

## IRIS MELANOMA IN CATS

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### **Abstract**

*Iris melanoma is a primary intraocular tumor with a high potential risk for metastasis, characterized by the presence of a single or a multiple hyperpigmentation focal areas, or diffuse hyperpigmentation of the anterior epithelium of the iris. This hyperpigmentation is due to an abnormal growth and proliferation of melanocytes. However, not any hyperpigmentation should be handled as a melanoma, is required differential diagnosis with melanosis, iris nevi, iris cysts, iridal discoloration due to inflammation, or melanosis secondary to chronic inflammation process. Depending of the expanding and the size of the tumor, it may cause complications as glaucoma and uveitis. The enucleation, despite the metastasis risk, represents the only treatment option that can be considered.*

**Key words:** *enucleation, feline, iris, melanoma, Russian Blue.*

### **INTRODUCTION**

The most common primary intraocular neoplasm in cats is malignant melanoma of the anterior uvea, usually is unilateral, is found in cats of all ages, with no breed predisposition (Boydell and Enache, 2012). A melanoma is clinically characterized by malignant growth of melanocytes, cells that are dark in appearance due to the inclusion of the melanin pigment, or, on the contrary, unpigmented in amelanotic iris melanoma.

The iris involvement is characterized by the presence of one, or more, golden to dark, brown pigmented foci, that slowly (over months to years) coalesce to form larger pigmented areas and eventually involve most of the iris as it becomes diffusely hyperpigmented, thicker, and less mobile.

Iris melanomas in cats usually arise from the front of the iris surface, with extension to the ciliary body and choroid (Gelatt, 2007).

In the cat, ocular melanomas are more common than oral and dermal ones, and ocular and oral ones are more malignant than dermal ones, with higher rates of mortality and metastasis (Pigatto et al., 2010).

Not all iris hyperpigmentation lesions are melanomas or malignant lesions. Brown hyperpigmentation of the anterior surface of the iris may start out as single or multi-focal pinpoint, flat regions, termed iris freckle or nevus. The

hyperpigmentation may progress to diffuse iris hyperpigmentation or coalescing freckles but still without changing the contour of the eye, is termed iris melanosis. This is considered a benign process, but increasing darkness and size of pigmented areas can be observed over months to several years, and the cells may eventually undergo malignant transformation into iris melanoma. Melanoma must be differentiated from non-neoplastic lesions, including pigmented cysts, freckles, nevi, discoloration consequent to granulomatous or nongranulomatous inflammation; and other intraocular tumors: adenoma or adenocarcinoma, lymphosarcoma, and metastatic tumors (Peiffer et al., 2002).

## **MATERIALS AND METHODS**

In the Clinics Department of Surgery from the Faculty of Veterinary Medicine Bucharest, two Russian Blue males had been examined and diagnosticated with iris melanosis. Periodical ophthalmic examinations highlighted the transformation of the hyperpigmentation area into tumoral, nodular masses which spreads and blocks the iridocorneal filtration angle. Evolution of the cases was different, two years, respectively five months.

Case A, Russian Blue, male, 6 years, in may 2010 the left eye presented a light-brown hyperpigmentation of the iris root, without changing the contour of the eye (Figure 1). This is considered a benign process, but increasing darkness and size of pigmented may eventually undergo malignant transformation into iris melanoma. Because of that the cat was closely monitoring through regular medical checks.

After 1 year the brown hyperpigmented area expanded with changing the contour of the pupil and distortion of the iris root, ring-shaped melanoma. After performing drug mydriasis, dyscoria was observed (Figure 2). Ultrasonography was performed, which revealed irregular iris thickening, a iris mass of 0.48 / 0.52 cm. Enucleation was recommended, but the owner did not accepted the treatment, thus that surgery was not performed. At the end of the year the hyperpigmented area is darker, increased in size, and anisocoria is obvious (Figure 3). The enucleation was performed after 2 years from the first visit.

Case B, a 6 year old cat, male, Russian Blue was examined in may 2012, presenting a brown hyperpigmentation of the iris root, localized at "3 o'clock", left eye, diagnosticated with iris melanosis. After 5 months the hyperpigmented area increased in size, deforming the sclero-corneal limbus. The complications, glaucoma and buphtalmia occurred, so that the eye is

painful. Physical examination was normal. As complementary exams had been realized complete blood cell count and serum chemical profiles, that were in physiological range. The abdominal ultrasonography did not shown any evidence of metastasis.

