

OCULAR SQUAMOUS CELL CARCINOMA IN A CROSS BRED DAIRY COW

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Abstract: A third lactation cross bred dairy cow was referred to the Veterinary dispensary with the history of growth on the nictitating membrane of the left eye since one month. Animal showed little discomfort due to the growth but have normal vision. The neoplastic outgrowth was excised after clinical and histopathological examinations with a general sterile procedure with local anaesthesia and lavaged with normal saline solution. The animal was recovered uneventfully within 15 days.

Keywords: dairy cow, eye, squamous cell carcinoma.

Introduction

Squamous cell carcinoma is a tumour of epidermal cells in which the cells show differentiation to keratinocytes. Squamous cell carcinoma is the most commonly occurring neoplasm afflicting the bovine eye (Fazili *et al.*, 2001; Kohlirn and Mashadi, 2008; Sivaseelan *et al.*, 2008). The most common areas affected are limbus (junction of the cornea and the sclera), third eyelid and on the upper and lower eyelid margins primarily at mucocutaneous junctions (Goldschmidt and Hendrick, 2002). Sunlight is probably the most important carcinogenic stimulant for these tumor and accounts for the prevalence of squamous cell carcinoma on the eyelid and conjunctiva of cattle and horses, the ear pinna of cats and sheep and the vulva of cattle, goats, and recently sheared sheep (Ginn *et al.*, 2007; Gharagozlou *et al.*, 2007). It is locally invasive, and occasionally metastasise in most domestic species. In addition, in cattle the etiology has been linked to a number of viral agents, especially bovine papillomavirus (BPV) (Rutten *et al.*, 1992). The tumor typically appears as a papule or nodule or cauliflower like growth, with varying degrees of hyperkeratosis and ulceration. Squamous Cell Carcinoma is usually easily treatable, it has the potential to recur locally and even metastasize, then leading to significant morbidity and

mortality. The present paper report on diagnosis and its successful surgical management of squamous cell carcinoma in the third eyelid in a cow.

Case history and observation

A cross bred dairy cow under third lactation was brought to veterinary dispensary S. Melapatti, Madurai (Dt), Tamil Nadu, with the history of an enlarged mass protruding out of left eye since last one month. Anamnesis, revealed that cow was housed and exposed to sunlight throughout day time. Clinical examination revealed a 5cm diameter, red, ulcerated protruding mass from the free edge of the third eyelid of the left eye. (**Fig-1**) The affected eye had ocular secretion. Severe hyperemia of the palpebral and bulbar surface of nictitating membrane was also noted. Prior to surgical excision, a biopsy of suspected tumorous tissue was done and the same was placed in buffered 10% formalin processed for light microscopy and section was stained with haematoxylin eosin for histopathological evaluation.

Treatment and Discussion

In the present case squamous cell carcinoma was diagnosed based on the result of histopathological examination which revealed nests of pleomorphic epithelial cells and keratin pearls (**Fig-3**). The tumorous growth was diagnosed as a squamous cell carcinoma as similar finding reported by Patel *et al.* (2009) in buffalo, Al-Asadi (2012) in Iraqi dairy cows and Fazili *et al.* (2001) in jersey cow.

Based on result the surgical excision was decided. The cow was prepared routinely for surgery. It was premedicated with local infiltration anesthesia with 2% lignocaine. After establishing a sterile procedure with local anaesthesia, the third eyelid neoplastic outgrowth was surgically removed (**Fig-2**). The eye was lavaged with normal saline solution. Then the cow was clinically treated with Inj. Ceftriaxone (4gm I/M), Inj. Chlorpheniraminemaleate (15ml I/M), Inj. Meloxicam (15ml I/M), Inj. Adchrome (10ml I/M), and locally Pendistrin-SH was given for next 5 days and the cow had an uneventful recovery, moreover there was no recurrence up to one year of follow up.

