Article de crédit UFC

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Iris Neoplasia

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Abstract

***Background*: While uveal melanomas are the most common type of intraocular malignancy, only 3% to 10% of uveal melanomas occur on the iris. Diagnosis is quite challenging, as iris neoplasia can resembleseveral other entities. Prognosis is good, as the risk for metastasis is relatively low. *Case Reports*: Three patients, each presenting for routine examination with no particular complaints, were discovered to have iris lesions suspicious for malignancy. The cases presented illustrate the typical findings and management. *Conclusions*: The optometrist should be familiar with the appearance iris neoplasia and aware of the differential diagnoses to consider when a patient presents with a suspicious iris lesion. The eyecare practitioner must also be aware of appropriate management strategies for these patients.**

Introduction

Uveal melanomas are the most common intraocular malignancy, making up 5% of all intraocular tumors.[1,2] Iris melanomas make up 3% to 10% of all uveal melanomas.[2-7] They are usually detected at an earlier age than other ocular melanomas due to their high visibility in the anterior segment.[5,8] The majority of iris melanomas follow a benign course, with low metastatic potential.[1,2,5,7-10]

The difficulty in managing the patient with an iris melanoma lies in definitively establishing the diagnosis. The diagnosis of an iris tumor is very challenging because there are a wide variety of lesions that can simulate iris tumors, and even benign lesions have suspicious characteristics.[9-11] There is disagreement among researchers regarding nomeclature and classification of lesions, and the distinctions between what might be considered benign or malignant are not clear.[6,9,10] Even the usage of the terms "melanoma" or "nevus" for pigmented iris lesions has been a matter of dispute.[9] Close scrutiny to distinguish malignant iris lesions from benign ones is a crucial but challenging step in the management process.

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Case Reports

Case 1

A 53-year-old white male presented for a routine eye examination reporting near vision blur. The patient stated that at his last exam, 33 years ago, he had been told that he had a "freckle" in the right eye. His medical history was positive for hypertension but he was taking no medication for it. His only medication was vardenafil.

Pupils were equal, round and reactive to light with no afferent pupillary defect. Extraocular motilities were full with no restrictions and confrontation visual fields were full to finger counting in each eye. The patient's best corrected visual acuity was 6/6 (20/20) OD and 6/6 (20/20) OS with a refraction of OD: +2.25-0.75x35, OS: +1.50 with add of +1.75. Slit lamp biomicroscopy revealed that lid and lashes were clear; the conjunctiva was white and quiet, and the cornea was clear. Angles were 1/2 x 1/2 by Von Herrick estimation. Anterior chambers were deep and quiet, and the lens and vitreous were also clear in each eye. A pigmented wedge-shaped lesion from 3:30 to 4:30 from the pupillary margin but not extending as far as the anterior chamber angle was discovered on the right iris. The lesion was vascularized and moderately elevated, and measured 3.8 x 3.8 mm in its greatest dimensions. The pupil was slightly peaked toward the lesion (Fig. 1A-D). Distortion of the pupil became exaggerated upon dilation. Intraocular pressure (IOP) by Goldmann applanation tonometry was 13 mmHg OD and 15 mmHg OS. Dilated fundoscopy revealed retinal pigment epithelium hyperplasia from 7-8 o'clock in the right eye. No anomalies were found in the left eye.

The patient was diagnosed with a suspicious vascularized pigmented iris lesion of the right eye and was

