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## Evisceration in Unsuspected Intraocular Tumors

Enucleation and evisceration are the 2 possible surgical management options for a disfigured or a painful blind eye.<sup>1-3</sup> Evisceration is replacing enucleation as the favored surgical option because of its potential advantages such as superior cosmesis, better prosthesis motility, and fewer implant-related complications.<sup>1-3</sup> Evisceration, however, is absolutely contraindicated in suspected intraocular malignancy. Before the availability of modern imaging techniques, 10% of blind, painful eyes with opaque media were found to contain unsuspected malignant tumors on histopathologic examination.<sup>3,4</sup> Although rare, pathologists continue to encounter clinically unsuspected intraocular tumors during histopathologic examination of eviscerated eyes. Several anecdotal studies of unsuspected tumors found after evisceration exist.<sup>4-13</sup> Although these articles include cases of carcinoma of the nonpigmented ciliary epithelium, adenocarcinoma of the retinal pigment epithelium, choroidal lymphoma, choroidal ganglioneuroma, spindle cell neoplasm, anaplastic tumor, and retinoblastoma, uveal melanoma predominates. Eagle et al<sup>13</sup> recently described a series of 7 additional cases of unsuspected uveal melanoma diagnosed in eviscerated specimens and have emphasized the role of detailed a medical history, clinical evaluation, and appropriate imaging before performing evisceration in painful blind eyes with opaque media. Our series comprises 6 cases of unsuspected intraocular tumors diagnosed following

evisceration and elaborates on the lessons learned from this experience.

**Methods.** This is a retrospective, non-randomized, clinicopathological case series of patients with previously unsuspected intraocular tumors diagnosed by histopathology of eviscerated blind eyes. The cases were collected by searching the indexed ocular pathology registry from January 1998 to December 2007 at a tertiary care center in southern India. The medical records were reviewed for patient age, sex, symptoms, initial clinical findings, initial clinical diagnosis, imaging, prior treatment, indication for evisceration, intraoperative findings, histopathology, postevisceration management, and final outcome for local tumor recurrence and systemic metastasis.

**Results.** We identified 6 patients with unsuspected intraocular tumors who had undergone evisceration (**Table**). The median patient age was 18 years (range, 8-70 years; mean [SD], 27.17 [22.46] years), and 5 were male. Preoperative ultrasound B-scan was available for 3 patients; a review of the documented images showed no obvious intraocular mass in 2 patients. A preoperative computed tomographic scan in one patient did not reveal an intraocular mass. Indications for evisceration included a painful blind eye in 4 patients, cosmetic concern in 1 patient, and a perforated hypotonus eye with uveal prolapse in 1 patient. No surgeons had recorded unusual features of intraocular contents observed during evisceration. Eviscerated tissue was not submitted for histopathology in 2 patients. Histopathology of the eviscerated tissue or biopsy from the recurrent orbital tumor revealed retinoblastoma in 2 patients, and 1 each of uveal melanoma, adenocarcinoma of the ciliary body, choroidal ganglioneuroma, and conjunctival squamous cell carcinoma with intraocular invasion. Orbital exenteration was eventually required to treat 4 of these patients. Two patients with retinoblastoma were treated with high-dose chemotherapy, orbital exenteration, and external beam radiotherapy. The patient with uveal melanoma had orbital exenteration and external beam ra-

diotherapy. Adenocarcinoma of the ciliary body was managed with enucleation and external beam radiotherapy. The patient with benign choroidal ganglioneuroma was observed. The patient with intraocular invasion of conjunctival squamous cell carcinoma had orbital exenteration. All of the patients were free of local recurrence or systemic metastasis at a median follow-up of 28 months (range, 4-41 months; mean [SD], 24.50 [14.90] months).

**Report of Cases. Case 1.** A systemically healthy and active 3-year-old boy presented to the glaucoma clinic in June 2001 with spontaneous progressive enlargement of the left eye of 2 years' duration. There was no history of prior trauma or surgery. Findings of the examination of right eye were essentially normal. The child had no light perception in the left eye. There was ciliary staphyloma, diffuse corneal edema, dilated fixed pupil, aphakia, and an intraocular pressure of 34 mm Hg by Perkin applanation tonometry under anesthesia. The fundus view was unclear. Ultrasound B-scan showed an increase in the axial length, a clear vitreous cavity, and optic disc cupping (**Figure 1A**). There was no evidence of subluxation of the crystalline lens or an intraocular mass. An immersion ultrasound B-scan, however, was not done. The glaucoma specialist performed semiconducting diode laser transscleral cyclophotocoagulation to control the intraocular pressure. The child had periodic follow-up at the glaucoma clinic thereafter. The child reported severe pain in the left eye in January 2005 and had evisceration by a pediatric ophthalmologist. A repeated ultrasound B-scan of the eye was not performed before evisceration. Histopathology of the eviscerated tissue showed a malignant round cell tumor with areas of necrosis and calcification, based on which a diagnosis of retinoblastoma was made (**Figure 1, B and C**), and the child was referred to the ocular oncology service. A computed tomographic scan did not reveal optic nerve invasion or orbital extension (**Figure 1D**). There was no evidence of systemic metastasis. Results of bone marrow biopsy and cerebrospinal fluid cytology