Treatment, the same for the both cases, was the enucleation of the eye, followed by cytological and histological examinations (Gelatt, 2001).

Surgical treatment, in terms of evolution, was applied differently, the enucleation was realized after 2 years, for case A, and after 5 months for case B.



Figure 1. Case A, first medical examination, iris melanosis.



Figure 2. Case A, 1 year after the first medical examination. Dyscoria



Figure 3. Case A, after 1 and a half year from the first medical examination.



Figure 4. Case B, dark-brown hyperpigmentation of the iris root.

## **RESULTS AND DISCUSSIONS**

Case A – after 2 years from the first visit the enucleation was performed, followed by histological and cytological examinations. Histologically, malignant transformation is characterized by a change in the histological

features of the cell. Tumor cells are exfoliated into the anterior chamber, implanted in the iridocorneal angle, and invaded the iridal stroma. Transformed cells tend to be round, with a large round nucleus and a prominent nucleoli. Cytological appearance reveals tumoral melanocytes, epithelioid cells, with anisocytosis and anisokaryosis, brown intracytoplasmic granules (Figure 5). Histologically, irido ciliary melanoma with pleomorphic melanic cells, epithelioid and spindle, with moderate pigmentation and clear criteria of malignancy (Figure 6).

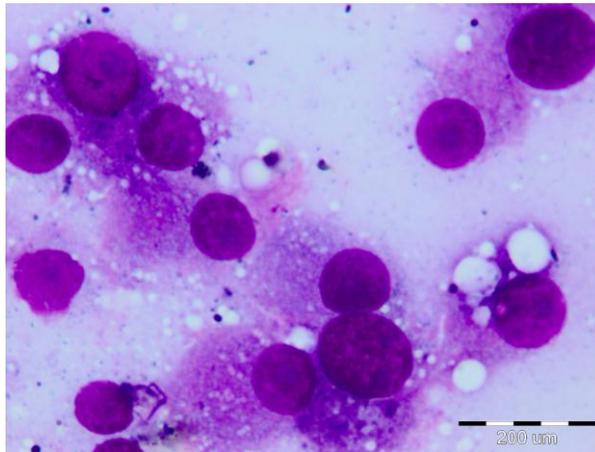


Figure 5. Case A, tumoral melanocytes, with anisocytosis and anisokaryosis. M-G G stain, ob. x 100

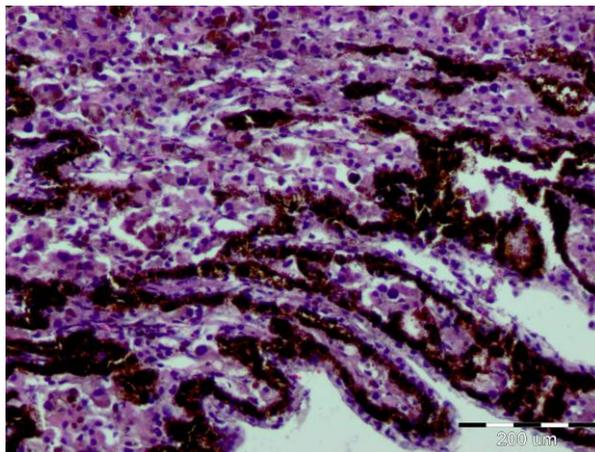


Figure 6. Case A, irido ciliary melanoma. HE stain, ob. x 20

Case B presented a rapid, a shorter evolution, for only 5 months, contrary to the case A, which had a 2 year evolution. The diagnostic in iris melanoma is established after a complete ophthalmic examination: ophthalmoscopy, tonometry and eye ultrasound to evaluate thickening of the iris root and ciliary body, to define the tumor shape and the extent of local invasion. Depending on the lesion's size and invasiveness, complications such as secondary glaucoma, corneal edema, hyphema and anterior uveitis may occur. When complications like glaucoma and buphtalmia occurs, such eyes fall into the category of the "blind painful eye" (Peiffer et al., 2002). Cytologically are observed tumoral melanocytes, with anisocytosis, anisokaryosis, frequent karyomegaly and binucleation, along with numerous melanophages (Figure 7). The histopathological evaluation confirmed the tumor as a malignant melanoma with involvement of the iris stroma and the ciliary body. Predominantly spindle melanocytes, pleomorphic, with evident melanin pigmentation. Spindle cell tumors are arranged in streams and interweaving bundles (Figure 8).