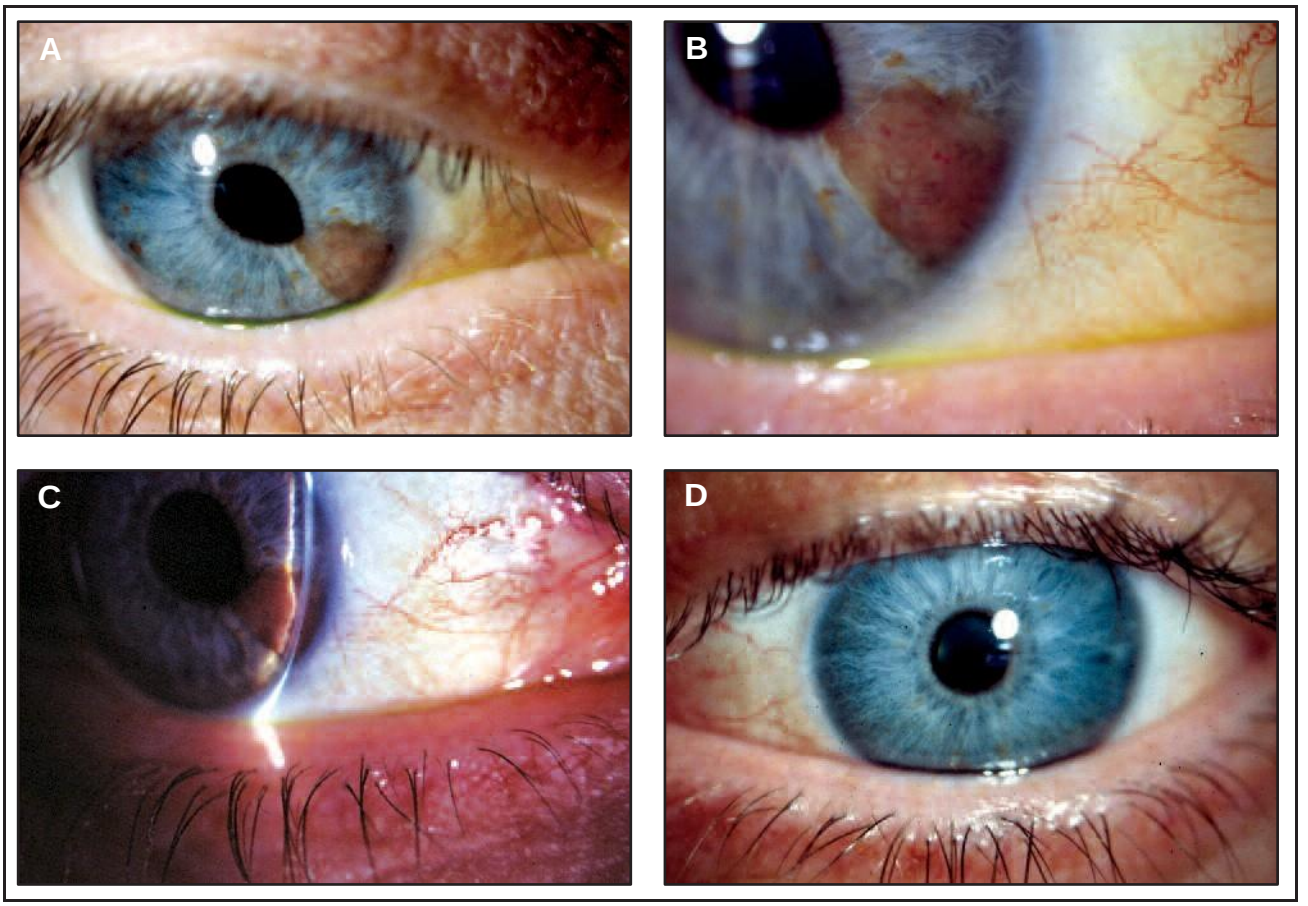

Fig. 1 Case 1: Moderately elevated, vascularized, pigmented lesion on the iris of the right eye remained unchanged (1A-1C); normal left eye (1D).

referred to Cornea/Anterior Segment Clinic for further investigation. At that visit gonioscopy was open in all four quadrants. All other exam findings were stable and the diagnosis remained that of a pigmented lesion of the iris. The significance of the lesion, differential diagnoses, low potential for metastasis, and complications were discussed with the patient. The patient was instructed to return in 4 months for continued monitoring. Baseline anterior segment photographs were taken of both eyes.

The patient continued to return every 4 to 6 months as instructed for monitoring of the lesion, and was asked to bring old photographs for comparison. Two years afterthe initial presentation, all findings remained stable except a possible increase in vascularization of the inferior portion of the lesion. The patient was referred back to the Cornea/Anterior Segment Clinic for re- evaluation. At that visit, gonioscopy was repeated and demonstrated no evidence of invasion of the angle or satellite lesions. The lesion appeared to be slightly thicker compared with the baseline photographs. The patient was advised of the increased suspicion for malignant melanoma with the inferior location of the vascularity and surgical risks were discussed. Because of the low risk for metastasis and slow growth, the plan was to observe given the potential side effects after excision such as glare and diplopia. He was instructed to return with any observed change in the lesion; otherwise, he was to be monitored in 3 to 4 months.

The patient returned 3 months later for follow-up. The size and vascularity of the lesion remained unchanged from the previous visit. The diagnosis of presumed amelanotic iris melanoma of the right eye was made at this time. The patient returned 4 months later for continued monitoring with no changes observed; he has not returned to clinic since then.

Case 2

A 50-year-old white male presented for a routine diabetic retinal screening and comprehensive eye examination.He had a history of superficial trauma to both eyes. The ocular history was otherwise negative. He was a type 2 diabetic for 18 years; medical history was otherwise

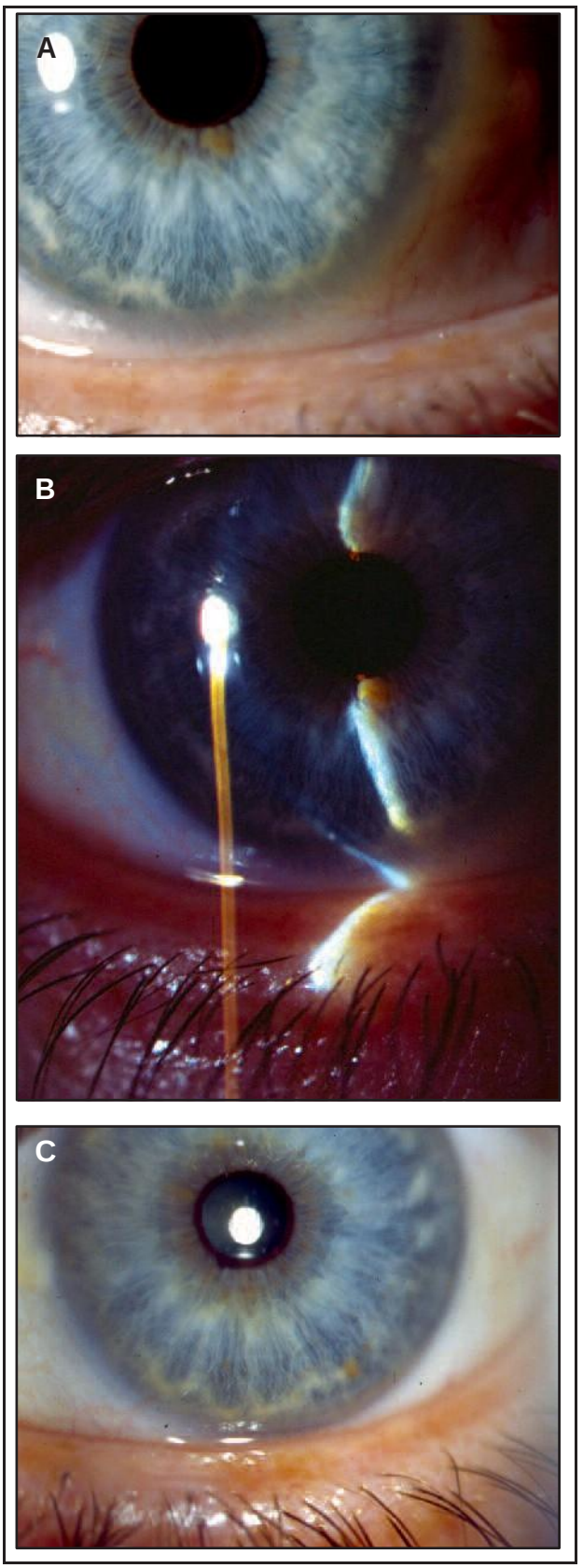

Fig. 2 Case 2: Iris nodules on the right eye (2A-2B) and the left (2C) were determined to be benign iris nevi.

significant for hypertension, benign prostatic hypertrophy, degeneration of intervertebral disc, hyperlipidemia, peripheral neuropathy, hemorrhoids, and hemorrhage of gastrointestinal tract. His medications included: acetaminophen, aspirin, cyclobenzaprine, etodolac, fluoxetine, fosinopril, glipizide, guaifenesin, hydrocodone, lovastatin, metformin, metoprolol tartate, nitroglycerin, and terazosin.

