Oculofacial Plastic Surgery 2014
A Global Summit

Program Directors
David B Lyon MD FACS and Michael T Yen MD

In conjunction with the American Society of Ophthalmic Plastic and Reconstructive Surgery

McCormick Place
Chicago, Illinois
Saturday, Oct. 18, 2014

Presented by:
The American Academy of Ophthalmology
2014 Oculofacial Plastic Surgery Subspecialty Day Planning Group

On behalf of the American Academy of Ophthalmology and the American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS), it is our pleasure to welcome you to Chicago and Oculofacial Plastic Surgery 2014: A Global Summit.
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Neuro-ophthalmix LLC: O

Mark L Mazow MD  
None

Mark J Lucarelli MD FACS  
None

Randal T Pham MD FACS  
None

Peter J Sneed MD  
None
# Oculofacial Plastic Surgery 2014 Contents

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CME Credit

Academy's CME Mission Statement

The purpose of the American Academy of Ophthalmology’s Continuing Medical Education (CME) program is to present ophthalmologists with the highest quality lifelong learning opportunities that promote improvement and change in physician practices, performance or competence, thus enabling such physicians to maintain or improve the competence and professional performance needed to provide the best possible eye care for their patients.

The American Medical Association has determined that non-U.S. licensed physicians who participate in this CME activity are eligible for AMA PRA Category 1 Credits™.

Attendees registered as exhibitors, spouses or guests are not eligible to receive CME credit.

2014 Oculofacial Plastic Surgery Subspecialty Day Meeting Learning Objectives

Upon completion of this activity, participants should be able to:

■ Identify modern, evidence-based algorithms in oculofacial plastic surgery disease treatment and understand how to effectively apply them
■ Introduce the contemporary management of congenital eyelid and orbital disease, thyroid eye disease and orbital vascular lesions
■ Evaluate complex orbital and oculoplastics cases to understand treatment outcomes
■ Gain familiarity with the practice patterns of experienced oculofacial practitioners and understand differences in patient management around the world

2014 Oculofacial Plastic Surgery Subspecialty Day Meeting Target Audience

The intended audience for this program is practicing oculofacial surgeons and comprehensive ophthalmologists from around the world with an interest in oculofacial surgery.

2014 Oculofacial Plastic Surgery Subspecialty Day CME Credit

The American Academy of Ophthalmology is accredited by the Accreditation Council for Continuing Medical Education to provide CME for physicians.

The American Academy of Ophthalmology designates this live activity for a maximum of 7 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Self-Assessment Credit

This activity meets the Self-Assessment CME requirements defined by the American Board of Ophthalmology (ABO). Please be advised that the ABO is not an accrediting body for purposes of any CME program. The ABO does not sponsor this or any outside activity, and the ABO does not endorse any particular CME activity. Complete information regarding the ABO Self-Assessment CME Maintenance of Certification requirements are available at http://abop.org/maintain-certification/part-2-lifelong-learning-self-assessment/cme/

NOTE: Credit designated as “self-assessment” is AMA PRA Category 1 Credit™ and is also preapproved by the ABO for the Maintenance of Certification (MOC) Part II CME requirements.

Teaching at a Live Activity

Teaching instruction courses or delivering a scientific paper or poster is not an AMA PRA Category 1 Credit™ activity and should not be included when calculating your total AMA PRA Category 1 Credits™. Presenters may claim AMA PRA Category 1 Credits™ through the American Medical Association. Please contact the AMA to obtain an application form at www.ama-assn.org.

Scientific Integrity and Disclosure of Financial Interest

The American Academy of Ophthalmology is committed to ensuring that all continuing medical education (CME) information is based on the application of research findings and the implementation of evidence-based medicine. It seeks to promote balance, objectivity and absence of commercial bias in its content. All persons in a position to control the content of this activity must disclose any and all financial interests. The Academy has mechanisms in place to resolve all conflicts of interest prior to an educational activity being delivered to the learners.

Attendance Verification for CME Reporting

Before processing your requests for CME credit, the Academy must verify your attendance at Subspecialty Day and/or AAO 2014. In order to be verified for CME or auditing purposes, you must either:

■ Register in advance, receive materials in the mail and turn in the Final Program and/or Subspecialty Day Syllabus exchange voucher(s) onsite;
■ Register in advance and pick up your badge onsite if materials did not arrive before you traveled to the meeting; or
■ Register onsite.

CME Credit Reporting

South, Level 2.5; Academy Resource Center, Booth 508

Attendees whose attendance has been verified (see above) at AAO 2014 can claim their CME credit online during the meeting. Registrants will receive an email during the meeting with the link and instructions on how to claim credit.

Onsite, you may report credits earned during Subspecialty Day and/or AAO 2014 at the CME Credit Reporting booth.
Academy Members: The CME credit reporting receipt is not a CME transcript. CME transcripts that include AAO 2014 credits entered onsite will be available to Academy members on the Academy’s website beginning Nov. 13, 2014.

NOTE: CME credits must be reported by Jan. 15, 2015. After AAO 2014, credits can be claimed at www.aao.org.

The Academy transcript cannot list individual course attendance. It will list only the overall credits spent in educational activities at Subspecialty Day and/or AAO 2014.

Nonmembers: The Academy will provide nonmembers with verification of credits earned and reported for a single Academy-sponsored CME activity, but it does not provide CME credit transcripts. To obtain a printed record of your credits, you must report your CME credits onsite at the CME Credit Reporting booths.

Proof of Attendance
The following types of attendance verification will be available during AAO 2014 and Subspecialty Day for those who need it for reimbursement or hospital privileges, or for nonmembers who need it to report CME credit:

- CME credit reporting/proof-of-attendance letters
- Onsite Registration Form
- Instruction Course Verification Form

Visit the Academy’s website for detailed CME reporting information.
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Oculofacial Plastic Surgery 2014: A Global Summit
In conjunction with the American Society of Ophthalmic Plastic and Reconstructive Surgery

SATURDAY, OCT. 18, 2014

7:00 AM  CONTINENTAL BREAKFAST

8:00 AM  Welcome and Opening Remarks  David B Lyon MD FACS
Michael T Yen MD *

Section I:  Poor Levator Function Ptosis—Congenital and Acquired
Moderator: Andrew R Harrison MD *

8:03 AM  Introduction and Self-assessment  Andrew R Harrison MD *

8:05 AM  Maximal Levator Resection in Congenital Ptosis With Poor Levator Function  Yoon-Duck Kim MD 1

8:17 AM  Congenital Ptosis With Poor Levator Function: Weighing the Options  Ashok K Grover MBBS 3

8:29 AM  Acquired Neurogenic and Myogenic Ptosis  Richard C Allen MD PhD 7

8:41 AM  Questions and Panel Discussion

8:50 AM  Conclusion and Self-assessment  Andrew R Harrison MD *

Section II:  Orbital Vascular Lesion Imaging and Management
Moderator: Michael T Yen MD *

8:52 AM  Introduction and Self-assessment  Michael T Yen MD *

8:54 AM  Hybrid Procedure for Orbital Vascular Lesions in the Endovascular Operating Room  Hunter Yuen MBCHB MRCSED 9

9:06 AM  Multiple Approach-Based Management of Orbital Venous Malformation  Xianqun Fan MD PhD 11

9:18 AM  Introduction of Keynote Speaker  Michael T Yen MD *

9:20 AM  Keynote Lecture: Simplified Approach to Vascular Malformations of the Extracranial Head and Neck  Suresh Mukherji MD 12

9:50 AM  Questions and Panel Discussion

9:58 AM  Conclusion and Self-assessment  Michael T Yen MD *

10:00 AM  REFRESHMENT BREAK and AAO 2014 EXHIBITS

Section III:  Congenital Anophthalmos and Microphthalmos
Moderator: Michael T Yen MD *

10:30 AM  Advocating for Patients  Philip R Rizzuto MD FACS 13

10:35 AM  Introduction and Self-assessment  Michael T Yen MD *

10:37 AM  Management of Congenital Anophthalmos and Microphthalmos  Mohammad H Abdulhafez MD FRCS 15

10:49 AM  Management of Anophthalmos and Microphthalmos in Children With the Use of Dermis Fat Grafts  Angela M Dolmetsch MD 16

11:01 AM  Congenital Anophthalmos and Microphthalmos: Treatment Concepts With Special Emphasis on Hydrogel Tissue Expansion  Rudolf F Guthoff MD 18

* Indicates that the presenter has financial interest.
No asterisk indicates that the presenter has no financial interest.
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<tr>
<td>11:13 AM</td>
<td>Orbital Development in Congenital Microphthalmic and Anophthalmic Patients of Chinese Ancestry</td>
<td>Dongmei Li MD</td>
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<td>11:25 AM</td>
<td>Management of Congenital Anophthalmia and Microphthalmia: The CHOP Experience</td>
<td>James A Katowitz MD</td>
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<td>11:48 AM</td>
<td>Conclusion and Self-assessment</td>
<td>Michael T Yen MD*</td>
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**Section IV:  Thyroid Eye Disease—Newer Alternatives in Medical Management and Surgical Orbital Decompression**

Moderator: Don O Kikkawa MD*

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<td>Introduction and Self-assessment</td>
<td>Don O Kikkawa MD*</td>
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<tr>
<td>1:02 PM</td>
<td>Steroid Options for Medical Management: Oral, Intravenous, and Intraorbital</td>
<td>Timothy J Sullivan MBBS</td>
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<td>1:14 PM</td>
<td>Where Are We With Biologics?</td>
<td>Rona Z Silkiss MD FACS*</td>
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<td>1:26 PM</td>
<td>Current Trends in Orbital Decompression Surgery: An Overview</td>
<td>Ioannis Mavrikakis MD PhD</td>
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<td>When and How to Perform Orbital Decompression</td>
<td>Miguel González-Candial MD</td>
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<td>Orbital Decompression and the Effect on Strabismus</td>
<td>Peter J Dolman MD</td>
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<td>Cases, Questions, and Panel Discussion</td>
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<td>2:18 PM</td>
<td>Conclusion and Self-assessment</td>
<td>Don O Kikkawa MD*</td>
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**Section V:  New Options for Rejuvenation of the Aging Face**

Moderator: Guy G Massry MD*

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<td>2:20 PM</td>
<td>Introduction and Self-assessment</td>
<td>Guy G Massry MD*</td>
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<tr>
<td>2:22 PM</td>
<td>Safe Filler Injection Technique for Deep Superior Sulcus</td>
<td>Audrey Looi MD FRCS(Ed)</td>
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<td>2:34 PM</td>
<td>Customized Blepharoplasty: Varying Techniques According to the Need</td>
<td>Altug Cetinkaya MD</td>
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<td>2:46 PM</td>
<td>Enhancing the Results of Cosmetic Blepharoplasty With Periocular Lipofilling</td>
<td>Martin H Devoto MD</td>
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<td>2:58 PM</td>
<td>Endoscopic Face Lifting and Autologous Fat Grafting: A Minimally Invasive Way to a 3-dimensional Rejuvenation</td>
<td>Francesco P Bernardini MD</td>
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<td>Guy G Massry MD*</td>
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**Section VI:  Challenges and Complications**

Moderator: Vikram D Durairaj MD*

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<td>Introduction and Self-assessment</td>
<td>Vikram D Durairaj MD*</td>
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<tr>
<td>4:02 PM</td>
<td>Eyelid Deformities and Surgery in Type 1 Neurofibromatosis</td>
<td>Guilherme Herzog Neto MD</td>
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<td>4:12 PM</td>
<td>Long-term Evaluation After Acellular Porcine Dermal Collagen Implantation (Permacol)</td>
<td>Karen Skjoedt MD</td>
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<td>4:22 PM</td>
<td>Management of Anophthalmic Socket Problems</td>
<td>David R Jordan MD</td>
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<td>4:32 PM</td>
<td>When Ptosis Surgery Goes Wrong: Explaining Complications and Management</td>
<td>Habibullah Eatamadi MD</td>
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<tr>
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<td>Blepharoplasty Complications</td>
<td>James H Oestreicher MD</td>
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<td>Questions and Panel Discussions</td>
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<td>5:03 PM</td>
<td>Conclusion and Self-assessment</td>
<td>Vikram D Durairaj MD*</td>
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Maximal Levator Resection in Congenital Ptosis With Poor Levator Function

Yoon-Duck Kim MD

Introduction

It has been commonly practiced that levator resection is useful for patients with fair to good levator function (> 4 mm), while the sling procedure is reserved for cases with poor levator function (< 4 mm). The surgical results for patients with congenital ptosis are often unpredictable and suboptimal, and the treatment for severe unilateral blepharoptosis is especially controversial and challenging. In 1965, Beard advocated excision of the normal levator muscle and suspension of both eyelids with fascia lata to create symmetrical lagophthalmos on downgaze. In 1981, Callahan suggested bilateral brow suspension without interfering with the normal levator. Other oculoplastic surgeons operate only on the abnormal eyelid, either with a unilateral brow suspension or a maximal levator resection.

