 clinical cases of eye cancer in 8 Deoni bullocks were aged between 8-10 years of age and 2 Deoni cows were aged between 5-6 years. Out of 8 Deoni bullocks, 4 bullocks had plaque growth on limbus and remaining 4 bullocks had papilloma growth either on cornea or sclera. Out of 2 Deoni cows, 1 cow had plaque adjacent to sclera and another cow had papilloma on eye lid region. Design of study is given in Table 1.

Animals were off fed for 48 hours prior to operation and were operated in standing position under xylazine sedation @ 0.03 mg/kg b.wt., i/m and auriculopalpebral and Petersons orbital nerve block with 2% lignocaine hydrochloride. Similar anaesthetic techniques were followed by other authors. Soma (1971) used auriculopalpebral and Petersons nerve blocks for eyelids and eyeball in bovines. Gelatt (1991) mentioned that eyelid and orbital surgery can be performed by using Peterson nerve block in standing cattle. Superficial keratectomy with cauterisation by 1% silver nitrate solution with the ear bud was followed. The eye was fixed by placing stay sutures on the sclera using silk. Prophylactic dose of ciprofloxacin injection @ 2 mg/kg, i/m was 3 hours before surgery. Membranoplasty was done to protect operated eye up to 15 days. Post operatively, the eye was cleansed with alum solution and ciprofloxacin eye drops instilled through the surgical window of membranoplasty. Along with 1ml ciprofloxacin injection was administered subconjuctivally and 15 ml meloxicam was administered intramuscularly.

Excised tumour mass was collected in 10% formal saline. The tissues were processed as per standard technique. The paraffin sections were cut to a size of 3-5 micron thickness. The slides were stained with haematoxyllin and eosin for histopathological studies (Culling, 1974).

Follow up of these animals was done up to 1 year to know recurrence of tumor.

Results and Discussion

The clinical cases of different size of eye cancer were subjected to superficial keratectomy followed by cauterization with 1% silver nitrate solution with ear bud. Similar operative procedure were performed by Pandey *et al.* (1989) where eye cancer in cattle were treated by surgical excision followed by cauterization of growth bed with silver nitrate. He observed healing of wound in 20 to 25 days in all the 36 animals. Membranoplasty was done to protect operated eye up to 15 days. Bullocks and cows showed normal healing of the excised wound at the site of surgery without lachrymation and inflammatory changes were minimum and no recurrence of tumour up to 3 months. However, mere inflammatory changes and cloudiness were noticed around surgical site. Vision was retained from rest of the cornea. After 3 months, no inflammatory changes and cloudiness were noticed around surgical site. Normal vision was retained.

As follow up of these animals up to 1 year, the recurrence

[1]Professor, [2]PhD Scholar

Fig. 1: Papillomatous growth at limbus

Fig. 2: Papillomatous growth at limbus

Table 1: Design of research work

Bullock/Cow No.	Histopathological Diagnosis	Location	Technique used
4 Deoni bullocks (8-10 years)	Plaque	Limbus	**Anaesthesia :** Xylazine[1] @ 0.03 mg/kg b.wt. i/m. and auriculopalpebral and Petersons orbital nerve block with 2% lignocaine hydrochloride[2]. **Surgery :** Superficial keratectomy with cauterisation by 1% silver nitrate solution. Membranoplasty to protect operated eye. Ciprofloxacin eye drops and injection[3] 1 ml subconjuctivally and Meloxicam[4] inj.15 ml intramuscularly. Follow up was done for 1 year.
4 Deoni bullocks (8-10 years)	Papilloma	Cornea/Sclera	
1 Deoni Cow (5-6 year)	Plaque	Adjacent to sclera	
1 Deoni Cow (5-6 year)	Papilloma	Eye lid	

[1]Xylazine- injections, Indian immunololgicals Ltd, Hyderabad; [2]Lignocaine hydrochloride-injections, Astra Zeneca Pharma Ltd, Bangalore; [3]C-Flox injection, 50 ml, Intas Pharmaceuticals, Matoda, Ahmadabad; [4]Melonex injection, 100 ml, Intas Pharmaceuticals, Matoda, Ahmadabad

of cancerous growth on the same eye was noticed in one papillomatous bullock on sclera and one papillomatous cow on eye lid. Similar recurrence reports were reported by other authors. Bhume *et al.* (1992) reported different treatments in 22 clinical cases of bovine ocular squamous cell carcinoma. The animals were observed for 200 days postoperatively. They reported recurrence in all the cases treated with surgical excision and subsequent cauterization with silver nitrate. Complete cure was observed in all the cases after exenteration of eye ball.

Panchbhai *et al.* (1987) treated 20 clinical cases of ocular growths in cattle with surgical intervention followed by cauterization of growth bed with 1 per cent solution of silver nitrate. Healing was optimum by about 25 days. After a follow up of 5 months, recurrence of growth was seen in 2 animals.