**Table. Clinical Profile of 6 Patients Who Had Evisceration With Unsuspected Intraocular Tumor**

Sex/ Age, y	Imaging	Initial Clinical Diagnosis	Initial Clinical Management Prior to Evisceration	Indication for Evisceration	Final Histopathological Diagnosis	Final Management	Follow- up, mo	Final Status
M/8	USG: anechoic, no mass	Staphyloma, secondary glaucoma	TSCPC, medical management of glaucoma	Painful blind eye	Retinoblastoma	Chemotherapy, orbital exenteration, EBRT	41	No local recurrence or systemic metastasis
M/8	Not performed	Secondary glaucoma after trauma	None	Painful blind eye	Orbital recurrence of retinoblastoma <sup>b</sup>	Chemotherapy, orbital exenteration, EBRT	36	No local recurrence or systemic metastasis
M/41	USG: <sup>a</sup> intraocular mass with low internal reflectivity suggestive of uveal melanoma	Uveal melanoma <sup>a</sup>	None	Painful blind eye	Orbital recurrence of uveal melanoma <sup>b</sup>	Orbital exenteration	10	No local recurrence or systemic metastasis
F/70	USG: closed funnel retinal detachment, no mass	Retinal detachment with secondary glaucoma	Trabeculectomy, medical management of glaucoma	Painful blind eye	Primary adenocarcinoma of the ciliary body	Enucleation, EBRT	23	No local recurrence or systemic metastasis
M/11	CT: enlarged eyeball, no mass	Neurofibromatosis type 1, developmental glaucoma	Trabeculectomy, medical management of glaucoma	Cosmetic concern	Choroidal ganglioneuroma	Observation	33	No local recurrence or systemic metastasis
M/25	Not performed	Necrotizing scleritis	Excision of epibulbar mass, medical management of necrotizing scleritis	Hypotonus eye with scleral necrosis and prolapse of uveal tissue	Squamous cell carcinoma with intraocular infiltration	Orbital exenteration	4	No local recurrence or systemic metastasis

Abbreviations: CT, computed tomographic scan; EBRT, external beam radiotherapy; TSCPC, transscleral cyclophotocoagulation; USG, ultrasound B-scan.

<sup>a</sup>The USG and information about the diagnosis of uveal melanoma were not available to the ophthalmologist who performed evisceration.

<sup>b</sup>Eviscerated tissue was not submitted for histopathology; diagnosis was confirmed by biopsy of the recurrent orbital tumor.

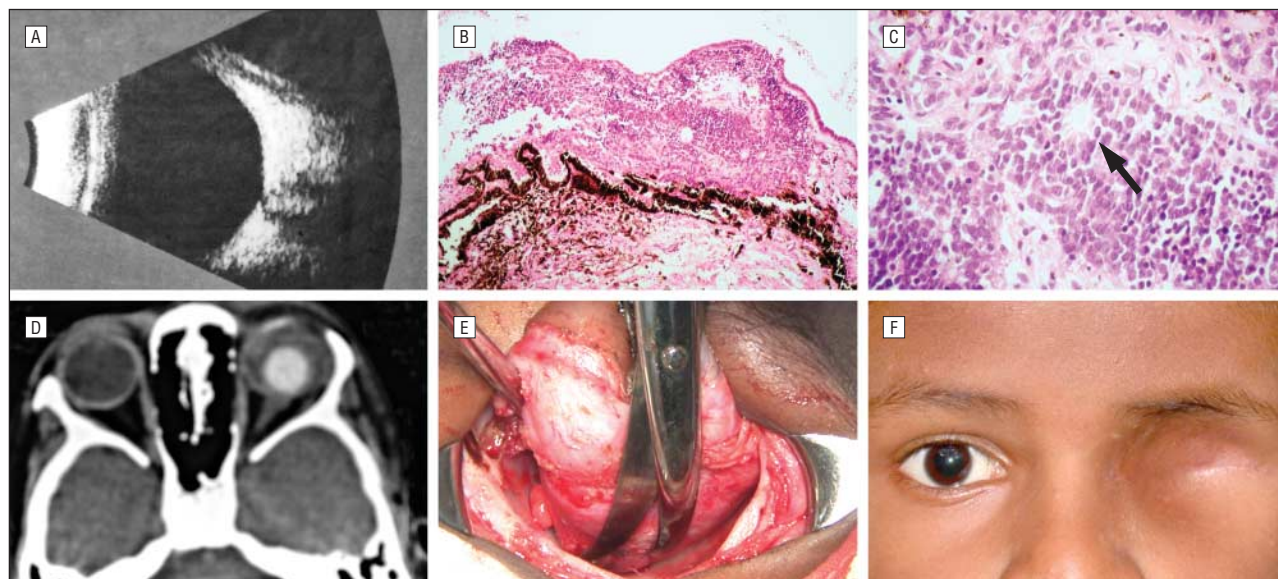
ogy were normal. The child was given high-dose chemotherapy with a combination of carboplatin, vincristine, and etoposide for 3 cycles, followed by eyelid-sparing orbital exenteration (Figure 1E), 4500-cGy (to convert gray to rad, multiply by 100) fractionated external beam radiotherapy to the orbit, and continued chemotherapy for 12 cycles. The child is alive and well, with no local recurrence or systemic metastasis 41 months after completion of treatment (Figure 1F).