Patients and Methods

Maximal levator resection was performed on 243 unilateral congenital ptosis patients with poor levator function. Levator resection was performed up to the Whitnall ligament without transecting medial and lateral horns.

Results

Good to excellent postoperative eyelid height was achieved in 223 patients (91.7%) (see Figure 1). 169 patients (69.5%) had excellent results, 54 patients (22.2%) had good results, and 20 patients (8.2%) had poor results. Of 86 eyes that showed levator dehiscence at operation, 60 (69.8%) had excellent results and 18 (20.9%) had good results (P = .87).

Postoperative complications included entropion, exposure keratopathy, upper lid crease asymmetry, temporal eyelid droop, suture abscess, and conjunctival prolapse.

Conclusion

In our study, favorable results were achieved in 91.7% of patients undergoing maximal levator resection, without significant complications. Maximal levator resection provides better cosmesis than frontalis sling, needs no implant materials, and can avoid disadvantages and complications of frontalis suspension. Levator resection is a better procedure as it is more physiologic, with a better eyelid crease, and it involves no brow scars or leg incisions to harvest the autogenous fascia lata. There is no need for a secondary incision in the leg with possible complications such as infection or hematoma. Nonautogenous sources such as cadaver or bovine may result in the complications of infection or rejection in the lid. Maximal levator resection should be considered primarily for the correction of severe unilateral ptosis with poor levator function.

References and Selected Readings


Congenital Ptosis With Poor Levator Function: Weighing the Options

Ashok Kumar Grover MD

Congenital ptosis with poor levator action poses a difficult management dilemma.

The conditions include:
- Congenital simple ptosis (unilateral) with poor levator function
- Congenital simple ptosis (bilateral) with poor levator function
- Congenital ptosis with poor levator function associated with superior rectus under action or monocular elevation defect (MED)
- Blepharophimosis syndrome
- Jaw winking ptosis severe enough to require disabling of levator

I. Congenital Simple Ptosis (Unilateral)

The options are:

A. Levator surgery
   1. Whitnall sling: In the presence of a well-defined Whitnall ligament, a Whitnall sling, preserving the horns and taking bites through or above the ligament, tends to give good results.\(^1\) These results, however, may not be lasting, and redrooping tends to occur over the next 6 months in many cases.
   2. Maximal levator resection: In cases where the Whitnall ligament is poorly defined, maximal levator resection is required. The results are unpredictable and undercorrection often results.

B. Unilateral frontalis sling
   1. Unilateral frontalis sling with synthetic materials, especially silicone rods, gives good results, though with significant lid lag and lagophthalmos. Long-term granulomas and recurrences can occur, however.
   2. Unilateral frontalis sling using fascia lata, though free from occurrence of granuloma or recurrences, tends to have an undercorrection, due to inadequate frontalis effort.\(^2\)

C. Bilateral frontalis sling
   Bilateral frontalis sling using fascia lata takes away the asymmetry of lid lag and lagophthalmos, but undercorrection of the ptotic side due to inadequate frontalis effort remains a problem.

D. Bilateral frontalis sling with disabling of contralateral levator using fascia lata offers the most consistent correction with aesthetically pleasing symmetry in lid folds, lid lag, and lagophthalmos. Modified Callahan double triangle technique is used, and a small skin excision at lid crease is helpful.

Figure 1a. Preoperative photograph of an 18-year-old young woman with left eye severe ptosis.

Figure 1b. Postoperative photograph following right eye levator excision with bilateral fascia lata sling.
Figure 1c. Preoperative photograph in upward gaze.

Figure 1d. Postoperative photograph in upward gaze.

Figure 1e. Preoperative photograph in downgaze.

Figure 1f. Postoperative photograph in downgaze.

Figure 1g. Preoperative photograph with eyelid closed.

Figure 1h. Postoperative photograph with eyelid closed.
II. Congenital Simple Ptosis (Bilateral) With Poor Levator Function

Bilateral frontalis sling surgery using fascia lata is the procedure of choice, offering excellent cosmetic symmetry. Silicone rods may alternatively be used, either due to patient preference or surgeon’s choice, though with less pleasing results.\(^3\)

III. Congenital Ptosis With Associated Motility Problems

After the initial correction of superior rectus underaction or MED by inferior rectus recession or Knapp procedure based on forced duction test, the management is similar to congenital simple ptosis and is tolerated well.\(^4\) In cases with persistent poor Bell phenomenon, silicone rather than fascia lata may be chosen because of its better elasticity, causing less lagophthalmos.

IV. Blepharophimosis Syndrome

Bilateral frontalis sling with fascia lata is used. Fox’s pentagon technique or double triangle technique without skin excision at the lid crease gives consistent, gratifying results.

Figure 2a. Preoperative photograph of 5-year-old boy with blepharophimosis syndrome.

Figure 2b. Postoperative photograph following Y-V plasty with transnasal wiring.

Figure 2c. Postoperative photograph following bilateral fascia lata sling.
V. Jaw Winking Ptosis

The most consistent results in Marcus Gunn jaw winking ptosis are achieved with bilateral levator disabling by excision of a 10-15 mm length of aponeurosis above the tarsus, including cutting of the lateral and medial horns. This is followed by a bilateral fascia lata sling using a closed technique modified by the author.

Figure 3a. Preoperative photograph of 8-year-old boy with jaw winking ptosis.

Figure 3b. Preoperative photograph showing jaw winking phenomenon.

Figure 3c. Postoperative photograph following bilateral levator excision with bilateral fascia lata sling surgery.

Figure 3d. Elimination of jaw winking phenomenon.

Consistent aesthetically gratifying results can be achieved for the entire spectrum of severe congenital ptosis by appropriate choice of surgical procedures.

References


Acquired Neurogenic and Myogenic Ptosis

Richard C Allen MD PhD

I. Classification of Ptosis
   A. Aponeurotic
   B. Myogenic
   C. Neurogenic
   D. Mechanical

II. Myogenic Ptosis
   A. Congenital
   B. Acquired
      1. Oculopharyngeal muscular dystrophy (OPMD)
      2. Chronic progressive external ophthalmoplegia (CPEO)
      3. Myotonic dystrophy

III. Neurogenic Ptosis
   A. Horner syndrome
   B. Third nerve palsy
   C. Myasthenia gravis

IV. Treatment
   A. Progressive myogenic ptosis
      1. Silicone frontalis sling
      2. Levator resection / advancement
      3. Blepharoplasty
   B. Neurogenic ptosis
      1. Horner: Müller muscle-conjunctival resection
      2. Third nerve: Frontalis sling
      3. Myasthenia gravis
         a. Medication
         b. Levator resection / advancement
         c. Frontalis sling

V. Controversies in Treatment
   A. Progressive myogenic ptosis
      1. Blepharoplasty
         a. Advantage: Simple
         b. Disadvantages
            i. Eventual failure
            ii. Lagophthalmos
            iii. Poor cosmetic result (obviation of lid crease)

   2. Levator advancement / resection
      a. Advantages
         i. Familiarity with procedure
         ii. No foreign body
         iii. Better cosmetic result?
      b. Disadvantages
         i. Eventual failure
         ii. Reoperation can be challenging.
         iii. Operating on a progressively weak muscle

   3. Silicone frontalis sling
      a. Advantages
         i. Elasticity of silicone
         ii. Circumvent progressively weak levator muscle
         iii. Ease of adjustment
         iv. Long lasting
         v. Proven superiority
      b. Disadvantages
         i. Foreign body
         ii. More involved surgery
         iii. Not as good a cosmetic result?
      c. Five principles of frontalis sling surgery
         i. Tarsal fixation
         ii. Retropseudal placement
         iii. Conservative skin excision
         iv. No preaponeurotic fat excision
         v. Incorporation of levator aponeurosis into skin incision

B. Our reliance on levator function as a measure of levator health—Is it valid?

Selected Readings


Hybrid Procedure for Orbital Vascular Lesions in the Endovascular Operating Room

Hunter Yuen MBBCHB MRCS ED

I. Classification of Orbital Vascular Lesions

A. Multiple nomenclatures for “angiomas” or “vascular birthmarks” or “port-wine stain” have long been an important obstacle to communication among the various medical specialists (pediatricians, dermatologists, surgeons, radiologists, angiologists, ophthalmologists, ENT surgeons, pathologists, etc.).

B. The suffix “-oma” (used in the term “angioma”) means proliferation of a tumor, and thus the words “angioma,” “hemangioma,” “lymphangioma” are erroneous when used for vascular malformations.

C. A very basic classification system was adopted by the International Society for the Study of Vascular Anomalies (ISSVA) during its 1996 workshop to give us a common language for communication.

D. ISSVA
   1. Tumor
      a. Infantile hemangiomas
      b. Congenital hemangiomas (RICH and NICHE)
      c. Tufted angioma (with or without Kasabach-Merritt syndrome)
      d. Kaposiform hemangioendothelioma (with or without Kasabach-Merritt syndrome)
      e. Spindle cell hemangioendothelioma
      f. Other, rare hemangioendotheliomas (epithelioid, composite, retiform, polymorphous, Dabska tumor, lymphangioendotheliomatosis, etc.)
      g. Dermatologic acquired vascular tumors (pyogenic granuloma, targetoid hemangioma, glomeruloid hemangioma, microvenular hemangioma, etc.)
   2. Malformation
      a. Slow-flow
         i. capillary malformation (port-wine stain, telangiectasia, angiookeratoma)
         ii. venous malformation, VM (common sporadic VM, Bean syndrome, familial cutaneous and mucosal venous malformation (VMCM), glomuvenous malformation (GVM), Maffucci syndrome)
         iii. lymphatic malformation
      b. Fast-flow
         i. arterial malformation (AM)
         ii. arteriovenous fistula (AVF)
      c. Complex-combined

II. Management of VM

A. Cavernous VM (cavernous hemangioma)
   1. Usually excision
   2. Factors need to consider

B. Noncircumscribed VM
   1. Observation
   2. Simple excision: Complete resection difficult, risk of bleeding
   3. Glue ± resection
      a. Staged procedure
      b. C-arm radiology with suboptimal quality
   4. Sclerotherapy: For smaller lesions only
   5. Others
   6. Acute bleeding with orbital compartment syndrome

C. Problems of excising noncircumscribed VM
   1. Interdigitation with surrounding tissue with lack of “capsule” and a well-defined plane between the lesion and surrounding tissue
   2. Differentiation between normal and abnormal tissue difficult. Feeder vessels and out-flow channels difficult to identify.
   3. May dissect into the lesion during attempted excision, result in bleeding and collapse of lesion
   4. Postoperative hemorrhage and swelling
   5. Incomplete resection and recurrence

III. Hybrid Procedures/Operations

A. Interventional treatment by means of a vascular catheter combined with open surgery

B. New potential areas of application are emerging, especially in trauma and orthopedic surgery, neurosurgery, cardiac and vascular surgery.

