Continuing Medical Education

ASOPRS is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor the Continuing Medical Education (CME) for physicians.

The American Society of Ophthalmic Plastic and Reconstructive Surgery designates this live activity for a maximum of **11.25 AMA PRA Category 1 Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

In addition, **2.0 AMA PRA Category 1 Credits™** may be claimed if the physician attends the ITEDS Course on Thursday, June 22.

Self-assessment CME credit may be claimed if the physician completes the self-assessment questionnaire at the end of the online meeting evaluation.

Continuing Medical Education Mission Statement

ASOPRS is dedicated to advancing knowledge and skill in all areas of ophthalmic plastic and reconstructive surgery, including medical and surgical management of aesthetics, orbital, eyelid and lacrimal diseases.

Electronic Evaluations/CME Certificates

A link to an electronic evaluation will be provided to attendees via email. Hard copy evaluations will not be available. Please complete the electronic evaluation in its entirety after the meeting. You will have an opportunity to print a CME certificate once you have completed the electronic evaluation.

Your feedback is carefully considered when planning future meetings. Thank you in advance for completing the evaluation and helping ASOPRS improve our Spring Scientific Symposium.

Abstract Disclaimer

Abstract information is published as submitted.
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(Financial Disclosures continued)
### FINANCIAL DISCLOSURES

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YASOPRS-SPONSORED EDUCATIONAL EVENT

Friday, June 23

7:00 - 8:00 am

Pearls to Building a Busy Academic Practice

Mark J. Lucarelli, MD, FACS

Slide 1

Toward a W Academic

Mark J. Lucarelli, M.D., FACS

Dentistry Professor of Ophthalmoloc Surgery
Director, Oculoplastic, Orbit and Facial Cosmetic Surgery
University of Wisconsin-Madison

Slide 2

A Fulfilling Academic Career

- Anecdotal, 20 years practice at UW-Madison
- Not-evidence-based, necessarily personal
  - All situations are different
  - Important topic
  - Honored and pleased to share
- Academic vs Private Practice Advice
  - Life of overlap
- Best ideas for rich professional life in an academic setting

Slide 3

A Fulfilling Academic Career

- Practice in a scholarly manner
  - Every day... every patient
    - “Chances favors the prepared mind.” Louis Pasteur, 1854
    - Must know the state-of-the-art to innovate
    - Stay current in the ophthalmic literature scientic writings
    - Remain intellectually curious
    - Observations that seem unusual /don’t make sense
- Be Patient Centered. Let your patients’ unmet medical needs continually motivate you to help solve their problems with better solutions

Slide 4

A Fulfilling Academic Career

- Evidence-based when possible and continually seeking better understanding of phenomena and better solutions for your patients
- New ideas, more effective modifications, better outcomes for patients

“Even the smallest thing should be done with reference to an end” Marcus Aurelius
Meditations II.14 170.C.E.

Slide 5

A Fulfilling Academic Career

- Tap into unique strengths of your AMC
  - LARGE integrated practices
  - Deep roster of expert colleagues for collaboration
  - Extensive resources for developing, acquiring and implementing new technologies

Slide 6

A Fulfilling Academic Career

- Cultivate relationships at your AMC
  - Patient care initiatives / Academic projects
  - Mohs / D arm Surg
  - Endocrine
  - OTO / Head and Neck
  - Plastic Surgery
  - Emergency Med

Slide 7

UW Facial Nerve Center

www.uwhealth.org/facial-paralysis/facial-nerve-clinic/42589

Slide 8

A Fulfilling Academic Career

- Inside your own Ophthalmology Department
  - Communicate and teach about your areas of special interest
    - TED, Trauma, Ophthology, etc.
  - Ophthalmology Grand Rounds
  - Journal Club
  - Quality Improvement efforts

(continued)
Slide 9

A Fulfilling Academic Career
- If possible, be very selective with Satellite / Outreach locations
  - Outreach provider as guest / visitor
  - Ml. expr.: > than 3 clinic settings and 3 surgical sites ± inefficiencies / logistical problems
  - Keep long-term view
    - Outreach sites not easy to establish, but even harder to dismantle / unwind
    - As practice matures, home AMC often higher

Slide 10

A Fulfilling Academic Career
- Be Patient...
  - Natural to want to get busier clinically rapidly...
  - Often a short period of "Just Right"
  - Then, many years of trying to keep professional demands in balance
  - "No thing great is created suddenly."
    - Epictetus, Discourses 101 C.E.

Slide 11

A Fulfilling Academic Career
- Academic Development
  - Academic work takes TIME
    - Recommend 1 day / week for academic efforts
      - Project conception and design
      - Data collection
      - Meetings with collaborators
  - Manuscript preparation
  - Grants and workshops can help, but should not be the main time source

Slide 12

A Fulfilling Academic Career
- Academic Development
  - For the best chance of a good harvest
    - Plant a variety of seeds, plant early, and see what grows

Slide 13

A Fulfilling Academic Career
- Academic Development
  - Try to develop one area of significant academic inquiry
    - More efficient than a series of one-and-done projects
    - Allows one to develop academic reputation over time
    - Will be viewed favorably by promotions committee

Slide 14

A Fulfilling Academic Career
- Mentorship
  - Meet with departmental mentoring committee annually until Associate Professor
  - Consider ASOPRS mentor program
  - Return the favor later

Slide 15

A Fulfilling Academic Career
- Service
  - Leadership opportunities in your AMC
  - Get involved with ASOPRS
    - Many ways to serve
      - No other organization is as closely aligned with your professional interests
  - Consider opportunities with AAO, ABO, etc.
  - International outreach

Slide 16

A Fulfilling Academic Career
- Personal Considerations
  - Commit proper resources to your personal life
    - Family
    - Relationships
    - Physical and mental health

Slide 17

A Fulfilling Academic Career
- Personal Considerations
  - Commit proper resources to your personal life
- Avocational Interests
  - “The young doctor should look about early for an avocation, a pastime...”
    - Fishing, gardening, music, photography, etc.
    - Any activity that can be done as a hobby and yields hard...
      - Dr. William Osler
Practical Secrets to Building a Referral Practice

David Samimi, MD

Slide 1

Practical Secrets to Building a Referral Practice

David B. Samimi, MD
Eyesthetica, Los Angeles
Assistant Professor, USC Roski Eye Institute

Slide 2

FINANCIAL DISCLOSURE

I have no financial interests or relationships to disclose.

Slide 3

Objective

To discuss effective tools for growing a new or existing referral Oculofacial Plastics practice.

Slide 4

Why give this talk?

Slide 5

Methods

• Consumer Marketing
  – Online/Print
• Social Media
• Referring Doctors
• Word of Mouth

Slide 6

Slide 7

Slide 8

Steps to Success

1) Make a list of potential providers
2) Meet the provider
3) Stay on their mind
4) Communicate patient results
5) Send patient back happy, primed for more of their services
6) Relationship maintenance

(continued)
**Know Your Audience**
- **THE BIG 3**
  - Ophthalmology
  - Optometry
  - Dermatology
- Choose Distance radius
- Old School: Buy directory from AAO, Optom, Derm
- Google, Yelp
- Low hanging fruit: doctors of current patients

**Getting in the Door**
- Phone call: takes persistence, remember staff names
- “The Golden Line”
- Drop in

**The Visit**
- Focus on personal connection
- Show before & afters
- Inquire about what they do
- Emphasize what you don’t do!
- Where are oculoplastics cases going now?
- Document personal notes, e.g. kids names etc..

**Staying on Their Mind**
- Template follow up letter
- Newsletter
- Holiday card/gift

**Relationship Maintenance**
- Always send referral letters
- Personally call any first time referral
- Handwritten thank you card
- Break bread together
- Refer them patients
- No skin care/injectables on Derm patients!

**Give Lectures**
- Primary Care
  - Managing the Red Eye
- Optom
  - Tearing, Chalazion, Eyelid Tumors
- Derm
  - Eyelid tumors, Cosmetic Surgery

**Summary**
- Establish a personal connection
- Emphasize what you don’t do
- Have thick skin & patience!
ANOPHTHALMIC SOCKET SESSION

8:03 – 8:08 am

**Hard palate-dermis fat composite graft for reconstruction of contracted anophthalmic socket**

Catherine J. Choi, MD, David T. Tse, MD
*Bascom Palmer Eye Institute, University of Miami, Miami, FL*

**Introduction:** To describe a novel technique of using a hard palate-dermis fat composite graft for reconstruction of a contracted anophthalmic socket.

**Methods:** Retrospective, non-comparative, interventional case series of three patients who underwent hard palate-dermis fat composite graft placement by one surgeon between 2010 and 2017. Description of surgical technique and outcome including prosthesis retention and cosmesis are provided.

**Results:** Four hard palate-dermis fat composite grafts were placed in three patients with contracted anophthalmic sockets. The surgical technique consisted of harvesting a hard palate graft and a dermis fat graft per standard method and adjoining the two with sutures to form a composite graft. All adhesions and symblephara between the eyelid and the anterior surface of the contracted anophthalmic socket were lysed. The composite graft was then positioned with the dermis fat graft toward the orbit and the hard palate graft toward the eyelid, with the line of union between the two portions of the graft forming a new fornix. The hard palate graft was then sutured to the edge of tarsus and the dermis fat graft to the cut edge of the bulbar conjunctiva, effectively lengthening the posterior lamella, recreating a fornix, and providing volume replacement (Figure 1).

**Conclusions:** Of the four composite grafts placed, two were used to reconstruct both the upper and lower lid fornices in a severely contracted socket. Two patients received post-operative 5-fluorouracil injections and one patient underwent an additional buccal mucosal membrane graft to the eyelid without the composite graft. All three patients achieved excellent cosmesis and comfortable prosthesis fit with no complications (Figure 2). Hard palate-dermis fat composite graft is an effective way of reconstructing a contracted anophthalmic socket by restoring volume, lengthening the posterior lamella, and reconstructing the fornix to allow for successful prosthesis retention.

(continued)
ANOPHTHALMIC SOCKET SESSION

(continued)

Figure 1

Figure 2
A Novel Reconstructive Technique in Eye Socket With Multiple Surgeries Approaches: Vascular Pedicle Nasoseptal Flap

Sara Plazola, MD¹, Ariana Cinco Sanchez¹, Rafael Ordonez Garcia²
¹Department of Oculoplastic of Centro Medico Nacional 20 de Noviembre, Mexico City, Mexico, ²Department of Otorhinolaringology of Centro Medico Nacional 20 de Noviembre, Mexico City, Mexico

Background: In patients with large eye socket defects after multiple reconstructive surgeries, have a significant risk of failure due to avascular tissues. Reconstruction with vascularized tissue is desirable to avoid the contracture of the eye socket especially in radiated patients.

Methods: We used a neurovascular pedicled flap of the nasal septum mucoperiosteum and mucoperichondrium based on the nasoseptal artery described by Hadad-Bassegasteguy flap (HBF). A prospective study was performed in patients with contracted socket and multiple surgeries undergoing reconstructive eye socket surgery with vascularized septal mucosal flap at the Centro Medico Nacional 20 de Noviembre during March 2016 to March 2017.

Results: Five patients undergoing reconstructive eye socket with nasoseptal flap. Four patients were successfully treated with surgery (80%). We encounter no infections only one patient with high blood pressure show an hematoma which resolved without complications. Other patient presented a cerebrospinal fluid leak also resolved with the same flap without further complications.

Conclusions: The HBF is a versatile and reliable reconstructive technique for complicated eye socket.

References:
5. Alfredo Vega Alarcon y cols. Colgajo nasoseptal pediculado y colgajo septal invertido en operación transnasal endoscópica para abordajes extendidos de la base del cráneo. AN ORL MEX VOL.57.N0.3,12.

(continued)
ANOPHTHALMIC SOCKET SESSION

(continued)

**Figure 1**

Follow up

Admission 1 week 1 month 4 months

**Figure 2**

Follow up

Admission 1 month 4 month

**Figure 3**

Follow up

Admission 1 week 1 month 2 months

**Figure 4**

Follow up

Admission 1 month 2 months

**Figure 5**

Adenocarcinoma of the pigmented ciliary epithelium in congenital microphthalmia with cyst

Ilya Leyngold, MD, Jennifer Lira, Christopher Weller, Alan Propia
Duke Eye Center, Durham, NC

A 5-year-old girl presented with microphthalmia associated with an enlarging orbital cyst. The enlargement was causing pain and poor retention of the prosthesis (Figure 1). MRI (Figure 2) revealed microphthalmia and cyst with greatly enlarged right orbit. The patient underwent enucleation with cyst resection and derma-fat graft placement. Histopathologic study revealed adenocarcinoma of the pigmented ciliary epithelium arising in a microphthalmic eye and lining the cavity of the colobomatous cyst. The patient has done well postoperatively with negative metastatic work up, and no evidence of tumor recurrence at 6 months follow up.

Adenocarcinoma of the pigmented ciliary epithelium is an extremely rare eye tumor, with only a few cases reported to date.¹ The prognosis has not been fully established, however the current literature supports a rarity of systemic metastasis in the absence of extrascleral extension.² We report the first known case in literature of this tumor associated with microphthalmia and cyst. Our case illustrates the need to have a low threshold for enucleation with complete cyst excision in any case of interval enlargement of the cyst associated with microphthalmia.
Porous Orbital Implants; Are They Advantageous? Anybody Still Pegging?

David R. Jordan, MD, FRCSC
Ottawa, ON, Canada

Orbital Implants can be classified as porous or nonporous; in either category, the implants are integrated, quasi-integrated, or non-integrated, depending on how the implant is connected to the overlying prosthetic eye. A variety of porous implants have been introduced over the past several years. Disagreement persists among orbital surgeons regarding the optimal material and design. Surgeons have their own preferences regarding use of spherical versus shaped, wrapped vs unwrapped and pegged vs unpegged implants. Cost, hospital budgets, and marketing pressures also play a role in implant selection. Pegged porous implants generally have the best overall prosthetic motility however pegs are neither for every patient nor for every surgeon implanting porous orbital implants. If a peg is not considered, the advantage of using a porous implant are diminished, as prosthetic motility associated with a nonpegged porous implant is similar to that of a nonporous spherical implant. A quasi-integrated non-porous implant is an alternative that offers improved motility over a standard sphere but is technically more difficult to utilize. Despite the improved motility associated with a peg, many surgeons and patients still elect to avoid peg placement because of the satisfactory results achieved without pegging and the possibility of post-pegging-related complications. Although the use of pegging has declined dramatically over the past few years, the author believes that with a precise and meticulous technique in the appropriately selected individual, with regular follow-up, pegging can be successful.
Perceptions and use of computer-assisted surgery (CAS) in the orbit: a survey of ASOPRS members

Ahsen Hussain, MD, Navdeep Nijhawan, MD, Dan DeAngelis, MD, FRCSC, James H. Oestreicher, MD
Department of Ophthalmology and Vision Sciences, University of Toronto, Toronto, ON, Canada

Introduction: Computer-assisted surgery (CAS) now plays an increasingly prominent role in certain surgical disciplines. We sought to investigate the current perceptions and use of this technology in orbital surgery by current ASOPRS members.

