Rifampin and Linezolid in the Treatment of Methicillin-Resistant Staphylococcus aureus Preseptal Cellulitis

Simon R. Bababeygy, M.D.*†, Ruwan A. Silva, M.D.*, Young Sun, M.D., Ph.D.*, and Atul Jain, M.D.*

Abstract: Methicillin-resistant Staphylococcus aureus (MRSA) preseptal cellulitis is an aggressive ophthalmic infection of increasing frequency. Previously reported cases were successfully treated with first line drugs such as vancomycin or Bactrim (trimethoprim and sulfamethoxazole); however, such drugs have limited efficacy in treating cutaneous MRSA. The authors report the first 2 known cases of MRSA-mediated preseptal cellulitis that resolved with systemic linezolid and rifampin following failed intravenous vancomycin treatment after incision and drainage of the abscess. The authors conclude that in cases of cutaneous MRSA infections that respond poorly to vancomycin, linezolid and rifampin combination therapy may provide an alternative therapeutic option.

Ophthalmic infections due to methicillin-resistant Staphylococcus aureus (MRSA) though once exceedingly rare, have experienced a recent rise in prevalence1 with reported cases most commonly limited to conjunctival and corneal infections.2 We present 2 cases of MRSA preseptal cellulitis that occur at a time when preseptal cellulitis itself is decreasing in incidence3 and represents, to our knowledge, the first reported clinical cases of MRSA preseptal cellulitis treated with rifampin and linezolid after failure of a full course of vancomycin.

CASE REPORTS

Case 1. A 19-year-old woman working as a nursing home aide developed a tender, erythematous painful left periorbital rash over 2 days. On examination, she had complete ptosis of the left eye with significant orbital fullness and induration (Fig. A). The patient did not have orbital signs of decreased motility, pain with eye movements, afferent pupillary defect, chemosis, or proptosis. Orbital CT with contrast confirmed preseptal cellulitis with no clear pocket of abscess (Fig. B). The patient was admitted for possible sepsis. With a history of clindamycin-induced Clostridium difficile, she was placed on intravenous (IV) vancomycin (1 g every 12 hours), with minimum improvement over the next 72 hours. During this time a conjunctival swab grew MRSA. The isolate was deemed susceptible to vancomycin and linezolid with both minimum inhibitory concentrations ≤2

*Department of Ophthalmology and †Howard Hughes Medical Institute, Department of Developmental Biology, Beckman Center, Stanford University School of Medicine, Stanford, California, U.S.A.

Accepted for publication November 10, 2008.

Simon R. Bababeygy and Ruwan A. Silva contributed equally to this work.

The authors have no financial or proprietary interest in a product, method, or material published in this manuscript.

Young Sun and Atul Jain are recipients of the HEED ophthalmic foundation fellowship award.

Address correspondence and reprint requests to Atul Jain, M.D., Department of Ophthalmology, Jules Stein Eye Institute, 100 Stein Plaza, Los Angeles, CA 90024, U.S.A. E-mail: fax light123@msn.com

DOI: 10.1097/IOP.0b013e3181a394ab


Case 2. A 37-year-old female IV drug user presented with a 7-day history of left periorbital swelling and pain with complete ptosis. Three days prior to admission she developed periorbital redness and swelling that was empirically treated with Augmentin and Bactrim with no improvement. The patient was not compliant with her outpatient medication, and was admitted with dramatic progression of preseptal cellulitis. On examination, she had uncorrected visual acuity of 20/20 OU, left upper eyelid swelling, and erythema with recovery of eyelid function. The patient was readmitted and started on IV linezolid (600 mg twice daily) and oral rifampin (300 mg twice daily). Three days after surgical debridement the patient noted markedly decreased swelling and erythema with recovery of eyelid function. The patient was discharged on oral linezolid (600 mg twice daily) and rifampin (300 mg twice daily). Three days after surgical debridement the patient noted markedly decreased swelling and erythema with recovery of eyelid function. The patient was discharged on oral linezolid (600 mg twice daily) and rifampin with 1-week follow-up showing complete resolution of the cellulitis (Fig. C).

DISCUSSION

Cutaneous MRSA abscess management requires incision and drainage followed by a course of vancomycin. Our cases, however, in providing instances of treatment failure in the context of a reportedly vancomycin-susceptible pathogen are illustrative of several critical points. First, S. aureus infection may occur in the environment of a biofilm—the exopolysaccharide matrix of which is poorly represented by the cultures under which susceptibility testing occurs. Thus, vancomycin, although effective in vitro for a particular MRSA strain, may prove inadequate clinically. Reasons for this include vancomycin’s antimicrobial capacity as likely impeded by both MRSA’s putatively escalating minimal inhibitory concentration and its failure to reach effective therapeutic concentrations in affected cutaneous tissue (equivalent to reducing the area under the drug concentration-time curve). One approach could have been vigorous trough monitoring and a more aggressive vancomycin dosing regimen. In this case, shortcomings of initial vancomycin therapy were circumvented by the use of both linezolid and rifampin. Linezolid, though not presently regarded as first-line MRSA treatment because of concerns of systemic toxicity with prolonged usage, is highly efficacious in treating refractory MRSA infections, with resistance infrequently reported. Rifampin, though discouraged as monotherapy, may also be used in combination therapy in treating MRSA, owing to the drug’s high bioavailability even in seemingly impregnable biofilms. Rifampin also is one of the rare antibiotics with penetration of and bactericidal qualities within the phagocytes in which MRSA may survive.

In conclusion, MRSA-mediated preseptal cellulitis requires aggressive surgical debridement, followed by intravenous vancomycin; in cases of poorly responsive cutaneous MRSA infections, linezolid monotherapy or, as these cases illustrate, in combination with rifampin, may offer an alternative antibiotic option. These 2 cases highlight the rising incidence of vancomycin treatment failure despite microbiologically susceptible organisms with conventional vancomycin dosing. They further suggest that novel treatment strategies, including higher treatment doses and use of more novel antibiotics like linezolid in combination therapy may be necessary to optimize treatment outcomes.

REFERENCES

Multiple Pilomatrixoma in Turner Syndrome


Abstract: Pilomatrixoma is typically an isolated benign tumor of the hair follicle matrix with very low recurrence rates. The authors report a case of multiple pilomatrixoma in a patient with Turner syndrome. The patient was a 13-year-old girl with a history, to date, of 10 separate facial lesions, manifesting over the course of 7 years, and confirmed by histopathology as pilomatrixoma. The presence of multiple pilomatrixoma in a patient raises the suspicion of Turner syndrome.

Henry H. Turner, an Oklahoma endocrinologist, is credited with being the first American to describe the cluster of clinical features now known as Turner syndrome, and in 1959, Ford et al. identified the underlying chromosomal abnormality—complete absence of one X chromosome—classically associated with Turner syndrome. Pilomatrixoma is a benign tumor of the skin that typically presents as a single subcutaneous nodule. Although rare, the occurrence of multiple pilomatrixoma has been reported in association with several genetic syndromes including myotonic dystrophy, Gardner syndrome, Rubinstein-Taybi syndrome, Sotos syndrome, and basal cell nevus syndrome. Pilomatrixoma can occur at any age, but appear most frequently in the pediatric population. The most common sites for pilomatrixoma to occur are on the head and neck.

CASE REPORT

A 13-year-old girl was diagnosed with Turner syndrome in February 2004 by standard karyotyping, which revealed a mosaic pattern in which 70% of the nongamete cell population was 45 (X, O) and the remaining 30% were 46 (X, Y). Her medical history was significant for congenital bicuspid aortic valve with critical aortic stenosis that required valvuloplasty at 6 weeks of age. During an MRI in early 2004 for abdominal pain, the patient was found to have a horseshoe kidney, which prompted a workup for Turner syndrome. Given the presence of streak-gonadal tissue containing Y chromosomal material, the patient underwent a prophylactic gonadectomy in June 2004. Prior to presentation to Emory Eye Center with 2 facial cysts in January 2007, the patient had undergone 3 earlier procedures to remove a total of 8 nodular lesions from her face. In 1999, 3 lesions were excised from the right lateral nose, right cheek, and right temple. In 2002, 2 lesions were removed from the left cheek and left preauricular region. In 2004, 3 additional lesions were excised from the left upper eyelid, left pinna, and right cheek.

All lesions were approximately 1 cm in largest diameter, and all 8 lesions were histopathologically identified as pilomatrixoma. In January 2007, 2 additional lesions were removed from the left upper eyelid and right lower eyelid; they were also diagnosed histopathologically as pilomatrixoma (Fig.). Diagnosis of pilomatrixoma relies on the presence of matrix epithelium admixed with shadow, or ghost, cells.

DISCUSSION

Pilomatrixoma is a relatively common, benign neoplasm of the skin that shows differentiation to hair matrix. Pilomatrixoma were first described by Malherbe and Chenantais in 1880 and were initially thought to be sebaceous gland tumors. The lesion was originally known as “calcifying epithelioma of Malherbe”; however, in 1961 it became apparent that the outer sheath cell of the hair follicle was the cell of origin and the name was changed to “pilomatrixoma.”

Turner syndrome is estimated to occur in 1 of 2,000 to 1 of 3,000 live female births and is the most common chromosomal abnormality affecting females. Turner syndrome is complete or partial absence of 1 of the 2 X chromosomes normally found in nongamete human female cells. Although patients with Turner syndrome share many physical findings, a considerable amount of variety exists across affected individuals. Given the spectrum of abnormalities found in the X chromosomes of patients with Turner syndrome, missing or incomplete genes

*Department of Ophthalmology, L.F. Montgomery Ophthalmic Pathology Laboratory, Emory Eye Center, Emory University School of Medicine, Atlanta, Georgia; and †Department of Ophthalmology, Section of Ophthalmic Plastic and Orbital Surgery, Yale School of Medicine, New Haven, Connecticut, U.S.A.

Accepted for publication October 22, 2008.

The authors have no financial interest in the material included in the manuscript.

Address correspondence and reprint requests to C. Robert Bernardino, M.D., F.A.C.S., 40 Temple Street 3B, New Haven, CT 06510, U.S.A.

E-mail: robert.bernardino@yale.edu

DOI: 10.1097/IOP.0b013e3181a146e7

© 2009 The American Society of Ophthalmic Plastic and Reconstructive Surgery, Inc.
North American Blastomycosis of the Eyelid


Abstract: A 26-year-old diabetic man presented with a papillomatous eyelid lesion. Histopathology was consistent with Blastomyces dermatitidis. A 1-year course of itraconazole led to resolution in this case. Although skin is the most common extrapulmonary site of blastomycosis, eyelid involvement is rare. Prompt diagnosis and treatment improve morbidity and mortality.