C. Intraoperative direct puncture venogram, glue injection under radiological control, followed by immediate resection afterwards.

D.Performed inside hybrid operating theater or endovascular operating rooms (EVOR)

E. Endovascular suite in the operating room
   1. Site: In operating theater, positive pressure room, infection control standard
2. Equipments: Appropriate digital subtraction fluoroscopic imaging equipment (digital subtraction angiographic system) and ultrasonography. Necessary glue, guidewires, and catheters available. Full range of available surgical instruments in the operating rooms.

3. Personnel: Trained interventional radiologists and surgeons. Appropriate ancillary personnel, including trained nurses and radiology technician.

F. Procedures
1. Preop evaluation and imaging
2. Direct puncture venogram in the EVOR equipped with biplane digital subtraction angiography machine
3. Image-guided glue injection
4. Immediate surgical resection with supplementary venogram and glue injection
5. Combined sclerotherapy in same operative session if indicated

G. Indications of treatment include enlargement mass with disfigurement, pain, and visual impairment.

H. Surgical resections were facilitated with reduced bleeding and all patients have uneventful postoperative recovery.

I. Advantages
1. Allow one-stop provision of diagnosis and treatment of vascular lesion (eg, examination of outflow draining vessels)
2. Enable real-time controlled injection of glue / sclerosants into the vascular lesion
3. Allow subsequent immediate open surgical removal of lesion if necessary with no transfer of patients needed
4. Allow open exposure of lesions for direct puncture / convert an unsuccessful percutaneous approach to an open surgical exposure
5. More complex cases can be treated since the suite can handle both endovascular and open procedures.
6. Suboptimal results or complications of the endovascular procedure (residual stenosis, occlusion, bleeding) can be treated with immediate surgery.
7. Surgical resection can be facilitated with reduced bleeding, better hemostasis. More complete resection of lesions is possible as lesions are more “solid.”
8. Better outcome
9. Less hospital admission, shorter length of stay

Selected Readings
3. ISSVA Website. www.issva.org/.
Multiple Approach-Based Management of Orbital Venous Malformation

Xianqun Fan MD PhD, Renbing Jia MD PhD, Shiqiong Xu MD

Orbital venous malformation (OVM) consists of most commonly occurring orbital vascular lesions and remains a challenging disorder with regard to management. A variety of treatment options, including surgical resection, laser therapy, sclerotherapy, and electrochemical therapy, have been used to deal with OVM, with variable results. With increasing knowledge on the histopathology and hemodynamics of OVM, surgical excision as a single way is seldom attempted because of its high risk of visual damage, massive bleeding, and deformity if the lesion is extensive or located in the deep orbit.

A combination of two or more of the above-mentioned methods has been advocated to treat OVM based on hemodynamics, size, and location. It is of note that multiple approach-based management should be performed in a well-ordered way. In general, laser therapy is firstly used to alleviate the lesion, followed by surgical procedure on residual lesions with shrunk vessels and reduced blood flow. In some circumstances, sclerotherapy may be subsequently used to treat deep parts of the lesion that cannot be reached by surgery or laser. The laser therapy and sclerotherapy can be performed percutaneously or with the help of surgical exposure, depending on lesion location. In our experience, the nonsurgical treatment options may be undertaken by guidance of a computer-aided navigation system in order to lower risk of vision damage for deep lesions. In addition, our latest research has shown that pingyangmycin as a single sclerosing agent has an encouraging effect on low-flow orbital venous malformations in selected cases.

In conclusion, OVM can be treated by a multiple approach-based formula with better results, as well as fewer adverse events. Sclerotherapy with pingyangmycin may be used as a first-line treatment option for selected cases with OVM.
Vascular anomalies of childhood, sometimes called birthmarks, are among the most common of all congenital and neonatal abnormalities. Many descriptive or histopathologic terms have previously been used to describe these anomalies (eg, strawberry hemangioma, port-wine stain, cavernous hemangioma). Although colorful, these terms were used inconsistently and often erroneously, potentially leading to inappropriate clinical management.

In a landmark publication in 1982, Mulliken and Glowacki proposed a system that now represents the international standard for classification of vascular anomalies in children. By examining the clinical and histopathologic features of vascular anomalies, these investigators sought to simplify categorization, thereby clarifying proper clinical management. After further refinement by multiple contributors, the modern classification scheme for vascular anomalies was accepted by the International Society for the Study of Vascular Anomalies (ISSVA) in 1992. Terms commonly used in the literature to describe vascular anomalies are categorized based on that classification system.

Vascular anomalies are now divided into 2 categories: vascular tumors, hemangiomas being by far the most common; and vascular malformations. The term “hemangioma” describes a lesion that undergoes a phase of proliferation involving high mitotic activity followed by a period of involution. In contrast, a vascular malformation shows normal endothelial turnover and growth commensurate with the child without spontaneous resolution. This category comprises malformations of arterial, venous, capillary, lymphatic, and mixed vascular endothelium. There are other vascular tumors (eg, kaposiform hemangioendothelioma, tufted angioma, hemangiopericytoma) that are distinct from hemangiomas.

Cross-sectional imaging is a valuable tool to help classify vascular lesions into hemangiomas vs. vascular malformations. Imaging can also be used to further subclassify vascular malformations into lymphatic, venous, capillary, and arterial malformations or a combination of these (“mixed” vascular malformations). The presentation will review the imaging findings of the various vascular lesions. It will also demonstrate how imaging will be able to determine if the vascular lesions are “high” flow vs. “low” flow and indicate how this affects management and treatment.
2014 Advocating for Patients

Philip R Rizzuto MD FACS

Ophthalmology’s goal in protecting quality patient eye care remains a key priority for the American Academy of Ophthalmology (the Academy). All Eye M.D.s should consider their contributions to the following three funds as (a) part of their costs of doing business and (b) their individual responsibility in advocating for patients:

- Surgical Scope Fund (SSF)
- OPHTHPAC® Fund
- State Eye PAC

Your Eye M.D. colleagues serving on the Academy’s Secretariat for State Affairs commit many hours on your behalf while strategizing and collaborating with state ophthalmology society leaders to ensure the success of Surgery by Surgeons. Their ultimate goal—protecting quality patient eye care in the states—requires a robust Surgical Scope Fund, and we need every single Eye M.D. to step up to the plate and deliver with their checkbooks.

The Academy’s federal advocacy arm works to protect ophthalmology practices from payment cuts, burdensome regulations, and scope of practice threats, as well as to advance the profession by promoting funding for vision research and expanded inclusion of ophthalmology in public and private programs. It is critical for our OPHTHPAC Fund to also be strong.

Surgical Scope Fund

The Surgical Scope Fund (SSF) provides grants to state ophthalmology societies to support their legislative, regulatory and public education efforts. Since its inception, the Surgery by Surgeons campaign, in partnership with state ophthalmology societies and with support from the SSF, has helped 31 state/territorial ophthalmology societies reject optometric surgery proposals.

2014 has proved to be a challenging year, with several battleground states facing major optometric surgery initiatives. A number of state ophthalmic societies benefited from SSF disbursements and were able to successfully implement patient safety advocacy campaigns to defeat attempts by optometry to expand its scope of practice to include surgery. The Nebraska Academy of Eye Physicians and Surgeons was successful in its patient advocacy and public education efforts to derail legislation that would have granted optometrists the authority to perform eyelid surgery and injections. Additionally, the Arizona Ophthalmological Society succeeded in protecting patients by stopping legislation that would have allowed optometrists to gain authority to perform injections. The SSF is also at work assisting ophthalmic societies with their efforts to protect patients in California, Delaware and Massachusetts.

Proactively, the Georgia Society of Ophthalmology introduced a bill that would establish a formal definition of “surgery” into state law. While the legislative session expired before the bill could advance, Georgia ophthalmologists will be back in 2015 in an effort to pass this important safeguard for their patients.

2014 was certainly not without its challenges. Despite a vigorous battle for patient safety on the part of the Tennessee Academy of Ophthalmology, the Tennessee Medical Association and the Academy, the legislature passed a bill allowing optometrists to inject anesthesia into the eyelids. Previously, optometrists were authorized to perform only therapeutic injections and any surgical procedure that required no more than a topical anesthetic. And in Louisiana, the Academy, the Louisiana Ophthalmology Association and the Louisiana State Medical Society vigorously opposed legislation that would authorize optometrists to perform certain scalpel and laser surgeries and injections. On June 1, 2014, Louisiana Governor Bobby Jindal signed into law a laser surgery bill that will allow optometrists to perform scanning laser trabeculoplasty and argon laser trabeculoplasty glaucoma surgery procedures, as well as YAG capsulotomy surgery procedures, with the completion of as little as 32 hours coursework. The Academy’s Secretariat for State Affairs knows from past experience that with this success in Louisiana, organized optometry will push hard in 2015 to see if they can gain additional surgery states. This is why everyone must “advocate for patients,” engage in the state political process and aggressively support the SSF.

California, Delaware and Massachusetts remain “in play” and are still faced with active O.D. surgery legislation. When it comes to state legislation of any kind, California and Massachusetts are often considered bellwether states for the rest of the nation. Now more than ever, your contribution to the SSF is needed as a critical tool of the Surgery by Surgeons campaign to protect quality surgical care for our patients. The Academy relies not only on the financial contributions to the SSF from individual Eye M.D.s and their business practices, but also on the contributions made by ophthalmic state, subspecialty and specialized interest societies. The American Society of Ophthalmic Plastic & Reconstructive Surgery (ASOPRS) contributed to the Surgical Scope Fund in 2013, and the Academy counts on its contributions in 2014.

OPHTHPAC® Fund

OPHTHPAC is a crucial part of the Academy’s strategy to protect and advance ophthalmology’s interests in key areas, including physician payments from Medicare as well as protecting ophthalmology from federal scope-of-practice threats. Established in 1985, today OPHTHPAC is one of the largest and most successful political action committees in the physician community. In the past, Politico highlighted OPHTHPAC as one of the most successful political action committees in the physician community. By making strategic election campaign contributions and independent expenditures, OPHTHPAC helps us elect friends of ophthalmology to federal leadership positions, ultimately resulting in beneficial outcomes for all Eye M.D.s. For example, in the 2012 election cycle, OPHTHPAC was able to help retain 20 physicians in Congress. Among the significant impacts made by OPHTHPAC are the following:

- Prevented onerous national patient prescription requirements for compounded drugs and preserved access to most ophthalmic compounded drugs for office use
Averted significant cuts to Medicare payments due to the Sustainable Growth Rate (SGR) formula

Protected practice expense increases for ophthalmology when other specialties sought legislative carve-outs

Protected ophthalmologists’ ability to provide in-office diagnostic testing without triggering self-referral violation

Prompted congressional action that helped reduce ophthalmology’s multiple procedure payment reduction

Secured appointment of full-time ophthalmology national program director in the U.S. Department of Veterans Affairs

Provided further exemptions from both the Electronic Prescribing and Meaningful Use EHR penalties

Leaders of ASOPRS are part of the Academy’s Ophthalmic Advocacy Leadership Group (OALG), which has met for the past seven years in January in the Washington, D.C., area to provide critical input and to discuss and collaborate on the Academy’s advocacy agenda. The topics discussed at the 2014 OALG meeting included a focus on the collaboration needed among the Academy and its OALG partners on the issue of compounding. As a 2014 Congressional Advocacy Day (CAD) partner, ASOPRS ensured a strong presence of oculofacial plastic surgeons to support ophthalmology’s priorities as nearly 400 Eye M.D.s had scheduled CAD visits to members of Congress in conjunction with the Academy’s 2014 Mid-Year Forum in Washington, D.C. The ASOPRS remains a crucial partner with the Academy in its ongoing federal and state advocacy initiatives.