Methods: An online survey was submitted to all active and candidate ASOPRS members. The survey included background information on CAS, the number of years the respondent had been in independent practice as well as their practice type. The remaining questions asked respondents to describe their frequency of orbital surgery, current experience and accessibility of CAS as well as their opinion on potential benefits and disadvantages of the technology. A final section allowed respondents to provide free text opinions on CAS and the survey.

Results: There were a total of 63 responses out of 92 unique visits to the site (68.5%). 46 respondents (73%) had been in attending/staff practice for over 10 years with 31 respondents (49.2%) working in either academic/teaching hospital and 27 (42.9%) in office-based practice. Orbital surgery volume represented 10-25% of the practice of 23 respondents (36.5%) and less than 10% in 20 (31.7%). The vast majority of respondents (65%) had none or superficial experience with CAS, with 31 (49.2%) having availability and accessibility to the technology. 81% of respondents never (43%) or rarely (1-10% of cases) use CAS for orbital surgery. Respondents felt that posterior orbital surgery or cases with abnormal anatomy were the two most useful reasons to implement CAS. Cost (60.3%) and perceived longer operating time (58.7%) were the two most selected weaknesses for CAS, whereas improved accuracy in attaining surgical end-point(s) (88.9%) and patient safety (61.9%) were perceived as potential or actual advantages. Number of years in practice or type of practice was not significantly associated with CAS use or availability. Demonstrated patient benefit, improved availability/accessibility and reduced setup time or cost were the most popular factors that could influence future use of CAS.

Conclusions: Our study confirms an expected variation in the perception and use of this currently ancillary technology. It is likely that the response rate is also a reflection of exposure to and familiarity with CAS. Case selection plays a prominent role in current CAS use. Demonstrated patient benefit as well as integration of refined and cost-effective CAS systems into operating room environments will influence its future role in orbital surgery.

(continued)
References:
Lacral Gland Volume in Graves Orbitopathy Subtypes

Peter J. Timoney, MD¹, Palak M. Majmudar, MD¹, James M. Huffman, MD¹, Edward Escott, MD²
¹Department of Ophthalmology and Visual Sciences, University of Kentucky, Lexington, KY, ²Department of Radiology, University of Kentucky, Lexington, KY

Introduction: A positive correlation may be expected between Graves orbitopathy patients exhibiting inflammatory activity and the size of the lacrimal gland.

Graves orbitopathy can be clinically subdivided into those who have a proliferative process (type I) and those who have an inflammatory process (type II) as indicated by an increased clinical activity score (CAS). Type II patients exhibit orbital inflammation and extraocular myositis, which may lead to compressive optic neuropathy in 35-45% of affected patients.¹ Evidence exists of lacrimal expression of the thyroid-stimulating hormone receptor leading to inflammation. Given the difficulty in obtaining histological evidence of lacrimal gland inflammation in Graves patients, the use of imaging tests is almost the only approach to visualizing lacrimal gland enlargement secondary to inflammation.”

Methods: A retrospective chart review was performed on Graves orbitopathy patients since January 2014. Clinical data was collected that included age, gender, smoking, and CAS. Patients were clinically categorized as type I or II and their respective imaging was reviewed if performed. A single oculoplastic attending reviewed orbital CT scans and the lacrimal gland was outlined on each coronal slice using the Osirix program that calculated the lacrimal gland volume. Patients were excluded if no CT scan of the orbits was performed or there existed concomitant orbital trauma and / or pathology.

Results: Ten type I and nine type II patients were identified. The average right lacrimal gland volume is 0.4120 cm³ in type I patients and 0.5988 cm³ in type II patients. The average left lacrimal gland volume is 0.5084 cm³ in type I patients and 0.7107 cm³ in type II patients. The lacrimal glands were enlarged in type II patients. Two of the nine type II patients had previously underwent a right lateral orbital wall decompression and their average right lacrimal gland size was 0.4531 cm³ and their average left lacrimal gland size was 0.8060 cm³, displaying a statistically significant difference in lacrimal gland size (p = 0.0001). Smoking correlated strongly with lacrimal gland enlargement in type II patients as did an increase in the CAS.

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**Conclusions:** Designation of Graves orbitopathy patients clinically into subtypes based on the presence or absence of orbital inflammation has prognostic value. The lacrimal gland is statistically enlarged in type II patients; namely those exhibiting orbital inflammation. Two type II patients that had undergone right orbital decompression prior to presentation had a significantly decreased right lacrimal gland volume when compared to the left lacrimal gland volume. In decreasing orbital inflammation, orbital decompression may have the added benefit of decreasing lacrimal gland inflammation and therefore improving ocular surface irritation by lessening aqueous tear deficiency. This study demonstrates the positive correlation between lacrimal gland enlargement and inflammatory Graves orbitopathy (type II patients), purports the added advantage of orbital decompression in improving lacrimal gland function and ocular health, and further supports the delineation of Graves orbitopathy patients into subtypes I and II based on inflammatory activity.

**References:**
A Case of Unilateral Enophthalmos Associated with Morphea

Marc Yonkers, MD, Thomas Vo, Jeremiah P. Tao, MD, FACS
UC Irvine, Orange, CA

Introduction: Morphea, a variant of localized scleroderma, is a rare skin condition that classically presents with ivory colored skin patches. Facial lipoatrophy secondary to morphea has been previously described, however less is known about the ocular manifestations of this rare condition. Here, we present a case of a 53-year old woman with a history of morphea referred for progressive unilateral enophthalmos.

Case: A 53-year old woman previously diagnosed with morphea was referred to the oculoplastics service for evaluation of an 8-10 month history of progressive enophthalmos in the right eye. Exam showed 20/20 vision OU and no afferent pupillary defect (APD). She displayed a mild abduction deficit. Hertel exophthalmometry was 9mm on the right and 15mm in the left. MRI with and without contrast of the orbits showed enhancement and stranding of the right retrobulbar fat. The patient underwent right orbitotomy and biopsy of the retrobulbar fat and the right lateral rectus muscle. The pathology report indicated chronic inflammation of the orbital fat with normal muscle. She was treated chronically with steroid sparing immunomodulatory medications and at her 4 month follow-up, her vision and enophthalmos remained stable.

Discussion: Morphea is a relatively rare condition with an incidence of 2.7 per 100,000. Due to this rarity, literature on this condition is sparse. Even less described are the ocular manifestations of this condition. One study conducted on 750 pediatric patients with morphea found significant ocular manifestations in 24 patients (3.2%). The most common manifestations were adnexal abnormalities involving the eyelids, eyelashes, and lacrimal glands. Our patient displays a unilateral variant of morphea with ipsilateral orbital fat inflammation and atrophy resulting in enophthalmos. She shows stable enophthalmos with chronic oral immune modulation.

Figure 1  Figure 2
9:03 - 9:06 am

**Rheumatoid arthritis-associated orbital vasculitis**

Adam C. Weber, MD, Michael T. Yen, MD, Debra J. Shetlar, MD

*Baylor College of Medicine, Houston, TX*

A 67-year-old Hispanic female presented for acute onset right upper eyelid edema. The patient had a medical history of rheumatoid arthritis treated with etanercept. The patient’s vision was 20/20 both eyes and was noted to have bilateral 2+ upper eyelid edema with a papular rash. She was diagnosed with eyelid dermatitis and treated with desonide cream. The patient’s symptoms worsened, and she was started on systemic steroids by an outside physician. Her symptoms did not improve, and on return exam she had a palpable thickened and erythematous lesion of the upper eyelids.

An MRI showed prominent and diffuse bilateral preseptal and suprorbital soft tissue swelling with no discrete fluid collections. There was mild enlargement of bilateral lacrimal glands with mild fat stranding around the right lacrimal gland. Given these findings, the decision was made to perform a right orbitotomy with exploration and biopsy. Pathology showed dense inflammatory infiltrate of the orbital fat with prominent vasculitis, consistent with granulomatosis with polyangiitis, Churg-Strauss or polyarteritis nodosa. Supplemental laboratory testing yielded positive anti-nuclear antibody and rheumatoid factor.

The patient was started on 6 rounds of monthly cyclophosphamide infusions and steroids. After her first dose of cyclophosphamide, the patient’s eyelid edema and erythema showed marked improvement. After 3 rounds of treatment, she showed continued improvement of eyelid edema and erythema with decreased induration. Following the completion of cyclophosphamide therapy and tapering of steroid due to Cushingoid symptoms, the patient’s symptoms returned. On most recent examination the patient had a large palpable, firm nodule in the right upper eyelid and increased fullness of the left upper eyelid. The patient volunteered that she had had similar skin lesions on her left triceps and right knee. The triceps lesion had been biopsied a year prior with similar pathology to the orbital lesion.

*Figure 1*  
*Figure 2*  
*Figure 3*  
*Figure 4*
Patient is a 27-year-old female who presented with bilateral periorbital swelling for seven year duration without any changes to vision, diplopia, or pain. On exam she had periorbital swelling upper lids greater than lower lids with yellow tint, and limitation of upgaze and lateral gaze. There was no lymphadenopathy. Her diagnostic testing showed normal ANCA, CBC, thyroid function tests, and ACE levels. MRI orbits showed an infiltrating mass in the upper eyelid preseptal space and involved orbital muscles, and paranasal sinuses. Eyelid biopsy was performed and the pathology was consistent with Xanthogranuloma with IgG-4 component. Patient was referred to Rheumatology and treated with different immunosuppressants including methotrexate, azathioprine, rituximab and oral steroids for a period of 2.5 years. Due to side effects and intolerance to medications, she underwent Right orbitotomy with excision of mass upper lid first with excellent response followed by left orbitotomy with excision of mass upper lid in a staged approach. An initial skin only flap was created and the orbicularis involving xanthogranuloma was excised en-bloc anterior to the septum. Then a flap of orbital septum was carefully excised and a small amount of orbital fat containing the lesion was also removed. Small portion of lacrimal gland was also resected. All surgical pathology was consistent with the diagnosis of adult onset asthma and periocular xanthogranuloma (AAPOX). Post-surgical debulking, the patient was switched to mycophenolate mofetil with better tolerance to medication and long term stabilization of her disease.

Here we report a case of AAPOX that was refractory to systemic immunosuppressants alone that was treated successfully with staged surgical excision of periorbital mass. Patient was able to retain normal eyelid function with good cosmesis. As shown in this case, surgical decompression may be a good adjuvant treatment to medical treatment and to decrease morbidity from disease.
Radiotherapy in Thyroid Eye Disease

Peter J. Dolman, MD, FRCSC
University of British Columbia, Vancouver, BC, Canada

**Slide 1**
Radiotherapy (XRT) in Active Thyroid Eye Disease

I do not have any financial interests or relationships to disclose.

Peter J Dolman, MD, FRCSC
Clinical Professor
University of British Columbia
Vancouver, Canada

**Slide 2**
Disease Severity

1. Proptosis
2. Eyelid retraction
3. Exposure symptoms/signs
4. Inflammatory signs
5. Restricted ocular motility
6. Optic nerve compression

**Slide 3**
Disease Activity: (Rundie’s curve)

**Slide 4**
XRT in TED

• Targets lymphocytes (TED effectors) and fibroblasts (extracellular matrix)

• 2000 Rads (20Gy) over 10 days through lateral port to retrobulbar space

**Slide 5**
XRT Safety Profile

• No increased risk of cataract

• No reports of radiation-induced tumors (theoretical risk = 0.3-0.9 %: avoid < 35 yrs old)

• 1% incidence of mild retinopathy (mainly associated with DM: avoid in diabetics)

**Slide 6**
Medical Rx Safety Profile

- Oral prednisone
  - Cushing’s, weight gain, DM, HT, osteoporosis, mood disorder, insomnia = 52%
  - IV methylprednisolone
    - Trenchant flushing, palpitations, dyspnea, mood disorder, insomnia = 2 %
    - BUT: acute liver damage in 0.8 % deaths in 0.4 %

- Rituximab
  - infusion reactions, severe infections (PML)
  - death: 1.5 %

- Tocilizumab
  - GI perforations (10%), URTI (10%)

**Slide 7**
Effectiveness of XRT

**Uncontrolled Studies**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Total # (%)</th>
<th>Favorable Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>XRT (35 yrs)</td>
<td>624 (60 %)</td>
<td></td>
</tr>
<tr>
<td>Oral prednisone (27 yrs)</td>
<td>184 (56 %)</td>
<td></td>
</tr>
<tr>
<td>IV Methylprednisolone (10 yrs)</td>
<td>53 (85 %)</td>
<td></td>
</tr>
<tr>
<td>IV Tocilizumab (3 yrs)</td>
<td>18 (92 %)</td>
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</tr>
</tbody>
</table>

**Slide 8**
Effectiveness of XRT

**Randomized DB Controlled Trials**

- **Prummel 1993**: XRT vs oral steroid
  - Success: Oral prednisone: 55% (better on STS)
    - XRT: 46% (better on motility)

- **Mourits 2000**: XRT vs sham XRT
  - Success: XRT: 63% (major benefit: motility)
    - Sham: 31%

- **Prummel 2004**: XRT vs sham XRT
  - Success: XRT: 52% (improved motility / less diplopia)
    - Sham: 27%

(continued)
Effectiveness of XRT
Randomized DB Controlled Trials

- Gorman (Mayo) 2001: XRT (one eye) vs Sham (other eye)
  
  **Results:** No difference in objective measures between XRT/Sham

  **Numerous rebuttals:** Most enrolled patients were **INACTIVE**
  1. Many patients had long-standing disease (50% patients > 2 years)
  2. Several treated unsuccessfully with steroids elsewhere
  3. Unreated orbit showed no progression during observation period

  **Conclusion:** XRT not beneficial in late, inactive disease


Effectiveness of XRT
Optic Neuropathy

- Kazim et al 1991: Prevention of Decompression surgery
  
  - **Optic neuropathy:** Steroids: 62% benefited
  - XRT: 94% benefited

- UBC 10 Year Experience: Prevention of new onset ON
  
  - i.v. pulse steroids (1 gm IV X 3 doses): 178 patients
  - 64% response: improved VISA inflammatory score within days
  - development of optic neuropathy: 17%