Upon examination, pupils were equal round and reactive to light with no afferent pupillary defect. Extraocular motilities were full; confrontation visual fields were full to finger-counting. His visual acuity was 6/6 (20/20) OD and 6/6 (20/20) OS through +0.50-0.75x89 OD and +0.50-1.50x94 OS. Intraocular pressure was 16 mmHg OD, 15 mmHg OS with Goldmann applanation tonometry. Slit lamp biomicroscopy revealed a white-brown bilobed nodule approximately 1 mm x 1 mm in size on the iris of the right eye at 4:30, near the pupillary border. No feeder vessels or pupil distortion was evident. On the left iris there were two brown nodules at the pupillary ruff with ectropion uveae and fine superficial pigment in the left eye. The crystalline lenses had trace nuclear sclerosis. Dilated fundoscopy was normal with no signs of diabetic or hypertensive retinopathy.

A tentative diagnosis of iris nodule was made in the right eye with a differential diagnosis of Busacca or Koeppe nodule. The patient was then referred to the Cornea/Anterior Segment Clinic for further evaluation. The nodules were discussed with the patient. Given the bilateral presentation, the likelihood that the findings represented neoplastic disease was considered very remote.

When the patient returned one year later, all examination findings were stable from the last visit. Gonioscopy revealed no angle nodules. Baseline anterior slit lamp photos were taken (Fig. 2A-C). The final assessment was iris nevi OU. The patient was advised to return in one year for follow-up, at which time no changes from the baseline photographs were observed.

Case 3

A 59-year-old white male presented for a routine diabetic evaluation. His ocular history was significant only for superficial trauma to the right eye with an arrow during childhood. He had been diagnosed with diabetes 6 months ago. His medical history was otherwise significant for hypertension, hypertriglyceridemia, gout, and attention deficit disorder. His medications were cyclobenzaprine, gemfibrozil, glyburide, losartan, metoprolol, niacin, sertraline, simvastatin, and tretinoin.

Upon examination, he was found to have a best corrected visual acuity of 6/6 (20/20) OD and 6/6 (20/20) OS with a refraction of OD -2.25 and OS +0.25 -1.00x90 with an add of +2.00. Both pupils were fully reactive to light; however, the right pupil was round while the left was slightly irregular. Extraocular motilities and confrontation visual fields were full. Goldmann

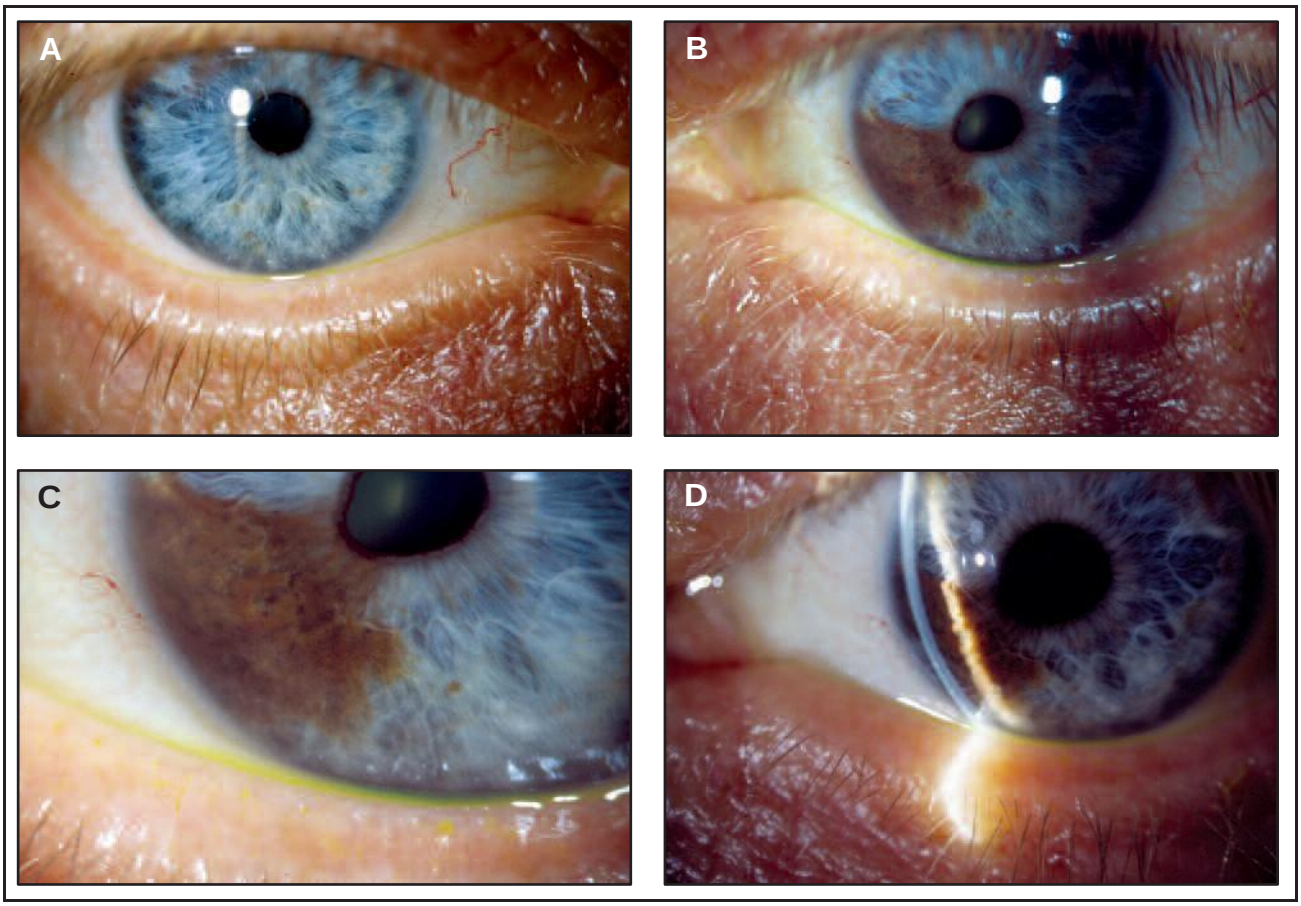

Fig. 3 Case 3: Normal right eye (3A); suspicious melanotic iris lesion on left iris remained unchanged over time (3B-3D).