State Eye PAC

We all must also support our respective State Eye PACs, because state ophthalmology societies cannot count on the Academy’s SSF alone. The presence of a strong State Eye PAC providing financial support for campaign contributions and legislative education to elect ophthalmology-friendly candidates to the state legislature is also critical. The Secretariat for State Affairs strategizes with state ophthalmology societies on target goals for state eye PAC levels.

ACTION REQUESTED: Advocate for your patients!!

Academy Surgical Scope Fund contributions are used to support the infrastructure necessary in state legislative / regulatory battles and for public education. PAC contributions are necessary at the state and federal level to help elect officials who will support the interests of our patients. Contributions to each of these three funds are necessary and should be considered the costs of doing business. Surgical Scope Fund contributions are completely confidential and may be made with corporate checks or credit cards, unlike PAC contributions, which must be made by individuals and are subject to reporting requirements.

Please respond to your Academy colleagues who are volunteering their time on your behalf to serve on the OPHTHPAC* and Surgical Scope Fund** Committees, as well as your state ophthalmology society leaders, when they call on you and your subspecialty society to contribute. Advocate for your patients now!

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Management of Congenital Anophthalmos and Microphthalmos

Mohammad H Abdulhafez MD FRCS

It is well recognized that orbital volume growth parallels ocular growth, and eye absence or reduction in its size will result in noticeable hemifacial deformity. Clinical anophthalmos is a rare congenital defect in which an eye never developed in the socket, while microphthalmos is a severe malformation of the eye. Both present with shortened eyelids, contracted conjunctivae, and ipsilateral hypoplasia of the bony orbit. The management of both congenital anophthalmos and microphthalmos is challenging.

Treatment of the hypoplastic juvenile orbit requires simultaneous management of both soft tissue hypoplasia and asymmetric bone growth. Soft tissue hypoplasia is treated with progressively enlarging acrylic fornix conformers as early as possible. Conventional methods of orbital expansion include static spherical orbital implants, dermis-fat graft, inflatable balloon expander, and osmotically active hydrogel implants.

The problem associated with static implants is that insertion of small implants yields negligible results; large implants risk extrusion. The dermis-fat graft will expand only the soft tissues and minimally stimulate orbital bony growth. The hydrogel implants require an average of 3 to 5 replacement procedures before the patient reaches puberty to ensure symmetrical orbital growth with the contralateral orbit. Both static implants and hydrogel implants require multiple sessions and repeated trauma to the conjunctiva.

Recently, the integrated orbital tissue expander (OTE) has shown efficacy in stimulating orbital bony growth in an established anophthalmic orbit. It addresses the drawbacks of the currently available orbital expansion options and has the following advantages: (1) small skin incision for implant placement, (2) ease of insertion, (3) absence of unpredictable implant movement or displacement, (4) sustained and uniform pressure delivered to constituent bones of the orbit without the need for serial implant exchanges, (5) reduced trauma, (6) well-tolerated long-term outcomes, (7) an implantation procedure that is familiar to orbital surgeons who routinely perform enucleation, and (8) reduced number of procedures needed for effective orbital bone stimulation.
Management of Anophthalmia and Microphthalmos in Children With the Use of Dermis Fat Grafts

Angela M Dolmetsch MD

I. The Pediatric Orbit
   A. Exhibits rapid growth
      1. 1 month of age: 60% of adult size
      2. 1 year: 75%
      3. 3 years: 85%
      4. 8 years: 96%
   B. Strict correlation between globe growth and orbital growth
   C. The orbit requires adequate stimulus to grow normally.
   D. Anophthalmia or microphthalmia are devastating in normal orbital growth.

II. Classification of Anophthalmia / Microphthalmia
   A. Congenital
      1. Incidence
         a. Anophthalmia: 0.18-0.4/10,000
         b. Microphthalmia: 1.5-19/10,000
      2. 50% associated with systemic abnormalities
      3. Genes involved: SOX, PAX6, OTX2, CHX10, RAX, CHD7, PTCH
      4. Environmental factors: intrauterine infections, solvent misuse, vitamin A deficiency, exposure to X rays, thalidomide
   B. Acquired
      Etiology: enucleation secondary to intraocular tumors, blind painful eyes, surgical or accidental trauma, ROP, endophthalmitis, complications of Coats disease

III. Management of Congenital Anophthalmia and Severe Microphthalmia
   A. Early management with custom-made acrylic conformers
   B. Hydrogel expanders
   C. Hard spherical orbital implants (largest possible)
   D. Hydrogel or inflatable orbital expanders
   E. Orbital tissue expander (Tse)
   F. Dermis fat grafts

IV. Management of Acquired Anophthalmia
   A. Hard spherical orbital implant (largest possible)
   B. Acrylic conformers and/or ocular prosthesis of increasing size to attempt to replace orbital volume

V. Ideal Orbital Implant in Children
   A. Easily inserted and readily available
   B. Provide adequate orbital volume
   C. Be able to integrate with intraorbital tissue and extraocular muscles
   D. Biocompatible
   E. Nonbiodegradable
   F. Does not promote excessive scarring, fibrosis, or contraction of orbital and conjunctival tissues
   G. Does not extrude, become exposed, or infected
   H. Does not migrate
   I. Stimulates orbital and facial growth
   J. Provides adequate prosthetic motility

VI. Orbital Dermis Fat Grafts in Children: Previous Studies

VII. Complications
   A. Central graft ulceration
   B. Conjunctival inclusion cyst
   C. Excessive growth
   D. Pyogenic granuloma formation
   E. Scar at donor site
   F. Graft atrophy

VIII. Orbital Dermis Fat Grafts in Acquired and Congenital Anophthalmos / Microphthalmos in Children
   The Clínica de Oftalmología de Cali / Hospital Universitario del Valle Experience

IX. Conclusions
   A. Orbital dermis fat grafts in young children with acquired and congenital anophthalmia offer excellent results and resemble an ideal orbital implant.
B. The unique tendency of dermis fat grafts to grow within the pediatric orbit promotes orbital growth and symmetrical development.

C. Cosmesis, growth, and symmetry are better in patients less than 5 years of age at implantation.

D. Complications are few and easily corrected.

E. Motility of the external prosthesis is limited with dermis fat grafts.

Selected Readings


Congenital Anophthalmos and Microphthalmos: Treatment Concepts With Special Emphasis on Hydrogel Tissue Expansion

Rudolf F Guthoff MD

Treatment of congenital clinical anophthalmos should start as early and as gently as possible. Therefore semispheres and spheres of osmoexpandable hydrogel implants have proven to play an important role in the management of these patients.

Depending on the size of lid and conjunctival structures, semispheres and spheres with an expansion factor of about 10 are implanted in the given space, preferably avoiding general anesthesia. After 6 months in many cases the first artificial eyes can be placed in the expanded sockets. In the long run spherical osmoexpanders may be implanted subconjunctivally for permanent volume substitution. They also work as a counterbalance for custom-made artificial eyes.

Our report is based on about 100 patients with microphthalmos and clinical anophthalmos seen in the last 12 years.
Orbital Development in Congenital Microphthalmic and Anophthalmic Patients of Chinese Ancestry

Dongmei Li MD

I. Introduction of Congenital Microphthalmia and Anophthalmia
   Leading cause of blindness
   A. Complicated facial malformation
   B. Psychological impact on the affected child

II. Current Limitation
   Lack of standardized intervention and treatments

III. Intervention and Treatment
   A. Conformer and prostheses
   B. Soft tissue expander
   C. Osmosis-dependent self-inflating hydrogel expanders

IV. Timely Replace the Applicable Prosthesis

V. Eyelid Expander
   Considered when the conformer is inefficacious

VI. Hemispherical Hydrogel Expander
   Age of 3 months to 1 year for socket expansion

VII. Spherical Hydrogel Expander
   Age of approximately 1 year or older (6 months after the conjunctival sac expansion), the bony orbit will be expanded with implantation of the ball-shaped osmotic expander.

VIII. Evaluation
   6, 12, 24, 36, and 48 months after treatment:
   A. Objective indicators
   B. Subjective satisfaction
   Everyone nurses an aspiration for beauty. Therefore, pursuit of rational and standardized treatments is important!
Management of Congenital Anophthalmia and Microphthalmia: The CHOP Experience

James A Katowitz MD

Introduction

Children born with true anophthalmos or extreme microphthalmos present not only with a reduced size of the eye but also of the bony orbit, lids / lashes / brow, and conjunctival space. Severe microphthalmos is difficult to differentiate from true anophthalmos, which can only be confirmed by imaging or histologic evaluation. For this reason, the term “clinical anophthalmos” is recommended to describe the absence of any visible globe. There is almost always some remnant of ocular tissue visible on imaging. Congenital anophthalmos is very rare, with a prevalence of 1-4/100,000 births. The relationship with syndromes and anomalies makes it important to routinely undergo genetic evaluation.

Due to the variety of symptoms, an individual treatment plan is required for each patient, but the traditional approach has been to attempt to stretch the shortened eyelid fissures gradually with serial expansion by using nonexpanding conformers of increasing size. Tissue expansion is necessary to increase the eyelids and conjunctival space as well as the bony orbit in order to reduce facial asymmetry, which is particularly problematic with unilateral anophthalmos. Intervention as early as possible is critical in order to take advantage of the rapid growth of the head in the first 2 years of life. The relative size of a child’s head compared to an adult is 40% at 3 months and 70% at 2 years and increases by only 10% over the next 3 years to 80% at 5.5 years.

Clinical Experience at The Children’s Hospital of Philadelphia

Since 1970, over 200 patients with congenital anophthalmos or microphthalmos have been examined and treated by the Pediatric Oculoplastic Service at The Children’s Hospital of Philadelphia (CHOP). A variety of management techniques have been utilized in an effort to achieve optimum results, with the goal of retaining an ocular prosthesis with eyelids and adnexae that approximate normal appearance and function.

In cases of severe anophthalmos with extremely underdeveloped cul-de-sacs, success with serial conformer expansion is often limited. Management of such cases has evolved from surgical osteotomies for bony orbital expansion to inflatable balloon expanders to our current approach using hydrogel osmotic expanders for both soft tissue and bony orbital expansion. Craniofacial orbital bone expansion was used in only 2 resistant cases early in our series.

The management goal has been to avoid or at least to minimize the number of surgical procedures, particularly when this requires a general anesthetic.

Our belief is that the most critical feature of a successful outcome is the appearance of the eyelids and their ability to retain an ocular prosthesis in the soft tissue socket. While enlarging the bony orbit is important to create sufficient space for an ocular implant and an overlying thin prosthetic shell, we believe that full volumetric symmetry of the bony orbit is less critical.

Once space is created, then volume must be added to fill the space. Dermis fat grafts (DFG) have been our choice for an implant because they provide volume with increased surface lining and, most importantly, increase in size as child grows.

I. CHOP Experience With DFG for Congenital Anophthalmia and Microphthalmia

(2005 Wendell Hughes Lecture AAO/ASOPRS: James A Katowitz MD)

A. 38/170 patients had DFG
   1. Total orbits = 44
   2. Bilateral orbits = 6
   3. Success rate 42/44 = 95.4%
B. No instances of graft failure; complications: 2
   1. Socket contraction, 1
   2. Inclusion cyst, 1
C. Debulking needed in 6/44 = 13%. These 6 cases were associated with a significant gain in body weight.