  **Radiotherapy:** CS: 80 patients
  - response 2 – 12 weeks
  - development of optic neuropathy: 0%


Effectiveness of XRT
Optic Neuropathy
Treatment of Relapses PostOp

- Muscles continue to enlarge post orbital decompression for ON

- 5% relapse of ON following successful restoration of vision by surgery

- 85% of these cases had restoration of vision with XRT without further surgery

Effectiveness of XRT
CRISEPTED Trial

- Combined radiotherapy and i.v. Steroids in Early Progressive TED

- 15 international centres

- 100 pts; early progressive TED: iv steroid (500mg X 6 wks, 250mg x 6 wks) vs iv steroid/XRT

- Follow for 1 year

- Outcomes: incidence of DON, primary diplopia, drop in CAS, improvement in QOL

www.thyroideyedisease.org

Summary
Safety and Cost

- XRT is safe (no systemic side effects)

- XRT is relatively inexpensive

Summary
XRT Usage (VISA Classification)

- **V:** (optic neuropathy/ON)
  
  - XRT better than steroids for:
    1. Preventing onset of ON during active stage (CRISEPTED)
    2. Preventing surgery once ON present
    3. Reversing relapses post-surgery

- **I:** (inflammation)
  
  - i.v. Steroids rapid and effective (85%), but relapses common
  - XRT slower, but may allow weaning off medicines
  - Combination Steroid/XRT may be better than monotherapy

- **S:** (strabismus/motility)
  
  - XRT improves ultimate ductions and reduces need for strabismus surgery (based on 3 RCT)
  - XRT may reduce risk of primary diplopia in early active TED (CRISEPTED)
Compartmentalizing Periocular Reconstruction

Shannon S. Joseph, MD, MSc
Wilmer Eye Institute, Johns Hopkins University School of Medicine, Baltimore, MD

69-year-old man with melanoma in situ involving the right upper eyelid, lower eyelid, medial canthus, nasal side wall, medial upper cheek. He does not have significant facial laxity. He underwent melanoma square procedure for margin clearance followed by complete excision. He then underwent reconstruction of the defect in a compartmentalized fashion, including 4 different local advancement flaps, and a full thickness skin graft. He has mild right lower eyelid retraction post-operatively, improving with triamcinolone acetate injections and massage.
10:28 - 10:31 am

Glabellar inset flap from large bilobed forehead flap for squamous cell carcinoma to prevent lagophthalmos

Rachel K. Sobel, MD¹, Alexander Langerman²
¹Vanderbilt University Medical Center, Nashville, TN, ²Vanderbilt University Medical Center, Department of Otolaryngology, Nashville, TN

This is a 79-year-old male with a history of recurrent squamous cell carcinoma to the suprabrow region s/p chemotherapy and radiation. The excision was 5.3 x 4.2 x 1.2 cm with clear margins except for perineural invasion. A large bilobed forehead flap was elevated in conjunction with the otolaryngology team and a smaller inset glabellar flap was designed to prevent post operative lagophthalmos. Post operatively his flaps appear healthy and he has no lagophthalmos.

**Figure 1**

**Figure 2**
Sebaceous cell carcinoma with pagetoid spread of conjunctiva

Hunter Yuen, MD
Hong Kong Eye Hospital, Hong Kong

A patient with biopsy proven right upper sebaceous cell carcinoma who refused surgery initially. When she agreed for surgery, there was conjunctival pagetoid spread of superior bulbar conjunctiva.

Option of orbital exenteration was explained but she refused. We have performed en bloc resection of upper eyelid, fornix and the bulbar conjunctiva.
Eyelid Retraction with a Twist

Brett W. Davies, MD, MS, Scott E. Bevans
San Antonio Military Medical Center, San Antonio, TX

59-year-old male with history of assault 9 years previously, s/p R orbital floor and midface repair with titanium plates. Presented with 1 year history of multiple R sided orbital and sinus infections with drainage through an sino-cutaneous fistula. Pt also with significant right lower lid retraction causing dry eye symptoms. Taken to OR for removal of midface and orbital hardware, placement of iliac bone graft, closure of fistula, release of R lower lid scar tissue and lid recession with placement of paramedian forehead flap.
Split paramedial forehead flap

Raymond I. Cho, MD, FACS
The Ohio State University Wexner Medical Center, Columbus, OH

56-year-old male with BCCa involving L lower lid, medial canthus, lacrimal sac, lateral canthus, medial/lateral upper lid. Underwent wide local excision with frozen section control and primary reconstruction with paramedian forehead flap covering medial canthus/lower lid/lateral canthus/medial upper lid, tarsal conjunctival autograft to medial upper lid, and buccal mucous membrane posterior lamellar graft to lower lid. Paramedian forehead flap divided and debulked 6 weeks later.
10:57 - 11:00 am

**Bucket handle flap repair for full thickness eyelid defects**

Peter J. Dolman, MD, FRCSC  
*University of British Columbia, Vancouver, BC, Canada*

A 48-year-old man with an extensive squamous cell carcinoma had a defect involving the entire lower eyelid to the inferior rim and 75% of the upper eyelid including the entire posterior lamella of the upper lid. Reconstruction was aided by using a sliding bucket handle flap of skin and orbicularis muscle from the cheek with a posterior lamellar ear cartilage graft to recreate the lower lid, with a donor skin graft over the donor bed site.

*Figure 1*  
*Figure 2*  
*Figure 3*
Intimate Partner Violence in Ocular Trauma: What Every Oculoplastic Surgeon Should Know

Erin M. Shriver, MD¹, Ali R. Cohen, BS², Lynette M. Renner, PhD, MSW³, Thomas J. Clark, MD¹
¹Department of Ophthalmology, University of Iowa, Iowa City, IA, ²University of Iowa School of Medicine, Iowa City, IA, ³University of Minnesota, St. Paul, MN

Introduction: Oculoplastic surgeons treating patients with ocular and orbital trauma will encounter patients with injuries sustained from intimate partner violence (IPV). Despite the high prevalence rate of IPV in this patient population, little attention has been dedicated to this topic in the literature, particularly as it relates to ocular trauma. The purpose of the study is to determine the prevalence of IPV as a mechanism of traumatic ocular injury in females and to evaluate the clinical course of affected patients. The study aims to increase awareness regarding IPV in ocular and orbital trauma patients, highlight the severity of IPV-related ocular injuries, encourage appropriate IPV screening in female patients presenting with ocular and orbital trauma, and promote adequate assessment of patients’ home-going safety and involvement of ancillary services.

Methods: ICD-9 diagnosis codes and retrospective medical record review were utilized to determine the rate of IPV as a mechanism of ocular trauma in all female patients evaluated and treated for traumatic ocular injuries at a large academic Level I trauma center between January 1995 and January 2015. The types of ocular injuries sustained were classified and the patients’ clinical courses evaluated.

Results: One hundred ninety-six women sustained traumatic ocular injuries during the study period. The leading causes of traumatic ocular injuries in female patients were accidental trauma with an inanimate object (n = 69/196, 35.2%), falls (n = 51/196, 26.0%), motor vehicle collisions (n = 21/196, 10.7%), and assault (n = 16/196, 8.2%). In 2.0% of cases (n = 4/196), no mechanism of injury was documented. In cases of assault-related injury, an intimate partner was identified as the perpetrator in 31% (n = 5/16) of cases. A perpetrator was not documented in 19% of these cases (n = 3/16). All 5 patients suffering from IPV-related injuries sustained scleral laceration or rupture with 80% (n = 4/5) ultimately requiring enucleation.

Conclusions: More than 1 in 3 women in the United States will experience IPV in their lifetime. The natural history of IPV is marked by chronicity and escalating severity with IPV accounting for 42% of female homicides. Given that nearly half of all murdered women had a documented visit to an ER within 2 years of their death, detection of IPV by could potentially be life-saving.

The most common anatomical locations for IPV-related trauma include the head, neck, and face. Nearly half (45%) of female patients suffering trauma from IPV are struck directly in the eye(s). IPV has been found to be responsible for 7-14% of orbital fractures in females.¹

(continued)
This study demonstrates that IPV is an important mechanism of traumatic ocular injury in females. IPV-associated injuries were severe in nature as demonstrated by the high rate of globe laceration or rupture and subsequent enucleation. Through appropriate IPV screening in female patients presenting with severe traumatic ocular injuries and orbital fractures, oculoplastic surgeons have the potential to redirect a potentially devastating, even fatal, course. Following disclosure of IPV, patient home-going safety must be ascertained and appropriate referral should be provided.

References:
Meta-analysis of physician based surveys in OPRS

Roxana Fu, MD\textsuperscript{1}, Mark A. Prendes, MD\textsuperscript{1}, Alon Kahana, MD\textsuperscript{2}, HB Harold Lee, MD\textsuperscript{3}

\textsuperscript{1}University of Louisville, Louisville, KY, \textsuperscript{2}University of Michigan, Ann Arbor, MI, \textsuperscript{3}Indiana University, Indianapolis, IN

Introduction: To review physician based surveys published in the Ophthalmic Plastic and Reconstructive Surgery (OPRS).

Methods: A search was performed with the terms “survey” within the OPRS journal. Studies were included if they were physician based surveys, excluded if they were patient based questionnaires, non-clinical in nature (i.e. surveys regarding trainees), or were conducted as part of an investigation. This search resulted in 460 articles and after dual-investigator independent screening, 13 surveys remained.

Results: Of the 13 surveys published from 2007 to January 2017, two were published in 2010, then one published per year in 2007, 2009 and from 2011 to 2013. Six of the 13 surveys were published since 2015, showing an increased trend in survey based publications. Topics included assessing practice patterns regarding eyelid disorders (ptosis, dermatochalasis, blepharospasm, actinic keratosis), thyroid eye disease, optic nerve sheath fenestration, enucleation/evisceration and diagnosing lacrimal disorders. Average response rate was 38.2\% (range 17.5\% to 60\%), with 199.8 average number of replies (range 72-310). Four out of 13 surveys included statistical analysis with the remainder presenting data in percentages.

Conclusions: Recent increase in survey based publications are reviewed. Further studies are needed to assess the value and integration of the results of surveys amongst our subspecialty.
Formulaic approach to external levator resection through small-incision versus with blepharoplasty

Tal J. Rubinstein, MD, Daniel Repp, MD, Bryan Sires, MD, PHD
Allure Laser Center and Medispa, Kirkland, WA

Introduction: We describe a small-incision formulaic external levator resection technique with or without blepharoplasty.

Methods: This was a retrospective study of eyelids with involutional ptosis and normal levator function. After a small incision or blepharoplasty, 2 mm of aponeurosis for every 1 mm of desired lid height was resected based on predetermined goal MRD1. During resection, the aponeurosis was held at consistent tension from case to case, as the aponeurosis is extensible (Fig 1). The remaining aponeurosis was sutured to the tarsus at two standardized locations. Primary outcome for success was lid height within 1 mm of goal MRD1.

Results: Postop MRD1 was 3.2 mm with small incision and 3.0 mm with blepharoplasty (p = 0.25; Fig 2-4). There was no difference in the amount of lids with intraoperative suture adjustment, but more lids needed the lateral suture adjusted in the blepharoplasty group (p = 0.04). All lids met primary outcome in the small-incision group and 80% did in the blepharoplasty group, with 5 under- and 3 over-corrections of more than 1 mm compared to goal. Lids with blepharoplasty that did not meet the primary outcome at the first postop visit (6-15 days) were likely not to reach it in the final postop visit (odds ratio 21.8).

Results: This technique was satisfactory in reaching the primary outcome in the majority of lids. The results were less predictable in the blepharoplasty group. The results suggest that events at surgery and/or within the first week surgery in the blepharoplasty group may affect outcomes. Consideration should be given for unbundling the procedures.

(continued)
PROFESSIONALISM SESSION

References:
INVITED ASOPRS MEMBER SPEAKER

11:30 - 11:55 am

ABO 101: New directions for the American Board of Ophthalmology’s second century

George B. Bartley, MD
Introduction: To review the literature on orbital cholesterol granulomas and provide key imaging findings to differentiate it from clinically similar entities.

Methods: A PubMed literature search of previously published cases of cholesterol granulomas as well as synonymous terms such as “hematoma cyst,” “blood cyst,” “organizing hematoma” was performed and included along with a case report from our institution. Clinical data, radiological imaging, and histology were reviewed and added to data from previous systematic reviews for a total of 189 cases in the English literature.

Results: Most cases occurred in middle-aged men without a history of trauma. Among 189 cases, the most common presenting sign was proptosis (64.5%) followed by globe displacement (53%). 94% of cholesterol granulomas were found in the superotemporal orbit followed by the orbital floor (4%) and intraconal space (2%). Lesions found on the orbital floor were almost always associated with prior orbital floor fracture repair with implant. Lesions found in the superotemporal orbit were almost universally associated with bony changes similar to those that can be associated with malignant lesions.

Conclusions: Orbital cholesterol granulomas are rare lesions that should be considered in the differential diagnosis for an orbital mass with prominent bone erosion. Although their associated bony changes may simulate those caused by orbital malignancies, an orbital cholesterol granuloma has a distinctive appearance on MRI as a well-circumscribed, non-enhancing mass that is hyperintense on both T1- and T2- weighted imaging. This characteristic appearance on MRI imaging can be used to help differentiate it from orbital malignancies that can have similar clinical presentations.
**Figure 1**

Figure 1: Above: A 37-year-old male presents with progressive left hypoglobus and ptosis. Below: Three months following orbitotomy and incisional biopsy of the orbital lesion, there is complete resolution of hypoglobus.

**Figure 2**

Figure 2: Axial CT image showing a cystic lesion in the superomedial orbit with associated aggressive bony expansion of the superomedial orbital wall. Below: Coronal CT image showing a 13mm x 5mm lytic bony lesion with bony expansion and increase in density.

**Figure 3**

Figure 3: Left: Hematoxylin and eosin staining (H&E), the excised portion of the lesion shows a histiocytic cell population at different magnifications. Right: The lesion involved the soft-tissue and bony structures, with increased atypical vascular proliferation.

**Figure 4**

Figure 4: Left: The histology of the lesion shows a histiocytic cell population at different magnifications. Right: The lesion involved the soft-tissue and bony structures, with increased atypical vascular proliferation.
Primary mucinous carcinoma of the eyelids: Clinical and histochemical study of 5 cases over 20 years

Pari Shams, MD1, Allan Ah-Weng, MD2, Caroline Thaung, MD1, John Bladen, MD1
1Moorfields Eye Hospital, London, UK, 2Croydon University Hospital, London, UK

Introduction: To report the presentation, immunohistochemical profile, management and outcome of primary mucinous carcinoma affecting the eyelid, a low-grade malignant tumour arising preferentially on the head and neck, with historically high rate of recurrence of up to 40% but low metastatic potential.