**Case 2.** An 8-year-old boy had undergone evisceration elsewhere with a history of painful blind right eye following trauma and a clinical diagnosis of secondary glaucoma. Imaging had not been performed before evisceration. Eviscerated tissue had not been submitted for histopathology by the comprehensive ophthalmologist who had per-

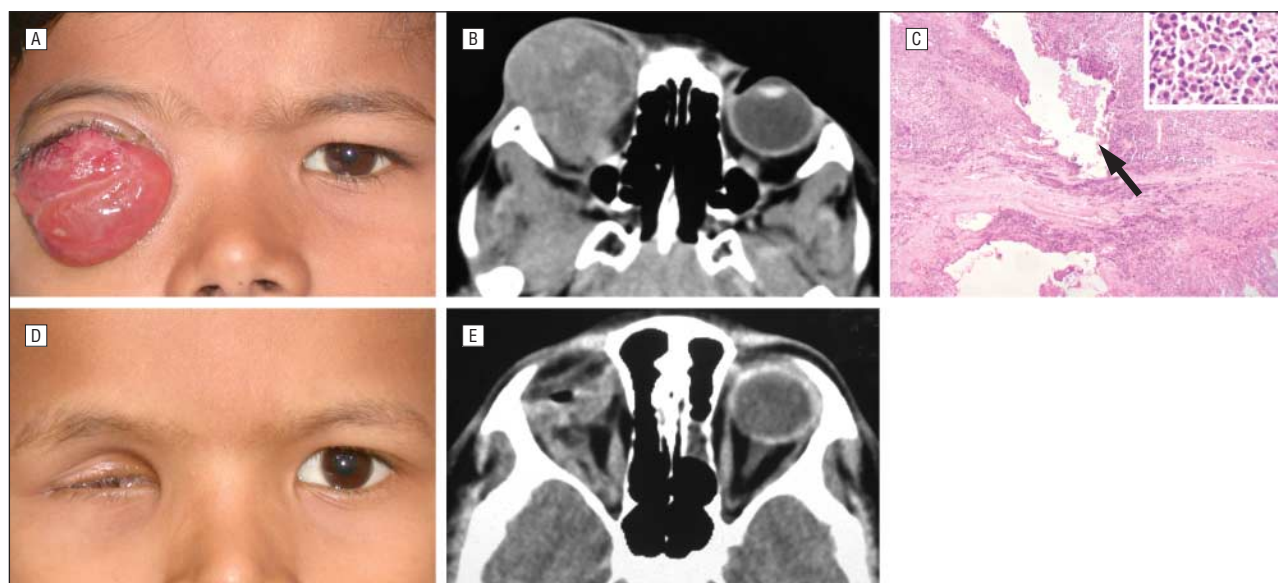
formed the surgery. The child developed a painful, rapidly growing orbital mass 2 months following evisceration (**Figure 2A**) and was referred to our ocular oncology service. A computed tomographic scan showed a large orbital mass with specks of intralesional calcification, suggestive of orbital recurrence of retinoblastoma (Figure 2B). Incisional biopsy of the orbital mass confirmed the diagnosis of retinoblastoma (Figure 2C). There was no evidence of systemic metastasis. Results of bone marrow biopsy and cerebrospinal fluid cytology were normal. The child received high-dose chemotherapy with a combination of carboplatin, etoposide, and vincristine for 3 cycles (Figure 2, D and E), followed by an eyelid-sparing orbital exenteration, 4500-cGy fractionated external beam radiotherapy to the orbit, and continued

chemotherapy for 12 cycles. The child had no local recurrence or systemic metastasis at 36 months following completion of treatment.

**Case 3.** A 41-year-old man presented with a painful, blind right eye of 3 months' duration. The right eye had no light perception. The anterior segment showed features of secondary angle-closure glaucoma and complicated cataract. Opaque media precluded fundus view. Ultrasound B-scan showed a large ciliochoroidal mass with low internal reflectivity (**Figure 3A**). The mass filled the vitreous cavity. Enucleation was advised with the clinical suspicion of a uveal melanoma. The patient was subsequently lost to follow-up. He developed severe pain 1 month later and consulted a comprehensive ophthalmologist elsewhere. The ophthalmologist, who was unaware of prior imaging and clinical diagnosis, pro-



**Figure 1.** An 8-year-old child with retinoblastoma who had evisceration of a painful blind eye with the clinical diagnosis of staphyloma with secondary glaucoma after transscleral cyclophotocoagulation (case 1). A, The posterior segment is anechoic on ultrasound B-scan performed at the initial visit when the child was aged 3 years. B, Histopathology of the eviscerated tissue shows cellular tumor on the surface of the ciliary body (hematoxylin-eosin, original magnification  $\times 40$ ). C, Higher magnification shows differentiated and undifferentiated round cells and Flexner-Wintersteiner rosettes (arrow) suggestive of retinoblastoma (hematoxylin-eosin staining, original magnification  $\times 400$ ). D, A post-evisceration axial computed tomographic scan shows an intrascleral implant and no evident orbital retinoblastoma. E, An intraoperative photograph shows eyelid-sparing orbital exenteration. F, Appearance of the exenterated socket is shown at the final follow-up.