applanation tonometry measured 14 mmHg OD and 12 mmHg OS. Anterior segment examination discovered multiple papillomas on the lids of both eyes. The corneae had trace inferior superficial punctuate keratitis, the anterior chambers were deep and quiet, and the crystalline lenses had trace nuclear sclerosis and trace cortical opacities. The iris was blue and flat in the right eye. The left iris had a slightly elevated lesion from 7:00-8:30 with pupil distortion. This lesion was light to medium brown with numerous tiny granules of dark brown pigment on its surface. No feeder vessels were visible. Upon inquiry, the patient reported that this lesion had been there all his life. Dilated retinal exam was normal with no diabetic retinopathy. Baseline anterior segment photographs were taken on a subsequent visit (Fig. 3A-D). The differential diagnoses of iris nevus versus malignant neoplasia with distorted pupil were considered.

A consultation with the Cornea/Anterior Segment Clinic was sought. At this evaluation, all examination findings were noted to be stable from the previous visit. Gonioscopy was normal with no vessels or masses extending to angle. The diagnosis was iris nevus of the left eye, with no signs of malignancy. The patient was instructed to follow-up yearly or sooner if any changes in size of iris nevus.

Discussion

Epidemiology and General Characteristics of Iris Melanoma

Iris melanomas comprise 2% to 5% of all uveal melanomas.[2,4,6,12] There seems to be no predilection when it comes to gender; they affect men and women equally.[3] They tend to occur unilaterally.[14] Uveal melanomas are considered rare in those under the age of 20 years, especially in children.[13] The peak incidence of iris melanoma occurs ten years earlier than choroidal melanoma, at around 40 to 47 years of age.[3-5,8-10,12,14] This may be due in part to the high visibility of the iris, where changes in iris color and pupil distortion are more apparent.[3,10] There is a predisposition for iris melanomas to occur in light-skinned people.[2,3,7,10,12,14] This may be

because their relative lack of skin pigmentation makes them more susceptible to damage from UV radiation.[15] Rootman speculated that short wavelength light (ultra-violet) or light in general may be an inductive factor for iris melanomas.[16] He hypothesized that predisposed or previously transformed melanocytes may be more intensely stimulated by light in a pale iris without protective pigmentation. Rootman also found that 21 out of 21 subjects in his study had light irides.[16]

The most common area affected is the inferior portion of the iris, possibly due to increased light exposure in this area.[10,12,17] The majority of these lesions are stable and do not grow or grow slowly, but thereis a small number that do grow and demonstrate both malignant and metastatic potential.[1,2,9,14]

Iris melanomas can present with a wide variety of signs. Most commonly they appear as pigmented lesions on the iris.[3] They can vary in degree and homogeneity of pigmentation, and also show associated vasculature, elevation and growth.[3] Other signs are unilateral increased IOP, pupillary distortion, ectropion iridis, and sector cataract.[3,18] Anterior staphyloma, hyphema, corneal edema, uveitis, and heterochromia can also be signs of an iris melanoma. Patients may experience a decrease in vision, pain, and photosensitivity.[3] The majority of patients are asymptomatic.[9] "Tapioca" melanoma is a rare type of iris melanoma characterized by diffuse involve-ment of the iris, a nodular appearance, and elevated intraocular pressure likely due to tumor invasion of the angle as well as obstruction of the trabecular meshwork by dispersed tumor cells.[19]

Clinical Evaluation

The clinical evaluation to diagnose iris melanomas should include a careful slit lamp exam of all anterior segment structures, including episceral tissue (to check for abnormal vascularity), cornea, anterior chamber angle, and the lens.[2] Anterior segment photographs should also be taken to monitor for growth.[3] Batiglou followed the patients in his study every six months with anterior segment photography. A refraction should be performed to look for a hyperopic shift. A unilateral increase in intraocular pressure suggests angle involvement, so measurement with Goldmann tonometry must be done.[6,10] A careful gonioscopic examination should be performed to determine if there is pigment in the anterior chamber angle structures and invasion of the trabecular meshwork and ciliary body.[3] Routine monitoring of iris melanoma should also include regular dilated fundoscopy to search for evidence of metastasis and to rule out a choroidal melanoma with iris metastasis. Although it is an invasive procedure, a biopsy may be necessary with a suspected iris melanoma to determine the histological characteristicsof the lesion.

Traditional ultrasonography has poor resolution of anterior segment, but ultrasound biomicroscopy provides noninvasive high resolution imaging of the anterior segment.[20] It produces images of intrastromal and posterior tumor margins and gives information about internal reflectivity.[21] It can be used to determine if there is tumor growth, vascularity, sector cataract, and disturbance of the iris pigment epithelium.[22] It is useful from differentiating iris nevus from iris melanoma.[20] Iris melanomas show distortion of the posterior iris plane andposterior bowing of the iris, whereas iris nevi appear as minimally elevated iris stromal lesions with medium to high reflectivity.[20] Iris melanomas tend to have low or medium reflectivity.[22] Gunduz found no correlation between ultrasound biomicroscopy and the histo- pathologic features of iris melanomas or iris nevi, but Marigo and Nordlund did find some histopathologic correlation with ultrasound biomicroscopy.[20-22] In Marigo's study hypoechoic areas corresponded to enlarged blood vessels, and increased iris thickness corresponded to infiltration of the stroma by neoplastic melanocytic cells.[21] Ultrasound biomicroscopy also helps in planning treatment, as it allows assessment of posterior chamber tumor extension, in which case local resection of the whole tumor may not be possible.[21] It also may prove beneficial in treatment as a means for measuring the response to radiation therapy.[23]