II. Osmotic Self-Inflating Expanders for Anophthalmic Sockets: Guthoff / Schittkowski Approach

A. Copolymer of methylmethacrylate and vinyl pyrrolidone
B. Can rapidly increase to 10-12x original size
C. More rapid mucosal socket expansion
D. Prosthetic shell can be fit in 3-6 months
E. Requires several exchanges under general anesthesia

III. CHOP Hydrogel Series (Initial Approach)

A. Close collaboration with Prof. Guthoff and his colleagues at University of Rostock since year 2000
B. Approach similar, but differences in insertion method: spheres inserted as anterior socket expanders with later placement of dermis fat grafts as posterior orbital implants
C. MRI imaging rather than CT with its radiation risks is used for baseline and follow-up. Permits both volumetric analysis and evaluation of brain as well as ocular/orbital soft tissues.
D. Hemispheres used initially when microphthalmic eye visible.
E. The hemisphere expanders in the initial cases were secured to arcus marginalis at superior and inferior orbital rims or maintained in position with suture tarsorrhaphies.
F. For clinical anophthalmia, spherical expanders were placed anterior in the conjunctival sac.
G. After 1-2 exchanges with 2-3 month intervals:
   1. DFG then inserted for volume
      a. 21 patients in initial series: 14 unilateral, 7 bilateral; 27 orbits treated
      b. Average age at first implant: 11 months (range: 1 month to 12 years)
      c. Hemispheres placed anterior in conjunctival sac: 15
      d. Spheres placed anterior in conjunctival sac: 8
      e. Spheres placed posterior behind conjunctival sac: 4
   2. Unilateral lid fissure change after first implant: 18.5% within 3 months
   3. Continued improvement approaching symmetry after implant exchanges and DFG: 15 orbits had DFG implants after expansion (3 bilateral)
   4. Average number of hydrogel exchanges before DFG: 2.1

IV. Current CHOP Protocol for Management of Anophthalmic Socket: Office Insertion of Hydrogel Expanders With Cyanoacrylate Glue Tarsorrhaphy

A. Simple insertion
B. No general anesthetic needed
C. Holds for 5-7 days and can be supplemented by care-giver
D. Useful particularly when economics, distance, and/or anesthesia problematic


A. Retrospective chart review performed to identify cases of congenital anophthalmos or microphthalmos for which cyanoacrylate glue tarsorrhaphies were used with hydrogel expanders as initial treatment
B. The patient’s age, sex, involved orbit and socket (conjunctival cul-de-sac), horizontal lid fissure length, size of implant, number of implants, episodes of expulsion, length of time the implant remained in place, and time to dermis-fat graft were documented.
C. Exclusion criteria included prior orbital surgery for socket expansion.
D. Eleven anophthalmic or microphthalmic orbits in 8 patients were identified.
E. Mean age at implantation: 6.5 months (range: 3 weeks – 25 months)
F. Mean duration of follow-up: 10 months
G. 27 total implants used in the 11 orbits
H. Implants were either exchanged for a larger size, replaced if the implant extruded, or removed at the time of dermis-fat graft insertion.
I. The mean duration of each implant was 6.3 weeks (range: 2 days – 30 weeks).
J. A total of 6 out of 27 implants (22.2%) were noted to have extruded through the glue tarsorrhaphy at an average of 4.3 weeks (range: 1-8 weeks).
K. The mean time to dermis-fat graft implantation was 10.8 months (range: 2 months – 25 months).
L. There were no complications noted and no cases of dermatitis secondary to use of the glue.

VI. Adnexal Problems in Anophthalmos / Microphthalmos

A. Microphthalmos with cyst; lid colobomas; cryptophthalmos (partial, complete); canthal abnormalities (epicanthal folds, telecanthus); ptosis; entropion; canicular and nasolacrimal duct abnormalities
B. These adnexal anomalies can present at birth or develop secondarily. Timing of repair must be individualized to the needs of the patient from both a functional and appearance perspective.

VII. Summary

The guiding principle for congenital anophthalmic patients is conservative therapy: Avoid incisional surgery whenever possible. If conformer treatment fails or is too slow in producing expansion, hydrogel expanders have proven a useful alternative method, with good results and minimal surgical trauma.

Based on our experience at The Children’s Hospital of Philadelphia, we now recommend the following therapeutic concepts:

A. Blind microphthalmos
   If the fornices are reasonably developed, scleral shells of increasing size are most often used, or in the case of constricted fornices, a hemisphere hydrogel socket expander can help to create a sufficient space to fit a prosthesis.

B. Clinical congenital anophthalmos
   1. Initial hemisphere expander for the conjunctival sac
   2. Sphere expander placed anteriorly in conjunctival space will stimulate bony growth and continue expansion of the lids
   3. Dermis fat graft implantation for volume when fissure opening is sufficiently large
   4. Thin prosthetic shell then fits, which may transmit some motility if rectus muscles are attached to DFG.

C. Children > 5 years of age (or patients operated on previously who present with constricted conjunctival sac due to scarring):
   An individualized combination must be found using mucosal grafts / dermis-fat grafts / inflatable...
expanders or even surgical osteotomies in order to achieve reasonable facial symmetry and prosthetic appearance.

References


Steroid Options for Medical Management: Oral, Intravenous, and Intraorbital

Timothy John Sullivan MBBS

Glucocorticoids work by anti-inflammatory and immunosuppressive pathways, including reduced T and B cell function, reduced recruitment of neutrophils, monocytes, and macrophages, inhibition of the function of immunocompetent cells, and inhibition of the release of mediators (cytokines), and they also decrease GAG and hyaluronin synthesis and secretion by orbital fibroblasts.

Oral glucocorticoids (GC) have long been used as treatment for thyroid eye disease (GO), starting with doses of between 40 and 100 mg/d and tapering over 10-24 weeks with a cumulative dose of 2-6 g.

Early reports of intravenous administration came from Japan and Newcastle. Nagayama reported 5 patients who underwent treatment with pulsed methylprednisolone 1-g methylprednisolone IV daily on 3 successive days, repeated 3 to 7 times for Graves ophthalmopathy (GO). They obtained a good response in 3, fair response in 1, and no response in 1. Kendall-Taylor reported 11 patients with GO given 0.5-g methylprednisolone IV x 2 over 2 days followed by oral steroids 40 mg daily with a 4-week taper. There was a clear response in 8, little response in 2, and no response in 1. Imaging by CT scan showed reduction in the bulk of eye muscles in 8 of 9. Kahaly et al compared weekly IV methylprednisolone or oral prednisolone in 70 euthyroid patients with untreated, active, severe GO with primary endpoints of improvement in proptosis, lid fissure, diplopia, visual acuity, eye muscle thickness, and patient’s quality of life (QOL). Seventy-seven percent IV vs. 51% oral responded (P 0.01). There was improved visual acuity (P 0.01), QOL (P 0.001), and TRAB (P 0.001) with IV administration. Importantly, the IV side effects were less (P 0.001), and the conclusion was that IV glucocorticoids were more effective and better tolerated than oral steroids.

Because retrobulbar steroids had been shown to have some effect in other ocular inflammatory processes, Ebner et al compared retrobulbar with no treatment in 50 patients. Treatment group received 4 doses of 20-mg triamcinolone acetate 40 mg/ml in a peribulbar injection to the inferolateral orbital quadrant, while controls had no treatment. The results showed that relative to the control group, patients treated with triamcinolone had less diplopia and smaller EOMs. There were no systemic or ocular side effects.

In a recent survey of ASOPRS members, participants were asked “Which treatments do you use at all in GO?” Respondents answered as follows: Oral steroids, 86.9%; IV steroids, 74.2%; Intraorbital injection of steroids, 27.5%; Radiation, 69.9%; Orbital decompression—bone, 57.6%; fat only, 24.5%; bone and fat, 82.5%; Steroid-sparing biologic agents, 32.8%.

Selected Readings

Where Are We With Biologics?
Update of Monoclonal Antibodies to Treat Thyroid Eye Disease

Rona Z Silkiss MD FACS

In 2010, Bartalena et al presented a decision tree for the treatment of moderate to severe thyroid eye disease. This framework described the use of oral and intravenous steroids, cyclosporine, surgical rehabilitation, and possibly rituximab, as first suggested by Hegedus, as the treatment regimen. In 2012, as presented at the American Academy of Ophthalmology Subspecialty Day, we elucidated on the use of rituximab for moderate to severe thyroid eye disease not responsive to steroids or other modalities.

In 2 years, some progress has been made in vetting rituximab and exploring the use of other monoclonal antibodies.

Rituximab is a mouse–human chimeric monoclonal antibody targeting CD20 protein on pre-B and mature B lymphocytes. Its use results in transient depletion of CD20+ B cells that does not affect effector plasma cells (CD20+), memory B-cells in the secondary lymphoid organs, B-cell regeneration from stem cells, or serum immunoglobulin levels.

It is postulated that the rituximab induces a 4-6+ month selective B-cell depletion that blunts the active inflammatory phase of thyroid eye disease. Normal B-cell levels are restored after 9-12 months. Rituximab decreases antigen presenting B cells, leading to diminished T-cell recruitment in orbital tissue, and decreases the level of IL-6 and other cytokines. This complex interaction has been well described by Hegedus and others.

Numerous studies have been published, largely individual case reports and small prospective, uncontrolled studies, which have demonstrated over 90% improvement in Clinical Activity Scores (CAS) in patients treated with rituximab. However, the Mayo Clinic completed a double blind prospective trial of 24 patients in 2013. Twenty-one patients completed the study. Recruited patients demonstrated a CAS of 4 or greater and failure or steroid refusal. Results indicated that both groups demonstrated improvement at 6 months, with no statistically significant difference compared to controls at 24 weeks.

Results of this trial have not yet been published, but concerns related to the variation in the time to treatment (7 months to 3.5 years) have been raised. Given this wide range, questions regarding whether patients were in the fibrotic stage of disease and unlikely to respond to treatment have been discussed. Additionally, the rituximab patients appeared to have more progressive disease at outset (more severe proptosis, retraction, dermopathy, TrAb, etc.), though deemed not statistically significant in this small cohort. A full analysis is anticipated.

We are, however, at the dawn of the operational use of proteomics, genomics, and molecular medicine.

There are a myriad of additional monoclonal antibodies that are being evaluated for safety and efficacy in the treatment of thyroid eye disease. Among them are anti-IL-6, anti-IL-1, anti-TNF, and a new Mayo Clinic-developed small molecular target antibody.

IL-6 promotes B-cell differentiation and immunoglobulin synthesis, regulates immune responses, and plays a critical role in the interplay between innate and adaptive immunity. IL-6 influences the development of cytotoxic and regulatory T-cells (Treg). High concentrations of IL-6 have been documented in patients with thyroid eye disease. IL-6 increases the expression of the TSH receptor in fibroblasts and preadipocytes. These high levels stimulate B cells to produce TSI. Fibroblasts stimulated by TSI differentiate to myofibroblasts or adipocytes, producing glycosaminoglycans, adipogenesis, and inflammation.

IL-6 receptor antagonists produce anti-inflammatory and proregulatory effects in tissue undergoing an autoimmune response. Toclizumab (RoActemra) is a recombinant humanized IgG1 monoclonal antibody to the IL-6 (interleukin-6) receptor. It is approved for the treatment of active moderate to severe rheumatoid arthritis unresponsive to standard therapies and is administered IV 8 mg/kg every 4 weeks (min 4 cycles).

Pérez-Moreiras et al recently published their results of the Treatment of Active Corticosteroid-Resistant Graves’ Orbitopathy with Toclizumab study. They studied 18 patients with thyroid eye disease, mean age 47.9 years, CAS > 4, refractory to intravenous steroids (300 mg/wk for at least 3 weeks). There was a delay of 3 months from steroid treatment to toclizumab infusions. This was a prospective intervention nonrandomized study.