CASE REPORT

A 26-year-old African-American, insulin-dependent diabetic man presented with a right upper eyelid lesion that began as a small pustule that progressed over 2 months (Fig. A). There were similar lesions on the thigh, chest, and back. Five months prior, the patient had pneumonia treated with intravenous antibiotics. The patient lives on a wooded riverbank in southern West Virginia and had no history of drug use or sexually transmitted disease.

Visual acuity was 20/40 OD, 20/20 OS. Mild punctuate keratopathy was present. A wedge biopsy was performed. Hematoxylin-eosin staining demonstrated pseudoepitheliomatous hyperplasia with dermal acute and chronic granulomatous inflammation. Foreign-body giant cells were found to contain refractile, thick-walled yeast (Fig. B). Broad-based budding yeast cells were seen with Gomori methenamine silver and periodic acid-Schiff staining (Fig. C, D). These findings are consistent with Blastomyces dermatitidis.

A 1-year regimen of itraconazole 200 mg twice a day was completed, after 1 week of intravenous amphotericin B (0.7 mg/kg per day) was discontinued because of renal toxicity. The necrotic biopsy site dehisced; closure 10 days postoperatively was successful. Fourteen-month follow-up showed complete resolution.

DISCUSSION

Gilchrist and Stokes described North American blastomycosis a century ago. Infection is caused by Blastomyces dermatitidis, a thermally dimorphic fungus that thrives in soil and rotting wood along riverbanks. Outdoor occupations in endemic areas, diabetes, and possibly African-American race are risk factors.

The main route of infection is pulmonary, which occurs 4 to 6 weeks after inhalation of Blastomyces conidia. Manifestations range from asymptomatic to widely disseminated fatal disease. Skin is the most common site of extrapulmonary involvement (40%–80%) but presentation may be months after initial infection, as in our case. Other sites include bone (20%–35%), genitourinary system (30%), and central nervous system (5%). In 1974, 25% of cases involved the eyelid. Twenty years later, Bartley reported an incidence of 1.27%.

Cutaneous manifestations present either as well-circumscribed verruca with raised irregular borders, or ulcerative lesions with a central depression containing granulation tissue and exudate. Cicatricial ectropion (and the black dot sign) are distinguishing eyelid features. Histopathology demonstrates acute and chronic granulomatous inflammation with pseudoepitheliomatous hyperplasia infiltrated with thick-walled, broad-based budding fungal elements. Definitive diagnosis is made by identification of these budding yeast with periodic acid-Schiff, Gomori methenamine silver, or potassium hydroxide staining. Cell size, absence of a pseudocapsule or endospores, and budding pattern distinguish Blastomyces from other fungi. Skin testing has poor sensitivity.

Treatment is required in most cases, although spontaneous resolution has been reported in immunocompetent individuals. Close monitoring is paramount. Therapeutic options include amphotericin B, ketoconazole, itraconazole, and fluconazole. Immunocompetent patients with mild to moderate pulmonary or extrapulmonary disease should be treated with azole antifungals because they are as effective as amphotericin B and less toxic. Immunocompromised patients may be treated with azole antifungals, but require amphotericin B if they demonstrate progressive toxicity.

REFERENCES

2. Yoshimoto S, Ichinose M, Udagawa A, et al. Are multiple pilomatri-

Department of Ophthalmology, Pathology, and Medicine, Section of Infectious Disease, West Virginia University, Morgantown, West Virginia, U.S.A.

Accepted for publication October 24, 2008.

Address correspondence and reprint requests to Jennifer A. Sivak-Callcott, M.D., Department of Ophthalmology, West Virginia University Eye Institute, One Stadium Drive, Morgantown, WV 26505, U.S.A. E-mail: jsivak@hsc.wvu.edu

DOI: 10.1097/IOP.0b013e3181a3038d

© 2009 The American Society of Ophthalmic Plastic and Reconstructive Surgery, Inc.
Summary of reported cases of blastomycosis with eyelid involvement

<table>
<thead>
<tr>
<th>Author</th>
<th>Sex</th>
<th>Age</th>
<th>Region of eyelid</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilchrist and Stokes⁴</td>
<td>M</td>
<td>33</td>
<td>LUL</td>
<td>Not reported</td>
</tr>
<tr>
<td>Coates³</td>
<td>M</td>
<td>37</td>
<td>RLL</td>
<td>Excision</td>
</tr>
<tr>
<td>Hyde and Ricketts⁶</td>
<td>M</td>
<td>33</td>
<td>LLL</td>
<td>Potassium iodide</td>
</tr>
<tr>
<td>Montgomery²</td>
<td>M</td>
<td>38</td>
<td>LLL, LUL</td>
<td>Potassium iodide</td>
</tr>
<tr>
<td>Montgomery¹</td>
<td>F</td>
<td>28</td>
<td>RUL</td>
<td>Potassium iodide, boric acid dressing</td>
</tr>
<tr>
<td>Montgomery²</td>
<td>M</td>
<td>33</td>
<td>RLL</td>
<td>Curratage, cautery, boric acid dressing</td>
</tr>
<tr>
<td>Pusey⁴</td>
<td>M</td>
<td>NR</td>
<td>LLL</td>
<td>Potassium iodide and radiation</td>
</tr>
<tr>
<td>Wood⁶</td>
<td>M</td>
<td>51</td>
<td>LUL, LLL</td>
<td>Not reported</td>
</tr>
<tr>
<td>Wood⁷</td>
<td>F</td>
<td>14</td>
<td>LLL</td>
<td>Potassium iodide and radiation</td>
</tr>
<tr>
<td>Montgomery⁷</td>
<td>M</td>
<td>33</td>
<td>RLL</td>
<td>Potassium iodide and radiation</td>
</tr>
<tr>
<td>Montgomery⁷</td>
<td>M</td>
<td>50</td>
<td>RUL, RLL</td>
<td>Potassium iodide and radiation</td>
</tr>
<tr>
<td>Blodi and Huffman¹⁰</td>
<td>M</td>
<td>57</td>
<td>LUL, LLL, RUL</td>
<td>Stilbamidine isethionate 5.5 g over 5 weeks</td>
</tr>
<tr>
<td>Bongiorno et al.¹²</td>
<td>M</td>
<td>45</td>
<td>LUL, LLL, RUL</td>
<td>Amphotericin B 2 g over 8 weeks</td>
</tr>
<tr>
<td>Vida and Moel¹³</td>
<td>M</td>
<td>63</td>
<td>L. temple</td>
<td>Amphotericin B 1.9 g in 6 months</td>
</tr>
<tr>
<td>Barr and Gamel¹⁴</td>
<td>M</td>
<td>84</td>
<td>LLL</td>
<td>Repeat amphotericin B 2.5 g in 7 months</td>
</tr>
<tr>
<td>Slack et al.¹⁵</td>
<td>M</td>
<td>37</td>
<td>LUL</td>
<td>Drainage of orbital abscess</td>
</tr>
<tr>
<td>Bartley²</td>
<td>M</td>
<td>43</td>
<td>RLL</td>
<td>Potassium iodide—no improvement, amphotericin B 410 mg stopped because of renal toxicity</td>
</tr>
</tbody>
</table>

LLL, left lower eyelid; LUL, left upper eyelid; RLL, right lower eyelid; RUL, right upper eyelid.

A, Right upper eyelid showing a papillomatous lesion, black punctate spots, and pinpoint exudates. B, Histopathology of right upper eyelid lesion. The arrow points to a giant cell containing 2 yeast cells with surrounding inflammation (hematoxylin-eosin, ×400). C, Yeast with broad-based budding, demonstrated by periodic acid-Schiff (×400). D, Broad-based budding yeast demonstrated with Gomori methenamine silver staining (×400).
pulmonary or extrapulmonary manifestations or have central nervous system involvement. Eyelid involvement with blastomycosis is uncommon. Prompt diagnosis and treatment can prevent morbidity and mortality.

REFERENCES


Basal Cell Carcinoma of the Eyelid With Exceptional Histomorphologic Expressions

Frederick A. Jakobiec, M.D., Eissa Hanna, M.D., and Daniel J. Townsend, M.D.

Abstract: A basal cell carcinoma of the eyelid had unique and potentially confusing histopathologic features. The tumor displayed a carcinoma in situ pattern with replacement of an extensive segment of the tarsal epithelium by neoplastic basaloid cells, a finding to the best of the authors’ knowledge that has not been previously documented. Within the infiltrating component of the dermis were classical solid basaloid nests and lobules; they were accompanied, however, by a separate and exceptionally prominent component of duct-like (pseudoglandular) units mimicking a microcystic adnexal carcinoma.

Basal cell carcinoma arises overwhelmingly from the epidermis or pilar structures of the eyelid skin but has also been rarely discovered within the conjunctival epithelium, particularly in the interpalpebral epibulbar zone from the corneoscleral limbus to the caruncle. We describe a case with a unique combination of histomorphologic features that could pose future difficulties in microscopic interpretation and diagnosis, and therefore create challenges in clinical management.

CASE REPORT

A 74-year-old woman had been aware of a right lower eyelid mass for several months. She had had anisometropic amblyopia in the left eye and bilateral glaucoma treated with topical drops. A 10 × 12-mm nodular, nonulcerating lesion involved the central eyelid margin, with reddening of the adjacent palpebral conjunctival surface. A wide local excision was performed with no recurrence a year later.

Conventional microscopic preparation and staining of sections with hematoxylin-eosin disclosed variously sized basaloid lobules, nests, and duct-like units infiltrating the dermis, tarsus, and orbicularis muscle (Fig. 1); peripheral palisading and clefting of the cellular nests and lobules were present. The tarsal epithelium was thickened and extensively replaced by an “in situ carcinoma” pattern of basaloid cells without accompanying goblet cells (Fig. 1, inset) that commenced at the mucocutaneous junction and proceeded downward onto two-thirds of the inferior tarsal surface.

Some of the larger basaloid lobules in the dermis exhibited adenoidal spaces. Within the central mass of the tumor, and particularly at its infiltrating margins within the tarsus and orbicularis muscle, a preponderance of the tumor cells adopted a nonclef ting duct-like architecture. The pseudolumens of these small clusters were created by a single or double layer of low to medium cuboidal cells characteristically containing an amorphous or faintly fibrillar eosinophilic content (Fig. 2 and insets).