**Figure 2.** An 8-year-old child with orbital recurrence of retinoblastoma following evisceration of a painful blind eye with glaucoma secondary to trauma (case 2). A, A large fleshy right orbital mass is seen. B, An axial computed tomographic scan demonstrates a large soft-tissue mass in the right orbit with specks of intrascleral calcification. C, Histopathology of incisional biopsy of the orbital mass shows a round-cell tumor infiltrating the orbital tissues (hematoxylin-eosin original magnification  $\times 40$ ); the inset shows small, round cells with high nuclear cytoplasmic ratio and coarse chromatin clumping, suggestive of retinoblastoma (hematoxylin-eosin, original magnification  $\times 400$ ). D, Following 6 cycles of neoadjuvant chemotherapy, the orbital tumor shows significant resolution. E, A computed tomographic scan axial cut shows significant resolution of the orbital tumor following 6 cycles of neoadjuvant chemotherapy.

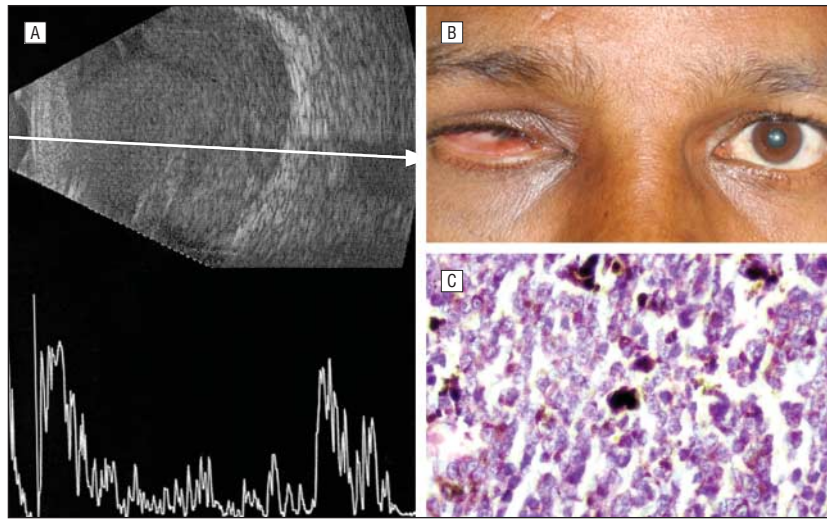
ceeded with evisceration of the painful blind eye but did not submit eviscerated tissue for histopathology. Six months later, the patient developed an orbital mass (Figure 3B) and was referred to our ocular oncology service. A computed tomographic scan showed a large, isodense orbital mass suggestive of orbital recurrence of

uveal melanoma. Systemic evaluation did not reveal any metastasis. The patient had an eyelid-sparing orbital exenteration. Histopathology confirmed the diagnosis of melanoma (Figure 3C). The patient received 6500-cGy fractionated orbital external beam radiotherapy. He was alive and well at last visit, 10 months after

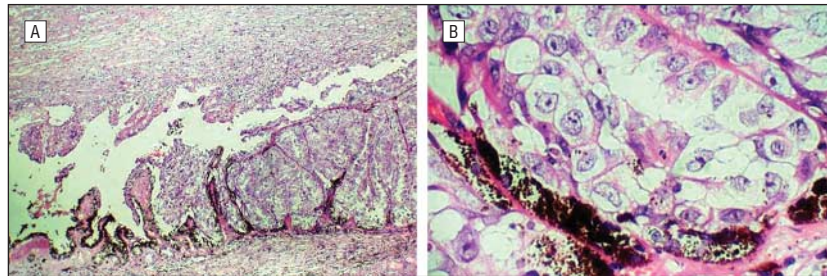
treatment, with no local recurrence or systemic metastasis.

**Case 4.** A systemically healthy 70-year-old with a history of severe pain and loss of vision in the right eye of 15 years' duration was seen by us. She had earlier undergone cataract surgery, followed by trabeculectomy elsewhere about 10 years ago. She had





**Figure 3.** A 41-year-old man with orbital recurrence of melanoma following evisceration of a painful blind eye with retinal detachment and secondary glaucoma (case 3). A, Ultrasound B-scan with cross vector shows a large intraocular mass filling the entire vitreous cavity (top panel), with low internal reflectivity (bottom panel), suggestive of uveal melanoma. B, A right orbital mass was noticed 6 months following evisceration. C, Histopathology of the exenterated orbit confirms orbital recurrence of uveal melanoma (hematoxylin-eosin, original magnification  $\times 400$ ).