Extraocularneoplasms may arise from any of the specialized or supporting tissues of the eyelids, conjunctiva, or orbit [Jones *et al.*, 1983; Jubb *et al.*, 1993; Meuten, 2002]. The incidence in cattle is greatest in those geographic areas with longest hours of sunlight per year and ultra violet radiation (Jubb *et al.*, 1993). Exposure to sunlight is a factor in the development of the lesions [Carlton and McGavin, 2002; Sastry and Rao, 2002]. Previous report suggested a greater frequency of ocular squamous cell carcinoma is the U.V radiation believed to be the primary carcinogen (Chahory *et al.*, 2002). The over expression of the

tumor suppressor gene P53 which is targeted by U.V radiation has been found in Squamous cell carcinoma (Leapis *et al.*, 2004). In addition to sunlight, carcinogens contained in tobacco, coal tar and soot and arsenic have been shown experimentally or by epidemiologic inference to cause squamous cell carcinoma of skin and other tissues (Ginn *et al.*, 2007; Gharagozlou *et al.*, 2007). Genetic factors and papilloma viruses also influence the occurrence of squamous cell carcinoma. Kohli *et al.*, (2004) shows that squamous cell carcinomas were the most common tumor (62%) followed by papillomas (26%). In the present case the fullout door farming management for this cow could have contributed to the development of tumor. Squamous cell carcinoma was recognized microscopically by identifying malignant epithelial cells demonstrating various degrees of differentiation towards keratinocytes. Cytoplasm was abundant and eosinophilic. Several degrees of keratinization were observed through tumor cells (Figure 2). The appearance of squamous cell carcinoma may vary depending on the location of the tumor. When they affect cornea or limbus squamous cell carcinoma usually present a high mass level and papillary and clear pink appearance (Gionfriddo *et al.*, 2009) and the third eyelid may develop a wavy or thick end look (Cotovio *et al.*, 1999). Squamous cell carcinomas are usually firm, white, poorly demarcated dermal masses that are ulcerated and streaked with red and usually been shown as a smooth mass (Dugan *et al.*, 1991). It concur our case on ophthalmic examination revealed a thick end, red mass, ulcerated and protruding at the free edge of the third eye lid. Squamous cell carcinoma is more often unilateral but it could be bilateral in approximately 10% of cases. This neoplasm could arise in any ocular tissue but lower eye lid, lateral cantus and the nictitating membrane is the most common site. In the present case, the tumor was unilateral and involved only the third eyelid of the left eye. Concur with (Gionfriddo *et al.*, 2009 and Leapis *et al.*, 2004) where in the prognosis is favorable when the tumor is diagnosed and treated early.

The treatment modalities for ocular squamous cell carcinoma depend on the location and extent of the tumor (Dugan *et al.*, 1991). The involvement of the nictitating membrane often requires their removal however this procedure should be avoided because of the predisposition for the development of keratoconjunctivitis. In the present case removal of third eyelid was carried out (Robo *et al.*, 2000) without any development of keratoconjunctivitis even after one year of followup.

The surgical excision is the most common effective treatment if not done the enucleation and exenteration of eye ball should be done because spread involves the eyeball

and complete resection of the tumor of third eyelid only cannot possible (Lavach *et al.*, 1977 and Robo *et al.*, 2000).

There is little literature reporting the success of the treatment of squamous cell carcinoma only by surgical removal as compared to a treatment together with supportive therapies. Surgical excision is the primary treatment option for most patients with SCC. The ability to completely excise the tumor depends on factors such as the size and location of the tumor. However in this present case surgical removal only gave good result and there may not be any recurrence after one year.

In conclusion, the gross and histological findings found in this case were consistent with the diagnosis of squamous cell carcinoma and it was treated by surgical resection only.

References

- [1] Al-Asadi, R.N., 2012. A survey and treatment of ocular carcinomas in Iraqi dairy Cows from 1987-2012. *Kufa J. Vet. Med. Sci.*, 3(2): 66-77.
- [2] Blowey, R.W. and A.D. Weaver, 1991. A Colour Atlas of Disease and Disorders of Cattle. Wolf Publications.Ltd., pp: 447-448.
- [3]. Carlton, W.W. and M.D. McGavin, 2002.Thomson's Special Veterinary Pathology, 4th edn, Mosby Company Ltd., pp: 595-596.
- [4] Chahory, S., B. Clerc, P. Devauchelle and A. Tnibar, 2002. Treatment of a recurrent ocular squamous cell carcinoma in a horse with Iridium 192 Implantation, *J. of equine veterinary science* 22(11):503-506.
- [5] Cotovio, M., O.C. Almedia, J.P. Oliveira, J.E. Pereira, J.R. Paulo and M.T.Pena,1999. Nictitanssquamous cell carcinoma in a horse. Surgical and Medical (5 fluorouracil) treatment. *Reutaportuguesadecienciasveterinarias* 100 (16):219-221.
- [6] Dugan, S.J., C.R. Curtis, S.M. Roberts and G.A. Severin,1991. Epidemiologic study of ocular/adnexalsquamous cell carcinoma in horses. *Journal of American veterinary Association* 1982: 251-256.
- [7] Fazili, M.R., B.A. Buchoo, M.M. Darzi and S.S. Hussain., 2001. Ocular squamous cell carcinoma in a cow. *Indian J. Vet. Surg.*, 22:132.
- [8] Goldschmidt, M.H. and M.J. Hendrick. 2002. Tumors of skin and soft tissues. Meuten, D.J. (ed.) *Tumors of Domestic Animals*, 4th ed. Iowa State Press.
- [9] Ginn, P.E., J.E.K.L., Mansell, P.M. Rakich,2007. Skin and appendages. In: Jubb, K.V.F., P.C., Kennedy, N.C. Palmer, Eds., *Pathology of the Domestic Animals*. 5th edn., Vol. 1, W.B. Saunders Co., Philadelphia. 751-753.