Immunohistochemical stains specific for conjunctival goblet cell secretory mucin (MUC5AC) and for conjunctival and corneal membrane-bound mucin (MUC16) did not react with the intraepithelial conjunctival neoplastic basaloid cells and infiltrating tumor cells (staining courtesy of Dr. Ilene Gipson). The small nests and medium-sized lobules stained negatively for cytokeratins CK-7 and CK/CAM5.2. The basaloid neoplastic cells spreading within the tarsal epithelium (Fig. 3, top), and those constituting the infiltrating solid tumor nests and duct-like units, stained with anti-Ber-EP4 antibodies (Fig. 3, bottom). The tumor cells of the duct-like units were nonimmunoreactive for epithelial membrane antigen, carcinoembryonic antigen, CK-7, and gross cystic disease fluid protein-15.
DISCUSSION

This tumor featured 2 distinctive morphologic variations. The first expression was an extensive carcinoma in situ spread of basaloid cells within the tarsal conjunctival epithelium representing replacement of this layer far afield from the main dermal nodule. This finding has not been previously reported in either primary conjunctival or epidermally derived basal cell carcinomas of the eyelids.

We propose that this in situ pattern points to an origin of the tumor from progenitor stem cells at the mucocutaneous junction, which have been established to have double phenotypic differentiation potentialities toward both conjunctival and epidermal epithelium.2 This pattern is typical for in situ squamous cell carcinomas of the conjunctiva and eyelids that eventuate in invasive carcinoma. In our case, the basal cell marker Ber-EP4 was positive for both the tarsal intraepithelial basaloid proliferation and the infiltrating dermal component.3 On the other hand, squamous cell carcinomas in situ and invasive squamous tumors are nonreactive for Ber-EP4, including the small cell or basaloid variants occurring in the skin and mucous membranes of other organs.4

The second unusual feature was the extent to which the invasive component comprised duct-like units. This histomorphologic aspect differs from that observed in adenoidal basal cell carcinomas, in which cribriform spaces that are essentially extracellular punctuate larger basaloid lobules. In our case, these infiltrating duct-like structures were a separate architectural aspect unrelated to any cribriform formations. That they were in fact pseudoglandular was established by the absence of any positive immunoperoxidase reactions for markers denoting eccrine or apocrine differentiation: CK7, epithelial membrane antigen, carcinoembryonic antigen, and gross cystic disease fluid protein-15. True ductular differentiation, however, has been immunohistochemically proven to occur in a subset of basal cell carcinomas with a predilection for the head and neck region, and especially of the eyelids.5

The duct-like features of our tumor could misleadingly suggest the diagnosis of a microcystic adnexal carcinoma (also called sclerosing sweat duct carcinoma). This more aggressive entity can be distinguished from a bona fide basal cell carcinoma because it typically stains negatively for Ber-EP4 and positively for cytokeratin 15, whereas the latter marker is usually negative in basal cell carcinoma.6

invasive squamous tumors are nonreactive for Ber-EP4, including the small cell or basaloid variants occurring in the skin and mucous membranes of other organs.4

The second unusual feature was the extent to which the invasive component comprised duct-like units. This histomorphologic aspect differs from that observed in adenoidal basal cell carcinomas, in which cribriform spaces that are essentially extracellular punctuate larger basaloid lobules. In our case, these infiltrating duct-like structures were a separate architectural aspect unrelated to any cribriform formations. That they were in fact pseudoglandular was established by the absence of any positive immunoperoxidase reactions for markers denoting eccrine or apocrine differentiation: CK7, epithelial membrane antigen, carcinoembryonic antigen, and gross cystic disease fluid protein-15. True ductular differentiation, however, has been immunohistochemically proven to occur in a subset of basal cell carcinomas with a predilection for the head and neck region, and especially of the eyelids.5

The duct-like features of our tumor could misleadingly suggest the diagnosis of a microcystic adnexal carcinoma (also called sclerosing sweat duct carcinoma). This more aggressive entity can be distinguished from a bona fide basal cell carcinoma because it typically stains negatively for Ber-EP4 and positively for cytokeratin 15, whereas the latter marker is usually negative in basal cell carcinoma.6

invasive squamous tumors are nonreactive for Ber-EP4, including the small cell or basaloid variants occurring in the skin and mucous membranes of other organs.4

The second unusual feature was the extent to which the invasive component comprised duct-like units. This histomorphologic aspect differs from that observed in adenoidal basal cell carcinomas, in which cribriform spaces that are essentially extracellular punctuate larger basaloid lobules. In our case, these infiltrating duct-like structures were a separate architectural aspect unrelated to any cribriform formations. That they were in fact pseudoglandular was established by the absence of any positive immunoperoxidase reactions for markers denoting eccrine or apocrine differentiation: CK7, epithelial membrane antigen, carcinoembryonic antigen, and gross cystic disease fluid protein-15. True ductular differentiation, however, has been immunohistochemically proven to occur in a subset of basal cell carcinomas with a predilection for the head and neck region, and especially of the eyelids.5

The duct-like features of our tumor could misleadingly suggest the diagnosis of a microcystic adnexal carcinoma (also called sclerosing sweat duct carcinoma). This more aggressive entity can be distinguished from a bona fide basal cell carcinoma because it typically stains negatively for Ber-EP4 and positively for cytokeratin 15, whereas the latter marker is usually negative in basal cell carcinoma.6

invasive squamous tumors are nonreactive for Ber-EP4, including the small cell or basaloid variants occurring in the skin and mucous membranes of other organs.4

The second unusual feature was the extent to which the invasive component comprised duct-like units. This histomorphologic aspect differs from that observed in adenoidal basal cell carcinomas, in which cribriform spaces that are essentially extracellular punctuate larger basaloid lobules. In our case, these infiltrating duct-like structures were a separate architectural aspect unrelated to any cribriform formations. That they were in fact pseudoglandular was established by the absence of any positive immunoperoxidase reactions for markers denoting eccrine or apocrine differentiation: CK7, epithelial membrane antigen, carcinoembryonic antigen, and gross cystic disease fluid protein-15. True ductular differentiation, however, has been immunohistochemically proven to occur in a subset of basal cell carcinomas with a predilection for the head and neck region, and especially of the eyelids.5

The duct-like features of our tumor could misleadingly suggest the diagnosis of a microcystic adnexal carcinoma (also called sclerosing sweat duct carcinoma). This more aggressive entity can be distinguished from a bona fide basal cell carcinoma because it typically stains negatively for Ber-EP4 and positively for cytokeratin 15, whereas the latter marker is usually negative in basal cell carcinoma.6

invasive squamous tumors are nonreactive for Ber-EP4, including the small cell or basaloid variants occurring in the skin and mucous membranes of other organs.4

The second unusual feature was the extent to which the invasive component comprised duct-like units. This histomorphologic aspect differs from that observed in adenoidal basal cell carcinomas, in which cribriform spaces that are essentially extracellular punctuate larger basaloid lobules. In our case, these infiltrating duct-like structures were a separate architectural aspect unrelated to any cribriform formations. That they were in fact pseudoglandular was established by the absence of any positive immunoperoxidase reactions for markers denoting eccrine or apocrine differentiation: CK7, epithelial membrane antigen, carcinoembryonic antigen, and gross cystic disease fluid protein-15. True ductular differentiation, however, has been immunohistochemically proven to occur in a subset of basal cell carcinomas with a predilection for the head and neck region, and especially of the eyelids.5

The duct-like features of our tumor could misleadingly suggest the diagnosis of a microcystic adnexal carcinoma (also called sclerosing sweat duct carcinoma). This more aggressive entity can be distinguished from a bona fide basal cell carcinoma because it typically stains negatively for Ber-EP4 and positively for cytokeratin 15, whereas the latter marker is usually negative in basal cell carcinoma.6

invasive squamous tumors are nonreactive for Ber-EP4, including the small cell or basaloid variants occurring in the skin and mucous membranes of other organs.4

The second unusual feature was the extent to which the invasive component comprised duct-like units. This histomorphologic aspect differs from that observed in adenoidal basal cell carcinomas, in which cribriform spaces that are essentially extracellular punctuate larger basaloid lobules. In our case, these infiltrating duct-like structures were a separate architectural aspect unrelated to any cribriform formations. That they were in fact pseudoglandular was established by the absence of any positive immunoperoxidase reactions for markers denoting eccrine or apocrine differentiation: CK7, epithelial membrane antigen, carcinoembryonic antigen, and gross cystic disease fluid protein-15. True ductular differentiation, however, has been immunohistochemically proven to occur in a subset of basal cell carcinomas with a predilection for the head and neck region, and especially of the eyelids.5

The duct-like features of our tumor could misleadingly suggest the diagnosis of a microcystic adnexal carcinoma (also called sclerosing sweat duct carcinoma). This more aggressive entity can be distinguished from a bona fide basal cell carcinoma because it typically stains negatively for Ber-EP4 and positively for cytokeratin 15, whereas the latter marker is usually negative in basal cell carcinoma.6

invasive squamous tumors are nonreactive for Ber-EP4, including the small cell or basaloid variants occurring in the skin and mucous membranes of other organs.4

The second unusual feature was the extent to which the invasive component comprised duct-like units. This histomorphologic aspect differs from that observed in adenoidal basal cell carcinomas, in which cribriform spaces that are essentially extracellular punctuate larger basaloid lobules. In our case, these infiltrating duct-like structures were a separate architectural aspect unrelated to any cribriform formations. That they were in fact pseudoglandular was established by the absence of any positive immunoperoxidase reactions for markers denoting eccrine or apocrine differentiation: CK7, epithelial membrane antigen, carcinoembryonic antigen, and gross cystic disease fluid protein-15. True ductular differentiation, however, has been immunohistochemically proven to occur in a subset of basal cell carcinomas with a predilection for the head and neck region, and especially of the eyelids.5

The duct-like features of our tumor could misleadingly suggest the diagnosis of a microcystic adnexal carcinoma (also called sclerosing sweat duct carcinoma). This more aggressive entity can be distinguished from a bona fide basal cell carcinoma because it typically stains negatively for Ber-EP4 and positively for cytokeratin 15, whereas the latter marker is usually negative in basal cell carcinoma.6

invasive squamous tumors are nonreactive for Ber-EP4, including the small cell or basaloid variants occurring in the skin and mucous membranes of other organs.4