Diagnostic Testing

Fluorescein angiography is also used in the management of iris melanomas. According to Geisse, fluorescein angiography is not helpful in distinguishing between benign and malignant iris melanomas, but it is helpful in determining the limits of tumor involvement.[8] There are three angiographic patterns of iris tumors developed by Demeler, and Jakobiec expanded on the patterns to include one more.[8,17,24] The first angiographic pattern is characterized by no vessels or leakage.[8] Those iris lesions displaying the first pattern have been shown to be mostly benign.[8] The second pattern is characterized by a well-defined vascular system that appears early and leaks late into the iris tumor and surrounding area.[8] There is a regular vascular net in the tumor.[8] In Jakobiec's study, irislesions with the second pattern were mainly associated with benign tendencies.[8,17] The third angiographic pattern shows disorganized vessels that leak with a diffuse or mottled pattern.[8,17] The intensity of fluorescein increases with time. These were also shown to be mostly benign. The fourth angiographic pattern was a mixture of the firstand third pattern. The angiogram showed angiographic "silence" intermixed with areas of well defined tumors vessels that usually showed late leakage. The iris melanomas that were categorized into the fourth angio- graphic pattern were shown to be malignant.[8,17,24]

Table I Classification system for iris melanomas[8,12]

Cell Type	Classification	Description
Spindle Cell	Elongated cells with plump, prominent nuclei High nuclear-cytoplasmic ratio Mild mitotic activity	Spindle A
	Arranged into fasicular pattern Mildly coarse chromatin Eosinophilic nucleolus	Spindle B
Epithelioid Cell	Large eosinophilic nuclei Larger and more pleomorphic compared to spindle cell Eosinophilic cytoplasm Distinct cell borders High nuclear-cytoplasmic ratio Macrophages present depending on degree of tumor cell pigmentation Usually low mitotic activity	
Mixed Cell	Mixture of malignant spindle cells with plump nuclei Prominent nucleoli Large polyehedral cells with glassy cytoplasm	Large nuclei with eosinophilic nucleoli Easily identifiable mitotic figures

Table II Jakobiec's classification/diagnostic criteria of iris melanomas[9,17]

Group	Classification	Description
1	Melanocytosis	Benign
2	Melanocytoma	Benign
3	Epithelioid Cell Nevus	Benign
4	Intrastromal Spindle Cell Nevus (precursor to group 5)	Benign
5	Spindle Cell Nevus with Surface Plaque	
6	Borderline Spindle Cell Nevus	Morphologically similar to group 5
7	Spindle Cell Melanoma	Spindle B
8	Spindle and Epithelioid Cell Melanoma	
9	Epithelioid Cell Melanoma	

The limits of Jakobiec's and Demeler's studies were that biopsies were not performed in all cases.[8] Of the biopsies that were performed in Jakobiec's study, they correlated with the above grouping patterns in terms of malignant or benign tendencies. The histology of group 1 fluorescein patterns were mainly benign nevoid spindle cell proliferations, the group 2 fluorescein patterns were spindle cell also, group 3 fluorescein pattern sample histology showed hypocellular pigmented nevoid cells, and the histology of the group 4 fluorescein pattern showed spindle B melanoma and spindle-epithelioid cell melanoma.[8] Jakobiec believed that the fluorescein pattern gave information regarding the behavior of the lesionand that this could be used to make inferences about cytology.[17] Demeler, Jakobiec, and Geisse found that iris lesions classified in group 1 were benign, but they had different findings for iris lesions classified in groups 2 and 3.[8,17,24] Contrary to Jakobiec's findings, Demeler and Geisse discovered that tumors classified into group 2 were malignant when they were biopsied.[8,24]

Another limitation of fluorescein angiography is that lesions such as inflammatory nodules and iris cysts can simulate fluorescein patterns similar to iris melanomas.[8,17] Despite the difference in opinion in group-ing pattern of malignant and benign lesions fluorescein angiography may be used to detect changes in vascular pattern. Any documented changes in vascular pattern should warrant a prompt biopsy.[17]

Histology of Iris Melanomas

Many clinicians agree that histologic examination is the best way to distinguish between malignant and benign iris melanomas.[8,21] Specific histological characteristics of iris melanomas are used to differentiate between benign and malignant lesions.[8] However, there is no uniformly accepted classification system.[6] The distinctions between what would be considered "benign" or "malignant", and what would be considered spindle A versus spindleB cytology have been debated among pathologists.[10] An additional drawback to histologic evaluation of iris lesions is that there is a limited amount of tissue available for examination.[25]

The modified Callender classification system is often used for categorizing iris melanomas.[12] This system consists of two main cellular types (spindle and epithelioid) and three categories of melanomas (spindle cell, epithelioid cell, and mixed cell type).[12] The histological cell types of iris melanomas are summarized in Table I.

Spindle cell cytology holds the most favorable prognosis, then epithelioid cell.[8,12] Mixed cell iris melanomas have the worst prognosis.[12] Geisse believed that spindle A melanomas were benign.[8] Some studies have shown that spindle A cells are incapable of metastasis, whereas others document that there have been

Table III Differential diagnosis of iris melanomas[11,29-31]