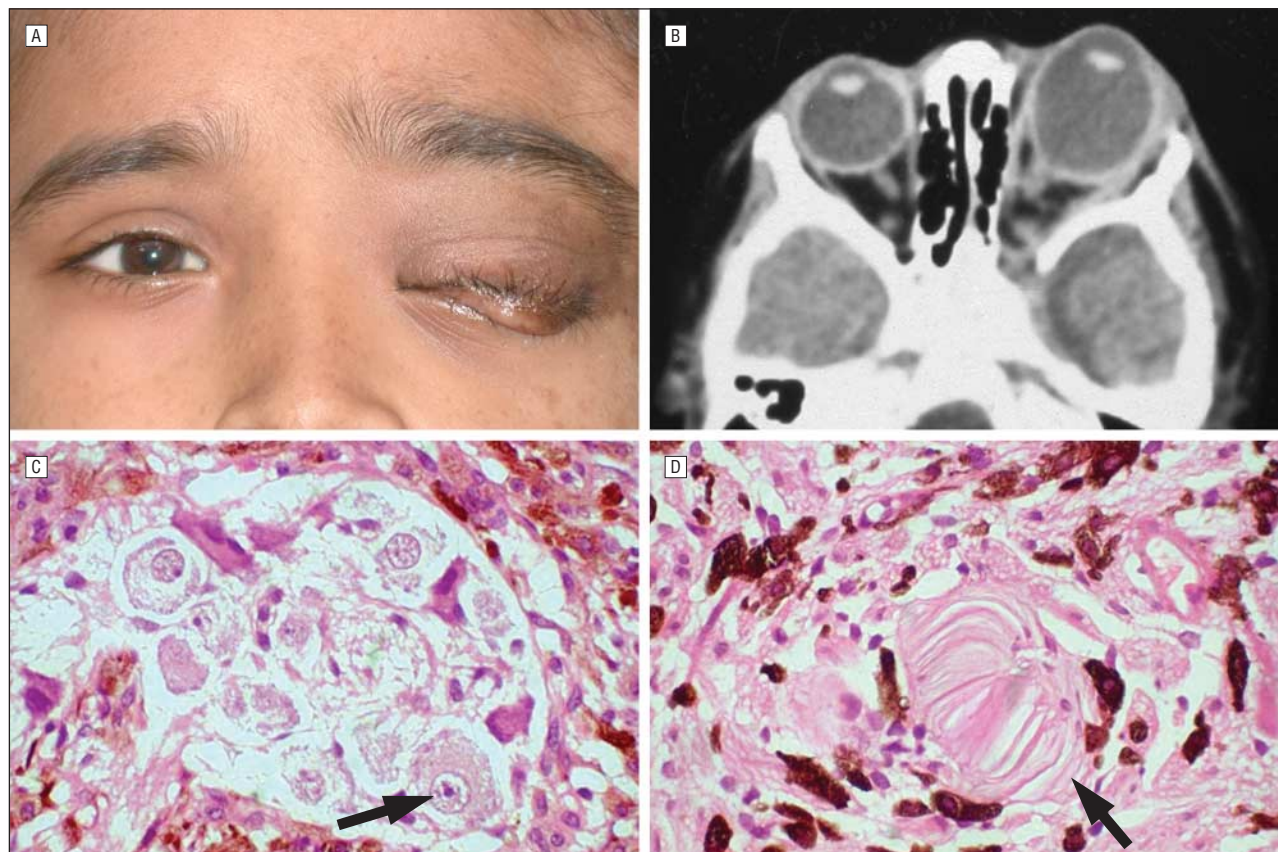
**Figure 4.** A 70-year-old woman with adenocarcinoma of the ciliary body discovered following evisceration of the painful blind right eye after trabeculectomy (case 4). A, Histopathology of the exenterated tissue shows a cellular tumor of the nonpigmented ciliary epithelium with glandular pattern (hematoxylin-eosin, original magnification  $\times 100$ ). B, Histopathology shows epithelial cells in a glandular pattern with a thick basement membrane, clear cytoplasm, large vesicular nucleus, and prominent nucleoli, suggestive of adenocarcinoma of the ciliary body (hematoxylin-eosin, original magnification  $\times 400$ ).

absent light perception, scarred bleb, and opaque cornea with spheroidal degeneration, precluding further evaluation of the anterior segment and fundus. Ultrasound B-scan showed a closed funnel retinal detachment and no evidence of an intraocular mass. Immersion B-scan, however, was not performed. The patient was advised to have evisceration for symptomatic relief by an oculoplasty surgeon. Histopathology of the eviscerated tissue showed neoplastic cells in glandular pattern with clear cytoplasm, vesicular nucleus, and prominent nucleoli, suggestive of adenocarcinoma of the ciliary body (**Figure 4**). Results of systemic evaluation were unremarkable. The patient was further treated with enucleation and 4500-cGy fraction-

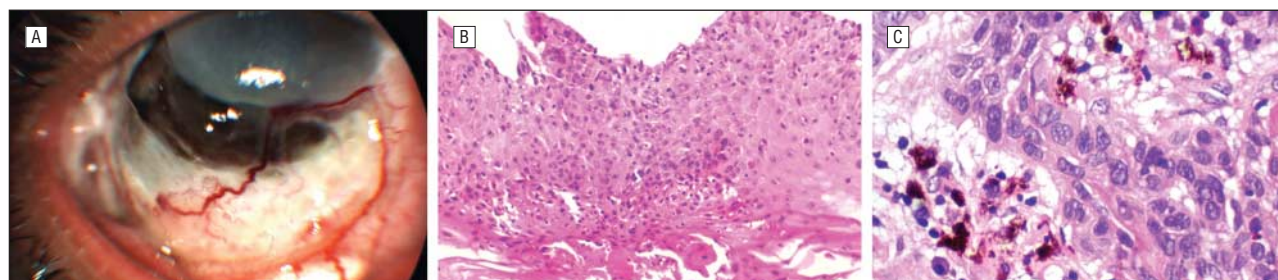
ated orbital external beam radiotherapy. She was alive and well 23 months following completion of treatment.