Methods: Retrospective case series of 9 patients diagnosed with Mucinous carcinoma at Moorfields Eye Hospital between 1997-2017. 5 patients were identified with primary mucinous carcinoma of the eyelid. 4 patients were excluded; one affecting the lacrimal system, one with an ovarian metastasis and 2 with incomplete medical records. Patients medical records were examined and Histology slides were reviewed.

Results: Demographics: mean age 79 (range 63-89), 2 female, 3 male. Incisional biopsy eluded the diagnosis and full body PET and MRI scans were performed to exclude metastasis. This guided the use of Mammogram, gastrointestinal endoscopy, USS and FNA of lymph nodes in selected cases. No patient had another documented malignant tumor at the time of diagnosis. There were disparate ethnicities 1 black Ghanian, 1 black Caribbean, 2 Indian Asians and 1 white British. Presenting size of tumor > 1cm. All patient presented with a 1-2 year history of an eyelid lump involving skin and one was a local recurrence on the tarsal plate. Three underwent simple excision but recurred (100%); two of these underwent further simple excision, one underwent Mohs micrographic surgery (MMS). Two patients had MMS initially with no recurrence. No metastasis were identified and all patients remain alive today. All tumours were strongly positive for cytokeratin 7, oestrogen receptor (ER), progesterone receptor (PR) and Alcian blue (mucous stain). They were negative for cytokeratin 20 and carcinogenic embryonic antigen.

Conclusions: Primary mucinous carcinoma is a rare sweat gland tumour with a predilection for the eyelid, slow growing and a high rate of recurrence, 60% in this series with simple excision only. PET scanning should be performed to exclude metastatic mucinous adenocarcinoma from extracutaneous organs and increasingly immunohistochemistry is aiding to differentiate these tumors from metastatic mucinous adenocarcinomas. In addition, metastatic breast cancer should be excluded in light of the ER/PR status. Conventional excision can result in recurrence and MMS may be a preferential treatment modality to prevent local recurrence.

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References:
A 54-year-old Caucasian female with a history of basal cell carcinoma of the right lower eyelid and nasal sidewall presented to clinic five years status post two resections and reconstruction by a different provider. The patient was noted to have a further recurrence and was sent to an otolaryngologist for evaluation and then to oculoplastic surgery for possible combined surgical planning. Examination revealed a hard mass originating inferiorly from the right medial canthus, involving approximately 50% of the medial right lower lid, extending over the nasolacrimal sac and to the previously placed skin graft. On MRI, the mass involved the ethmoid and maxillary sinuses and the inferior orbit. She underwent a combined case with ENT, oculoplastic surgery and plastic surgery involving a complex tumor excision, an orbitotomy to remove bone and tumor with placement of an orbital implant, a Hughes flap for eyelid reconstruction and placement of a radial arm free flap. The free flap failed days later despite several trips to the OR to salvage the flap. A glabellar flap was instead created on a separate trip to the operating room and a cervicofacial flap advanced medially to help cover the defect. The orbital implant was later removed due to exposure. She lost vision in the eye thought secondary to vascular compromise and has now developed epiphora from lack of a tear drainage system, hypoglobus and resulting facial deformity from multiple surgeries. This case highlights the difficulties of reconstruction of large facial defects in light of free flap failure and paucity of tissue. We would like input from the experience of the group on what to do next without the option of a free flap due to vascular insufficiency.
A 46-year-old Caucasian woman was referred with both a nasal visual field defect and loss of visual acuity in the right eye. An examination just two months prior revealed visual acuity of 20/30 OD, with a nasal visual field defect of the right eye near fixation, with a mean deviation of -13.8dB. The visual field in the left eye was normal. The patient had a history of migraines and was taking topiramate 100mg daily for the prior 15 months and was also taking an oral contraceptive. The patient’s medical and ophthalmic history were otherwise unremarkable. She had undergone an MRI revealing a right orbital apical lesion, abutting the optic nerve, measuring 5 x 5 x 10mm (Figures 1,2,3). The lesion was well-defined, dark on T1-weighted images, bright on T2-weighted images, and enhanced with gadolinium.

At presentation, her VA was 20/70 OD, 20/20 OS with normal pupils, color vision, extraocular movements, intraocular pressures, and anterior chamber depth. Dilated funduscopic examination revealed blunted foveal light reflex bilaterally, with normal optic nerves and retinal periphery.

A new visual field was performed; it revealed significant progression of the right visual field defect, with a mean deviation of -22.9dB (Figure 4). An OCT demonstrated bilateral, symmetric, cystic subfoveal changes in the inner and outer plexiform layers, subfoveal loss of the ellipsoid layer and the external limiting membrane, and cystic disruption of the outer nuclear and outer plexiform layers. The inner nuclear layer was thinned. No chorioretinal folds were seen and there was no evidence of vitreomacular traction.

The case is presented for discussion of management.
An arteriovenous malformation masquerading as a rhabdomyosarcoma

Kristen E. Dunbar, MD, Ashley A. Campbell, MD, Michael Kazim, MD
Edward S. Harkness Eye Institute, Columbia University Medical Center, New York, NY

A 15-month-old previously healthy male was referred for biopsy of a presumed rhabdomyosarcoma. His symptoms included several months of progressive, left-sided proptosis and an intermittent left esotropia previously diagnosed as pseudostrabismus. Examination revealed left-sided periorbital edema and inferior displacement of the globe. The remainder of the afferent and efferent exam was normal. The T2-weighted MRI revealed a soft tissue density mass lesion within the left lateral retrobulbar space. Like a rhabdomyosarcoma, it was T2 hyperintense; however, the hint of flow voids suggested that this lesion might have a different composition than initially noted on outside imaging [Figure 1]. Shortly thereafter, the boy developed acute periorbital ecchymosis. [Figure 2]. Other aspects of the examination remained unchanged. Given the suspicion for a vascular lesion, a CT was performed with dynamic arterial and venous imaging [Figure 3]. Central filling was noted in the lateral retrobulbar component with increased enhancement on delayed venous imaging in the middle cranial fossa component favoring the diagnosis of a veno-lymphatic malformation. In the setting of spontaneous orbital hemorrhage and concern for potential irreversible vision loss, the decision was made to proceed with a combined neurosurgical approach treating the intracranial component of the malformation which was found to be adherent to the dura and debulking the orbital component [Figure 4]. Post-operatively, the patient’s examination returned to normal with no subsequent episodes of orbital hemorrhage. This case highlights the importance of maintaining suspicion for a vascular lesion and carefully reviewing imaging before proceeding with a biopsy that could have vision or life-threatening consequences.
Asymptomatic Adenoid Cystic Carcinoma of the Lacrimal Gland Diagnosed after Orbital Trauma

Thomas Kandl, MD¹, Oded Sagiv¹, Sudip Thakar¹, Mithra O. Gonzalez, MD², Bita Esmaeli, MD, FACS¹
¹The University of Texas MD Anderson Cancer Center, Houston, TX, ²University of Rochester School of Medicine and Dentistry, Rochester, NY

A 32 year old man presented to an outside facility for evaluation after trauma to his right orbit. Examination of his right eye was significant for a choroidal hemorrhage with a visual acuity of 20/50. His left eye exam was unremarkable with a visual acuity of 20/20. A non contrast CT was performed as part of the initial trauma evaluation. On imaging, there was an incidental finding of a well circumscribed mass of the left lacrimal gland. This lesion was completely asymptomatic. The working diagnosis was a possible pleomorphic adenoma. A left anterior orbitotomy and gross total resection of the lacrimal gland mass was attempted. The pathology report suggested an adenoid cystic carcinoma of the lacrimal gland. The patient underwent a second orbitotomy with goal of gaining clear margins; pathologic review of tissue removed during the second surgery was negative for tumor. The patient was then referred to our facility for additional evaluation and management. This case is being presented because of its unusual asymptomatic presentation and the treatment challenges that followed.

References
Total excision of a large cranial-orbital distensible venous malformation

David Liu, MD, Cuihong Liu
Xi’an No.4Hospital, Shaanxi Ophthalmology Medical Center, Xian, China

A patient with a large complex orbital/facial distensible venous malformation is presented emphasizing attention to mapping, embolization and the use of adjunct external neck compression.
The case involved a 74 year-old cachectic male presenting acutely to the emergency department with bleeding from the left eye. A 2-month history of an enlarging periocular mass that initially began in the left upper eyelid was provided. Past medical history was significant for NIDDM, HTN and atrial fibrillation. There was no history of cancer. On examination, corrected distance visual acuity was 20/50 OU. Pupils and color testing were within normal limits. Extraocular movements were restricted in all fields of gaze especially in adduction and infraduction on the left side. External examination revealed soft tissue masses of the left upper lid and lower lid/maxilla with tumor extending from the inferonasal fornix obstructing the visual axis. There was proptosis with supralateral globe displacement OS. Orbital MRI revealed a large, multilobulated and homogeneously enhancing soft tissue mass centered in the left medial orbit with anterior extension involving the periocular tissues. An urgent biopsy was performed. Flow cytometry was non-diagnostic. Immunohistochemical staining demonstrated large lymphoid cells that were positive for CD138, CD56, and MUM-1 with kappa restriction. Immunostains for CD79a is positive in rare scattered cells but negative for CD20. In situ hybridization for EBV was strongly positive. These findings supported the diagnosis of a plasmablastic lymphoma with plasmacytic differentiation. PET/CT demonstrated a left thigh mass, as well as peritoneal carcinomatosis. Biopsy of the leg mass confirmed the diagnosis of PBL. Bone marrow biopsy was negative and attributed to the primary disease being focal. The patient received Involved-Field Radiation Therapy of 30 Gy in 15 fractions to the left orbit. He was then begun on lenalidomide and over the course of a month has responded well to therapy with significant resolution of the orbital disease.
LACRIMAL SESSION

8:45 - 8:50 am

Lacrimal Gland Stimulation vs. Nasal Stimulation to Increase Aqueous Tear Secretion: How we got here

Andrea L. Kossler, MD\textsuperscript{1}, Mark Brinton, MD\textsuperscript{2}, Christopher Ta, MD\textsuperscript{1}, Koung Hoon Kook, MD\textsuperscript{3}, Daniel Palanker, MD\textsuperscript{1}

\textsuperscript{1}Department of Ophthalmology, Stanford University, Stanford, CA, \textsuperscript{2}Electrical Engineering Department, Stanford University, Stanford CA, \textsuperscript{3}Ajou University School of Medicine, Ophthalmology, Suwon, Korea

Introduction: In United States, approximately 20 million Americans suffer from dry eye disease and it is a leading cause of eye morbidity. This multifactorial process results from a tear film disorder due to aqueous tear deficiency or meibomian gland dysfunction resulting in ocular discomfort, visual disturbance, and tear film instability. Neurostimulation has been previously reported to increase aqueous tear production for the treatment of dry eye disease. Here, we evaluate and compare two methods to increase aqueous tear volume through neurostimulation of the lacrimal gland and anterior ethmoid nerve.

Methods: Two experimental animal studies were performed. The first study involved five white New Zealand rabbits that underwent implantation of a neurostimulator beneath the periosteum of the inferior orbital floor, adjacent to the inferior lobe of the lacrimal gland. The second study involved six white New Zealand rabbits that underwent implantation of a neurostimulator beneath the mucosa of the nasal septum, adjacent to the anterior ethmoid nerve. In each study the corresponding targets were stimulated (~2.8 mA pulses at 30 Hz for 3-5 minutes daily). Tear volumes were measured with Schirmer test strips and scores were compared to the sham (no stimulation but with a transmitter next to the animal) and baseline (no transmitter).

Results: Lacrimal gland stimulation (LGS) engages the efferent parasympathetic nerve to increase tear volume by 57% above baseline, \( p < 0.01 \) (\( n = 5 \)). Anterior ethmoid nerve stimulation (AENS) increases tear volume by 133% above baseline, \( p = 0.01 \) (\( n = 6 \)). Interestingly, tear secretion after AENS significantly increased in the fellow, non-stimulated, eye compared to baseline and sham, \( p = 0.01 \) (\( n = 6 \)), suggesting simulation of the afferent arc of the tearing reflex pathway. Lacrimal gland neurostimulator implantation is well tolerated with no gross systemic effects to the health of the animals, however, ex-vivo assessment showed some damage to acinar cell membranes with chronic lacrimal gland stimulation. Nasal septum neurostimulator implantation did not show any gross systemic effects to the health of the animals however ex-vivo assessment showed mucosal damage at the superior most edge of the mucosa.

Conclusions: Neurostimulation of the lacrimal gland and anterior ethmoid nerve significantly increases aqueous tear secretion. Anterior ethmoid nerve stimulation is more effective at enhancing tear secretion than lacrimal gland stimulation. Moreover, AENS significantly increases tear secretion in the stimulated eye and fellow, non-stimulated eye, suggesting stimulation of the tearing reflex pathway. Additional studies will explore the quality of the electrically-enhanced tear composition and its impact on dry eye disease in animal models. Further studies are necessary to improve the implantation device and technique and to verify these results.
(continued)

References:
Retrieval of dacryolith during routine endoscopic dacryocystorhinostomy: risk factors, presenting signs and surgical outcomes

Rayna Piskova, MD, Francesca Nesi-Eloff, MD, Evan H. Black, MD, FACS
Consultants in Ophthalmic and Facial Plastic Surgery, Southfield, MI

Introduction: This study was designed to determine if concurrent surgical removal of dacryoliths affects surgical outcome. Presenting signs and risk factors are also examined.

Methods: A retrospective case series was done, involving the review of charts in our practice of patients who underwent endoscopic DCR with removal of dacryoliths from 2010 to 2016. 8 patients’ records were studied.

Results: Dacryolithiasis has a variety of presenting symptoms which can vary from purulent discharge and medial canthal swelling to asymptomatic. Of the 8 cases we studied, there was a female predominance. Removal of dacryolith via the endoscopic approach revealed no recurrence of dacryolithiasis but one case performed with the endoscopic laser did require future intervention and eventual successful Jones tube placement.

Conclusions: While no recurrence of dacryolith formation occurred, the simultaneous removal of dacryolith via the endoscopic approach did not prognosticate improved surgical success rates.