- [10]. Gharagozlou, M.J., P. Hekmati and J.Ashrafihelan, 2007. A clinical and histopathological study of ocular neoplasms in dairy cattle. *Vet. Arhiv.*, 77: 409-426.
- [11] Gionfriddo, J.R., G.A. Severin, E. Schou and S.Woodard, 2009. Tattooing of the equine eyelid, A retrospective study. *Journal of equine veterinary science* 29(2): 82-86.
- [12] Jones, T.C. and R.D. Hunt, 1983. *Veterinary Pathology*. 5th.Edn., Lea and Febiger. Philadelphia., pp: 1721-1724.
- [13]. Jubb, K.V.F. and P.C. Kennedy, N. Palmer, 1993. *Pathology of domestic animals*, 3.4th. Edn., Academic Press., pp: 17: 36-49.
- [14] Kohlirn, E.W. and A.G. Mashadi. 2008. Squamous cell carcinoma in an Iranian buffalo. *Indian Vet. J.*, 85: 555-556.
- [15] Kohli, R.N., B. Mohammadian and M. Saiyari, 2007. A retrospective study on the incidence of bovine external neoplasms in south-western Iran. *Indian J. Anim. Sci.*, 77: 991-993.
- [16] Leapis, L.K., and L. Genovese, 2004. Haemangiosarcoma of the third eyelid in a dog. *Veterinary Ophthalmology*. 7 (4): 279-282
- [17] Lavach, J.D and G.A. Severin, 1977. Neoplasia of equine eye, adnexa and orbit: a review of 68 cases. *J. of the American veterinary medical Association* 170 (2): 202-203.
- [18]. Meuten, D.J., 2002. *Tumors in Domestic Animals*. 4th. ed., Iowa State Press, A Blackwell Publishing Com., pp: 51-54.
- [19] Patel, P.B., J.N. Mistry, D.N. Suthar and J.B. Patel, 2009. Surgical Management of ocular squamous cell carcinoma in buffalo calf. *Intas Polivet*, 10(2): 293-294.
- [20] Robo, J.S., H.S. Usman and Koloym, 2000. Studies on ocular squamous cell carcinoma among horses in borno state Nigeria. *African. J. of. Biomedical Research*. 3:129-130.
- [21] Rutten V.P., W.R. Klein, M.A. De Jong, W. Quint, W. Den Otter, E.J. Ruitenber and W.J. Melchers ,1992. Search for Bovine Papilloma Virus DNA In Bovine Ocular Squamous Cell Carcinomas (BOSCC) and BOSCC-Derived Cell Lines. *American Journal of Veterinary Research* 53 1477-1481.
- [22] Sastry, G.A. and P.R. Rao, 2002. *Veterinary Pathology*. (7th. Edn.), CBS Publishers and Distributors Com., pp: 249-250
- [23] Sivaseelan, S., G.A. Balasubranmaniam, P. Srinivasan, P. Balachandran, R. Thangathurai and S. Dharmaceelan, 2008. Squamous cell carcinoma of eye in a she buffalo. *Tamilnadu Journal of Veterinary and Animal Sciences*, 3: 117-118

Figure 1: Before removal of Ocular Squamous cell carcinoma**Figure 2: After surgical removal of Ocular Squamous cell carcinoma****Figure 3: The tumour cells had pleomorphic epithelial cells and keratin pearls (H&E)**