**Case 5.** An 11-year-old boy had a history of an enlarged left eyeball by birth. He had earlier had a trabeculectomy elsewhere with a diagnosis of developmental glaucoma. He had light perception, intraocular pressure of 34 mm Hg by applanation tonometry, plexiform neurofibroma of the left upper eyelid (**Figure 5A**), buphthalmos with scarred bleb, enlarged and edematous cornea, Lisch nodules on the iris, ectropion uveae, and total cataract. Systemic evaluation revealed café au lait spots. Computed tomography of the orbit showed an enlarged left eyeball, and a hypoplastic greater wing of the sphenoid (**Figure 5B**). There was no evidence of an intraocular mass. The child was diagnosed with neurofibromatosis type 1 with developmental glaucoma, status post trabeculectomy. The child had evisceration of the disfigured left eye and debulking of the eyelid plexiform neurofibroma by an oculoplasty surgeon for cosmetic concern. Histopathology of the eviscerated tissue showed thickened choroid with nests of mature polygonal ganglion cells admixed with nerve fibers (**Figure 5C**), focal areas of ganglion cells, and Pacinian bodies (**Figure 5D**), diagnostic of choroidal ganglioneuroma. The child was observed. He showed no local tumor recurrence at the final follow-up at 33 months.

**Case 6.** A 25-year-old immunocompetent man with a history of recurrent redness and pain in his right eye of 6 months' duration was seen by a cornea specialist. A year earlier, he had undergone excision of a growth on the surface of the eye, twice, at an interval of 1 month, by a comprehensive ophthalmologist. A pathologist had described the excised specimen as having nonspecific inflammation. The slides were not available for a review. His visual acuity was 20/160 OD. He had scleral necrosis, uveal prolapse, and cells in the anterior chamber. He was diagnosed with necrotizing scleritis and treated with oral prednisolone and methotrexate, and subsequently with oral azathioprine. However, his visual acuity deteriorated over the next 6 months to bare perception of light, scleral necrosis progressed, and the patient had unbearable pain (**Figure 6A**). The cornea specialist performed evisceration along with excision of the entire cornea, contiguous necrotic sclera, and overlying unhealthy conjunctiva. Ultrasound B-scan was not performed prior to evisceration. Histopathology showed conjunctival tumor with complete loss of polarity and surface maturation and infiltrating the contiguous sclera. The cells were large and polygonal, with prominent nuclei with desmosomal attachments between the cells (**Figure 6B**). There was dyskeratosis and squamous pearl formation. Sections from the eviscerated tissue showed the iris and ciliary body to be infiltrated by tumor cells (**Figure 6C**).



**Figure 5.** An 11-year-old boy with neurofibromatosis type 1, with ganglioneuroma of the choroid in the buphthalmic left eye after trabeculectomy, eviscerated for cosmetic concern (case 5). A, A clinical photograph of the face shows plexiform neurofibroma of the left upper eyelid. B, A computed tomographic scan axial cut shows an enlarged left eyeball and a hypoplastic greater wing of sphenoid. Note that there is no evident intraocular mass. C, Histopathology of the eviscerated tissue shows nests of large ganglion cells (arrow) interspersed with spindle-shaped neural cells (hematoxylin-eosin, original magnification  $\times 400$ ). D, Histopathology shows Pacinian body diagnostic of ganglioneuroma (arrow) (hematoxylin-eosin, original magnification  $\times 400$ ).



**Figure 6.** A 41-year-old man with intraocular invasion of conjunctival squamous cell carcinoma of the right eye after excision, eviscerated with the clinical diagnosis of necrotizing scleritis with uveal prolapse (case 6). A, A slitlamp photograph showing necrotic sclera, abnormal episcleral feeder vessels, a large perforation, and prolapse of uveal tissue. B, Histopathology shows well-differentiated squamous cell carcinoma with surface keratinization (hematoxylin-eosin, original magnification  $\times 100$ ). C, Histopathology shows the tumor infiltrating the uvea (hematoxylin-eosin, original magnification  $\times 400$ ).

A diagnosis of squamous carcinoma of the conjunctiva with intraocular invasion was made. The patient was subsequently referred to our ocular oncology service. Clinical evaluation revealed diffuse residual conjunctival tumor. Regional lymph nodes were not involved, and the systemic evaluation did not reveal metastasis. The patient had an eyelid-sparing orbital exenteration. Histopathology confirmed the presence of

a residual conjunctival tumor. Four months after completion of treatment, the patient was alive and well, with no local recurrence or systemic metastasis.

**Comment.** Evisceration has replaced traditional enucleation as the favored surgical option for patients with blind disfigured or painful eyes.<sup>1-3</sup> However, controversy regarding the advantages and disadvan-

tages of each procedure continues.<sup>14</sup> Potential advantages of evisceration over enucleation include ease of surgery, better implant and prosthesis motility, preservation of orbital anatomy resulting in fewer complications such as ptosis, socket contraction, and deep superior sulcus, and scleral barrier precluding implant migration and implant extrusion.<sup>15</sup> A survey demonstrated that the overwhelming majority of ocularists



believe current evisceration techniques result in a superior clinical outcome compared with enucleation.<sup>16</sup> A recent comparative analysis, however, indicated that enucleation and evisceration produce functionally and aesthetically similar outcomes.<sup>14</sup>

Two of the most dreaded complications of evisceration are sympathetic ophthalmia and evisceration of an eye with an unsuspected intraocular tumor.<sup>1,2,13</sup> Although sympathetic ophthalmia is no longer a major concern,<sup>1,2</sup> evisceration of an eye with an unsuspected intraocular tumor continues to be a potential risk.<sup>4,13</sup> The incidence of diagnostic surprise following evisceration has been reported to be 0.62%, 1 case of unsuspected adenocarcinoma of the ciliary body in a series of 161 eviscerations over 20 years.<sup>17</sup> Eagle et al,<sup>13</sup> however, believe that unsuspected intraocular tumor has been underrepresented in the literature owing to medicolegal concerns. Scheffler and Abramson<sup>18</sup> further question if evisceration is appropriate at all in blind, painful eyes with no obvious cause and favor enucleation specifically in such situations. Our series is a collection of 6 eyes with unsuspected intraocular tumor that were eviscerated. We have attempted to highlight the lessons learned from this experience.