Diagnosis	Description
Primary iris cyst	Causes anterior displacement of peripheral iris Best viewed by dilating pupil and using slit lamp biomicroscopy and Goldmann lens
Iris nevus	
Essential iris atrophy	Areas of iris atrophy Peripheral anterior synechiae with breaks in iris stroma
Lymphoid infiltrate of the iris	Confirmed by histopathology
Foreign body	
Corneal perforation	
Peripheral anterior synechiae	
Iris metastases	ex. Ciliary body tumor with metastasis to iris
Aphakic iris cyst	
Miscellaneous iris atrophy	
Pigment epithelial hyperplasia or migration	
Iris neovascularization	
Atypical iris vessels	
Vascular tumors of iris (cavernous hemangioma, capillary hemangioma, racemose hemangioma, varix)	
Iris depigmentation	
Leiomyoma	Benign smooth muscle tumor
Intraocular uveal tissue	
Melanocytoma	Usually benign Monomorphic proliferation of plump, polyhedral cells
Occluded pupil	
Iris nevus syndrome (Cogan-Reese)	Diffuse nevus of anterior iris Presents with heterochromia, glaucoma, corneal edema, breaks in iris stroma, and peripheral anterior synechiae Benign condition but difficult to diagnose
Reactive lymphoid hyperplasia	
Adenoma of iris epithelium	
Congenital heterochromia	
Iridoschisis	

cases of metastasis from spindle A melanomas proven after enucleation of uveal melanomas.[8,10] There have been attempts to classify spindle A melanomas as spindle nevus due to their benign characteristics and zero metastatic potential.[10] However, differentiating cytologically between spindle A and spindle B is difficult.[10] Epithelioid and mixed cell melanomas show more malignant histology than the spindle cell counterpart and have metastatic potential.[3,10] Kersten found that smaller iris melanomas were made of spindle cell typology whereas larger tumors had malignant mixed or epithelioid cytology.[10] Jakobiec reclassified iris lesions into nine histopathologic classification/diagnostic categories. Group 1 is melanocytosis; Group 2 is melanocytoma, Group 3 is the epithelioidcell nevus; Group 4 is intrastromal spindle cell nevus; Group 5 is spindle cell nevus with surface plaque; Group 6 is comprised of the "borderline" spindle cell nevus; Group 7 is spindle cell melanoma; Group 8 includesspindle and epithelioid cell melanoma; and Group 9 is theepithelioid cell melanoma (Table II).[9] This classification system has received criticism because it classified all spindle cell A cells to spindle cell nevi, despite known cases of metastasis from spindle A cells.[10,12]

Kersten suggested that iris melanomas actually develop from pre-existing iris nevi.[10] He hypothesizedthat clones of malignant cells transform to become small melanomas.[10] Kersten also found that cells could exhibit spindle or epithelioid cytology depending on the tissue environment which suggested that the two cell histology were not separate entities but two environmentally influenced expressions of the same genotype.[10] Kersten hypothesizes that spindle A melanomas would not continue to exhibit benign tendencies if left alone. He theorized that spindle A melanomas could have the potential to evolve into spindle B and epithelioid cell types. Jakobiec also concluded that a large number of malignant melanomas of the iris existed from preexistent nevi.[17] It has been suggested that spindle A, spindle B and mixed epithelioid cells form a continuum.[9,10] So even with the more benign spindle A histology, one must carefully monitor for change or progression into epithelioid cytology.

Table IV Characteristics associated with enlargement of iris lesion[18]
Medial location of mass
Pigment dispersion onto adjacent iris or into anterior chamber angle
Increase in lesion size
Abnormal vasculature
Secondary glaucoma

Differential Diagnosis

Malignant iris melanomas are commonly misdiagnosed because many anterior segment lesions can mimic melanomas.[3,11] One study found that 35% of eyes that were enucleated for being iris melanomas were found to be pseudomelanomas.[3,11,26] In Ferry's study anterior staphylomas, inflammatory masses, iris stromal atrophy, and corneal perforations were the most common misdiagnoses in presumed iris melanomas.[11,26] In Shields' study iris cysts, iris nevus, and essential iris atrophy were most commonly misdiagnosed as iris melanomas.[11] Iris cysts cause anterior displacement of the peripheral iris.[11] They are best viewed by widely dilating the pupil and using slit lamp biomicroscopy and Goldmann 3-mirror lens examination.[11] Shields diagnosed an iris nevi if it was a solid mass that locally replaced iris stroma but failed to meet their diagnostic criteria for melanoma.[11] Shields' diagnostic criteria for an iris melanoma was a melanocytic lesion that locally replaced iris stroma, at least 3 mm in diameter and 1 mm in thickness and had at least three of the following features: (1) prominent vascularity, (2) ectropion iridis, (3) secondary cataract, (4) secondary glaucoma, and/or (5) photographic documentation of progressive growth.[11]

Iris nevus syndrome is also a differential diagnosis of malignant melanoma.[11,27] It presents as a diffuse nevus of the iris along with a variety of other ocular signs including peripheral anterior synechiae frequently associated with defects in adjacent iris stroma, matted appearance of the iris stroma with a velvety whorl-like surface and loss of iris crypts, iris nodules, ectropion uveae, heterochromia, and secondary glaucoma.[27]

Iris melanocytomas are rare and are diagnosed histopathologically with the presence of monomorphic proliferation of plump, polyhedral cells. Iris melanocytomas are usually benign with the least potential for malignant change but there have been reports of transformation to malignant melanoma.[13,28]

Table III enumerates the wide variety of lesions that should be considered as differentials for iris melanomas. The clinical diagnosis of a malignant melanoma is extremely difficult, which leads to a high error rate.[3,11] Benign iris melanomas can seem malignant and vice versa.[10] A study done in 1975 found that 0.9% to 1.3% of enucleated eyes actually contained malignant melanomas.[10] Most reports agree that documented rapid growth is concerning. However other factors, such as increased intraocular pressure has not always been reported in association with a malignant lesion. Territo found clinical features associated with tumor enlargement to be medial location of mass on iris and presence of pigment dispersion onto adjacent iris or into anterior chamber angle structures.[18] Overall malignant potential is increased with an increase in lesion size, abnormal vasculature, secondary glaucoma, and documented enlargement.[3,18] Table IV lists the characteristics that have been associated with enlargement of iris lesions.