The second unusual feature was the extent to which the invasive component comprised duct-like units. This histomorphologic aspect differs from that observed in adenoidal basal cell carcinomas, in which cribriform spaces that are essentially extracellular punctuate larger basaloid lobules. In our case, these infiltrating duct-like structures were a separate architectural aspect unrelated to any cribriform formations. That they were in fact pseudoglandular was established by the absence of any positive immunoperoxidase reactions for markers denoting eccrine or apocrine differentiation: CK7, epithelial membrane antigen, carcinoembryonic antigen, and gross cystic disease fluid protein-15. True ductular differentiation, however, has been immunohistochemically proven to occur in a subset of basal cell carcinomas with a predilection for the head and neck region, and especially of the eyelids.5

The duct-like features of our tumor could misleadingly suggest the diagnosis of a microcystic adnexal carcinoma (also called sclerosing sweat duct carcinoma). This more aggressive entity can be distinguished from a bona fide basal cell carcinoma because it typically stains negatively for Ber-EP4 and positively for cytokeratin 15, whereas the latter marker is usually negative in basal cell carcinoma.6
Primary Lacrimal Sac Rhinosporidiosis With Grossly Dilated Sac and Nasolacrimal Duct

Neelam Pushker, M.D.*, Seema Kashyap, M.D.†, Mandeep S. Bajaj, M.D.*, Rachna Meel, M.S.*, Archana Sood, M.D., D.N.B.§, and Venkatesh L. Konkal, M.D.*

Abstract: Rhinosporidiosis is a chronic infection of the mucous membranes of the upper respiratory tract. The authors report a case of primary lacrimal sac rhinosporidiosis with a grossly dilated sac and nasolacrimal duct as seen on CT dacryocystography. Despite a chronic infection of 12 years’ duration, there was no involvement of conjunctiva, nasal, or nasopharyngeal mucosa.

Rhinosporidiosis is a chronic granulomatous disease caused by Rhinosporidium seeberi, an aquatic protistan parasite belonging to the class Mesomyctozoa.1 About 15% of cases of rhinosporidiosis are ocular in location.2 The conjunctiva is most commonly involved. The lacrimal drainage system, eyelid, cornea or sclera may also be rarely affected.2–4 We report a case of lacrimal sac rhinosporidiosis with a brief review of the literature.

CASE REPORT

A 22-year-old man presented with a painless, progressive swelling below the medial canthal region of his right eye and a 12-year history of tearing (Fig. A). On examination, there was a large (5 × 5 cm), ill-defined, boggy swelling in the right lacrimal sac area. The remainder of the ocular examination was normal. On syringing, there was regurgitation of mucopurulent material from the upper punctum. Nasal and oral examinations were normal. Conventional dacryocystography showed a dilated right lacrimal sac with intraluminal filling defect. CT dacryocystography, performed for better delineation of the abnormality, showed a dilated lacrimal sac measuring 3.5 × 1.6 × 0.8 cm. The nasolacrimal duct was dilated, measuring 0.92 cm in width on the affected side and 0.45 cm on the normal side. There was a soft-tissue lesion within the lacrimal sac and nasolacrimal duct extending up to the inferior meatus of the nose (Fig. B). The expanded nasolacrimal duct had displaced the inferior turbinate medially, compromising the ipsilateral nasal cavity.

Intraoperatively, the sac wall was incised to examine the cavity. It was full of pink, vascularized, polypoidal growths. The sac wall was sutured and a dacryocystectomy was performed. The extensions of the growth in the nasolacrimal duct were removed en bloc with the sac. The

ACKNOWLEDGMENTS
The authors thank Drs. Lynn Duncan and Martin Mihm of the Dermatopathology Service of the Department of Pathology at the Massachusetts General Hospital, for reviewing the slides from this case and confirming the observations and diagnosis.

REFERENCES
nasolacrimal duct wall was curetted after removal of the growth. No significant bleeding was encountered during surgery.

Gross examination of the resected tissue showed a dilated, thick-walled lacrimal sac filled with polypoidal growths. Histopathologic examination of the polyps showed multiple sporangia in different stages of evolution with endospores diagnostic of rhinosporidiosis (Fig. C).

Postoperatively, the patient was started on oral dapsone 100 mg once a day. There was no recurrence over a follow-up interval of 6 months.

DISCUSSION

Ocular rhinosporidiosis accounts for 0.1% of all ophthalmic cases in a coastal state of Southern India. Conjunctival involvement accounts for 84% to 93% of these cases. Lacrimal drainage system involvement, as reported in 4 different case series on ocular and adnexal rhinosporidiosis, was found in 14.3%, 5.6%, 7.3%, and 24% cases.

Lacrimal sac involvement in rhinosporidiosis is extremely rare, and a grossly dilated sac with widened nasolacrimal duct is even rarer. In the only report of its kind, the authors found that 7 of 49 cases of ocular and adnexal rhinosporidiosis had lacrimal sac involvement, associated with dilated nasolacrimal duct in some, which was noted clinically on probing. All of these patients had nasal infection also, unlike the present case where, despite a longstanding infection of 12 years, the conjunctival and nasal mucosa were not involved. Such an entity, to the best of our knowledge, has never been studied before using CT dacryocystography. This imaging tool gave us additional preoperative information regarding the size of the lacrimal sac and nasolacrimal duct, the extent of soft-tissue growth, and changes in the surrounding structures.

Lacrimal sac rhinosporidiosis may present as a diverticulum, swelling over the sac area, epiphora, or bleeding from the nose. The swelling may feel like a “bag of worms” with no regurgitation, or the regurgitant if present, may contain fine, white granular particles or blood. Some patients may have no epiphora or regurgitation, or may present with a partial block.

Most of the previous studies did not emphasize the role of imaging and bony changes in lacrimal sac rhinosporidiosis. The reported bony changes are lacrimal fossa erosion and enlargement, and dilated nasolacrimal duct. Imaging findings reported are a partial or complete nasolacrimal duct blockage as seen on conventional dacryocystography. CT dacryocystography helped us to assess some of the important features of our case.

Medical modalities have a controversial role in the treatment of rhinosporidiosis. Long-term dapsone therapy has been found to arrest the maturation of spores. Definitive treatment is dacryocystectomy with curettage or cauterization of surrounding infected tissues. The prognosis after complete surgical excision is usually good.

In conclusion, an isolated involvement of the lacrimal sac and nasolacrimal duct causing such a huge dilatation of both is rare. CT dacryocystography seems to be a useful modality in the diagnosis and management of such cases.

REFERENCES

Canaliculocele Presenting as a Medial Canthal Mass

Jin Chul Kim, M.D.*, Young Hyeh Ko, M.D.†, Kyung In Woo, M.D.*, and Yoon-Duck Kim, M.D.*

Abstract: Canaliculocele is an extremely rare cause of a medial canthal mass. The authors report 2 cases in which painless medial canthal masses occurred. A 77-year-old man presented with a nontender, firm mass in the medial canthal area. This mass was located at the common canalicular level and was observed to obstruct lacrimal outflow. It was determined to be filled with mucinous material and was connected with the canaliculi. A 40-year-old woman had a fluid-filled globular cyst on her lower eyelid. The cyst was found to consist of dilated inferior canaliculus wall from the punctum to the common canaliculus. On histopathologic examination, the 2 cases shared a common feature: the walls were composed of nonkeratinized stratified squamous epithelium, which was compatible with the canaliculus. Canaliculocele should be considered in the differential diagnoses of a medial canthal mass.

Case Reports

Case 1. A 77-year-old man had a 1-year history of a painless mass located in the right medial canthal region (Fig. 1A). The patient had no history of infection or long-term use of eyedrops. The ophthalmologic examination revealed a nontender, immobile, and firm mass located within the right medial canthal region. A canalicular obstruction was detected on lacrimal probing. There was no obstruction or stenosis of the right lower punctum. CT revealed an ovoid, well-marginated, homogenous, nonenhancing soft-tissue mass measuring 1.5 × 1.4 × 1.1 cm in the right medial canthal region. An excisional biopsy was conducted. A transcutaneous incision approximately 10 mm below the lower eyelid margin was made because the mass was located in the medial canthal area, where a transconjunctival or subciliary approach might not provide optimal exposure. On opening of the mass wall, mucinous material was encountered. The mass was shown to be cystic, and a lacrimal probe inserted through the lower punctum was detected within the mass (Fig. 1B). The length of the intact canaliculus was more than 8 mm from the punctum. Mass excision and canaliculodacryocystorhinostomy with silicone intubation were performed. The pathologic examination showed that in addition to chronic inflammation without foreign bodies, the wall of the cyst comprised nonkeratinized stratified squamous epithelium (Fig. 1C). During the 1-year follow-up period, the patient did well and had no tearing.

Case 2. A 40-year-old woman was referred with a left lower eyelid mass that had persisted for 20 years. The mass had enlarged slowly, but had not provoked any symptoms. On our initial ophthalmologic examination, a 1- × 1-cm nontender cystic mass was observed on the medial side of the left lower eyelid (Fig. 2A). The left lower punctum was occluded, and the upper lacrimal pathway was intact with irrigation and probing. Ultrasound biomicroscopy showed a

FIG. 1. A, A right medial canthal mass was observed in a 77-year-old man. B, Intraoperatively, a lacrimal probe inserted in the lower punctum was detected inside the lesion. C, The wall of the cyst comprised nonkeratinized stratified squamous epithelium (hematoxylin-eosin, ×200).

Departments of *Ophthalmology and †Diagnostic Pathology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea Accepted for publication October 31, 2008.

The authors declare that they have no financial interests related to this article.

Address correspondence and reprint requests to Yoon-Duck Kim, M.D., Department of Ophthalmology, Samsung Medical Center, Sungkyunkwan University School of Medicine, 50 Ilwon-dong, Kangnam-ku, Seoul, 135-710, Korea. E-mail: ydkimoph@skku.edu.net

DOI: 10.1097/IOP.0b013e3181a3379b

© 2009 The American Society of Ophthalmic Plastic and Reconstructive Surgery, Inc.
fluid-filled cyst on the left lower eyelid (Fig. 2B), whereas the lower canaliculus was located in the right lower eyelid (Fig. 2C). This mass was excised surgically. A transconjunctival approach was performed because of easy accessibility from the conjunctiva. During surgery, a lacrimal probe inserted through the opened left lower punctum was detected within the cystic mass (Fig. 2D). The lower lacrimal pathway was not bypassed because of the absence of epiphora preoperatively and a patent upper lacrimal pathway. On histopathologic examination, the wall of the cyst was found to be composed of nonkeratinized stratified squamous epithelium. Neither inflammatory cells nor foreign bodies were found.