Cases 1 and 2 were children with retinoblastoma. Case 1 initially was seen with glaucoma and staphyloma. An ultrasound B-scan was performed, but retinoblastoma was not detected, possibly because the tumor was anterior and could have been seen only on an immersion B-scan or a computed tomographic scan. More importantly, when the child returned after 5 years with severe pain, the pediatric ophthalmologist who performed evisceration did not repeat the imaging study prior to surgery. Case 2 shows the lack of clinical acumen enough to perform imaging before evisceration in a child who had a painful blind eye, or even to submit the eviscerated tissue for histopathology.

Case 3 highlights the important aspect of paucity of communication in medical practice. This patient had evisceration despite having a prior diagnosis of uveal melanoma. Eviscerated tissue was

not submitted for histopathology in this patient. He seemingly lacked a clear understanding of his clinical condition. A detailed medical report incorporating the ultrasound B-scan image could have cautioned the surgeon against performing an evisceration. Online standardized electronic medical records in the future may help make pertinent patient details available to the serial caregivers irrespective of logistic and geographic barriers.

The adenocarcinoma of the ciliary body in case 4 was not detected on ultrasound B-scan. An immersion B-scan or an ultrasound biomicroscopy would have been appropriate for this anteriorly located tumor. In case 5, a choroidal ganglioneuroma was not detected on computed tomographic scan. It is possible that an ultrasound B-scan would have been able to demonstrate a subtle choroidal mass. Case 6 had a clear history of a lesion on the ocular surface that had been excised. The histopathology report, however, was misleading, prompting the corneal specialist to consider a diagnosis of necrotizing scleritis. An ultrasound B-scan may have revealed the intraocular tumor in this case.

There are 6 possible steps to prevent evisceration surprises and their consequences: (1) a thorough clinical history and diligent examination, specifically in a blind eye with no evident cause, unusual and ill-explained clinical findings, and multiple prior surgical procedures (that modify the clinical picture); (2) appropriate imaging and its interpretation; (3) enucleation in lieu of evisceration when an intraocular tumor cannot be reliably ruled out by reasonable clinical means; (4) careful intraoperative evaluation for unusual appearance or feel of intraocular contents and modification of the surgery as appropriate; (5) routine histopathology of all eviscerated tissues; and (6) appropriate treatment if a malignant intraocular tumor is found.

Older children with retinoblastoma may manifest with atypical features simulating developmental glaucoma, staphyloma, uveitis, hypopyon, hyphema, vitreous hemorrhage, endophthalmitis, and orbital cellulites.<sup>9,18-20</sup> A child with unusual clinical features such as these should be

thoroughly evaluated. Uveal melanoma can manifest with pain and inflammation induced by necrosis and may simulate endogenous endophthalmitis or orbital cellulitis.<sup>13,18,21-24</sup> Imaging studies must be interpreted carefully in patients who have inflammatory signs that might be caused by necrotic tumors.<sup>13</sup> Adenocarcinoma of the ciliary body is a rare tumor and is known to occur in a phthisical eye.<sup>25</sup> This, being an anteriorly located tumor, can be missed unless an immersion B-scan or an ultrasound biomicroscopy are performed. Choroidal ganglioneuroma in a child with neurofibromatosis type 1 teaches us to be diligent when a patient with a blind eye has an associated systemic cancer predisposition syndrome.<sup>12</sup> Reports of ocular surface squamous neoplasia masquerading as necrotizing scleritis exist in the literature.<sup>26,27</sup> A careful evaluation of the ocular surface for a conjunctival tumor could have helped in the diagnosis.

The role of appropriate preoperative imaging and its adequate analysis and interpretation prior to evisceration of a blind eye with opaque media cannot be overemphasized. Four patients had preoperative imaging in our series. Of 3 patients with a preoperative ultrasound B-scan, the tumor was not detectable in 2; one was a retinoblastoma in an older child, and another was an adenocarcinoma of the ciliary body. Both these tumors may have been missed on routine ultrasound B-scan because of their anterior location. A computed tomographic scan did not demonstrate the tumor in a patient with ganglioneuroma. In all, of 6 patients in our series, the surgeon did not perform or have access to preoperative imaging in 4, and images in 2 other cases were suboptimal.

While ultrasound B-scan continues to be an ideal imaging modality to diagnose intraocular tumors, it is essential that an ultrasonologist experienced in intraocular tumor imaging reports it, or the ophthalmologist either reviews the dynamic images in real time or has access to the same for remote interpretation. Ultrasound examination is incomplete without an immersion technique and/or ultrasound biomicroscopy in a case with suspected

anteriorly located tumor. Where ultrasound B-scan fails to detect an intraocular tumor, or if there is diagnostic dilemma, further evaluation by computed tomography or magnetic resonance imaging depend on the index of suspicion. However, preoperative imaging does not totally exclude the possibility of inadvertently eviscerating an eye with occult tumor.<sup>13</sup> If an intraocular tumor cannot be excluded by reasonable clinical means, it may be prudent to consider enucleation in lieu of evisceration.