The results were impressive: mean CAS reduction, 5.89; mean TSI levels lowered by 76.2%. Thirteen patients (72%) demonstrated reduced proptosis (mean: 3.94 mm), 15 patients (83%) demonstrated improved motility; 7 of 13 patients (54%) experienced resolution of diplopia. No severe side effects or relapse were reported.

In this study, 50% of patients were active smokers at entry, 50% experienced disease < 1 year. The average period to treatment was 15.7 months. Patients received a mean of 5.4 treatments. The mean follow-up was 15 months, with CAS stable for 27 months. The few adverse reactions were mild (fatigue, neutropenia, URI, elevated LFT).

Tumor necrosis factor is produced by T-cells, natural killer cells, mast cells, and fibroblasts. It stimulates apoptotic pathways and cell proliferation, leads to activation of NK-kB, mitogen-activated protein, Erk, and Jun kinase. Tumor necrosis factor leads to expression of IL-6, IL-8, IL-18, and cyclo-oxygenase 2, resulting in inflammation. There are a few case studies suggesting its use.

In 2013 Rivervision Corporation initiated a 20-center prospective double blind study of the use of interleukin-1 inhibitor (teprotumumab). This is an insulin-like growth factor 1 receptor antagonist. This project builds on the work of Terry Smith, Raymond Douglas, and many others who describe thyroid-stimulating hormone receptor and insulin-like growth factor receptor (IGF-1R) expression at higher levels in the orbital connective tissue from individuals with thyroid eye disease than in healthy tissues.

The Mayo Clinic group has published preliminary data regarding a small molecule antagonist that inhibits thyrotropin receptor antibody-induced orbital fibroblast functions involved in the pathogenesis of Graves ophthalmopathy.

Much work remains to be done to discover an appropriate target and antibody therapy. However, given the strides in molecular medicine, a site-specific solution to this debilitating disease may be close at hand.
Selected Readings


Current Trends in Orbital Decompression Surgery: An Overview

Ioannis Mavrikakis MD PhD

I. Current surgical techniques for orbital decompression surgery involve:
   A. Expansion of the bony orbit, and/or
   B. Fat removal

II. Technical options for bony decompression can be divided into two main categories:
   A. Those that allow access to medial wall and floor
      1. Caruncular
      2. Medial skin, Lynch
      3. Inferior conjunctival
      4. Endoscopic transnasal
      5. Transantral, Ogura
   B. Those that allow access to deep lateral wall, floor, and medial wall
      1. Lateral canthal + medial approach
      2. Lateral upper skin crease + medial approach
      3. Swinging eyelid
      4. Coronal

III. Technical Options for Soft Tissue Removal
   A. Intraorbital fat removal
      1. Inferolateral
      2. Medial
         a. Inferomedial
         b. Superomedial
   B. Blepharoplasty
      1. External
      2. Internal

IV. Preferred Techniques for Orbital Decompression Surgery
   A. Minimally invasive, keyhole approaches
   B. Lateral canthal ± medial caruncular ± intraorbital fat removal
   C. Swinging eyelid approach ± lower eyelid elevation
   D. The above techniques can be combined with blepharoplasty or upper eyelid lowering.

Selected Readings
When and How to Perform Orbital Decompression

Miguel González-Candial MD

Multiple factors need to be considered prior to performing orbital decompression surgery, including age, sex, race, the individual characteristics of each patient, and the particular way the disease is affecting our patient clinicopathologically and psychologically. We have to determine the right time to proceed to surgery. Staging the disease is paramount.

- In its severe forms thyroid orbitopathy more commonly affects older patients; for this reason we have to be ready to act more rapidly in these patients than in younger patients, who have a milder process. On the other hand, tissues have generally an increased laxity in older patients, and that allows the orbit to expand anteriorly in a more marked way than in younger patients.
- As we know, thyroid orbitopathy is more frequent in women than in men, but it is usually more severe in men.
- The incidence and severity of thyroid orbitopathy has been related to smoking. Smoking also affects healing and skin texture. For these reasons the patient should be strongly encouraged to stop smoking.
- The status of the cornea and the tear film should be evaluated as they may determine the indication for surgery and the outcome afterwards.

The patient’s appearance may also have an important impact, both psychologically and socially. It may affect their private life as well as their social life, including their job. That is sometimes the primary reason why these patients are keen to undergo surgery.

In some other cases, the changes in appearance may be subtle and that can induce the surgeon to undertake the wrong procedure. It is very important to obtain previous photographs of the patient in order to stabilize the real changes that have been suffered.

The timing to proceed to surgical decompression is determined by the indication. There are two particular indications where urgent surgery is required:

1. Corneal exposure and subsequent corneal damage
2. Optic nerve function compromised due to apical compression or marked proptosis

Elective surgery is usually considered once the inflammation has ended, the thyroid gland function has been stable for some time (6 months), and the patient presents unacceptable symptomatic or aesthetic changes. Decompression techniques include acting on the orbital fat and/or the orbital walls.

When planning surgery it is paramount to obtain adequate orbital images, a CT scan, preferably, with axial and coronal views. The surgeon has to evaluate the changes that the disease has produced, the degree of muscle and fat enlargement, and also which muscles have been primarily involved.

In case of increase in orbital fat volume, fat excision should be considered. Preseptal fat, via blepharoplasty incision, or orbital fat in the inferolateral or medial orbit is frequently excised.

Surgical access to perform bony decompression includes superolateral skin crease incision, when the deep lateral wall is targeted, and the transcaruncular approach if the goal is to decompress the medial wall and medial floor. These incisions can be extended by the swinging eyelid technique, to further expose the orbital floor if needed.

Bony decompression can be achieved by addressing the medial wall, the deep lateral wall, and the orbital floor. The more posterior the bony decompression is performed, the lower the risk of misalignment of the anterior orbital structures and pulley mechanisms.

Balanced bony decompressions, addressing the medial and the deep lateral wall, have been shown to cause less postoperative shifting of the orbital contents and less diplopia. Once the bony decompression is achieved, periorbitotomy is necessary to allow the orbital contents to prolapse into the gained space.

Selected Readings


Orbital Decompression and the Effect on Strabismus

Peter J Dolman MD

I. Thyroid Eye Disease

Autoimmune disease causing enlargement of orbital fat and muscle

A. Disease severity

1. Two-thirds of patients have mild disease with primarily fat expansion, proptosis, and lid retraction.
2. One-third of patients have significant extraocular muscle enlargement with congestive features, possible restriction of motility, and occasionally dysthyroid compressive optic neuropathy.

B. Disease activity (Rundle’s curve):

Biphasic course with 6-18 months of progressive disease followed by an inactive phase

II. Indications for Orbital Decompression (OD)

Reduction of orbital compression by removal of bony walls or orbital fat.

A. Dysthyroid optic neuropathy
B. Disfiguring proptosis
C. Chronic congestion

III. Incidence of Diplopia in Orbital Decompression Cases

Case series review. (Jordan, et al., ITEDS International symposium, 2013): 123 patients

A. 75% had no preop diplopia: 30% developed diplopia following OD.
B. 25% had preop diplopia.
   1. 65% had similar diplopia following OD.
   2. 7% had worse diplopia.
   3. 28% had less diplopia.

IV. What Factors Influence Risk of Postop Strabismus?

A. Nature of orbital disease
   1. Fat vs. muscle involvement
   2. Active vs. quiescent disease

B. Surgical factors
   1. Surgical approach
   2. Surgical indications

V. Fat vs. Muscle Involvement (149 cases) and Effect on Post-OD Strabismus: Review by Author

<table>
<thead>
<tr>
<th>New Onset / Worsening Strabismus</th>
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<tbody>
<tr>
<td>Fat (80)</td>
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<tr>
<td>Muscle (69)</td>
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</table>

VI. Active vs. Quiescent Disease

A. Active disease (usually optic neuropathy cases):

Continued extraocular muscle (EOM) expansion in 35% with associated progressive strabismus

B. Quiescent disease (disfiguring proptosis or chronic congestion cases):

Stable EOM postop so induced strabismus less common and restorative surgery can be offered soon.

VII. Surgical Approaches

A. Fat removal
   1. Rare to perform in isolation (4/149 cases)
   2. New onset / worsening diplopia: 0%

B. Medial wall / orbital floor
   1. New onset / worsening diplopia
      a. 55% if done for optic neuropathy (enlarged EOM)
      b. 8% if done for disfiguring proptosis

C. Balanced medial and lateral wall
   1. Avoids sinusitis and torsional diplopia


Table 2.

<table>
<thead>
<tr>
<th>New-Onset Strabismus</th>
<th>Resolution of Strabismus</th>
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<tbody>
<tr>
<td>Balanced medial/lateral</td>
<td>33%</td>
</tr>
<tr>
<td>Lateral wall</td>
<td>7%</td>
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</tbody>
</table>
VIII. Surgical Indications
   A. Dysthyroid optic neuropathy
      1. Pre-existing strabismus: 35%
      2. New onset / worsening diplopia: 55%
   B. Disfiguring proptosis
      1. Pre-existing strabismus: 10%
      2. New onset / worsening diplopia: 8%
   C. Chronic congestion
      1. Pre-existing strabismus: 15%
      2. New onset / worsening diplopia: 20%
IX. How does a preceding OD affect subsequent strabismus surgery?
   A. Surgery easier as less congested and less proptosis
   B. No worsening on outcomes of strabismus surgery following OD (Kim, et al. J AAPOS. 2013: 17(2).)
X. Summary
   A. Orbital decompression may affect strabismus / diplopia.
      1. New onset: 30% overall new strabismus following OD
      2. Pre-existing strabismus
         a. 75% unchanged or worse
         b. 25% may improve.
   B. Type of disease
      1. Fat vs. muscle: 8% vs. 40% new-onset diplopia (NOD)
      2. Active vs. quiescent
         a. Active has progressive changes and necessitates delaying alignment surgery.
         b. Quiescent: Induced strabismus is stable and may align eyes quicker.
   C. Surgical approach
      1. Fat excision: 0% NOD
      2. Medial wall / floor: 30% NOD (55% for optic neuropathy, 8% for disfiguring proptosis)
      3. Balanced medial wall/lateral wall: 30% NOD
      4. Lateral wall: 8% NOD (small series)
   D. Surgical indication
      1. Optic neuropathy: 55% NOD / worsening diplopia
      2. Disfiguring proptosis: 8% NOD / worsening diplopia
      3. Chronic congestion: 20% NOD, worsening diplopia
Safe Filler Injection Technique for Deep Superior Sulcus

Audrey Looi MD FRCS(ED)

The skeletonization of the aging face is centered prominently on the superior sulcus. Filler injections in this area can yield a marked rejuvenative effect. However, the spectre of complications, including central retinal artery occlusion, discourage more frequent application of this treatment. This presentation will showcase 2 patients and highlight an injection technique that reverses the skeletonization process in the safest manner possible.
Customized Blepharoplasty: Varying Techniques According to the Need