(continued)
LACRIMAL SESSION

(continued)

References:
8:55 - 8:58 am

**Severe Epistaxis After DCR Treated With Arterial Embolization**

Silvia Rodrigues, MD, Murilo Alves Rodrigues, MD, Cristiana Cardoso Musaccachio, Rogerio Zenobi Darwich  
*Hospital Vila da Serra, Belo Horizonte, Brazil*

A 76-year-old male patient was submitted to a standard right eye DCR. On immediate pos-op, he presented a severe epistaxis that was immediately treated with nasal packing. He had another episode of bleeding 12 hours later that was controlled with cold compress. However, 24 hours later, the patient presented a third bleeding that even with a posterior nasal packing could not control. We decided to refer the patient to interventional radiologist. Angiogram revealed an arterial variant and embolization was successfully performed with plastic microparticle on distal branches of right internal maxillary artery.

Bleeding is a common complication in DCR surgery. A multi-disciplinary team is required when dealing with this life treating complication.

As far as we know, this is the first case of post-DCR epistaxis treated with embolization.

*Figure 1*  
*Figure 2*
PRACTICE MANAGEMENT SESSION

Saturday, June 24

9:05 - 9:50 am

Medicare Rules and RAC Audit

Panelists/Moderators: Stuart R. Seiff, MD, FACS, Jeffrey P. Edelstein, MD, Mark L. Mazow, MD, Tom Wood
Lower Blepharoplasty in Eyelids Previously Injected with Hyaluronic Acid Gel Filler

Mehryar Taban, MD
Private Practice, Beverly Hills, CA, UCLA, Los Angeles, CA

**Introduction:** As under eye filler injection has become widespread, it is important to understand possible differences and outcome of lower blepharoplasty in these patients. The purpose of this study is to describe the author’s experience to address under-eye fat prolapse (via lower blepharoplasty) in patients with “residual fullness” after previous eyelid hyaluronic acid gel filler injections.

**Methods:** Retrospective analysis of all patients undergoing (transconjunctival) lower blepharoplasty (with fat repositioning) by one surgeon from 2013-2015 in eyelids previously injected with hyaluronic acid gel. Analysis included 15 patients with “residual” fullness in the under-eye area after previous hyaluronic acid gel (+/- hyaluronidase) injection(s) who underwent lower blepharoplasty. Preoperative and postoperative photographs at the longest follow-up visit were analyzed by blind observers. Minimum follow up time was 6 months. Patient satisfaction was recorded using questionnaire. Surgical anatomy was observed and analyzed.

**Results:** The surgical anatomy was slightly to moderately distorted with soft tissues (orbital fat, SOOF fat, orbicularis oculi muscle) being more “spongy” with less clear delineation of surgical landmarks, septa and fat pads. Total of 15 patients (28 eyelids) underwent lower blepharoplasty in eyelids previously injected with hyaluronic acid gel (latter to treat under-eye hollowness (tear-trough deformity) and/or to camouflage under eye fat prolapse (“bags”)). There were 13 females and 2 males, with mean age of 47 years old (range, 28-68 years old). All patients had at least one prior treatment with hyaluronic acid gel injection with “residual fullness”. 10 patients had also received at least 1 previous hyaluronidase injection. The average follow-up after surgery was 9 months (range, 6 months to 2 years). All patients reported satisfaction with the surgical outcome. There were no complications and no re-operations. 3 patients received “touch-up” hyaluronic acid gel injection after lower blepharoplasty.

**Conclusions:** Lower blepharoplasty has a definite role in patients previously treated with under eye hyaluronic acid gel injections. It can be done safely and effectively to address “residual fullness” after previous hyaluronic acid gel filler (+/- hyaluronidase) injections. Given the anatomical changes that do occur after filler injection, “revision” lower blepharoplasty is a more proper term.

(continued)
AESTHETIC SESSION

(continued)

References:
Microanatomical Location of Hyaluronic Acid Gel Following Injection of the Vermillion Border of the Upper Lip: Comparison of Needle and Microcannula Injection Technique

Alexander Blandford, MD¹, Catherine J. Hwang, MD¹, Thomas P. Plesec², Julian D. Perry, MD¹
¹Cole Eye Institute, Cleveland Clinic Foundation, Cleveland, OH, ²Department of Anatomic Pathology, Cleveland Clinic Foundation, Cleveland, OH

Introduction: Purpose: To compare needle and microcannula injection techniques in regards to the microanatomical location of hyaluronic acid gel injected in the upper lip vermillion border of fresh frozen cadavers.

Methods: The upper vermillion border was injected transcutaneously with hyaluronic acid gel in 8 fresh frozen hemifaces of 4 female human cadavers. Each hemiface was injected by a single experienced injector, the right side using a 27-gauge microcannula and the left side using a 30-gauge needle. A 2cm region of each lip was excised lateral to a point 1cm lateral to the philtrum. Specimens were fixed in 95% alcohol, embedded in paraffin, and stained with hematoxylin and eosin for histologic examination.

Results: The majority of hyaluronic acid injected with either a needle or microcannula was located within the orbicularis oris muscle, and the remaining hyaluronic acid resided within the subcutaneous fat. In 3/4 left (microcannula) hemifaces, 100% of the hyaluronic acid was located within the muscle. Only 2/4 right (needle) hemifaces had at least 95% of the hyaluronic acid located within the muscle. Overall, in left (microcannula) hemifaces 93% of the filler was located within the muscle and in right (needle) hemifaces 79% of the filler was located within the muscle (p =0.14).

Conclusions: The majority of hyaluronic acid filler injected into the vermillion border after either microcannula or needle injection resides within the orbicularis oris muscle rather than in a subcutaneous/submucosal location. Injection with a microcannula shows a trend for more uniform intramuscular location compared to needle injection.
AESTHETIC SESSION

(continued)

References:
INVITED ASOPRS MEMBER SPEAKER

10:40 - 11:00 am

The Evolution of Botulinum Toxin

Jean D. Carruthers, MD, FRCSC

Jean Carruthers Cosmetic Surgery, Inc., Vancouver, BC, Canada
TRAUMA SESSION

11:10 - 11:15 am

Entrapped posterior orbital floor fractures

Michael K. Yoon, MD, Juan Carlos Jimenez-Perez
Massachusetts Eye and Ear Infirmary, Boston, MA

Introduction: Orbital fractures are common injuries, representing 25% of facial fractures.\(^1\) Diplopia commonly results from these fractures, although generally is transient and secondary to soft tissue edema. Entrapment of the muscles is relatively rare, particularly in adults, where comminuted fractures are less prone to incarcerate rectus muscles as in white eyed blow out fractures.\(^2,3\) We have encountered a specific phenotype of posterior orbital floor fracture (POF) with severe herniation of the inferior rectus causing entrapment and poor motility and describe our experience treating it.

Methods: A retrospective, case controlled series of patients with orbital floor fracture repair in a 6 year period. Inclusion criteria were POF with inferior rectus herniation as seen in sagittal view of CT scan (Figure 1) and complete ophthalmologic examination. A case control group (3:1) with similar demographics but without POF was identified for comparison. (Figure 2) Baseline characteristics, motility, time to surgery, post-operative findings, need for post-operative imaging, and need for reoperation were recorded.

Results: In our series, nine patients with a mean age of 35 years (range, 18-89 years old) were included, with a similar control group of 27 patients identified. All patients in the study group had symptomatic diplopia (100%) and EOM limitation (100%) on presentation. In the control group, 52% had symptomatic diplopia and 67% had EOM limitation on presentation. Time between trauma and presentation was approximately 5 days in the study group and 14 days in the control group. Time between presentation and surgery was approximately 2 days in the study group and 15 days in the control group. Following surgery, 78% in the study group had persistent EOM limitation compared to 22% in the control group. Two patients in the study group required imaging after surgery for persistent diplopia. The first patient’s scan demonstrated a well-reduced fracture and implant position. The second patient continued to have downgaze restriction five months later despite revision surgery.

Conclusions: POF with inferior rectus muscle herniation is an uncommon subtype of fracture with a worse prognosis than unentrapped fractures. These patients had a higher percentage of pre- and post-operative EOM dysfunction. Despite earlier intervention compared to the control group, the patients with POF had persistently worse diplopia and EOM limitation outcomes. This type of fracture is best seen on CT scan with a sagittal view, which is now almost universally available with thin cut reconstructions, making recognition easier. We hypothesize that incarceration of the soft tissues with possible scarring or hematoma prevents restoration of normal motility. If a POF is present, we recommend immediate surgical repair, similar to pediatric trapdoor fractures, although outcomes may still be limited due to the severity of injury.

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**Figure 1**
Orbit CT scan, sagittal views of four different patients demonstrating posterior orbital floor fracture with bowing of inferior rectus muscle.

**Figure 2**
Sagittal view of orbital CT scan showing orbital floor fracture without inferior rectus muscle herniation.

References:
Traumatic Optic Neuropathy Treatment Trial (TONTT); A Prospective Multicenter Semi-Experimental Trial

Mohsen Kashkouli, MD\textsuperscript{1}, Sahar Yousefi, MD\textsuperscript{1}, Mohammad Etezad Razavi\textsuperscript{2}, MD, Morteza Entezari\textsuperscript{3}, Mohammadreza Razeghinejad\textsuperscript{4}

\textsuperscript{1}Iran University of Medical Sciences, Tehran, Iran, \textsuperscript{2}Mashad University of Medical Sciences, Mashad, Iran, \textsuperscript{3}Beheshti University of Medical Sciences, Tehran, Iran, \textsuperscript{4}Shiraz University of Medical Sciences, Shiraz, Iran

Introduction: IV erythropoietin (EPO) was firstly commenced for the treatment of indirect traumatic optic neuropathy (TON) by our group in 2011. This multi center trial was designed to compare its effect with IV steroid and observation (ClinicalTrial.gov, NCT01783847, 02/01/2013) in patients with TON.

Methods: Included were age = 5 years and trauma treatment interval of = 3 weeks. BCVA, Color, and RAPD were recorded pre- and 1, 2, 3, 7, 14, 30, and at least 90 days after treatment. There were 3 groups: EPO (20,000 units/ day for 3 days), methyl prednisolone (250 mg 4 times daily for 3 days), and observation. Systemic examination and blood tests were performed pre-treatment and 3 and 7 days after treatment. Improvement was assessed based on $=0.3$ LogMAR decrease in BCVA and Improvement percentage (Formula).

Results: Out of 120 patients, 100 (EPO: 69, Observation: 16, and steroid: 15) were included in the analysis. No variable was significantly different between three groups before treatment. All 3 groups showed a significant improvement of BCVA which was not (adjusted for pretreatment BCVA) significantly different between the groups. EPO group showed an insignificantly better improvement. Improvement of vision was observed in 27% of 41 patients with NLP which was not significantly different between three groups. While color vision significantly improved just in the EPO group, RAPD was improved in all three groups. Patients with age > 25 years, male gender, earlier treatment (= 3 days), and car accident showed a better outcome in which earlier treatment was significant ($P= 0.02$). Whereas, initial VA of NLP, ethmoid and sphenoid fracture showed a worse outcome in which initial NLP vision reached the significance ($P=0.001$). No side effect was observed in any group.

Conclusions: A significant improvement of BCVA was observed in all 3 groups with no significant difference. Color vision improvement was only significant in the EPO group. Initial VA of NLP and late treatment (>3 days) were significant risk factors for visual improvement.
Optic nerve stretch without orbital hemorrhage in anterior skull base fractures

Sarah DeParis, MD, Nicholas Mahoney, MD
Wilmer Eye Institute, Johns Hopkins Hospital, Baltimore, MD

Introduction: Straightening of the optic nerve with or without posterior globe tenting in the absence of orbital hemorrhage may be a sign of cerebrospinal fluid (CSF) leak in the setting of anterior skull base fractures.

Methods: A single case is reported, and a retrospective review was performed of 130 consecutive orbital fractures presenting to the emergency department of a single institution.

Results: A 28-year-old male patient suffered a gunshot wound to the face resulting in extensive fractures of the face and anterior skull base (Figure 1). Three days later, he developed new imaging findings of optic nerve stretch with tenting of the posterior globe bilaterally (Figure 2). He subsequently underwent bicoronal craniotomy with repair of lacerated dura of the anterior fossa with an autologous pericranium flap. On follow up imaging at postoperative month 2, his optic nerve stretch and tenting of the globe had resolved (Figure 3).

In a review of 130 consecutive orbital fractures, five additional patients with anterior skull base fractures were identified with unilateral or bilateral optic nerve straightening without orbital hematoma. Three additional patients with anterior skull base fractures did not have straightening of the optic nerve or globe tenting.

Conclusions: Orbitorrhea has been described as leakage of CSF into the orbit, with oculorrhea (extravasation of CSF through the ocular surface) rarely occurring (Chi 2014, Salame 2000).

On review of 130 orbital fractures, we then identified 8 patients with anterior skull base fractures, 5 of which were found to have straightening of the optic nerve in the absence of intraorbital hematoma. Three additional patients with anterior skull base fractures were not found to have optic nerve straightening.

Stretch or straightening of the optic nerve with or without posterior globe tenting can be seen as a sign of CSF leak in the presence of anterior skull base fractures. This finding is likely due to mass effect from CSF orbitorrhea. The finding of optic nerve straightening on imaging may aid in diagnosis of CSF leak and management of such fractures, for example with fractures of the frontal sinus, in which the presence of a CSF leak may be an indication for repair (Chen 2006).