If an intraocular tumor is indeed missed on imaging and evisceration is performed, astute intraoperative observation, intraoperative histopathology, and appropriate modification to the surgery (conversion to enucleation or orbital exenteration) could help salvage the situation. It is surprising that no surgeons reported or documented unusual features noticed during evisceration of the 6 cases. It would be reasonable to assume that a tumor would appear and feel different than a routine evisceration. Use of illumination and magnification could help further enhance the visual clues.

Routine histopathologic examination of eviscerated tissues as a standard of care could help identify tumors that are missed on clinical evaluation, imaging, and intraoperative observation. Two cases in our series did not have histopathology of the eviscerated tissues, and the tumor was detected only when it recurred in the orbit. Data indicate that only 43% of surgically removed eyes and ocular contents are sent for histopathologic investigation.<sup>17</sup> Decisions to send are possibly made on a case-by-case basis and common sense rather than a blanket policy.<sup>17</sup> The national specialist ophthalmic pathology service of the United Kingdom recognizes that there is insufficient reporting capacity and advises ophthalmologists to retain "current pathology specimen referral practices."<sup>17</sup> The situation may be similar in other countries as well. Logistic issues such as these may need to be adequately addressed.

Adequate management of residual or recurrent tumor following evisceration can help minimize the risk of local recurrence and systemic metastasis. Two patients with retino-

blastoma in our series had chemotherapy, orbital exenteration, and external beam radiotherapy. The patient with melanoma had orbital exenteration and external beam radiotherapy. The patient with adenocarcinoma of the ciliary body had enucleation and external beam radiotherapy, while the patient with benign choroidal ganglioneuroma was observed, and the patient with squamous cell carcinoma had orbital exenteration. It is gratifying that no patients had local recurrence or systemic metastasis at the last follow-up.

We recommend that adequate caution must be exercised to follow standards of care and due diligence to rule out an intraocular tumor before performing an evisceration in a blind eye. Based on our experience, we believe that an astute clinical evaluation, appropriate imaging and its interpretation, conversion to enucleation if an intraocular tumor cannot be clinically excluded, intraoperative inspection of intraocular contents during evisceration and modification of the surgery as appropriate, and histopathology of the eviscerated tissues can all help minimize the risk and consequences of eviscerating an eye with an occult intraocular tumor. If an eye with an occult intraocular tumor is indeed eviscerated, appropriate postevisceration management can prevent local tumor recurrence and systemic metastasis.

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## Ophthalmic Images

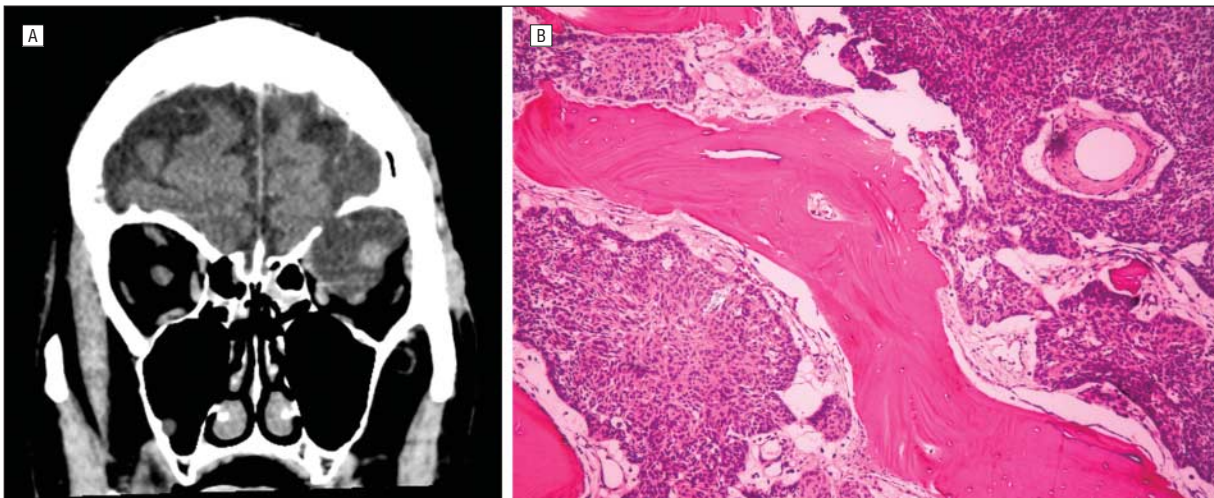
### Invasive Orbital Basal Cell Carcinoma

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**Figure 1.** Clinical appearance of a 78-year-old white man who presented with progressive left proptosis and vision loss over 2 years. His forehead lesions date back 16 years.



**Figure 2.** Radiologic and histologic appearance. A, Computed tomographic orbits demonstrated a 2.4 × 3.3-cm left orbital mass enveloping the optic nerve and eroding the orbital roof. B, A light micrograph (hematoxylin-eosin, original magnification ×100) shows peripheral palisading within and artifactual separation from frontal bone marrow, consistent with invasion by basal cell carcinoma. Exenteration with wide margins included craniotomy for frontal bone invasion.