Altug Cetinkaya MD

I. Overview of Cosmetic Eyelid Surgery Evolution
   A. What was done in the past
   B. Changing trends in the near past
   C. What are we doing today?
II. Patient Evaluation
   A. First encounter
      1. Use the mirror to understand patient expectations.
      2. Listen to the patient carefully: What does he/she really mean?
      3. Patient selection, patient education
      4. Precise discussion about what the surgery can achieve
      5. Discussion about additional pre- or postsurgical tools that may help the patient needs: BOTOX, fillers-fat injections, peeling, radiofrequency
   B. Examination pearls
      1. Taking a good history
      2. What not to miss during initial examination
         a. Eyelid ptosis, brow ptosis, lacrimal gland prolapsus
         b. Is it bags, or is it edema?
         c. Is it fat herniation, excess skin, orbicularis hypertrophy?
         d. Examine the whole face.
         e. Lower eyelid tonus, canthal stability
      3. Examination of the eye
      4. Systemic considerations
      5. Photography
III. Surgery
   A. Upper eyelids
      1. Anesthesia
      2. Measuring and marking: Measure twice, cut once
      3. Skin only vs. skin- orbicularis
      4. Fat pads: medial only vs. medial and central
         a. Mini-incision fat removal
      5. Crease, crease, crease: Sutures / cautery
      6. Recognizing and dealing with eyelash ptosis
   B. Lower eyelids
      1. Fat pads
         a. Always have a drawing of fat pads before surgery.
         b. Access the fat pads, preserving the septum.
         c. Fat excision vs. preservation vs. both
      2. Tear trough management
      3. How to make sure how much skin to remove: Techniques of safe skin removal
         a. Pinch excision
         b. Lateral-only skin excision
      4. Lateral canthus is the key: Techniques of stabilization
         a. How to determine the type and amount of intervention
         b. Lateral tarsal strip
         c. Lateral canthopexy techniques
         d. Lateral retinaculopexy techniques
      5. Dealing with the orbicularis
         a. Determine whether there is hypertrophy / laxity
         b. Suspension of orbicularis and suborbicularis oculi fat
      6. Closing the incisions
IV. Postoperative Management

References

The periocular region is the area of the face that mainly conveys the signs of aging and fatigue. Cosmetic surgery around the eyes provides the most cost-effective measure for improving facial appearance. Aging is associated with descent and loss of volume. The use of periocular autologous fat transfer (AFT) enhances the result of modern techniques of blepharoplasty. Autologous fat is an ideal filler for periorbital and facial rejuvenation because of its excellent biocompatibility as a living graft that is easily harvested and incorporated into the surrounding tissues, with no hypersensitivity potential and minimal chance of infection. It is readily available in large quantities at low cost, and grafted fat gives a natural consistency, with excellent volume augmentation. It is potentially permanent, and the regenerative ability of fat is believed to improve the overlying skin quality. Coleman suggested that delicate aspiration and careful handling and purification, along with microinjection of small particles of fat in multiple layers, would increase the graft survival.

The sharp-needle intradermal fat (SNIF) grafting technique was described by Zeltzer et al to use the smallest possible amount of fat in intradermal grafting. In this technique, 2- to 3-mm diameter cannulas with multiple small-diameter (1-mm) sharp holes were used, and the harvested fat was injected through 23-gauge sharp needles. The authors used this technique successfully in 250 patients, obtaining good improvement in wrinkle reduction rather than volumization without any major complication. Further, Tonnard et al have recently shown that processing the harvested fat into what they name “nanofat” can produce an injectable solution that does not contain viable adipocytes but still promotes skin improvement through the presence of adipose-derived stem cells.

Based on the preceding concepts, the combination of conservative excision of excess skin in the upper lids, fat transposition in the lower lids, and periocular AFT using very fine fat harvested with cannulas of 0.5- and 0.8-mm holes addresses both components of periocular aging. This finely harvested fat is centrifuged for 1 minute at 3000 RPM to isolate the adipocytes. A 0.7-mm cannula is used to inject the fluid fat obtained with the 0.8-port cannula into multiple deeper layers. A 25-gauge needle is used to inject in a very superficial layer the finer fat, harvested through the 0.5-mm hole cannula. In this manner, fat is used both to volumize and to improve the skin quality by grafting stem cells very close to the skin. This technique is particularly useful for younger patients who do not want to pursue more extensive surgery of the face.

References
Endoscopic Face Lifting and Autologous Fat Grafting: A Minimally Invasive Way to a 3-Dimensional Rejuvenation

Francesco P Bernardini MD, Alessandro Gennai MD, and Martin H Devoto MD.

Introduction

Modern oculofacial surgeons should address the entire area around the eye as a single aesthetic unit rather than offering isolated techniques that can achieve only limited improvements. A variable combination of tissue descent and fat atrophy affect the tissues that form the unit. In the superior complex of the unit, formed by the upper lid, brow, and forehead tissue, descent caused by gravity and protractors muscles tissue descent causes brow ptosis, blepharochalasis, and temporal hooding. At the same time fat atrophy causes skeletonization of the brow and deepening of the superior sulcus, while contributing to a lesser extent to brow ptosis (see Figure 1A). In the lower complex, formed by the lower lid, malar eminence, and the cheek and in the lateral complex, formed by the temple and zygoma, volume loss prevails, with consequent “pseudo descent” of the cheek, skeletonization of the malar eminence, tear trough deformity, and skeletonization of the zygomatic arch and the temple.

We propose a systematic combination of endoscopic face-lifting to vertically reposition the descended tissues, combined with fat grafting to provide a 3-dimensional rejuvenation, where conservative blepharoplasty can be associated in selected cases for result optimization (see Figures 1B and C).

Background Observations

Endoscopic surgery has so far been proposed only as brow-lifting technique, often associated with subtractive upper and lower blepharoplasty and too often causing surprised looks and worsening of the periocular skeletonization. On the other hand, traditional fat grafting to the periocular area has been discouraged because of the risks of visible lumpiness under the thin eyelid skin.

Recently, various authors have focused their attention on microfat grafting in order to achieve a more fluid fat, richer in stem cells, that can be implanted superficially with needles and indicated for the treatment of the most delicate areas of the face, such as the periocular and perioral regions. The microfat solutions proposed so far are based on various fat processing methods after harvesting, using either collagenase-digestion or manual emulsification. Strict legal limitations regulate the use of collagenase in humans, while manual centrifugation eliminates adipocyte viability. Trivisono et al have recently shown that harvesting fat with small side-port cannulas carried a 2-fold content in adipose tissue-derived stromal cells (ADSC) compared to traditional harvesting cannulas.

Surgical Technique

We propose a systematic approach to rejuvenate the face and the periocular area that consists of a minimal incision vertical endoscopic lift (MIVEL), which is a scarless technique that respects the vertical vector of tissue descent that occurs in the face. We proposed a novel fixation technique that doesn’t require foreign body implantation, bone tunnel, or scalp removal and that just relies on the use of an absorbable suture to achieve brow and malar fixation.

The MIVEL is systematically combined with a novel technique of microfat grafting that consists in the use of “micro” side-port cannulas to harvest a “microfat,” rich in stem cells and viable adipocytes, without further processing. This fat is enhanced and rendered fluid with autologous platelet-rich plasma and is ready to be injected superficially with syringe needles. In respect to the recent microfat evolution, the technique is unique as it doesn’t require processing and is rich in both viable adipocytes to provide volume restoration and stromal vascular fraction (SVF) to regenerate tissues. We called this microfat grafting technique “superficial enhanced fluid fat injection” (SEFFI), and we used it to achieve volume restoration and skin regeneration of the entire face and periocular unit in our patients in association with MIVEL.

Figure 1. Diagram of the periocular aesthetic unit. (A) Impact of descent and atrophy across the unit. (B) Vertical vectors and force of the endoscopic dissection with MIVEL (minimal incision vertical endoscopic lift). (C) Areas of fat implantation.
Surgical Results

We have treated a consecutive large series of patients that achieved good or excellent results with no visible scars and minimal complications. Lifting and volume restoration effects could be easily discerned in all our patients, showing natural and long-lasting results (see Figures 2 and 3).

Conclusions

Based on the anatomical changes that occur in the periocular aesthetic unit, vertical endoscopic tissue repositioning is indicated to address the descent of the superior complex and in minor part of the inferior complex. Microfat grafting with SEFFI offers many clinical applications and advantages. Because of the small size of the fat lobules implanted, it can be used to correct volume defects in the upper eyelid sulcus, infraorbital hollows, and the tear trough, as well as to restore volume loss in the entire face, including the nasolabial folds, marionette lines, and lips. Thanks to the high content in ADSC present in the SVF, growth factors, and cytokines contained in autologous platelet-rich plasma, it provides regenerative effects, with rhytides reduction and skin tone and quality improvement across the entire face, including...
rejuvenation of the delicate eyelid skin and smoothing out of the fine lines of the perioral area.

In conclusion, it is important for modern oculofacial plastic surgeons to recognize the periocular unit as the most central aesthetic unit in the face. By approaching our unit systematically, repositioning the descended tissues and restoring the lost volumes as proposed, oculoplastic surgeons will have a leading role as facial surgeons.

References


Eyelid Deformities and Surgery in Type 1 Neurofibromatosis

Guilherme Herzog Neto MD

Introduction

Type 1 Neurofibromatosis (NF) is a chronic and progressive disease of autosomal dominant transmission that may compromise the cutaneous, osseous, and nervous systems. It affects approximately 1:2500-5000 newborns, and 50% of these are a new mutation.3,5

Background Observations

Eyelid deformities may be minimal (see Figures 1 and 2) or extremely severe (see Figures 3-5).

Figure 1. Minimal external deformities in neurofibromatosis 1.

Figure 2.

Figure 3. Severe orbital and periorbital deformities in neurofibromatosis 1.
Classification of periorbital deformities caused by NF include the following:¹,²

- Orbital and periorbital volume enhancement caused by tissue infiltration from localized, plexiform or diffuse neurofibromas and schwannomas of various sizes of the orbit, eyelid, and face
- S-shaped upper eyelid, as the infiltration tends to affect the lateral part of the upper eyelid. This may be unilateral or bilateral and affect the inferior eyelid.
- Eyelid ptosis, due to excessive weight and/or levator dehiscence
- Mechanical ptosis of the eyebrow
- Pulsating exophthalmos
- Enophthalmos may be rarely found.
- Eyelid hypopigmentation or hypertrichosis
- Mechanical ectropion of the lower lid
- Floppy eyelid, from dehiscence of the lateral canthal ligament
- Conjunctival and lacrimal gland infiltration

Two patients had bilateral and 31 patients (94%) had unilateral orbital / temporal NF. All their patients had upper lid disease, and 19 patients (58%) had lower lid involvement. Six patients (18%) had significant brow infiltration.⁴

Procedures for correction of eyelid deformities in NF include the following:

Eyelid, eyebrow, and facial infiltration debulking and tumor / eyelid removal and reconstruction, eyebrow elevation, levator reinsertion and/or resection, eyelid suspension, reattachment of lateral canthus, eyelid, and canthal tissue tightening to stabilize exophthalmos (see Figures 6 and 7). These procedures may be done in one session or multiple sessions if necessary. The surgery is usually palliative and not curative, but results can be considered satisfactory in some cases, especially when the orbital shape is preserved and the eyelid structure has not been excessively altered by the disease; in all other cases, the cosmetic outcome is inferior to the patient’s and parents’ expectations.¹
The serious problem of recurrence is also a limitation to cosmetic surgery in eyelid neurofibromas. Cosmetic surgery is, for this reason, best delayed to the age of 18 years or when the disease has stabilized.\textsuperscript{4}

Complications reported in the literature include residual ptosis, ptosis overcorrection, poor lid contour, eyelid / facial asymmetry, dry eye, corneal exposure, upper and lower lid entropion / ectropion, and conjunctival prolapse. In the authors’ experience residual ptosis, poor lid contour, and eyelid asymmetry are relatively frequent postoperative complications (see Figure 8). Neurofibromas have a low potential to undergo malignization.\textsuperscript{6}

The authors conclude that the patients with orbital disease and more severe eyelid disease tend to have more surgeries and decreased cosmetic satisfaction.

