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A Review On Eye Cancer

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ABSTRACT

Cancer eye, technically known as squamous Cell Carcinoma, is a common locally invasive tumor of the eyes and eyelids of older cattle. Like pinkeye, its occurrence is associated with exposure to sunlight and is more common in cattle with white eyelids and conjunctiva. As a result, cancer eye is very common in Colorado dairy cattle. The third eyelid appears to be the most common site of cancer eye in dairy cows, followed in frequency by the lower lid and then by the limbus (junction of the clear cornea with the sclera or colored portion of the eye). Cancer eye may exist in a "premalignant" form as a flat white plaque or as a wart-like growth on the lower lid. The malignant form is not well-circumscribed, and its surface is ulcerated. Malignant squamous cell carcinoma will grow steadily and will invade adjacent tissues including the eyeball itself, conjunctiva, and eventually the bony orbit. Once the eyeball is invaded, blindness in the affected eye will soon follow. Metastasis to distant sites is uncommon; the tumor is more likely to extend to local lymph nodes such as those below the ear and behind the mandible.

Keywords: Melanoma, Melanocytes, Tumor, Enucelation

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INTRODUCTION

Retinoblastoma is a cancer derived from retina. In many, it is a hereditary disease. The hereditary cases are usually bilateral. Those which are non- hereditary are more common and are mostly unilateral. Both girls and boys are equally affected. Between 500 and 600 cases of eye cancer (ocular cancer) are diagnosed in each year.[1]

There are a number of different types of cancer that affect the eyes, including:

- eye melanoma
- squamous cell carcinoma
- lymphoma
- retinoblastoma – a childhood cancer

Cancer can also sometimes develop in the tissues surrounding your eyeball or spread to the eye from other parts of the body, such as the lungs or breasts.

Symptoms of eye cancer

Eye cancer doesn't always cause obvious symptoms and may only be picked up during a routine eye test.

Symptoms of eye cancer can include:

- shadows, flashes of light, or wiggly lines in your vision
- blurred vision
- a dark patch in your eye that's getting bigger
- partial or total loss of vision
- bulging of one eye
- a lump on your eyelid or in your eye that's increasing in size
- pain in or around your eye

Melanoma of the Eye

Melanoma is cancer that develops from pigment-producing cells called melanocytes. Most melanomas develop in the skin, but it's also possible for them to occur in other parts of the body, including the eye.

Eye melanoma most commonly affects the eyeball. Doctors sometimes call it uveal or choroidal melanoma, depending on exactly which part of your eye is affected. It can also affect the conjunctiva, the thin layer that covers the front of the eye, or the eyelid.

What causes eye melanoma?

Eye melanoma occurs when the pigment-producing cells in the eyes divide and multiply too

rapidly. This produces a lump of tissue known as a tumour.

It's not clear exactly why this occurs, but the following factors may increase the risk of it happening:

- lighter eye colour – if you have blue, grey or green eyes, you have a higher risk of developing eye melanoma compared with people who have brown eyes
- white or pale skin – eye melanoma mostly affects white people and is more common in those with fair skin
- unusual moles – if you have irregularly shaped or unusually coloured moles, you're more at risk of developing skin cancer and eye melanoma
- use of sunbeds – there's some evidence to suggest that exposing yourself to ultraviolet (UV) radiation from sunbeds, for example, can increase your risk of eye melanoma
- overexposure to sunlight – this increases your risk of skin cancer, and may also be a risk factor for eye melanoma[2,3]

The risk of developing eye melanoma also increases with age, with most cases being diagnosed in people in their 50s.

Diagnosing Melanoma of the Eye

If your GP or optician (optometrist) suspects you have a serious problem with your eyes, they will refer you to a specialist eye doctor called an ophthalmologist for an assessment.

If they suspect you have melanoma of the eye, they'll refer you to a specialist centre for eye cancer. There are four centres in the UK, located in London, Sheffield, Liverpool, and Glasgow.

It's likely you'll have a number of different tests at the centre, including:

- an eye examination – to look at the structures of your eyes in more detail and check for abnormalities
- an ultrasound scan of your eye – a small probe placed over your closed eye uses high-frequency sound waves to create an image of the inside of your eye; this allows your doctor to find out more about the position of the tumour and its size
- a fluorescein angiogram – where photographs of the suspected cancer are taken using a special camera after dye has been injected into your bloodstream to highlight the tumour

Occasionally, a thin needle may be used to remove a small sample of cells from the tumour (biopsy). The genetic information in these cells is analysed to give an indication of the chances of the cancer spreading or coming back.[4,5]

Treatments for Eye Melanoma

Treatment for melanoma of the eye depends on the size and location of the tumour. Your care

team will explain each treatment option in detail, including the benefits and any potential complications.