**DISCUSSION**

The differential diagnosis of a noninflammatory medial canthal mass includes lacrimal sac tumor, dacryocystocele, lacrimal sac diverticula, dermoid cyst, meningocele,² cutaneous benign adnexal tumor, and sinus mucocele. In the 2 cases described herein, the patients were diagnosed with canaliculocele, which was confirmed during surgery. The mass wall was continuous with the canaliculus and lacrimal probes inserted through the punctum were detected inside the masses. The level of cyst formation in the canaliculus was determined by the length of the remaining canaliculus. Showing more than 8 mm

![Figure 2](image-url)
of intact canaliculus, the first case was regarded as canaliculocele in the common canaliculus. The canaliculocele in the second case was determined to have originated from the inferior canaliculus, as the cyst was located throughout the entire length of the inferior canaliculus. Pathologic examination confirmed that the walls of the cystic lesions comprised nonkeratinized stratified squamous epithelium, which is consistent with the canaliculus rather than the lacrimal sac. The possible pathogenesis may be reminiscent of that of dacryocystocele. In the dacryocystocele, reflux inhibition has been determined to result in the distension of the lacrimal sac, in addition to chronic distal obstruction. Similarly, in rare circumstances of proximal and distal blockages, the canaliculus might be distended and undergo cystic change.

In these cases, mass excision resulted in permanent loss of the lacrimal passage. Bypass with a Jones tube could be an option. However, in the first case, as the remnant of the canaliculus after mass excision was longer than 8 mm from the punctum, we conducted canaliculodacryocystorhinostomy with silicone intubation. In the second case, bypass surgery might be the only choice because mass excision left no inferior canicular structure for reconstruction. Because the patient had not previously reported epiphora and the upper lacrimal pathway was intact, bypass surgery was not performed. Herein, we report 2 cases of canaliculocele, an extremely rare clinical phenomenon, and demonstrate that it should be considered in the differential diagnosis of medial canthal mass.

REFERENCES


Epithelial Inclusion Cyst Associated With a Porous Polyethylene Orbital Floor Implant

Roxane J. Hillier, M.R.C.O.phth.
Sarah F. Osborne, M.R.C.O.phth. and
Brian Leatherbarrow, F.R.C.S., F.R.C.O.phth

Abstract: A 50-year-old man presented with reduced vision, hyperglobus, and an inferior orbital mass 3 1/2 years after the repair of an orbital floor fracture using a porous polyethylene (Medpor) implant. On funduscopy, the sclera was markedly indented. This was associated with retinal striae and a retinal pigment epithelial disturbance involving the macula. CT revealed a large inferior orbital cystic mass displacing the globe. The cyst was excised and the orbital implant was removed. Histologic findings were consistent with a respiratory epithelial inclusion cyst. Postoperatively, the vision improved and the hyperglobus resolved. The retinal striae and pigmentary disturbance persisted. Late capsule-related complications, such as epithelial cyst formation and intracapsular hemorrhage, have been reported in association with nonporous materials only. This case demonstrates that epithelial cyst formation may occur in association with a porous orbital floor implant and result in visual impairment.

Porous materials such as porous polyethylene (Medpor) and hydroxyapatite are thought to have advantages over traditional nonporous alloplastic materials in the repair of orbital wall fractures. Their porous nature allows fibrovascular ingrowth, reducing the risk of late infection and increasing implant positional stability. Nonporous implants have a tendency to become encapsulated, as integration in the surrounding tissue does not occur. This may result in late complications such as orbital cysts or intracapsular hemorrhage. Neither complication has previously been reported in association with a porous implant. We present a case of orbital cyst formation associated with a Medpor implant, leading to visual impairment.

CASE REPORT

A 50-year-old man had previously sustained blunt trauma to his left orbit, resulting in an extensive orbital floor fracture necessitating surgical repair. A channeled Medpor implant containing a single linear titanium plate had been positioned to reconstruct the orbital floor, and secured to the anterior orbit rim via a transconjunctival approach. No globe injury had been sustained at that time, and the visual acuity was documented as 20/40 on discharge. The patient presented 3 1/2 years later with a several-week history of reducing visual acuity and a tense infraorbital mass. On funduscopy, the inferonasal sclera was markedly indented (Fig. A), which was associated with retinal striae and a retinal pigment epithelial disturbance, which extended to involve the macula. CT of the left orbit revealed a large inferior orbital cystic mass, which was displacing the globe superotemporally. In the center of the cyst, there was a high signal area corresponding to the titanium microplate (Fig. C).

The cyst was approached via an inferiorn fornix incision and found to contain clear serous fluid. The cyst was completely excised and the orbital floor implant was removed. The orbit remained separated from the maxillary sinus by a layer of dense fibrous tissue. A dermis fat graft was harvested from the abdomen and placed in the space left by the removal of the cyst along the orbital floor. The graft extended over the inferior orbital rim to prevent adhesions between the eyelid and the bone. A histologic examination of the cyst wall showed that this was consistent with an epithelial inclusion cyst, with respiratory type epithelium lining the internal surface. Postoperatively the visual acuity improved to 20/120 and the hyperglobus resolved. The retinal striae and pigmentary disturbance involving the macula persisted.

DISCUSSION

Orbital floor implants may be associated with a number of early and late complications such as infection, extrusion or fistula formation, epithelial inclusion cyst formation, or intracapsular hemorrhage. Visual loss may rarely occur due to direct intraoperative trauma to the globe or optic nerve, or compressive optic neuropathy due to hemorrhage or posterior migration of the orbital floor implant. Epithelial inclusion cysts are thought to result from seeding of respiratory or squamous epithelial cells from the sinus mucosa or conjunctiva, respectively. In this case, the likely origin of the epithelial cells was...
be reported in association with nonporous alloplastic materials such as silicone, Teflon, Gelfilm, and Supramid, but not in association with a porous material such as Medpor. This case demonstrates that late capsule-related complications may occur in association with a porous orbital floor implant.

REFERENCES

Unilateral Orbital Inflammation in a Child After a Jellyfish Sting to the Lower Extremities

Michael A. Kapamajian, M.D.*, Amjad Ahmad, M.D.†, Joseph W. Burnett, M.D.‡, Henry W. Burnett, M.D.§, and Shahar Frenkel, M.D., Ph.D.¶

Abstract: A 3-year 10-month-old child initially developed locally recurrent cutaneous eruptions within the first 2 weeks after sustaining a jellyfish sting to her lower extremities. After 5 asymptomatic weeks, she developed unilateral orbital inflammation that did not respond to systemic antibiotics, antihistamines, or steroids. Imaging revealed a rapidly growing mass of the right lacrimal gland. Urgent anterior orbitotomy was performed and the lacrimal gland was biopsied. Histopathologic diagnosis revealed sclerosing dacryodenitis consistent with orbital inflammatory syndrome and/or an immune response to an antigen challenge.

Orbital inflammatory syndrome has been reported in children as young as 3 months of age. Although the etiology of this condition remains unknown, autoimmunity has been suggested. We report the case of a child who developed unilateral orbital inflammation 7 weeks after sustaining a jellyfish sting to her lower extremities and propose sensitization to jellyfish venom as the inciting event that triggered this delayed inflammatory response.
CASE REPORT

A healthy 3-year 10-month-old girl with no known history of atopy developed erythematous, urticarial, linear marks on both legs immediately after being stung by a jellyfish on a Florida Gulf Coast beach off St. George’s Island. Although she was seen rubbing her eyes, no lesions were noted around either orbit. Diphenhydramine syrup was administered and the lower extremity reactions subsided within 5 days.

Two days later, the lesions reactivated and oral diphenhydramine was reinstituted. Although this calmed the itching, the erythema progressed. The patient was taken to the emergency room where she received intravenous corticosteroids and cephalexin, and was sent home with hydrocortisone cream and prednisone syrup. Again, the lesions resolved in 5 days.

Five asymptomatic weeks later, her parents began to notice swelling and erythema of the right upper eyelid. Amoxicillin and diphenhydramine were prescribed, but over the next 3 days the eyelid acquired a purplish hue and the swelling progressed to complete ptosis (Fig. 1A). She was taken to a community hospital where CT demonstrated a mass in the right superotemporal orbit involving the lacrimal gland. The patient was admitted and started on intravenous antibiotics. Over the next 72 hours, repeat CT revealed interval growth of the mass and MRI (Fig. 2) confirmed its location; oculoplastics was consulted.

Examination of the right eye revealed an erythematous, ptotic, swollen upper eyelid that would not open, even on upgaze. On slit-lamp examination, the superotemporal conjunctival fornix was swollen and erythematous (Fig. 1B). Urgent anterior orbitotomy was performed and multiple biopsy specimens of the lacrimal gland were taken. The patient was discharged the following day on oral prednisone and erythromycin ointment.

One week later, erythema and swelling of the eyelid was decreased. The histopathologic diagnosis was sclerosing dacryoadenitis with infiltrates of lymphocytes, plasma cells, eosinophils, and neutrophils (Fig. 3), consistent with orbital inflammatory syndrome and/or an immune response to an antigen challenge.

DISCUSSION

Although the source of the cutaneous eruptions is clear in this case, 2 caveats remain regarding the dacryoadenitis: is 7 weeks too long to permit its association with the jellyfish sting, and what was the inciting factor? The literature suggests delayed hypersensitivity for skin reactions in individuals previously exposed to jellyfish venom, but one can speculate that the same mechanism may also be responsible for the dacryoadenitis seen in our patient. Alternatively, one cannot ignore the possible compounded effect of corticosteroids, which have been reported to have a masking effect on cutaneous eruptions, along with the amount of ultraviolet exposure.

FIG. 1. A, Purplish hue and near-complete ptosis of the right upper eyelid 7 weeks after the sting. B, Swelling and erythema of the right conjunctival fornix.

FIG. 2. MRI of the orbits shows a mass of the right lacrimal gland.

FIG. 3. Histologic specimens show areas of sclerosis, along with cellular infiltrates, namely lymphocytes, indicating chronicity (magnification ×20).
REFERENCES


Bilateral Microphthalmos With Cyst: Excision With Orbital Free Fat Graft

Damrong Wiwatwongwana, M.D.*, and Jack Rootman, M.D., F.R.C.S.C.*†

Abstract: Bilateral microphthalmos with cyst was diagnosed in a 4-month-old female term infant who presented with bilateral lower eyelid cysts and the right eye displaced beneath the upper eyelid. Imaging of the orbits revealed bilateral microphthalmic globes with large orbital cysts. Treatment consisted of bilateral cyst removal and free fat grafts for volume replacement, which yielded good cosmetic results with reduction of right globe displacement.