These animals were subjected to above surgical technique with immunotherapy where subcutaneous administration of 5 ml autogenous vaccine and 1 ml Bacillus Calmetta Guerin (BCG) were followed. This treatment was repeated for 3 times at 5 days intervals. Again these animals were subjected to 1 year follow up, recurrence of tumour was not seen. Tyagi and Singh (1993) stated that Bacillus Calmetta Guerin (BCG) and methanol extract of mycobacterial cell membrane were used non-specific immunotherapeutic agents for bovine squamous cell carcinoma where recurrences of the tumors were not seen provided those were caused by viruses.

Panchbhai *et al.* (1989) treated the ocular squamous cell carcinoma of cornea and conjunctiva of both the lids and third eye lid in cattle with surgical intervention followed by autogenous vaccine along with BCG. Complete cure was observed in 37.5% cases. In another group where the surgery along with cauterization of growth bed with marking nut oil was done, 12.5% cure was observed.

Radhakrishnan *et al.* (1999) reported successful treatment of bovine ocular squamous cell carcinoma through immunotherapy and surgery. They used BCG as immunotherapeutic agent.

Grossly, the plaques were round, raised, smooth and size in millimetre. Papillomatous growths were irregular or ulcerated, cauliflower like appearance and size in centimetre (Fig. 1 and 2). The growths were whitish to pinkish coloured. In some cases, show fragile bleeding surface and foul odour. Similar findings were observed by Gharagozlou *et al.* (2007) and Kachhawa *et al.* (2015) where they reported that papillomatous growth vary from few centimetre to several centimetres, had cauliflower like appearance. The surfaces

were ulcerated and bleed easily.

On histopathological examination, these were characterised by keratin "pearl" formation with highly anaplastic, small and hyperchromatic cells with no keratinisation. Inflammatory cells infiltration was also evident indicative of Bovine Ocular Squamous Cell Carcinoma (BOSCC). Similar findings were observed by other authors. Kircher *et al.* (1974) described carcinoma histopathologically and observed tumour that arises in the nests of the cell in the basal layer of plaques or papillomas. Spradbrow *et al.* (1977) detected the characteristic features of invasive carcinomas as branching down growth of the columns of the cells from the surface epithelium.

No recurrence of cancerous growths was noticed in these animals on 1 year follow up. In conclusion, surgical excision of tumour followed by cauterization with 1% silver nitrate solution and immunotherapy is best suggestive technique to prevent the recurrence of growths on eye. This technique is beneficial in initial stages of cancerous growth and also saves the vision of animal.

References

Bhaskar, R.P. (2011) *Vision saving techniques for initial stages of eye cancer in bullocks*. M.V.Sc. Thesis, KVAFSU, Bidar, Karnataka

Bhume *et al.* (1992) *Indian J. Vet. Surg.* **13**(1): 16-17

Cleaver, J. E. *et al.* (1972) *Amer. J. Vet. Resi.* **33:**1131

Culling, C.F., (1974) *Handbook of Histopathological and Histochemical Techniques.* 3rd ed. Butterworth and Co, London.

Gelatt, K.N. (1991) *Text Book of Veterinary Ophthalmology*. 2nd ed. Lea and Febiger, Philadelphia.

Gelatt, K.N. and Williams, L.W. (1985) *Text Book of Veterinary Ophthalmology*. 2nd ed. Lea and Febiger, Philadelphia.

Gharagozlou, M. J. *et al.* (2007) *Veterinarski Arhiv.* **77**(5): 409-426.

Kachhawa, J.P. *et al.* (2015) *Vet. Pract.* **16**(1): 153-154

Kircher, C.H. *et al.* (1974) *Bull. World Health Org*. **50:** 135-142.

Moulton, J. E. (1961) *Tumors in Domestic Animals*. 1st ed. University of California press, Los Angeles.

Panchbhai, V.S. *et al.* (1987) *Indian Vet. J.* **64(**4):29-32.

Panchbhai, V.S. *et al.* (1989) *Indian Vet. J.* **66**(1**):**65-68.

Pandey, S. K. *et al.* (1989) *Indian Vet. J.* **10**(2**):**161-163.

Priester, W.A. and Mantel, N. (1971) *J. Nat. Canc. Inst.* **47:**1333-1344.

Radhakrishan, C. *et al.* (1999) *Indian Vet. J.* **76**(3)**:**245-246.

Radostits, O.M. *et al.* (1995) *Text Book of Veterinary Medicine.* 8th ed. ELBS London, England.

Soma, L.R. (1971) Text Book of Veterinary Anaesthesia. 1st ed. The Williams and Williams Co. Baltimore.

Spradbrow, P.B. *et al.* (1977) *Australian Vet. J.* **57:** 159-162

Tyagi, R.P.S. and Singh, J. (1993) *Ruminant Surgery.* 1st ed. CBS Publication and Distributors, New Delhi.