Treatment will aim to conserve the affected eye whenever possible.

The main treatments for eye melanoma are:

- brachytherapy – tiny plates lined with radioactive material called plaques are inserted near the tumour and left in place for up to a week to kill the cancerous cells
- external radiotherapy – a machine is used to carefully aim beams of radiation at the tumour to kill the cancerous cells
- surgery to remove the tumour or part of the eye – this may be possible if the tumour is small and you still have some vision in your eye
- removal of the eye (enucleation) – this may be necessary if the tumour is large or you've lost your vision; the eye will eventually be replaced with an artificial eye that matches your other eye.[6,7]

Chemotherapy is rarely used for eye melanoma, but may be suitable for other types of eye cancer.

The Cancer Research UK website has more information about thetreatment options for eye cancer and the types of eye cancer surgery.

Outlook for eye melanoma

The outlook for melanoma of the eye depends on how big the cancer is at the time it's diagnosed and exactly which parts of the eye are affected.

Overall:

- about 8 out of every 10 people (80%) diagnosed with a small eye melanoma will live for at least five years after diagnosis
- about 7 out of every 10 people (70%) diagnosed with a medium-sized eye melanoma will live for at least five years after diagnosis.[8,9]
- about 5 out of every 10 people (50%) diagnosed with a large eye melanoma will live for at least five years after diagnosis

Eye Cancer in Children

Figure 1: Eye Cancer

Children whose parents or siblings are affected are at high risk for developing this disease. It can also occur in any child under the age of 5. It is mostly manifested within first two years of life. The pupil shows a white (actually yellow) reflex, called leukocoria. Sometimes squint and / or nystagmus may be present. Fundus shows the tumour which has a cheesy appearance and calcification. Multiple tumour areas and retinal detachment are seen.

Later on, the growth extends anteriorly and causes increase in intraocular pressure. Child experiences pain. If the tumour bursts through the sclera, the ocular pressure comes down and pain is relieved. Sclera is the most common site for perforation. When the tumour bursts through cornea, it is seen as a fungating, bleeding mass.[10,11]

Tumour extends via the optic nerve also. Finally the tumour spreads to regional lymph nodes, the cranial bones, distal bones, spinal cord, brain and rarely, liver. Its progress is divided into four stages.

Cases of retinoblastoma, if they survive, develop "second" cancer later in life.

Signs and Symptoms

- White pupil (leukocoria)
- Redness
- Pain in the eye - proptosis

How is it detected: Examination under anaesthesia helps in the diagnosis of the disease. Ancillary tests like ultrasound (B-Scan), CT / MRI scan may also have to be performed. Biopsy is not needed.

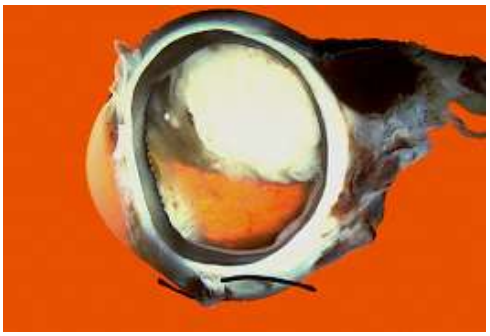

Figure :2 Scanned view of eye

CONCLUSION

Treatment of cancer eye depends on its location and the degree of involvement of ocular structures. Veterinarians easily remove lesions on the third eyelid by cutting out the free border of the third eyelid using local anesthesia and tranquilization. Lesions removed in this way are very unlikely to recur. On the lids, small lesions (< 1 inch) are managed by cutting out the bulk

of the tumor and then applying hyperthermia (high temperature) or cryotherapy (freezing) to kill the remaining tumor cells in the tissue of the lids. Instruments to accomplish either hyperthermia or cryotherapy are commonly available to veterinarians. Larger lesions on the lids may require surgical removal and radical reconstructive surgery, although in some advanced cases the lid cannot be repaired and the eye must be removed. Cancer eye lesions on the eyeball itself are somewhat tricky to treat if sight is to be preserved. The bulk of the tumor is cut off carefully to avoid puncture of the eyeball, and the lesion is treated with hyperthermia. Removal of the entire eyeball is indicated when tumors have spread to the extent that the eyeball is blind; the tumor has invaded deeper structures surrounding the globe; or the eyelid is involved to the extent that it cannot be repaired after removal of the tumor. It may appear to be a drastic procedure, but trained veterinarians can accomplish it quickly and humanely. At slaughter, one-eyed cattle are not condemned as long as the local lymph nodes are not involved.[12,13,14]

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