(continued)
Figure 1

Figure 2

Figure 3

References:
11:25 - 11:28 am

**Warfarin-associated delayed orbital hemorrhage after orbital fracture repair with smooth nylon foil implant**

Pimkwan Jaru-ampornpan, MD¹, Shannon S. Joseph, MD, MSc¹, Ana B. Diniz Grisolia¹, Cesar A. Briceno, MD²

¹Kellogg Eye Center, University of Michigan, Ann Arbor, MI, ²Scheie Eye Institute, University of Pennsylvania, Philadelphia, PA

The authors describe a case of delayed orbital hemorrhage following an orbital fracture repair with nylon foil implant that may be partly caused by supratherapeutic anticoagulation. A 52-year-old man presented with acute-onset left orbital pain, lower lid swelling, proptosis, and double vision for 3 days. Nine months prior to presentation, he had sustained left orbital trauma which resulted in blowout fractures of the left orbital floor and underwent orbital fracture repair with placement of a 0.6 mm smooth nylon foil implant. At his 5-month follow-up visit, he was noted to have full extraocular movements without enophthalmos. He sustained no additional orbital trauma and had no additional orbital surgery after his repair. Of note, he was diagnosed with atrial fibrillation 3 months after his orbital surgery, and was started on warfarin. On the day of presentation, his INR was supratherapeutic at 3.2. Examination revealed normal visual acuity. There was no afferent pupillary defect. The left eye had mildly limited supraduction. There was 3 mm of left proptosis and hyperglobus (Fig. 1). CT of the orbits with contrast revealed a homogeneously enhancing mass along the left orbital floor surrounding the orbital implant, concerning for an acute orbital hematoma within the capsule of the implant (Fig. 2). He was started on oral steroids and antibiotics, monitored closely for 3 weeks without significant improvement in his diplopia, extraocular movement or proptosis. During this time, his INR was normalized and he received preoperative clearance for surgery from his cardiologist. Warfarin was held for 5 days prior to surgery. Surgical drainage of the orbital hematoma and removal of the orbital implant was performed. A transconjunctival approach was used to expose the orbital floor implant and its capsule, and the hematoma was drained. The nylon foil implant was removed. At one-month follow-up, the patient had full ductions, no diplopia, and 1mm of enophthalmos.
Ocular and Orbital Electrical Injury

Matthew M. Zhang, MD, Jacqueline R. Carrasco, MD, FACS, Mary A. Stefanyszyn, MD
Wills Eye Hospital, Philadelphia, PA

We report a case of electrical burn resulting in progressive destruction of the globe, eyelid, and orbital tissue. A 28-year-old male had direct contact with a current of 1500 amps and 28 volts while welding. The visual acuity was 20/80 OS. External examination showed erythema and eschar of the left upper lid with supraduction and infraduction deficit. SLE revealed corneal epithelial defect, corneal edema, and +3 cell and flare. DFE showed superior peripheral retinal whitening consistent with a retinal burn. The patient was admitted and treated with IV and topical antibiotics. After 1 week, the patient had sloughing of the medial upper eyelid, corneal melting, anterior uveitis, and visual acuity of 20/400. Due to the loss of upper lid tissue, a tarsocconjunctival flap was developed from the lower lid for globe coverage. Three weeks post injury, 75% of the upper lid had necrosed, and the tarsocconjunctival flap had dehisced. There was necrosis of superonasal orbital tissue and scleral melt with uveal and vitreous prolapse superonasally. The visual acuity declined to hand motions. Enucleation was performed. The upper lid defect was reconstructed with a tarsocconjunctival flap from the lower lid and local skin flap. Histopathology revealed a perforating scleral wound with acute keratitis, chronic uveitis, hypopyon, and necrosis of the uvea and retina. Siderosis was present in the vitreous and along the necrotic orbital tract. The superior rectus muscle had inflammation and extensive necrosis.

Electrical injury causes instant thermal coagulative necrosis and vascular thrombosis. In addition to the thermal damage, delayed necrosis occurs due to electroporation, which causes disruption of cell membranes and increased permeability resulting in prolonged and unpredictable tissue loss. Discussion of electrical injury, ocular complications, and management will be reviewed.
A Case of Osteo-symblepharon after Twelve Reconstructive Surgeries following Trauma

Kian Eftekhari, MD
University of North Carolina, Chapel Hill, Department of Ophthalmology, Chapel Hill, NC

A 40-year-old woman developed cicatricial right lower eyelid retraction following a motorcycle accident four years prior to presentation. She had undergone 12 previous surgeries related to the facial injuries including initial repair of bilateral ZMC fractures & subsequent procedures over four years to address lower eyelid malposition with severe cicatricial scarring via lower eyelid wedge excision, then post-auricular graft placement, then a transposition flap from the right upper eyelid to the right lower lid with Enduragen. Three years after injury, after additional porcine acellular dermal matrix placement failed, she underwent right inferior rectus recession and her inferior conjunctiva was severely scarred such that bare sclera was exposed to orbital rim. She then had additional strabismus surgery and a Hughes tarsoconjunctival flap. By this time, she had developed extensive lagophthalmos & a Gunderson flap was placed to protect the cornea.

She presented to us at this point (Fig 1). Given the extensive cicatrix of eyelid to bone, we first removed all titanium plating and she experienced mild improvement. We hypothesized that the failure of her prior eyelid surgeries may have been related to insufficient vascular supply, which would explain the cycle of scarring after surgical manipulation. In fact, her lower eyelid skin resembled the dermatologic changes that can occur with vascular occlusion after filler injection (Fig 2). Therefore, decision was made to avoid free grafts. We performed a cervicofacial flap to the right lower eyelid with a turnover pedicle of deep cheek fat (Fig 3) to provide blood supply & volume. Intraoperatively, she was noted to have extensive symblepharon of the eyelid to bone at the inferior orbital rim, along with globe adhesion to the rim. Because she was an active smoker, topical nitroglycerin ointment was prescribed post-operatively to maintain flap vascularity and the flap remained healthy post-operatively (Fig 4).
Transcranial penetrating injury involving bilateral orbital apices and the skull base

Audrey Ko, MD, Amir Marvasti, Don O. Kikkawa, MD, FACS, Bobby S. Korn, MD, PhD, FACS
UC San Diego, La Jolla, CA

Introduction: To present a case of a transcranial trauma from a railroad spike involving both orbital apices and skull base.

Methods: A retrospective case report.

Results: A 61-year-old male was brought to the emergency room. He had a foreign body firmly lodged at the left temple and a subcutaneous protrusion in the contralateral temple (Fig 1). There was 2mm of relative left exophthalmos. Visual acuity was unobtainable and the pupils were nonreactive and fixed at 4mm bilaterally. There was no optic nerve edema bilaterally, but the left optic nerve was pale. The CT scan showed extensive beam-hardening artifact; therefore, x-rays and 3D rendering were used to further characterize the metallic foreign body (Fig 2).

Emergent cerebral angiography showed complete occlusion of the left ophthalmic artery (OPA) but otherwise no evidence of intracranial vascular injury (Vid 1). In the operating room, bilateral carotid exposure was first achieved to allow for control of possible intracranial hemorrhage. The foreign body extraction was followed with direct endoscopic visualization, which surprisingly showed only a small arterial bleed. A communicating transcranial defect was visualized after removal of the foreign body (Vid 2), which was identified as a railroad spike (Fig 3). Repeat cerebral angiography showed persistent occlusion of the left OPA without flow-limiting stenosis.

Postoperatively, there was no improvement in vision. At 5-month follow-up, the patient regained right upper eyelid function and ocular motility, but continued to have complete left upper eyelid ptosis and frozen globe. The optic nerves were pale and vision was no light perception bilaterally.

Conclusions: Intracranial foreign bodies need careful characterization preoperatively with cerebral angiography. Carotid artery exposure is a method of intracranial hemostatic control when cautery is not possible. X-rays and 3D image rendering can characterize metallic foreign bodies causing artifact obscuring images on CT.

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(continued)

**Figure 1**

**Figure 2**

**Figure 3**
Advances in military ocular and combat casualty care: translating lessons learned in war to peacetime practice

Robert A. Mazzoli, MD. FACS
DoD-VA Vision Center of Excellence, Washington, DC

It is widely held that the only beneficiary of war is medicine. Current conflicts support this premise. Despite historically high rates of eye injuries and devastatingly complex systemic traumas, US combat casualties have an unprecedented survival rate of approximately 95%, a result of deliberate systems-level improvements in prevention, communication, evacuation, and treatment. Predictably, hard-learned lessons from the battlefield inevitably make their way to civil care.

Ocular casualty care has similarly benefited. Working under extreme duress and severe limitations of personnel, equipment, and time, military ophthalmologists once more applied their own lessons for systems improvement.

Drawing comparisons to prior conflicts, this talk will look at selected changes to the US combat casualty care system, focusing primarily on ocular casualty care. Lessons learned are easily adaptable to peacetime practice. Given the increasing worldwide incidence of civil mass casualty incidents with military-style injuries, adoption of these lessons would benefit most communities at large.
Patients with ptosis frequently recruit their frontalis muscles to improve their superior visual field obstruction. This common adaptation may be subconscious and not readily broken despite clinical discussion with visual recognition. Patients with habitual, compensatory frontalis spasm may also have an incomplete blink, exposure keratopathy and worsened dry eyes. Blepharoptosis repair has been cited to result in an improvement in keratopathy in patients with frontalis antagonist blink syndrome. Ptosis surgery is complex with several factors that may result to a less than excellent outcome. Relaxation of frontalis muscle contraction post-operatively may result in an undesirable undercorrection and recurrence of ptosis. Pre-operative off-label, adjuvant botulinum toxin allows for relaxation of spastic frontalis recruitment prior to surgical intervention. This presentation will cover my experience with this common triad.
Orbital Fat Prolapse Serving as a Fulcrum for Tarsal Inversion in Spastic and Involutional Entropion

Kenneth Cahill, MD¹, Craig Czyz, MD², Jill A. Foster, MD¹
¹Grant Medical Center, Columbus, OH, ²Ohio University, Columbus, OH

Introduction: This case series describes a mechanical process in which lower lid tarsal inversion occurs in spastic and involutional entropion.

Methods: IRB approved, non-randomized, case series that demonstrates the anatomical and physiological processes that cause instability of the inferior tarsus resulting in spastic and involutional entropion. The proposed concepts of previous investigators is reviewed and compared.

Results: A tissue mass posterior to the inferior edge of the tarsal plate was found in patients exhibiting spastic and involutional lower lid entropion. Surgical repair which diminished this mass resulted in successful correction of ectropion.

Conclusions: Spastic and involutional lower lid entropion results not only from the previously described conditions of horizontal laxity, inferior retractor laxity, and the force of the orbicularis oculi muscles, but also the effect of prolapsed orbital fat or other tissue which displace the inferior edge of the tarsus anteriorly and acts as a fulcrum for the inversion of the tarsal plate and lid margin.

References:
Pediatric Periorbital Necrotizing Fasciitis: A Report of Two Cases and Review

Gregory J. Griepentrog, MD
Section of Orbital and Ophthalmic Plastic Surgery, Department of Ophthalmology, Medical College of Wisconsin Eye Institute, Milwaukee, WI

Introduction: The purpose of this study is to report the clinical presentation and treatment of two pediatric patients diagnosed with periorbital necrotizing fasciitis (PNF) including the first reported incidence of orbit-involving necrosis in a child, followed by a comprehensive review.

Methods: The medical record of two children with PNF were retrospectively reviewed, followed by a literature review.

Results: Two previously healthy male children aged 3-years-old and 22-months-old were diagnosed with unilateral upper eyelid PNF at the Medical College of Wisconsin following minor trauma. During early admission, the 3 yo developed septic shock and required hemodynamic supportive treatment including vasopressors. Examination of each child revealed prominent edema and violaceous discoloration of the affected eyelid, bilateral facial edema, and skin necrosis with sloughing in the 3 yo only (Figure 1A, 3yo / Figure 1B, 22 mo). Both children were taken to the operating room for wound exploration which revealed anterior orbital necrosis in the 3 yo (Figure 2A) and extensive subcutaneous necrosis without orbital involvement in the 22 mo (Figure 2B). In addition to broad-spectrum antibiotics, both patients were treated with adjunctive intravenous immunoglobulin (IVIG) and 3-5 days of hyperbaric oxygen therapy. Tissue cultures revealed group A Streptococci (GAS) in combination with multidrug resistant Methicillin-resistant Staphylococcus aureus (MRSA) in the 3 yo GAS with penicillin-resistant Staphlococcus hominis in the 22 mo. Further subcutaneous tissue necrosis in the 3 yo was noted to extended laterally and inferiorly to the upper cheek region requiring two additional debridements in subsequent days. The 3 yo (Figure 3A, s/p post-auricular full thickness skin graft) was doing well without amblyopia when last seen at 4 months and the 22 mo (Figure 3B, s/p direct wound closure) is doing well at 3 weeks. A current literature review reveals increasing rates of necrotizing fasciitis in children and 15 cases of pediatric PNF out of ~130 total cases reported with a relatively young median age of onset of 10-months-old (range, 14 days to 8 years). The children were mainly immunocompetent with minor trauma as the leading source of infection, did not display orbital extension of their disease, and with the exception of one child, were all hemodynamically stable. The majority (n=9) of children had Type II (GAS in isolation, n=7, or GAS + staph aureus, n=2) necrotizing fasciitis, with the remaining cases due to pseudomonas aeruginosa (n=4) or an unknown source (n=2). All children underwent tissue debridement and survived. Currently, there is weak evidence to support the use of adjunctive IVIG and hyperbaric oxygen therapy.

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**Conclusions:** Pediatric PNF appears to most often affect the pre-septal tissues of relatively young children. While pediatric PNF remains rare, the overall incidence of necrotizing fasciitis in children is increasing and antibiotic-resistant bacteria present a significant concern moving forward. Indeed, to our knowledge, we report the first case of Type II PNF of GAS in combination with multidrug resistant MRSA resulting in anterior orbital necrosis in the setting of life-threatening septic shock.

**Figure 1**

**Figure 2**

**Figure 3**
The Marginal Arcade Based Transposition Flap: A Novel Flap for Medial Canthal and Eyelid Reconstruction

Alan B. Brackup, MD, FACS
Scheie Eye Institute/University of Pennsylvania, Philadelphia, PA

Introduction: We propose a vertically oriented marginal arcade based transposition flap to repair medial canthal and eyelid defects. This flap offers the benefits of excellent color, texture, thickness and contour as compared to the use of skin grafts or flaps rotated from the glabella and forehead. It offers an effective alternative to traditional techniques for reconstruction of these areas.

Methods: 28 patients (including 30 flaps) with medial canthal and/or eyelid defects after excision of cutaneous malignancies were included in this study. All were treated by the same surgeon (ABB) using a vertically oriented marginal arcade based transposition flap of the upper and/or lower eyelid. Outcome measures included eyelid function, complications, cosmetic appearance, and need for further surgery.

Results: Complete closure of the defect was achieved in all cases. One case had transient upper lid lagophthalmos that resolved with massage. One case required injection of triamcinolone acetonide to improve a hypertrophic scar. No cases of necrosis were seen. Length of follow-up ranged from 1 to 36 months. The cosmetic result was excellent in all cases, and all patients were highly satisfied with their repair. No secondary surgery was performed.

Conclusions: The vertically oriented marginal arcade based flap is an effective technique for medial canthal and eyelid reconstruction that can be modified according to the location, size, and depth of the defect. It provides excellent cosmesis and is associated with minimal complications.
EYELID SESSION I

(continued)

Figure 1

Figure 2

Figure 3

References:
Cicatricial Ectropion precipitated by Anti-TNF therapy in a 15-year-old boy

Kira Segal, MD, Tatiana Deveney, MD, Hakan Demirci, MD

Kellogg Eye Center, University of Michigan Medicine, Ann Arbor, MI

A 15-year-old boy presented with history of bilateral lower eyelid cicatricial ectropion for eight months. His medical history was significant for Crohn’s Disease as well as eczema of the abdomen, arms, lower back and ears (Figure 1). He had been started on Infliximab one year prior to his presentation, and two months prior he had a flare of the Crohn’s disease and was switched from infliximab to adalimumab.