Prognosis and Complications

Glaucoma can be one of the complications of a benign iris lesion and a malignant iris melanoma. Iris melanomas can cause glaucoma by obstructing outflow at the level of the trabecular meshwork through direct extension or seeding of tumor cells, pigment granules, or macrophages into the anterior chamber angle.[32,33]

The fatality rate of iris melanomas is very low.[3] The metastasis rate from iris melanomas is estimated to be 3% to 5%.[2,8,14] The risk of metastasis is greater in older patients, those with elevated intraocular pressure, extra- ocular extension, and those in whom the iris root is involved by the tumor.[2] Some have said that if the drainage angle is involved, the rate doubles to 6%.[34] Spindle A melanomas had no potential for metastasis according to Geisse, but Kersten found documented cases of metastasis from spindle A melanomas.[8,10] Spindle melanomas (including spindle A and spindle B) metastasized at a rate of 2.6%, epithelioid melanomas at a rate of 6.9% and mixed cell melanomas at a rate of 10.5%.[8] The average time to metastasis was 6.5 years. Geisse recommended a follow-up of at least five, ten and fifteen years to check for stability and metastasis.[8] Kersten found that most metastasis occurred from pure epithelioid or mixed tumors with a peak that occurred two to four years after enucleation and a second peak at six to seven years after enucleation.[10] Kersten's study found that that age lessthan twenty, increased intraocular pressure at diagnosis, peripheral location of iris tumor and mixed or epithelioid histology increased the risk of metastatic death from iris tumors. Sunba's study showed that diffusely infiltrating, heavily pigmented tumors, and tumors whose cell nuclei show prominent nucleoli were more likely to metastasize.[14] Diffuse iris melanomas have a relatively poor prognosis.[3,12,14] Nordlund found that iris melanomas were more likely to metastasize if there was involvement of the iris root or the anterior chamber angle along with elevated intraocular pressure or when there is extraocular spread.[22]

Metastasis to the iris is relatively rare in comparison with metastasis to the choroid.[36] The most common carcinomas that metastasize to the iris and ciliary body arise in the breast, lung, and kidney (Table V).[35,36] In a

Table V Primary cancer locations that metastasize to the iris[36]
Primary tumor type and location
Breast carcinoma
Lung carcinoma
Melanoma
Colonic carcinoma
Esophageal carcinoma
Laryngeal carcinoma
Prostatic carcinoma
Renal cell carcinoma

study of 1,200 patients with iris lesions, Shields et al found that the most common source of metastasis to the iris was breast carcinoma, accounting for 40% of their cases of iris metastasis; lung carcinoma was the source ofmetastasis in 28%; and bronchial "carcinoid" tumor in 8%.[36] They found that most metastatic lesions of the iris were located inferiorly, 15% had multiple lesions, 50% of cases had engorged bulbar conjunctival or episcleral vasculature, and 60% had an irregular pupil.[36]

Treatment and Management

Iris melanomas usually do not require immediate intervention. These lesions are slow-growing and mostly follow a benign course.[3] The usual treatment is observation, with regular follow-ups, documentation by anterior segment photography, and treatment of complications such as glaucoma.[3,6,12] Sector iridectomy or iridocyclectomy is performed for smaller iris melanomas that show growth (Table V).[3,37] Any surgical options must be taken with caution because of the risk of tumor seeding. There has been a case where iridocyclectomy for a malignant iris melanoma resulted in seeding of the tumor cells.[38]

Plaque radiotherapy is an alternative to enucleation in the case of large diffuse tumors that have extensive seeding of the iridocorneal angle and intractable glaucoma. Plaque radiotherapy has been shown to be effective against malignant iris melanomas. One patient out of fourteen developed epitheliopathy, abrasion and corneal edema.[39] The most worrisome complication was radiation induced iris vasculopathy but none developed iris neovascularization in Shields' study. However, in Finger's study there were cases of iris neovascularization after treatment.[23] There have not been any reported cases of radiation retinopathy or optic neuropathy. A summary of complications of plaque radiotherapy is provided in Table VI. Bianciotto et al described successful treatment of a case with iris melanoma and secondary neovascular glaucoma with a combination of plaque radiotherapy and bevacizumab injection.[40]

Photoradiation therapy uses light to activate certain photosensitizing tissues such as hematoporphyrin derivative which has an affinity for neoplastic tissue.This method of treatment results in selective tumor necrosis without damaging adjacent tissue. Side effects

Table VI Treatment for iris melanoma and their associated side effects.[8,12,39,40,43]	
Treatment	**Side Effects**
Sector iridectomy or iridocyclectomy	Photophobia, glare, diplopia
Plaque radiotherapy	Corneal abrasion, corneal edema, uveitis, hyphema, corneal epitheliopathy, posterior synechiae, focal iris vasculopathy, telangiectasia of the iris, radiation cataract, preradiotherapy tumor induced glaucoma
Proton beam therapy	Glaucoma, cataract, dry eye
Photoradiation therapy	Uveitis, keratic precipitates, neovascularization of the angle

from the treatment include keratic precipitates, iritis, and neovascularization of the anterior chamber angle, and glaucoma.[41]

Another method of treating large non-resectable iris melanomas is proton beam therapy. The major complication was found to be glaucoma along with symptomatic dry eye and cataract.[42] Radiation complications usually occur 12 to 24 months after treatment.[37]

Recent developments in treating malignant iris melanomas have looked at vascular endothelial growth factor. Vascular endothelial growth factor is a glycoprotein that functions as an endothelial cell mitogen and a vascular permeability factor. It is thought to play a role in tumor angiogenesis.[43] This could also help in iris neovascularization following radiation therapy. Anti-VEGF factors could be used as a conservative treatment to enucleation from neovascularization.[40,43]

For cases with glaucoma, laser trabeculoplasty, filtering surgery (Scheie procedure or unguarded filter surgery), and trabeculectomy (guarded filter surgery) are contraindicated because they can spread tumor cells.[30,34,44] The safer approach is to reduce inflow by cyclocryotherapy of the ciliary body. As mentioned previously, successful treatment with the anti-VEGF agent bevacizumab in combination with plaque radiotherapy has been reported in a case with neovascular glaucoma due to iris melanoma.[40] When a large, diffuse tumor has resulted in surgically uncontrollable glaucoma, enucleation may be necessary.[3,12]

Conclusion

There is much debate surrounding the diagnosis of malignant iris melanomas. There are no definitive criteria that make an iris lesion a malignant iris melanoma. What used to be considered malignant characteristics such as documented growth and glaucoma are now known to also be associated with benign iris lesions. Optometrists must be familiar with the numerous differentials that should be considered when a patient presents with a suspicious lesion

on the iris. The best care is photodocumentation and regular follow-up. Patients suspected of having a metastasis to the iris should be evaluated by ocular and systemic oncologists.[36] O

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Faites défiler deux pages vers le bas pour accéder aux instructions du questionnaire de test UFC

Voici enfin la lentille multifocale que vos patients presbytes attendaient – vision claire et nette à **toutes les distances** et dans **toutes les conditions d'éclairage en plus d'un confort tout au long de la journée**[1].