Microphthalmos with cyst is a rare congenital malformation, accounting for only 0.9% of pediatric patients with orbital disease seen at the University of British Columbia. Most cases are unilateral. When the cystic lesion is small, management is usually observation, but those of larger size may require aspiration or surgical excision. We report a case of bilateral microphthalmos with cyst that required surgical excision of the cysts followed by orbital volume reconstitution.

**CASE REPORT**

A 4-month-old female infant presented with congenital bilateral microphthalmos with enlarging cysts. She had an autosomal dominant family history of the same condition, her mother having right microphthalmos. Progressive inflammation of the right eyelid was noted with occasional bouts of bleeding. On examination, the right eye was not visible, being displaced superiorly under the upper eyelid by a large cyst; there was lower eyelid ectropion and conjunctival prolapse in the interpalpebral fissure (Fig. 1A). Her left eye had roving movement with a tendency to hold the eye in pronounced adduction. Turning on the room light or shining a bright light on her face resulted in sudden centration of the eye with widening of the palpebral fissure. Slit-lamp examination showed left microphthalmos with a corneal diameter of 5 mm. The anterior chamber was formed, iris present, and pupillary reflexes present.

**FIG. 1.** A, At presentation, this 4-month-old female infant had bilateral microphthalmos with right lower eyelid ectropion, and the right eye was not visible. She underwent right orbital cyst removal and volume reconstitution with free fat graft. B, At 10 months postoperative follow-up, the right globe was in the interpalpebral fissure and responded to light.
The lens was only slightly opaque; however, the fundus could not be visualized and there was no red reflex. On the right, the lens appeared to be clear. Ultrasonography showed severe bilateral microphthalmos (globs 1 cm in diameter), cataracts, persistent hyaloid arteries, and large orbital cysts. On CT, both globes appeared very microphthalmic with the lens virtually filling the eye on each side. The optic nerves and chiasm were hypoplastic and the orbits expanded (Fig. 2A, B). Visual evoked potentials showed significant delay from the left optic nerve, which demonstrated more impairment than on the right. The right eye showed low amplitudes but surprisingly normal latency.

Because of the better visual prognosis on the right and the lower eyelid ectropion, we removed the cyst via an inferior fornix approach, which left a very large inferior volume deficit. A 4-cc fat graft harvested from the periumbilical area was used to reconstitute the orbital volume and avoid excessive vertical dystopia and entropion. Histopathology of the cyst showed laminated fibrovascular connective tissue, lined by retinal-glial tissue and foci of pigmented cells consistent with retinal pigment epithelium. The right globe was now in the interpalpebral fissure; of note, it responded to light. Ten months later, the right globe remained aligned and the lens was clear with persistent reconstituted orbital soft-tissue volume and the left orbital cyst had expanded clinically (Figs. 1B and 2C, D). The parents wished to have the cyst removed to achieve symmetry, which was performed with reconstitution of orbital volume by free fat graft.

**DISCUSSION**

Microphthalmos with cyst is an ocular developmental defect caused by failure of closure of the embryonic fissure at an early stage. It is noted in the neonatal period, and is usually unilateral and isolated. The microphthalmic eye is often obscured by conjunctival folds or a large cyst. Enlargement of the cyst with time can be due to fluid production by the glial cells, or by the eye in cases in which there is communication between the globe and cyst. Although diagnosis is made clinically in most patients, imaging studies (A- and B-scan ultrasonography, CT, and MRI) are helpful in supporting the diagnosis and defining the size of microphthalmos and orbital cyst. Electrophysiologic studies are recommended if there is any doubt regarding the visual potential. Treatment may consist of observation only or in severe cases may require surgical removal of the cyst alone or removal of the blind eye and cyst. Filling a large orbital volume defect left after excision of the cyst is an important consideration in orbital reconstruction.

In our case, we performed only cyst excision without removing the eyes in the hope that there was some visual function. Furthermore, we performed free fat grafts to fill the expanded orbit. The surgery was performed on the right before the left because of the better visual potential and the ectropion. The right eye was visible postoperatively and interestingly, it responded to light. Left orbital cyst removal with fat graft was performed successfully 10 months later because of progressive enlargement of the cyst.

**REFERENCES**

Abnormal Cytogenetics in Orbital Lipoma

Lorraine Y. Ong, M.B.B.S.Hons, F.R.A.N.Z.C.O.*
Bruce Mercer, M.H.G.S.A.†
Lynda J. Campbell, F.R.C.P.A., M.H.G.S.A.†
and Alan A. McNab, M.B.B.S., F.R.A.N.Z.C.O.*

Abstract: Orbital lipoma is a rare entity with only a small number of cases previously described. The authors describe a case of orbital lipoma in a 56-year-old man, which was treated with surgical excision. Cytogenetic analysis of the lesion demonstrated abnormalities of chromosome 12, consistent with chromosomal abnormalities in lipomas found elsewhere in the body. Therefore, cytogenetic analysis may be useful to differentiate lipomatous tumors from normal orbital fat.

Lipomas are the most common benign mesenchymal tumor, occurring most frequently in the trunk and extremities. Histologically, they are composed of mature adipose tissue, which can be virtually impossible to distinguish from normal fat. Despite an abundance of fat in the orbit, orbital lipomas are exceedingly rare, with few cases previously reported. We describe a case of orbital lipoma and the cytogenetic abnormality present in the lesion. To our knowledge, the cytogenetics of an orbital lipoma has not previously been described.

CASE REPORT

A 56-year-old man presented with a 1-year history of increasing left upper eyelid swelling. He had no diplopia. Review of previous photographs showed that the lesion was present for 8 years prior to presentation and had gradually increased in size. His best-corrected visual acuity was 20/25 OS. A fluctuant, smooth mass was visible and palpable in the superior orbit with extension under the left brow. The mass was increased in size. His best-corrected visual acuity was 20/25.

CT of the orbits revealed a well-defined soft-tissue mass of low density in the superior orbit extending in the supraorbital region (Fig. 1). MRI showed that the lesion had a similar intensity to orbital fat, being hyperintense on T1-weighted images and isodense to brain in T2-weighted images (Fig. 2).

The patient underwent an anterior orbitotomy via an upper eyelid crease incision. A well-defined mass was identified in the sub-brow region. It was paler than the preaponeurotic fat, but had similar consistency. The lesion extended posteriorly through a grossly enlarged supraorbital foramen in the anterior and superior orbit. It was readily dissected from surrounding tissues and was completely excised. His postoperative course was uncomplicated.

Pathologic examination confirmed the diagnosis of a lipoma. Macroscopically the lesion was pale, with a homogenous cut surface. Partially lobulated, mature adipose tissue was identified on microscopy, with no evidence of atypia.

A single-locus labeled, Cambridge, United Kingdom) and a single-locus

FIG. 1. Coronal CT view of a low-density soft-tissue mass (A, black arrow) in the left superior orbit with an expanded superior orbital foramen (B, white arrow).

No conflicting relationship exists for any author.

Address correspondence and reprint requests to Lorraine Y. Ong, F.R.A.N.Z.C.O., 173 Lennox Street, Richmond, Victoria 3121, Australia. E-mail: lorraine.ong@gmail.com

DOI: 10.1097/IOP.0b013e3181a1d78d

© 2009 The American Society of Ophthalmic Plastic and Reconstructive Surgery, Inc.
probe, locus specific indicator C/EBP homologous protein (CHOP) (12q13) dual-color break-apart rearrangement probe (Vysis, Inc., Downers Grove, IL, U.S.A.), according to the manufacturers’ instructions, analyzed on a Zeiss Axioplan 2 fluorescent microscope, and metaphase images were captured using Isis image analysis system (Metasystems).

FISH showed that chromosome 12 had undergone a paracentric inversion in addition to a reciprocal translocation with chromosome 1. The CHOP locus was not involved in either the inversion or translocation but its location was changed by the inversion (Fig. 3B, C). The revised karyotype was as follows.

\[
46,XY,der(1)(12pter \rightarrow 12p11.2::1p32 \\
\quad \rightarrow 1qter),der(12)(1pter \rightarrow 1p32::12q15 \\
\quad \rightarrow 12p11.2::12q15 \rightarrow 12qter)
\]

**DISCUSSION**

Although lipomas are common in the trunk and the extremities, they occur rarely in the orbit. Henderson et al., in a survey of 1,376 orbital tumors, reported 3 cases of orbital lipoma. This contrasts with an earlier study performed in the pre-CT era by Forrest that identified lipomas in 8.6% of orbital tumors. Forrest commented that the lipomas were histologically indistinguishable from normal fat. Thus, the diagnosis was based on clinical suspicion of a mass, and it is likely that most “lipomas” represented normal orbital fat.

Lipomatous tumors have a high incidence of cytogenetic abnormalities, which correlate well with clinical and histologic findings. The chromosomal abnormalities are tumor specific and can help differentiate between normal fat, benign lipomatous lesions, and liposarcomas when the histology is difficult to interpret.

Approximately 60% of subcutaneous, benign typical lipomas show clonal chromosomal alterations, the commonest being structural abnormalities of chromosome bands 12q13–15 resulting in deregulation of the *HMGA2* gene. Our case contained such an abnormality of chromosome 12.
Spontaneous Resolution of Intraorbital Arteriovenous Fistulas
Kai-Chun Cheng, M.D.*,‡; Cheng-Hsien Chang, M.D., Ph.D.*‡§; and Wei-Chen Lin, M.D.#

Abstract: Spontaneous intraorbital arteriovenous fistulas are extremely rare. A 50-year-old man presented with progressive right blurred vision for 1 year and right proptosis for 2 months. He had no history of orbital trauma or family history of vascular disorders. Orbital MRI showed increased vascularity in the right orbital apex and bilateral dilated superior ophthalmic veins. Digital subtraction angiography of the carotid circulation demonstrated several small fistulas between the right ophthalmic artery and the right superior and inferior ophthalmic vein. He did not receive any intervention treatment for the intraorbital arteriovenous fistulas because of technical difficulty and high risk. His vision and symptoms gradually improved over a follow-up interval of 6 months. Patients with intraorbital arteriovenous fistulas without significant loss of visual function could be observed for spontaneous resolution.