The patient reported bilateral crusting of the eyelids, upper and lower margin redness, and eye irritation. Previous therapies included steroid ointment, topical anti-histamine, topical antibiotic and oral antibiotics. He had been prescribed a course of oral prednisone for the severe dermatitis, which did not significantly improve his symptoms.

Examination demonstrated bilateral lower eyelid ectropion with associated periocular scale, dermatitis and mucoid discharge. Upper and lower eyelid margins were injected with 2+ papillary and 3+ follicular reactions and neovascular pannus. Puncta were slit-like and scarred. Conjunctiva was injected bilaterally and there was bilateral anterior stromal haze (Figure 2). The remainder of the ophthalmologic examination was normal.

Ultimately, adalimumab was discontinued and replaced with methotrexate due to concern for treatment related side effect. Within two weeks of discontinuing the medication, examination was already improved significantly (Figure 3). Two and a half months following the discontinuation of adalimumab he was nearly back at his baseline (Figure 4).

Cutaneous reactions, including eczema, dermatitis or psoriasis, have been increasingly recognized as a common adverse effect of tumor necrosis factor (TNF) inhibitors. In most patients, skin complications can be treated with topical medications. If this is not sufficient, discontinuation of anti-TNF therapy and/or systemic treatment may be warranted.
**Case:** A 15-year-old female presented with bilateral upper and lower eyelid masses. The lesions began 3 years previously as golden brown macules near the eyelashes, then progressively enlarged into confluent firm brown nodules protruding from the skin surface. Over the same time, she developed difficulty breathing through her nose. Sinus exploration and biopsy of obstructive intranasal lesions were concerning for juvenile xanthogranuloma (JXG). The intranasal process had a trial of steroid nasal spray without response. No other systemic symptoms were present, and no other workup had been performed. As the family lives in rural Alaska and is of limited means, the eyelid lesions were quite advanced by the time of presentation.

**Literature:** JXG is rare, and the literature ranges broadly regarding management recommendations. As cutaneous JXG can be self-limited, some recommend observation without intervention.\(^1\) Others recommend surgical excision to debulk or even fully remove the lesions.\(^2,3\) In small case series, lesions have regressed with intralesional corticosteroids.\(^3,4\) Chemotherapy and radiation have shown success for disseminated cases or internal involvement.\(^5,6\)

**Management:** The size of her lesions, presence on all 4 lids, late-onset of disease, non-regressing course, and comorbid sinus lesions all add complexity to this case of periocular JXG. Observe? Inject? Pursue full-body workup for lesion burden, and then systemic therapy? Excision? If excising, reconstruction method of choice?
EYELID SESSION I

(continued)

References:
A Combination of Bevacizumab and Bleomycin Injections for Treating Orbital Lymphaticovenous Malformations

Wenjing Liu, MD1, Daniel Rootman, MD2, Jack Rootman, MD3, Steven Leibowitz, MD1, Robert A. Goldberg, MD, FACS1
1Stein Eye Institute, Los Angeles, CA, 2Doheny Eye Institute, Los Angeles, CA, 3University of British Columbia, Vancouver, BC, Canada

Introduction: Bleomycin injections have previously been reported as effective in sclerosing orbital lymphaticovenous malformations.1-4 Both VEGF-C/VEGFR-3 and VEGF-A/VEGFR-2 have been implicated in lymphangiogenesis, and may respond to anti-VEGF agents such as bevacizumab.5,6 The purpose of this study is to describe our experience with bevacizumab and bleomycin injections for managing lymphaticovenous malformations of the orbit.

Methods: In this case series, orbital lymphaticovenous malformations treated with injections of bevacizumab combined with bleomycin are described. The demographic information, clinical presentation, imaging characteristics, dosage of injections, ancillary procedures, adverse events and follow-up changes were reviewed.

Results: Three of the four cases were female, and the mean age was 25.6 years (range 8.1 to 62.2 years). All of the orbital lymphaticovenous malformations extended intraconally and extraconally. The mean dosage of bleomycin injected at each setting was 9.3mg (range 1 to 15mg) and the mean dosage of bevacizumab injected at each setting was 7.8mg (range 1.3 to 20mg) in a volume of 0.5 to 5cc of solution. Three of the cases underwent two sets of injections. Ancillary procedures performed at the same time included macrocyst drainage, conjunctivoplasty, embolization with n-BCA glue, orbitotomy with lesion excision, and temporary tarsorrhaphy. After treatment, all of the cases had reduction in the size of the malformation as well as improvement in their clinical presentation. The mean follow-up time was 3.8 months (range 0-13 months). Adverse events after injections were typically mild to moderate periorbital edema.

Conclusions: There is a biologic basis for the combined use of sclerosants and anti-VEGF agents in lymphaticovenous lesions. Our pilot data suggests that the combination of bleomycin and bevacizumab may be valuable in the treatment of orbital lymphaticovenous malformations.

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References:
Custom Polyetheretherketone (PEEK) Implants for Orbito-Facial and Orbito-Cranial Reconstruction

Jean-Paul Abboud, MD, Aaron Mason, MD, Charles L. Rosen, MD, PhD, J. Richard Casuccio, MD, Jennifer A. Sivak-Callcott, MD
West Virginia University, Morgantown, WV

Introduction: Orbito-facial and orbito-cranial reconstruction can pose a challenge that may be mitigated with computer-designed customized implants. Polyetheretherketone (PEEK) is an alloplastic inert material that is biocompatible with nervous tissue, has high tensile strength, is radiolucent with minimal imaging artifact, and retains its mechanical properties after autoclave sterilization and its chemical structure after Gamma and electron beam radiation. We report experience with a series of extended orbital reconstructions using custom PEEK implants.

Methods: High resolution computed tomography (CT) images were used by the manufacturer to generate composite 3-dimensional models of the patients’ skulls. Custom implants were produced based on the 3D models for traumatic facial and cranial defects. In cases of neoplasm, simulated tumor resection was performed on the models followed by custom implant creation. Where possible, mirror image CT data were used to design the implants. All cases were performed with neurosurgery, otolaryngology, and/or plastic surgery.

Results: Eight patients underwent reconstruction with custom PEEK implants (3 orbito-facial; 5 orbito-cranial). All patients tolerated their procedures well without operative complications or postoperative loss of vision. One patient had a wound dehiscence and exposure of the implant, requiring washout and closure of the wound. One patient had erosion onto the skin requiring explantation. There were no cases of implant infection. One patient underwent subsequent fat grafting procedures to supplement soft tissue deficits. All patients had acceptable cosmetic outcomes.

Sample case: A 54-year-old female with extensive left facial bone fractures and left anophthalmia, presented with bony resorption of the inferior and lateral orbital rims, a large defect in the orbital floor, and soft tissue atrophy in the temporal and periorbital regions (Figure 1A,C). She was unable to retain an ocular prostheses due to volume loss in the socket and expansion of the orbit. A custom PEEK implant of her orbital rim and maxilla was fashioned from her facial CT scan (Figure 2) and implanted in conjunction with a plastic surgeon using a combined sublabial, transconjunctival, and sub-brow approach. She also underwent revolumization of her orbit by placement of an intraconal orbital implant and an enophthalmic wedge along the orbital floor defect (Figure 3) and, fat transfer to the temporal and periorbital regions. There were no complications, and the patient achieved good cosmesis (Figure 1B,D).

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Conclusions: PEEK implants can simulate the strength and thickness of natural bone, have excellent biocompatibility, and can undergo autoclave sterilization on site. Additionally, pre-operative implant synthesis and surgical planning based upon the patient’s CT scan allows for a customized fit in complex defects, which produce excellent cosmetic results that cannot be otherwise achieved with standard methods. Because PEEK is non-ferromagnetic and radiolucent, it does not hinder post-operative imaging in oncologic patients. The main disadvantage of this material and technique is expense. As with any large alloplastic implant, coverage with viable soft tissue is crucial to prevent infection and tissue erosion. PEEK is a promising option for complex orbital reconstruction, including cases of meningioma resection and trauma. The long term stability of the implants still remains to be observed, but present indications make PEEK an intriguing alternative to standard reconstruction materials.
**Orbit Session II**

7:52 - 7:57 am

**Placement of an Intraoperative Interposition Fat Graft Between Residual Skull Base Tumor and the Optic Nerve to Facilitate Postoperative Stereotactic Radiosurgery**

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¹University of Minnesota, Minneapolis, MN, ²Minnesota Neurovascular and Skull Base Surgery, P.A., Minneapolis, MN

**Introduction:** Involvement of critical structures can limit the extent of resection of selected skull base tumors. Unfortunately, proximity of residual tumor to the optic apparatus may preclude the safe use of postoperative stereotactic radiosurgery (SRS). In such cases, we have placed an intraoperative fat graft to create a separation between the residual tumor and the optic nerve to facilitate safe postoperative SRS planning.

**Methods:** We report our surgical technique, utilizing an interposition fat graft between residual tumor and optic structures to facilitate safe postoperative stereotactic radiosurgery planning.

**Results:** Via a standard orbitocranial approach, the optic structures are decompressed by opening the optic canal and falciform ligament and debulking adjacent tumor as feasible. When residual tumor, typically extending into the cavernous sinus, was left in proximity to the optic structures, we place a small fat graft between tumor and optic apparatus. We have utilized this technique in 30 skull base tumors (meningioma -25, craniopharyngioma -2, pituitary adenoma - 2, metastatic carcinoma -1) to create a separation between residual tumor and optic nerves/chiasm, and in particular to prevent the nerves from settling into contact with the tumor postoperatively. The fat graft was visualized on postoperative MRI and facilitated SRS treatment planning by creating a safe distance between tumor and optic nerves in all cases.

**Conclusions:** The placement of a small fat graft between residual, unresectable skull base tumor and the optic apparatus is a safe technique and may facilitate postoperative SRS planning.
Neurosurgical approach to plexiform neurofibroma: six year follow-up and 24 year old

Simeon A. Lauer, MD
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In a previous ASOPRS Spring Meeting a combined eyelid and neurosurgical approach to plexiform neurofibroma was proposed. The technique involves mobilizing the eyelid tumor at the orbital entrance of the supraorbital nerve and introducing through the periorbita retrograde to the extraperiostial plane along the roof. The supraorbital nerve is removed to the extent of tumor involvement. A second dissection of the supraorbital nerve after its exit from the orbit into the forehead is also needed, to the extent of tumor involvement. The previously presented case is now shown with six year follow-up, and a new case in a 24 year old will be presented. Previously it had been concluded that the combined surgical approach is only appropriate as a primary intervention early after presentation. This presentation will propose expanding the utility to late intervention for established tumors.
Maxillary dental implant induced orbital fracture and inferior oblique paralysis

Sara T. Wester, MD, Ann Q. Tran, Zakeya M. Al-Sadah, MD, Hilda Capo
Bascom Palmer Eye Institute, Miami, FL

Introduction: Modern techniques for dental implants have high success rates in functional and aesthetic outcomes. While complications are low, implant migration and mechanical problems can occur. We present a case of a right upper maxillary dental implant with removal causing a right inferolateral orbital floor fracture with inferior oblique paresis.

Methods: Observational case report

Results: A 51-year-old female presented to ophthalmology clinic for persistent binocular diplopia one month following a right upper maxillary implant placement. The implant was removed after one day, and the diplopia continued after resolution of her eyelid and jaw swelling. She presented with a right hypotropia, worse on upgaze, left gaze and left head tilt with 10 degrees of incyclotorsion and ocular torticollis. The right eye could not elevate in adduction and had limited abduction. CT scan of the orbit revealed inferolateral fracture with fibrosis around the inferior oblique muscle.

Intraoperatively, further exploration revealed an orbital floor fracture and a round defect in the inferolateral orbital rim with the fracture extending medially to the inferior orbital fissure. A hand over hand technique freed the incarcerated scar tissues with significant improvement of motility. A high density porous polyethylene implant along the medial and lateral wall allowed repositioning of displaced orbital bone and tissue. For the significant symblepharon in the inferior fornix, reconstruction was completed with an amniotic membrane graft and 5-fluorouracil injection.

Post-operatively, the patient continued to have paresis of her right inferior oblique. Six months later, she underwent a recession of the left superior rectus to improve ocular alignment and head posture.

Conclusions: Improper techniques of dental implants can lead to increased risk of orbital trauma. We report a case of a patient with right inferolateral orbital fractures and extraocular muscle paresis after dental implant.

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Figure 1
Is the incidence of ectropion and ptosis with aponeuritic defects increasing?

Haraldur Sigurdsson, MD, Gudleif Helgadottir
Dept of Ophthalmology, University of Iceland, Landspitalinn, Reykjavik, Iceland

Introduction: Iceland is an island in the North Atlantic. Has today a population of 320,000 inhabitants. From 1989-present, there has been just one Oculoplastic surgeon in Iceland. He operates on most functional eyelid abnormalities in the country. The incidence of eyelid operations is therefore close to being the national incidence figures of eyelid abnormalities in Iceland.

Methods: In this study, two 3 year time periods were defined, 1999-2001 and 2014-2016, 15 years apart. The incidence of the following eyelid operations was compared for those two time periods.

1. Entropion.
2. Ectropion.
3. Probing due to nasolacrimal duct obstruction.
4. Ptosis due to aponeurotic defects.

Results: The incidence of entropion operations and probing for congenital nasolacrimal obstruction was similar for those two time periods.

On the other hand, the incidence of ectropion operations and ptosis operations due to aponeurotic defects is twice as common in the latter time period (2014-2016), compared to the time period 15 years earlier. For Ectropion the incidence was 17 operations/100,000 per year for the time period 2014-2016, while it was 8 op./100,000 per year in 1999-2001.

For ptosis the figures for the time period 2014-2016 were 11 op./100,000 per year, while it was 6 op./100,000 per year in 1999-2001.

Conclusions: The incidence of operations due to ectropion and ptosis due to aponeurotic defects is increasing while the incidence for entropion operations and probing due to nasolacrimal obstructions is similar for those two time periods.

The prevalence of involutional entropion and ectropion in the elderly population has been described as 2.1% and 2.9%, respectively (1). For the earlier time period in this study, the incidence of Ectropion and Entropion operations were similar, 8 op per 100,000 for both of them, while in the latter time period the incidence of ectropion operations was twice as high. These results need discussion.