ACUVUE[MD] OASYS **MAX** 1-jour MULTIFOCALE réunit **3 technologies puissantes** pour répondre à plus de besoins presbytes*.

Conception d'optimisation pupillaire

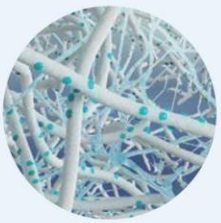
Pour une vision à **toutes les distances**[1]

- 100 % des paramètres adaptés aux variations de taille de la pupille en fonction de l'âge et de la réfraction^^[2]
- Même conception optique unique pour toutes les lentilles cornéennes ACUVUE[MD] multifocales[2]
- 92 % des patients s'adaptent avec succès à leur première paire lors de la première visite et 96 % s'adaptent avec succès à 2 paires de lentilles ou moins‡[3]

Technologie LarmeStable[MC]

Pour un **confort tout au long de la journée** et une vision uniforme[1]

- Optimise la distribution de l'agent mouillant à travers la lentille et sur la surface[4,5,6]
- Notre seul et unique matériau de lentille conçu pour prolonger la stabilité du film lacrymal[5]
- Offre un taux d'évaporation 2 fois plus faible§[4,6]



Filtre de lumière OptiBleue[MC]**

Pour une clarté dans **toutes les conditions d'éclairage**[**1]

- Filtre la lumière bleue-violette** à 60 % – le niveau le plus élevé de l'industrie††[4]
- Réduit la diffusion de la lumière‡‡[5]
- Réduit les halos et les étoilements‡‡[5]

* Comparativement à ACUVUE[MD] MOIST 1-JOUR MULTIFOCALE et ACUVUE[MD] OASYS MULTIFOCALE.
^^ Comparativement aux conceptions des produits concurrents; la technologie est optimisée aussi bien en fonction des paramètres d'erreur de réfraction qu'en fonction de la puissance d'addition.
‡ Quatre lentilles au total.
§ Comparativement à DAILIES Total1[MD], MyDay[MD] et ULTRA[MD] ONE DAY. Également beaucoup moins élevé qu'ACUVUE[MD] OASYS 1-jour.
** Il n'a pas été démontré que la filtration de la lumière HEV par les lentilles cornéennes confère un quelconque avantage pour la santé de l'utilisateur, y compris, mais sans s'y limiter, la protection de la rétine, la protection contre la progression de la cataracte, la réduction de la fatigue oculaire, l'amélioration du contraste ou de l'acuité, la réduction de l'éblouissement, l'amélioration de la vision en faible luminosité, du rythme circadien ou du cycle de sommeil. Le professionnel de la vue doit être consulté pour de plus amples renseignements.
†† Comparativement aux informations accessibles au public pour les lentilles cornéennes 1-jour standard en date du mois de juillet 2022.
‡‡ Comparativement à ACUVUE[MD] OASYS 1-jour.

1. Données internes de JJV, 2022. Allégations subjectives autonomes pour les lentilles cornéennes ACUVUE[MD] OASYS MAX 1-jour MULTIFOCALE - Méta-analyse exploratoire. **2.** Données internes de JJV, 2022. Technologie de CONCEPTION D'OPTIMISATION PUPILLAIRE ACUVUE[MD] : lentilles cornéennes JJVC, caractéristiques de la conception et avantages associés. **3.** Données internes de JJV, 2022. Allégations de réussite de l'ajustement autonome des lentilles cornéennes ACUVUE[MD] OASYS MAX 1-jour MULTIFOCALE. **4.** Données internes de JJV, 2022. Définition de la technologie LarmeStable[MC]. **5.** Données internes de JJV, 2022. Effet sur le film lacrymal et évaluation des artefacts visuels de la famille ACUVUE[MD] OASYS MAX 1-jour avec technologie LarmeStable[MC]. **6.** Données internes de JJV, 2022. Propriétés du matériau : lentilles cornéennes de marque ACUVUE[MD] MOIST 1-JOUR, ACUVUE[MD] TruEye[MD] 1-JOUR, ACUVUE[MD] OASYS 1-jour avec technologie HydraLuxe[MD], ACUVUE[MD] OASYS MAX 1-jour avec technologie LarmeStable[MC] et d'autres marques de lentilles 1-jour jetables.

Informations importantes sur la sécurité : Les lentilles cornéennes ACUVUE[MD] sont recommandées pour corriger la vue. Comme toute lentille cornéenne, des problèmes oculaires peuvent se développer, y compris des ulcères cornéens. Certains porteurs peuvent ressentir une légère irritation, une démangeaison ou un inconfort. Les lentilles ne devraient pas être prescrites en cas d'infection ou d'inconfort oculaire, de larmoiement excessif, de changements de la vue, de rougeurs ou d'autres problèmes oculaires. Consulter la notice du produit pour obtenir plus d'information. Communiquer également avec les Soins de la vision Johnson & Johnson, division de Johnson & Johnson inc., en composant le 1 800 667-5099 ou en visitant fr.jnjvisionpro.ca.

ACUVUE[MD]

INSTRUCTIONS POUR OBTENIR UN CREDIT UFC

Pour obtenir un crédit UFC pour ce cours remplissez le questionnaire ci-dessous et renvoyez-le soit en ligne, par courriel ou par courrier ordinaire. Le coût de la notation de chaque quiz est de 25,00 $ (plus taxes) et vous serez facturé via PayPalaprès avoir reçu votre certificat de crédit UFC. Ce cours expirera pour le crédit UFC le 31 mars 2024. Veuillez ne pas le soumettre après cette date.

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