Intraorbital arteriovenous fistulas (AVFs) are exceptionally rare and most are part of extensive intracranial or facial arteriovenous malformations.1–6 Wright's series1 of 627 patients with orbital tumors included only 3 cases of intraorbital AVFs. To our knowledge, only 6 cases of spontaneous intraorbital AVF have been reported in the English literature.3 We report another such case with spontaneous resolution.

CASE REPORT
A 50-year-old man presented with progressive right blurred vision for 1 year and right proptosis for 2 months. There was no history of orbital trauma or family history of vascular disorders. Ophthalmologic examination disclosed marked conjunctivally and episclerally connected venous loops and chemosis OD. Proptosis of 4 mm OD was noted as measured by Hertel exophthalmometry (18 mm OD, 14 mm OS). The best-corrected visual acuity was 20/100 OD and 20/20 OS. A mild right relative afferent pupillary defect was also noted. Humphrey autoperimetry examination revealed severe right visual field constriction. There was no significant optic disc pallor or edema OD. Ocular movements and intraocular pressures were normal. MRI showed right exophthalmos, increased vascularity in the right orbital apex, and dilatation of bilateral superior ophthalmic veins (Fig. 1). Further study of subtraction digital 4-vessel angiography of the carotid circulation demonstrated several small fistulas between the right ophthalmic artery and the right superior and inferior ophthalmic vein and a severe stenosis of the junction between the right superior ophthalmic vein, inferior ophthalmic vein, and cavernous sinus with regurgitation of blood flow from the right superior and inferior ophthalmic vein into facial venous system. No nidus was observed but the contralateral superior ophthalmic vein was

FIG. 1. MRI T1-weighted axial views without contrast show increased vascularity in the right orbital apex (white arrow) and bilateral dilated superior ophthalmic veins (black arrowhead).
stained during the late arterial phase, which implicated a right–left cavernous high flow to the left superior ophthalmic vein (Fig. 2). The patient did not undergo vascular intervention for the AVFs because of technical difficulty and high risk. His vision improved to 20/25 OD and symptoms gradually subsided over a follow-up period of 6 months. Follow-up magnetic resonance angiography showed no overt vascular lesions in the right orbital cavity (Fig. 3).

**DISCUSSION**

The hemodynamic characteristics of AVFs in the orbit are similar to those of carotid-cavernous sinus fistulas or orbital arteriovenous malformations. Several imaging techniques are capable of investigating intraorbital AVFs. Color Doppler methods demonstrate engorgement and pulsation of the superior ophthalmic veins and arterialized blood flow in the vessels can also be distinguished. CT and MRI are both useful screening tools that reveal dilated superior ophthalmic veins. Magnetic resonance and CT angiography delineate abnormal vessels in detail but digital subtraction angiography is still the definitive method to demonstrate the presence of hemodynamic lesions. Angiographic features of AVFs are characterized by arteriovenous communications within the vascular mass.

Success of embolization therapy for AVFs necessitates obliteration of the fistulas. Transarterial embolization of the multiple small fistulas between ophthalmic artery and veins carries a high risk of vision loss once the central retinal artery is blocked. Although transvenous embolization of AVFs is the current mainstay of treatment for intraorbital AVFs, it was not feasible in our case because severe stenosis located at the junction between the ophthalmic veins and cavernous sinus made transvenous embolization through cavernous sinus to the ophthalmic veins extremely difficult. Retrograde embolization via the facial and angular vein to the superior ophthalmic vein is another approach to intraorbital AVFs. However, the complex, tortuous intraorbital venous structures may interfere with the precise approach to the orifice of intraorbital AVFs. Because of the patient’s fair vision, we chose conservative observation over aggressive vascular intervention. His vision improved and the fistulas resolved in 6 months.

In conclusion, spontaneous intraorbital AVF is extremely rare and presents a treatment dilemma. In cases of moderately decreased visual function, with low-flow fistula, patients could be conservatively observed for spontaneous regress.

**FIG. 2.** Right internal carotid artery angiography, arterial phase anteroposterior (A) and lateral view (B), demonstrates multiple intraorbital arteriovenous fistulas (white arrowheads) between right ophthalmic artery and right superior and inferior ophthalmic vein (black arrow and small black arrow). Right ophthalmic artery (white arrow) supplies these fistulas. There is severe stenosis (black arrowhead) at the junction between the right superior ophthalmic vein, inferior ophthalmic vein, and cavernous sinus. Late arterial phase anteroposterior view (C) reveals contrast medium flowing to the contralateral superior ophthalmic vein (white arrow).

**FIG. 3.** After 6 months, magnetic resonance angiography reveals no overt vascular lesions in the right orbit.
Growth of a Presumed Orbital Venous Anomaly During Pregnancy With Spontaneous Resolution Postpartum

Andrew S. Eiseman, M.D.*, David Bigelow, M.D.†, and Kimberly P. Cockerham, M.D.‡

Abstract: A 27-year-old pregnant woman in her second trimester presented with a 3-month history of gradual proptosis, decreased vision, and choroidal folds in her right eye. MRI revealed an intracranal mass with inhomogeneous enhancement consistent with a vascular lesion. The patient was followed clinically and the lesion remained stable for the remainder of her pregnancy and delivery by Cesarean section. Three months postpartum, the proptosis, choroidal folds, and decreased vision had resolved. Repeat scanning revealed complete resolution of the lesion. Pregnant patients with orbital vascular lesions need to be followed carefully during their pregnancy and after delivery. These lesions can worsen during pregnancy and may resolve spontaneously in the postpartum period.

Orbital vascular anomalies are among the most common orbital space occupying lesions found in the adult population. They are more common in women and they may enlarge and become symptomatic during pregnancy.1,2 One prior case report discusses the growth of an orbital cavernous hemangioma during pregnancy.3 Two other previous reports describe worsening during pregnancy with spontaneous resolution postpartum. This case presents what we believe to be the first reported case of a presumed orbital vascular lesion that enlarged and became symptomatic during pregnancy and then resolved spontaneously after delivery.

CASE REPORT

A 27-year-old G1P0 woman presented in her second trimester with a 3-month history of slowly progressive proptosis and decreased vision in her right eye. The patient denied having ocular pain, diplopia, a sensation of pulsation, or increased fullness with dependent head position. Her uncorrected visual acuity was 20/40 OD and it was correctable to 20/25 with a +1.25 diopter lens. Her uncorrected visual acuity was 20/15 OS. There was increased resistance to retropulsion OD with 2 mm of axial proptosis. Intraocular pressure was normal and equal OU. No afferent pupillary defect was detected and extraocular motility was normal. The optic nerve on the right was normal without swelling. Choroidal folds were present OD (Fig. A). MRI demonstrated an intracranal mass in the right orbit with inhomogeneous gadolinium contrast enhancement, consistent with a vascular lesion. There was no evidence of hemorrhage (Fig. B).

The patient was followed clinically and the rest of her pregnancy was uneventful without changes in her ocular status. She delivered by Cesarean section to minimize increases in intraorbital pressure during pushing and Valsalva. Three months after delivery, the proptosis had resolved, her uncorrected visual acuity had returned to normal, and the choroidal folds had resolved. Repeat MRI revealed no evidence of an orbital mass (Fig. C).

DISCUSSION

Considering the timing of this patient’s signs and symptoms, it is reasonable to assume that her presentation was due to changes associated with pregnancy, particularly those of the hematologic and cardiovascular systems. Pregnancy causes the body to undergo many physiologic changes and these alterations affect the eye and orbit in health and disease.3 A pregnant woman’s blood volume increases significantly during pregnancy.4 For a single gestation pregnancy, the average total increase is approximately 570 ml, which represents a 48% increase over prepregnancy levels.4 There is also an increase in resting pulse rate and cardiac output, with a concomitant decrease in systemic vascular resistance secondary to increased venous distensibility caused by progesterone-induced smooth-muscle relaxation. Based upon our current understanding of the pathophysiology of orbital vascular abnormalities, it is reasonable to believe that the above physiologic changes could alter the size and activity of these lesions.

The medical literature contains case reports of both orbital cavernous hemangiomas and arteriovenous malformations worsening during pregnancy.1,2 One possible explanation for the growth of orbital cavernous hemangiomas during pregnancy is that some contain sex hormone receptors in their walls.5 Because this case presented as an intracranial vascular lesion with painless proptosis and choroidal folds that became symptomatic during pregnancy, an orbital cavernous hemangioma was considered as part of the differential diagnosis. However, it is unlikely that this lesion was a cavernous hemangioma because although partial regression can occur from thrombotic occlusion, spontaneous complete resolution is highly unlikely.

The second orbital vascular lesion that has been reported to worsen during pregnancy is the arteriovenous malformation.2 By definition, these lesions have a connection to the arterial systemic

REFERENCES

vasculature. It is therefore not surprising that they could worsen during pregnancy because of characteristic hemodynamic changes. An arteriovenous malformation was not strongly considered in the differential diagnosis of this case because the clinical presentation and imaging characteristics are usually different. Also, such a lesion would be unlikely to completely resolve spontaneously in the postpartum state. Regardless of the exact diagnosis and cause of the pregnancy-induced exacerbation and post-partum spontaneous resolution, we present what we believe to be the first report of an orbital vascular lesion that worsened during pregnancy and then resolved spontaneously after delivery. When pregnant patients present with what appear to be orbital vascular lesions, careful follow-up is important because these lesions can change significantly during pregnancy and after delivery.

REFERENCES


Visual Loss Secondary to Orbital Apex Invasion as the First Manifestation of Recurrent Nasopharyngeal Carcinoma

Francesco P. Bernardini, M.D.,*, J. Oscar Croxatto, M.D.,†, Giulio Fraternali Orcioni, M.D.,‡ and Stefania Bianchi, M.D.§

Abstract: A 51-year-old white man was referred for evaluation of visual loss in the right eye caused by an apical orbital...
lesion. His medical history was positive for “lymphoepithelial carcinoma” of the nasopharynx successfully treated with radiotherapy 6 years previously. Cranial CT showed a diffuse orbital mass extending from the pterygopalatine fossa, infiltrating the inferior orbital fissure, the orbital apex, and the cranial cavity. Results from an incisional biopsy of the lesion were consistent with the diagnosis of nasopharyngeal carcinoma, nonkeratinizing lymphoepithelial variant of squamous cell carcinoma. The patient underwent stereotactic radiosurgery, which arrested the tumor progression. Orbitocranial recurrence of nasopharyngeal carcinoma is rare and ocular symptoms may be the first manifestation of the disease.