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**Modified Blepharotomy for Upper Eyelid Retraction**

Jessica R. Chang, MD, Sarah W. DeParis, MD, Timothy J. McCulley, MD  
*Wilmer Eye Institute, Baltimore, MD*

**Introduction:** Graves ophthalmopathy (GO) related eyelid retraction has traditionally been repaired with recession of the levator muscle. In 2003, Elner et al. described a full-thickness anterior blepharotomy. Although effective, shortcomings include flattening of eyelid contour, eyelid crease elevation and overcorrection (Kikkawa 2010, Lee 2015). Modifications have been described to address this, each with its limitations. In this study we describe a modified full-thickness blepharotomy technique: septal incision with preservation of a 5mm conjunctival bridge with graded release of Muller muscle. This allows for tailored correction, while maintaining normal contour and eyelid crease position.

**Methods:** In this retrospective review, we assessed the outcomes of 14 eyelids in eight patients (3 male; mean age 52, range 25 to 70 years of age) managed for GO related upper eyelid retraction. Surgery was performed as follows: Eyelid crease incision is made at the desired height. Following dissection through orbicularis oculi, the orbital septum is incised, which aids in control of crease height. Dissection is then continued at the superior tarsal border, through Muller muscle and conjunctiva. A 5 mm bridge of conjunctiva is preserved, centered slightly medial to the pupil. Eyelid height is assessed stepwise throughout the procedure. If retraction remains at this point, the conjunctival bridge is preserved and Muller muscle is then dissected in a graded fashion off the conjunctival bridge until the desired eyelid height is achieved.

**Results:** All patients had improvement in MRD1 and superior scleral show. Eyelid position improved from preoperative mean MRD1 of 7+ 1.7mm (range 4.0-10.0 mm) to 3.9+0.8mm (range 3.0-5.0 mm). There were no occurrences of eyelid crease elevation, duplication, or flattened contour (Figure 1).

**Conclusions:** Although limited by size, our results suggest that modified full-thickness blepharotomy with septal lysis, preservation of a conjunctival bridge and graded release of Muller muscle may allow for precise correction of GO related eyelid retraction. Further study is warranted.

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References:
Surgical management of floppy eyelid syndrome in Down Syndrome children

Marc Yonkers, MD, Christina Tse, Jeremiah P. Tao, MD, FACS
UC Irvine, Orange, CA

Introduction: There are limited reports regarding cases of congenital lax eyelid conditions in patients with Down Syndrome. This case series aims to report three cases of floppy eyelid syndrome in children with Down syndrome treated and management.

Methods: Case series report of three patients with Down syndrome and floppy eyelids including presenting symptoms and surgical management.

Results: Three patients with both Down syndrome and floppy eyelids presented at ages 2 months, 3 years, and 13 years of age. The older children had trace lagophthalmos (1-2 mm) and minimal signs of corneal pathology with mild peripheral corneal neovascularization. Both showed clinical signs of increased eyelid laxity with highly distensible eyelid excursion, rubbery tarsi, and spontaneous eversion of the eyelids. Each was initially treated with bilateral four-lid tightening and lateral tarsoconjunctival onlay flaps, however both continued to demonstrate poor lid closure and mild exposure. Additional surgery with bilateral lateral tarsorraphies overlying the lateral tarsoconjunctival flaps significantly improved the exposure while preserving the visual axis. The 2 month old presented with constant eversion of the eyelids and early band keratopathy on the right eye from chronic exposure. Based on the prior cases we progressed to performing bilateral four-lid tightening and lateral tarsorraphies with no noted postoperative lagophthalmos.

Conclusions: Case reports of Down syndrome and floppy eyelids syndrome are few and management of consists of lid tightening procedures. Here we report three cases with Down syndrome, floppy eyelid syndrome, and related corneal exposure. Improvement in exposure was achieved by progressing to lateral tarsorraphy procedures. This case series aims to further develop the clinician’s understanding and approach to treating children with Down syndrome affected by severely lax eyelids.

(continued)
EYELID SESSION II

Figure 1  Figure 2  Figure 3

References:
A Simplified Triangular Frontalis Sling

Peter J. Dolman, MD, FRCSC
University of British Columbia, Vancouver, BC, Canada

Introduction: Frontalis slings are typically used for congenital or acquired ptosis with poor levator function. Most techniques place the slings in a square, rhomboid or stacked triangle pattern (as originally described by Crawford). We introduce a simplified pattern in which the sling is placed in a simple triangle fashion.

Methods: Retrospective review of frontalis sling cases with a minimum of one year follow-up documented over a 12 year period. Outcomes include a review of the technique and the results at one year including percentage with adequate height, pleasing contour, and patient satisfaction. Incidence of late slippage and recurrent ptosis are compared between those with and without tarsal fixation using non-dissolving sutures.

Results: 85 cases were included in this study with 48 performed with, and 37 performed without, securing the silicone sling to the tarsal plate using non-dissolving sutures. At one year follow-up, 86% of cases were within 1 mm of the opposite lid height, 96% had satisfactory contour, and 93% of subjects were pleased with their outcome. Late slippage of slings from the tarsal plate were significantly more frequent in non-fixated compared with fixated surgery.

Conclusions: The simplified triangular frontalis sling using a silicone rod is easy to perform, allows easy adjustment and results in excellent contour and balance. Use of an upper lid crease with fixation of the sling to the tarsal plate avoids lash ptosis and reduces the risk of late slippage.
Photochromatic Modulation with Fluorescein for Blepharospasm

Michael T. Yen, MD, Adam C. Weber, MD, F. Keith Manuel, OD, Stephen C. Pflugfelder, MD
Cullen Eye Institute, Baylor College of Medicine, Houston, TX

Introduction: Benign essential blepharospasm is a form of focal dystonia with involuntary contractions of the eyelid protractors. In addition to the motor signs of eyelid spasm, blepharospasm patients also experience a distinct constellation of sensory symptoms. Large series in the medical literature have reported that up to 79% of blepharospasm patients find bright light to be the most frequent exacerbating factor of blepharospasm. These patients also report bright light still to be highly bothersome despite muscle spasm relief with either botulinum toxin injections or myectomy. This study evaluates the effect of photochromatic modulation with fluorescein in blepharospasm patients.

Methods: Retrospective review of 5 patients with the diagnosis of blepharospasm receiving maximal treatment with botulinum toxin injections and oral pharmacotherapy. Fluorescein dye was instilled within the fluid reservoir behind a scleral contact lens or prosthetic replacement of the ocular surface ecosystem (PROSE) device. Patients were assessed with measurements of their blink rate and using the Jankovic Rating Scale.

Results: All patients reported subjective improvement of their eyelid spasm and photophobia with the addition of fluorescein to the fluid reservoir behind a scleral contact lens or PROSE device. Objective measurements demonstrated a 58% reduction in blink rate and 55% reduction in Jankovic Rating score after treatment.

Conclusions: Photochromatic modulation with the fluorophore fluorescein may provide significant improvement of the motor and sensory symptoms in some blepharospasm patients.

References:
**Factitious disorder induced on another presenting as recurrent preseptal cellulitis and sanguineous discharge**

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*American University of Beirut Medical Center, Beirut, Lebanon*

**Introduction:** Present a case of factitious disorder imposed on another, (previously Munchausen syndrome by proxy) perpetuated by a refugee single mother on her infant, with resulting devastating ocular manifestations.

**Methods:** An 18-month-old refugee under the care of his single parent, was referred to a tertiary care university hospital for left periorbital cellulitis resistant to antimicrobial therapy. Mother reported a one year history of recurrent bilateral periorbital swelling and sanguineous discharge, associated with progressively worsening seizures and cyanotic spells. The right eye was enucleated three months earlier in an outside hospital for presumed corneal perforation, total retinal detachment and chronic inflammation.

**Results:** Examination under anesthesia revealed left periorbital swelling, bulbar conjunctival chemosis with marked Tenon’s capsule thickening and contraction with hooding over superior cornea. Inferior corneal infiltrates and thinning were also noted. Remainder of exam including eyelid margin, skin and palpebral conjunctiva were otherwise unremarkable. Orbital CT scan and MRI/MR Angiography were pertinent for left pre-septal diffuse edema with enhancement and orbital fat streaking. Conjunctival biopsy showed diffuse fibrosis and non-specific inflammation with mixed PMN, lymphocytes and blood extravasation. Extensive workup including CBC, CRP, ESR, ANA, Plasminogen, dsDNA, ANCA, swab cultures and EEG were negative. Hospital stay in a monitored unit was complicated with recurrent corneal perforations and apneic episodes despite optimal treatment. Review of 24-hour continuous EEG and CCTV video monitoring showed evidence of an apneic episode physically induced by the mother. Confronted with evidence, she confessed to suffocating her baby, and manually injuring his eye.

**Conclusions:** Medical attention and sympathy are often sought after as secondary gains of psychiatric factitious disorders. We present a case of severe ocular damage inflicted by a refugee single parent on her infant to alert medical practitioners on the prospect of this illness in susceptible individuals. Refugee populations with poor socio-economic support make for a particularly vulnerable group, and might be a risk factor for factitious disorders. Physician awareness could be vital in future cases for the early recognition and intervention to help improve visual outcomes.

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References:
Mycobacterium abscessus infection following oculoplastic surgery

Timothy Ekhlassi, MD¹, Javier Servat, MD²
¹Consultants in Ophthalmic and Facial Plastic Surgery, Southfield, MI, ²Oculofacial Plastic Surgeons of Georgia, Suwanee, GA

The rapid growing acid-fast bacillus Mycobacterium abscessus (M. abscessus) is ubiquitous in the environment and is known to cause skin and soft tissue infections, including after surgical procedures. Here, we describe a case of a 60 year old female who underwent bilateral upper lid ptosis repair, bilateral lower lid tightening, and CO2 laser skin resurfacing, who subsequently developed cellulitis and an orbital abscess at the surgical site. A traditional antimicrobial regimen did not adequately treat the infection, and an orbitotomy and abscess drainage was performed. This allowed us to diagnose M. abscessus as the causative pathogen. Despite surgical drainage and multimodal antimycobacterial therapy, the patient continued to develop multiple abscesses. This necessitated repeat abscess drainage twice over the next 2 months. Coupled with adjustment of antimicrobial therapy, including the addition of tigecycline, the infection cleared nearly 6 months after her initial surgery. This protracted clinical course is not unexpected, as M. abscessus is known to exhibit antimicrobial resistance. In addition, the organism is resistant to standard disinfectants. Patients may therefore have multiple potential sources of infection, including contaminated surgical materials and instruments as well as environmental exposure. Diagnosis is often delayed, as culture results are often negative. When isolated, susceptibility testing is required, with prolonged monitoring of cultures for inducible macrolide resistance. A multi-drug regimen is necessary. Despite the difficulty in treating this organism, most infections are successfully treated and cleared in 3-6 months. Sequelae of infection may include scarring, hyperpigmentation, or, as in our patient, failure to achieve desired surgical outcomes. This case demonstrates the importance of maintaining a high index of suspicion of M. abscessus when surgical site infections that are resistant to traditional antimicrobial regimens arise.
Prolonged Post-blepharoplasty Edema in Patients on Gleevec: Report of 3 Cases

Harry Marshak, MD
Harry Marshak, MD, Palm Desert, CA

Imatinib mesylate is known to cause peri-orbital and eyelid edema. However, its effects on the post-operative course of patients undergoing eyelid surgery have not been reported. Three cases of patients on imatinib mesylate who underwent blepharoplasty and sustained prolonged post-operative edema for over one year are presented.

Case #1: A 75 year old woman on imatinib mesylate for CML underwent routine upper blepharoplasty. After one year, she still exhibited significant soft edema of the upper eyelids. The edema also extended to and persisted in the lower eyelids.

Case #2: A 71 year old man on imatinib mesylate for CML underwent routine upper blepharoplasty. After two years, he still exhibited soft edema of the upper eyelids.

Case #3: A 65 year old man on imatinib mesylate for prostate cancer underwent upper, skin pinch lower blepharoplasty and lateral canthoplasty. After 3 years, he still exhibited soft edema of the right lower eyelid and malar area. A previous scar in the left malar area may explain the asymmetry of the edema.

56-70% of patients on imatinib mesylate show signs of peri-orbital edema. This is thought to be due to inhibition of the platelet-derived growth factor receptor (PDGFR). This may result in increased capillary permeability. It follows that even in patients without pre-operative edema, surgical trauma from blepharoplasty in these patients may cause tissue disruption that allows for greater extravasation of fluid and prolonged time for re-absorption. These issues should be kept in mind when considering blepharoplasty surgery on patients on imatinib mesylate.
Apremilast for the treatment of severe lamellar ichthyosis causing lower eyelid ectropion

Jean-Paul Abboud, MD, Alexander Whittington, MD, Masih Ahmed, MD, John Nguyen, MD
West Virginia University, Morgantown, WV

Cicatricial ectropion, which is often recurrent, is the most common ocular manifestation of ichthyosis. Various treatment modalities have been utilized. We herein describe the successful use of apremilast in a patient with severe lamellar ichthyosis. A 59-year-old male with lamellar ichthyosis, initially controlled on acitertin, was hospitalized due to MRSA bacteremia and cicatricial ectropion of all four eyelids causing corneal ulceration (Fig 1). Despite aggressive use of moisture chambers, lubricants, and fortified topical antibiotic drops, his visual acuity rapidly deteriorated to 20/200 OD and hand motion OS from a normal baseline. The patient underwent emergent repair of bilateral upper and lower eyelid cicatricial ectropion using skin grafts from his left upper arm (Figure 3). After resolution of the bacteremia, he was started on oral apremilast, which achieved good control of his skin disease. He subsequently underwent a left corneal transplant, and at 16 months, his vision improved to 20/30 OD and 20/200 OS with minimal signs of exposure. He remained free of symptoms without the need for topical treatment for ichthyosis or additional eyelid surgery (Fig 4). Intracellular cAMP in the epidermis is involved in skin barrier hemostasis. A disrupted skin barrier is consequential in the pathogenesis of skin diseases such as ichthyosis. A cAMP-specific inhibitor of phosphodiesterase 4, which is approved for treatment of psoriasis, appears to be effective in controlling ichthyosis and minimizing recurrence of eyelid ectropion. While it represents a viable alternative to retinoid therapy, additional studies are necessary to fully and systemically evaluate the long term efficacy of this treatment.

Figure 1 Figure 2 Figure 3 Figure 4
9:45 - 10:00 am

OMIC Insights: How to Stay Out of Trouble with Cosmetic Patients

Robert G. Fante, MD, FACS