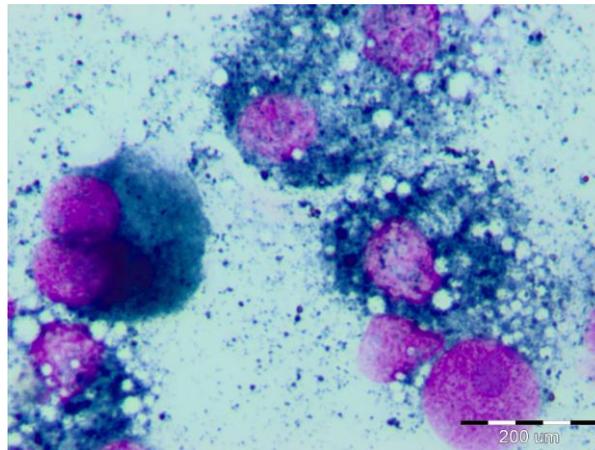


Figure 7. Case B, melanophages and binucleated cell. M-G G stain, ob. x 100

Differential diagnosis should include iris freckles or nevi, melanosis, pigmented uveal cysts, iridal discoloration due to inflammation and other uveal neoplasia. The diagnosis through of the fine needle aspiration

cytology of anterior segment is not recommended due to potential intraocular complications. (Boydell and Enache, 2012)

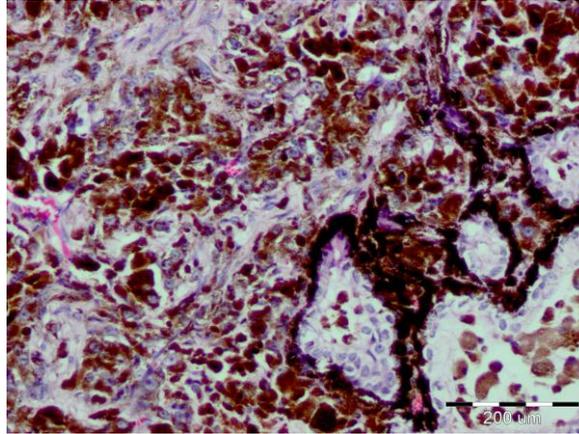


Figure 8. Case B, spindle melanocytes, pleomorphic. Spindle cell tumors are arranged in streams and interweaving bundles. HE stain, ob. x 20

Diffuse iris melanomas should be regarded as potentially aggressive malignant neoplasms with a potential for metastatic disease that can have long latency periods. They may extend through the sclera into the orbit or extend to the cranial cavity via the optic nerve and may spread to distant organs. The tendency of feline uveal melanomas is to metastasize first to regional lymph nodes and later to all visceral organs and to the skeletal system. Metastasis to the lungs, pleura, heart, pericardium, mediastinum, hilar lymph nodes, diaphragm, omentum, liver, spleen, bone, and brain has been documented (Peiffer et al., 2002).

A systemic examination should also be performed to evaluate and check for metastatic disease. This may include a complete blood profile, including a blood count and serum chemistry panel, thoracic and abdominal radiography or abdominal ultrasonography. This is necessary due to the risk of metastasis in organs such as regional lymph nodes, lungs and liver, being the main sites for metastasis. Feline intraocular melanoma is considered to have a greater metastatic potential than in dogs (Peiffer et al., 2002).

In both cases the treatment was surgically, the enucleation of the affected eye, and cytology and histopathology exams were performed from the

excised eye. After enucleation, the definitive diagnosis is confirmed by histopathology.

## **CONCLUSIONS**

Ocular globe enucleation, despite the metastasis risk, represents the only treatment option that can be considered for iris melanoma.

The earlier the enucleation is performed, the better is the prognosis.

Iris melanoma represent the most common primary intraocular neoplasm in cats.

For iris melanosis and small iris freckles the treatment recommendation is monitoring closely through regular medical checks.

Not any melanosis should be treated as a melanoma, neither as melanoma should not be treated as melanosis.

Thoracic radiographs and complete blood work should be performed prior to enucleation.

The globe should always be submitted for histopathology examination in order to confirm the neoplastic disease.

The cats are alive, returns periodically to the clinic for regular checks.

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