**CASE REPORT**

A 51-year-old white man was referred for evaluation of visual loss caused by an orbital apex lesion. His medical history was positive for “lymphoepithelial carcinoma” of the nasopharynx successfully treated with radiotherapy 6 years previously. At the time of the first ophthalmic evaluation, mild elevation of visual acuity (20/70) and visual fields, despite the lack of radiologic evidence of tumor regression. Gross pathologic examination of the removed orbital mass showed a pale tan, solid lesion. Light microscopy revealed a cellular tumor composed of large, undifferentiated epithelial cells with vesicular nuclei, prominent nucleoli, and a moderate amount of eosinophilic cytoplasm, accompanied by a dense inflammatory infiltrate of lymphocytes and plasma cells permeating the cell nests in the so-called “Schmincke” pattern (Fig. 2). Immunohistochemical stains showed a strong staining for cytokeratin (Fig. 3). In situ hybridization was negative for Epstein-Barr virus DNA.

**DISCUSSION**

Nasopharyngeal carcinoma is a tumor arising from the epithelial cells that cover the surface of the nasopharynx. Regaud and Schmincke first described NPC as a separate entity in 1921. The most frequent type is the undifferentiated carcinoma (WHO type 3) followed by the nonkeratinizing carcinoma (WHO type 2). Squamous cell carcinoma (WHO type 1) is the most frequent NPC in the United States. NPChas a marked tendency to invade adjacent tissues. It may spread in the cranium, nasal cavity, paranasal sinuses, and the orbital apex. In an area of high prevalence of China, NPCs represent as much as 3.2% of all orbital tumors. Orbital involvement occurs most often from a recurrence of the primary tumor or as the first manifestation of the disease in patients with a known history of NPC. The most frequent

![Image 1](https://example.com/image1.png)  
**FIG. 1.** Orbital CT repeated after discontinuation of steroids shows enlargement of the orbital component of the lesion with invasion of the optic canal, cranial cavity, and pterygopalatine fossa.

![Image 2](https://example.com/image2.png)  
**FIG. 2.** Sheets of undifferentiated cells separated by a dense infiltrate of lymphocytes and plasma cells. Tumor cells have vesicular nuclei, distinct nucleoli, more distinct cell borders, and moderate amount of eosinophilic cytoplasm.
manifestations include proptosis, diplopia, blurred vision, and orbital pain. In other individuals, the bulk of the tumor may affect the anterior orbit nasally. Current therapy for NPC includes mainly radiotherapy and chemotherapy. The choice of therapy follows the American Joint Committee on Cancer stage based on the TNM system adapted to nasopharyngeal cancer. Stage 4 comprises tumors with intracranial extension and/or involvement of cranial nerves, hypopharynx, infratemporal fossa, or orbit. High-dose radiation therapy of the primary tumor is only used in stage 1, including prophylactic radiation of the nodal drainage. High-dose radiotherapy in addition to systemic chemotherapy is used for the treatment of advanced-stage disease. Recurrences may be treated with different forms of local radiotherapy. Surgery may only be indicated for neck dissection in cases with persistent or recurrent nodes if the primary tumor site is controlled, or focal recurrences in highly selected patients. Patients with orbital involvement may also have intracranial extension, which carries a poor prognosis for survival. Ophthalmologists should be aware of orbital involvement with this disease. Orbital CT and ophthalmic evaluation should be a part of follow-up of NPC patients to detect early invasion in the pterygopalatine fossa to prevent cranio-orbital invasion, which has been shown to be the preferred pathway for orbital invasion.

REFERENCES

Collagenous Fibroma (Desmoplastic Fibroblastoma) of the Lacrimal Gland
Min Ahn, M.D.*, Vladimir Osipov, M.D.†, and Gerald J. Harris, M.D.*

Abstract: A 53-year-old woman presented with mild right upper eyelid edema without erythema or tenderness. Postcontrast, fat-suppressed, T1-weighted MR images demonstrated a slightly enlarged, mildly enhancing right lacrimal gland, with an internal zone of hypointensity. Histopathologic examination showed scattered spindled to stellate fibroblasts within a myxocollagenous matrix. Cells were immunohistochemically positive for vimentin and negative for smooth muscle actin, desmin, S-100 protein, CD34, cytokeratin, and epithelial membrane antigen. To our knowledge, this is the first report of collagenous fibroma involving the orbit.

REFERENCES

Collagenous Fibroma (Desmoplastic Fibroblastoma) of the Lacrimal Gland
Min Ahn, M.D.*, Vladimir Osipov, M.D.†, and Gerald J. Harris, M.D.*

Abstract: A 53-year-old woman presented with mild right upper eyelid edema without erythema or tenderness. Postcontrast, fat-suppressed, T1-weighted MR images demonstrated a slightly enlarged, mildly enhancing right lacrimal gland, with an internal zone of hypointensity. Histopathologic examination showed scattered spindled to stellate fibroblasts within a myxocollagenous matrix. Cells were immunohistochemically positive for vimentin and negative for smooth muscle actin, desmin, S-100 protein, CD34, cytokeratin, and epithelial membrane antigen. To our knowledge, this is the first report of collagenous fibroma involving the orbit.

REFERENCES
Collagenous fibroma (CF) is a slow-growing, benign, fibroblastic/myofibroblastic lesion, first described in 1995 as desmoplastic fibroblastoma and renamed 1 year later.\(^1\)\(^2\) The lesion most often involves the subcutaneous tissue or skeletal muscle of the extremities or neck.\(^3\) We describe a case of CF involving the lacrimal gland; to our knowledge, it represents the first reported orbital occurrence of the entity.

**CASE REPORT**

A 53-year-old woman had a 2-week history of mild right upper eyelid swelling, without redness or pain, which began laterally and extended medially. Medical history included childhood strabismus treated orthoptically, hysterectomy for benign disease, and 45 pack-years of smoking. Best-corrected vision was 20/20 OU. There was diffuse, slightly doughy edema of the right upper eyelid. The orbital lobe of the lacrimal gland was not palpable or tender, and the palpebral lobe did not appear inflamed. There was no measurable proptosis or globe displacement, and ocular motility was full. CT showed mild enlargement of the right lacrimal gland without associated bone change. MRI demonstrated mild enhancement of the gland and adjacent levator muscle, with a zone of hypointensity (Fig. 1).

The patient underwent anterior orbitotomy through a lateral eyelid-crease incision. A large, pale, firm nodule emanated from the medial aspect of the lacrimal gland, with tenacious attachments to the overlying peri-orbita and adjacent levator muscle, and without clear distinction from normal glandular tissue. Two small “satellite” nodules were present at the lesion’s medial and posterior aspects. Because neither a pleomorphic adenoma nor a malignant epithelial tumor could be excluded by the lesion’s appearance, it was removed without violating the surface layer, in continuity with normal-appearing glandular tissue (Fig. 2A).

Microscopic examination showed a hypocellular nodule composed of dense bands of hyalinized collagenous tissue peripherally, and looser, more myxoid fibrosis centrally (Fig. 2B). Scattered fibroblasts and sparse small- to medium-caliber vessels were intermixed among collagen fibers, and fat was entrapped peripherally. Neither mitotic activity nor necrosis was observed. In continuity with the nodule, lacrimal gland acinar and ductal architecture was preserved (Fig. 2C). Immunohistochemical staining was positive for vimentin (Fig. 2D), but negative for smooth muscle actin, desmin, S-100 protein, CD34, cytokeratin, and epithelial membrane antigen.

**FIG. 2.** A, Mass excised from the orbital lobe of the right lacrimal gland. A firm, pale nodule extends to the surface at the medial pole. B, Collagenous fibroma with scattered spindled to stellate fibroblasts (inset) in an edematous collagenous matrix (hematoxylin-eosin, \(\times100\); inset, \(\times600\)). The tumor is virtually devoid of blood vessels; fat is entrapped at the periphery. C, Interface of tumor and lacrimal gland parenchyma (hematoxylin-eosin, \(\times100\)). Glandular elements are not infiltrated or separated. D, Immunohistochemical reactivity of fibroblasts with vimentin (\(\times100\)).
The patient has been followed for more than 1 year without recurrence of the lesion.

**DISCUSSION**

In 1995, Evans\(^1\) reported a histopathologically distinctive fibrous lesion, involving the neck or extremities in 7 patients, which comprised "medium-sized to large 'reactive appearing' spindled to stellate fibroblasts sparsely distributed in a fibromyxoid to densely fibrous background." There was absent-to-rare mitotic activity, no tumor necrosis, and minimal vascularity. Evans labeled the condition "desmoplastic fibroblastoma." One year later, Nielsen et al.\(^2\) reported 7 similar cases and demonstrated ultrastructural features of both fibroblasts and myofibroblasts, and immunohistochemical reactivity for vimentin, with negativity for desmin, keratin, and CD34. The authors favored the term "collagenous fibroma." Among 63 cases of CF from the files of the Armed Forces Institute of Pathology,\(^3\) men accounted for 80%, and the median age was 50 years (range, 16–81 years). A painless, slow-growing mass involved an upper extremity, shoulder, posterior neck, or upper back in 65% of cases; a lower extremity, hip, or abdominal wall was affected in 34%. Lesions were mainly subcutaneous, but involvement of fascia and/or skeletal muscle was common.Although CFs have grossly appeared well circumscribed, infiltration or entrapment of adjacent fat or muscle have often been described.\(^1\)–\(^3\)

Whether a CF represents a benign neoplasm or a reactive lesion remains unclear. Favoring neoplasia are persistence, slow growth, and relatively large size at presentation (median, 3 cm; range, 1–20 cm).\(^4\) In addition, clonal chromosomal abnormalities have been reported in 2 cases.\(^4\) In support of a reactive process are extreme hypocellularity and morphology suggestive of mature, reactive fibroblasts. In addition, no recurrences were noted among the 85 total cases reported through 2004,\(^5\) despite simple excision in almost all cases, and microscopically confirmed marginal extension in some.\(^3\)

To our knowledge, CF of the orbit has not been previously reported. In our case, the origin appears to have been within, or at the perimeter of, the lacrimal gland. Of interest, in the single reported case of parotid gland involvement, the bulk of a CF was extraglandular, but normal parotid acini and ducts were entrapped at the tumor's periphery.\(^6\) The authors speculated that the lesion might have originated in the masseteric fascia and secondarily infiltrated the gland.

**REFERENCES**