The author intends to show his experience with 15 patients submitted to periorbital surgery due to NF.
Table 1. Demographics and Surgery of the Study Cohort (Case Presentations)

<table>
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<th>Lower Lid</th>
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<th>Previous Surgery</th>
<th>Periorbital Surgery</th>
<th>Debunking Surgery</th>
<th>Ptosis Surgery</th>
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Abbreviations: M = male; F = female.

* Suspension

References


Long-term Evaluation After Acellular Porcine Dermal Collagen Implantation (Permacol)

Karen Skjødt MD

When the lower lid descends beyond the lower limbus, eye closure is impaired. The patient complains of tearing, grittiness, eye infections, or corneal problems. Reasons for lower eyelid malposition vary from fibrosis of the retractor muscle (TAO) to facial paralysis or involutional changes. If this is combined with a flat maxillary bone and a long or proptotic eye, a normal tightening procedure might worsen the problem. A spacer must then be inserted to lift the lower eyelid.

For years autologous tissue of hard palate or ear cartilage has been preferred as a spacer. Drawbacks, however, are morbidity at the donor site and unpredictable shrinkage.

Newer alloplastic materials are emerging with a high safety profile, alleviating the need for general anesthesia. Permacol, a crosslinked acellular porcine dermal collagen, has been well documented in hernia repair. Long-term evaluation of Permacol as a spacer in eyelids, however, is lacking.

Case Presentation

The author has routinely implanted Permacol as a spacer for more than 7 years. In order to ascertain long-term results, 43 consecutive eyelids implanted with Permacol from 2006 to 2013 were evaluated.

Methods

During surgery, the spacer was sutured between the tarsal plate and retractor and covered by conjunctiva at the posterior aspect of the lid.

Results

Four eyelids were unavailable for follow-up. Ages of the patients were 40-88 years. Average: 70.9 years. Postoperative follow-up was 12-81 months. Average: 37.2 months.

The lowered lid was caused by:

- Involutional laxity (including 88% floppy eyelids): 18 eyelids (2 were previously enucleated)
- TAO: 12 eyelids
- Facial paralysis: 3 eyelids
- Postirradiation retraction: 3 eyelids
- Myotonic dystrophy: 3 eyelids

All patients had a distance from the anterior pole of the eye to the maxillary bone of 5 mm or more. Lagophthalmos decreased from preoperative 4.3 mm (2-10 mm) to postoperative 0.33 mm (0.3). See Figure 1.

Figure 1.

Retraction (eye lid edge to lower limbus) decreased from preoperative 6 mm average (3-12) to postoperative 1 mm (0-3). See Figure 2.

Figure 2.

Two lids needed revision; a small corner of graft eroded through the conjunctiva. After revision there were no problems.

Complications

Three lids had the spacer explanted because of looseness. All had previously had irradiation (TAO, 2; maxillary carcinoma, 1). All the explanted spacers were intact in size and texture. Microscopy showed minimal reaction and no degradation of collagen fibers.

Conclusion

Permacol seems safe and useful also in the long run for most patients. Irradiated patients, however, should probably be offered other alternatives.
Selected Readings


Management of Anophthalmic Socket Problems

David R Jordan MD

Introduction

The anophthalmic socket has long been a challenge for the ophthalmologist and ocularist. Anophthalmic surgery is no longer simply about replacing a diseased eye with an orbital implant and delegating the procedure to the junior resident staff. As with other microsurgical ophthalmic procedures, enucleation and eviscerations should be performed meticulously to attain the best functional and cosmetic result and to avoid deformities that may compound the patient's already challenging situation.

Characteristics of the ideal anophthalmic socket include the following:

- A centrally placed, well-covered, buried implant of adequate volume, fabricated from a bioinert material
- A socket lined with healthy conjunctiva and fornices deep enough to retain a prosthesis and to permit horizontal and vertical excursion of an artificial eye
- Eyelids with normal position and appearance, as well as adequate tone to support a prosthesis
- A supratarsal eyelid fold that is symmetric with the supratarsal fold of the contralateral eyelid
- Normal position of the eyelashes and eyelid margin
- Good transmission of motility from the implant to the overlying prosthesis
- A comfortable ocular prosthesis that looks similar to the sighted, contralateral globe and in the same horizontal plane

Close collaboration between the ophthalmologist and the ocularist is essential in order to obtain the best functional and cosmetic results with an ocular prosthesis in an anophthalmic socket and to reduce the frequency of secondary periorbital procedures. Excellent cosmetic results and long-term control of socket problems are the ideal, but they are difficult to achieve in all cases. Secondary procedures can be helpful but at times may be emotionally unsatisfactory for both the patient and surgeon. No one procedure answers all of these requirements, as evidenced by the numerous surgical procedures advocated over the years. The goal is always a natural postoperative appearance with symmetry, excellent motility, and little socket irritation or discharge, as well as the maintenance of maximal anatomic integrity. When the patient tells you their friends and colleagues “don’t know which is the prosthetic eye,” you know you have achieved the goal.

The oculist may be able to achieve the needed correction of socket and eyelid deformities without the need for surgical intervention. Yearly follow-up examinations with the oculist for prosthesis polishing and implant fit evaluation, as well as with the ophthalmologist to examine for any socket issues that are more easily addressed when identified at an early stage (eg, implant exposure that may lead to implant infection and implant removal) are also important.

Fabrication, Care, and Maintenance of the Artificial Eye

The ideal prosthesis is custom fit to the dimensions of the conjunctival fornices using the “modified impression technique.”

Most patients become accustomed to wearing an artificial eye within several days of custom fitting. Patients are asked to continue with their normal facial hygiene and to try to ignore the presence of the prosthesis, including leaving the prosthesis in the socket while sleeping. Frequent removal and manipulation of the artificial eye roughens the fine polished surface of the prosthesis and may lead to microtrauma of the conjunctiva and socket irritation. The patient should return to their ocularist at least once per year to have the artificial eye polished and adjusted. A smoother surface not only looks better but also allows for smoother movement of the eyelids over the prosthesis, decreasing conjunctival irritation and associated mucous production. Progressive changes to the eye socket such as fat atrophy and laxity of the upper and lower eyelids may cause rotation or malposition of the prosthetic eye. Minor adjustments in the shape or thickness of the artificial eye may provide the patient with a more comfortable fit and natural appearance.

If the prosthetic eye has to be removed, proper handling of it is important. A mild, nonirritating soap (eg, Dove, Ivory, or baby shampoo) can be used to clean the prosthesis by gently rubbing soap and water on the artificial eye surface followed by rinsing with warm water. Alternatively, daily soft contact lens cleaner can be used instead of a mild soap, followed by rinsing with a contact lens rinsing solution. The prosthetic eye is gently dried with a nonabrasive soft cloth or soft facial tissue. Abrasive cloth materials will wear away the polished surface, creating a dull acrylic surface.

If the artificial eye is left out while sleeping or for more prolonged periods, it should be stored in soft contact lens soaking or rinsing solution.

Anophthalmic Socket Problems

Numerous anophthalmic socket problems can occur in the lifetime of an artificial eye patient. The author will highlight the common problems encountered from the following list.

- Dryness
- Discharge and irritation
- Lagophthalmos with exposure of prosthetic surface
- Socket pain
- Lower eyelid malposition
- Eyelash misdirection and entropion
- Ectropion
- Blepharoptosis
- Anterior orbital cysts
- Deep superior sulcus and enophthalmos
- Implant migration implant exposure and extrusion
- Implant infection
- Socket contraction
References


When Ptosis Surgery Goes Wrong: Explaining Complications and Management

Habibullah Eatamadi MD

I. Anatomy of the Upper Lid

The correct understanding of the surgical anatomy of the upper lid is possibly one of the most important determinants of successful surgery.

A. Different layers at different levels
B. Skin, orbicularis, tarsal plate
C. Skin, orbicularis, septum, preaponeurotic fat pad, levator, Müller muscle
D. Whitnall ligament (superior transverse ligament)
E. Anatomy at the superior tarsal border

II. The First Steps to Avoid Complications

A. Expect the patient’s expectations.
B. Proper examination
   1. Lid examination
      a. Levator palpebrae superioris (LPS) function
      b. Palpebral fissure in primary position
      c. Marginal reflex distance
   2. Ophthalmic examination
      a. Visual acuity
      b. Refractive error, including cycloplegic refraction
      c. Orthoptic examination
      d. Dilated fundus examination
      e. Tear function tests
      f. Corneal sensitivity
   C. Brow ptosis and its contribution to the patient’s symptoms

III. Other Important Examinations

A. Jaw winking phenomenon
B. The pupillary size and the iris color differences between the eyes: Horner syndrome
C. The lid position in downgaze: Lagophthalmos
D. Bell phenomenon
E. Palpation of the eyelids and the orbital rim for lid mass: plexiform neuromas, lymphoma, leukemia, rhabdomyosarcoma
F. Exophthalmometry: relative proptosis or enophthalmos

IV. Surgical Care: Consent

A. Generally both patients and parents have unrealistic expectations.
B. Ample time in discussing why the procedure is needed, different approaches, outcomes, complications
   1. Perfect lid symmetry
   2. Secondary operations may be needed.
   3. Functional results depend on the preoperative LPS function.
      a. Best results in patients with mild to moderate ptosis with good levator function
      b. For severe ptosis, with poor levator function the best expectation is similar palpebral fissures in primary position.

V. Consent: Complications

A. Infection, bleeding, bruising
B. Lid lag and lagophthalmos
C. Eyelid asymmetry
D. Droopiness of the contralateral eyelid
E. Poor cosmesis (lid show, lid crease, excess skin, etc.)
F. Scarring
G. Lid margin abnormal shape (peaking, lateral flare, flat shaped, etc.)
H. Ocular surface exposure
   I. Failure
   J. Overcorrection
   K. Undercorrection
   L. Abnormal contour
   M. Conjunctival prolapse
   N. Entropion and ecretropion
   O. Lash ptosis
   P. Bleb-related complications
   Q. Suture exposure

VI. Patient’s Expectations

A. Explain well what to expect to avoid disappointments
B. A patient with severe post-traumatic ptosis and scarring is easier to satisfy than a patient who has 10-year history of BOTOX, fillers, face lift, etc.
VII. What to Expect

The level of the lid may change in the first 6 weeks after the operation.

A. The lid will rise by 1-2 mm if the levator function is 7-10 mm.
   Undercorrect by 1-2 mm.

B. The lid will drop by 1-2 mm if the levator function is 7-10 mm.
   Overcorrect by 1-2 mm.

C. The lid will remain the same if its function is about 7-10 mm.
   Keep at the same level.

D. As a general rule overcorrection is rare in pediatric age groups and more common in adults.

VIII. Despite all of the planning complications still happen.

A. Overcorrections
   1. Occur due to:
      a. Too much LPS resection
      b. Too much skin resection
      c. Uncooperative patient during the operation / oversedated
      d. Pseudo: Overcorrection in the early postoperative period due to unilateral brow overaction
   2. If the lid is very high then immediate lowering is required.
   3. If the overcorrection is mild, instruct the patient to massage the lid with traction on the lashes regularly for up to 3 months. Wait 6 months and reassess.

B. Lagophthalmos and exposure
   1. Causes
      a. Too much LPS resection
      b. Anterior lamellar shortening
      c. Incorporation of septum in the sutures
   2. Regular lubricant and antibiotic drops and ointment
      a. Lowering the lid: if the cornea is jeopardized
      b. Recession of the levator muscle
      c. Skin graft

C. Undercorrections
   1. Causes
      a. Inadequate LPS advancement, resection
      b. Uncooperative patient
      c. Immediate postop bleeding, infection
   2. If marked, immediate re-do surgery is indicated.
   3. If mild, wait 6 months and review.

D. Conjunctival prolapse
   1. Occurs with large levator resections if the suspensory ligament of the superior fornix is incised or prolapse
   2. Management
      a. Copious lubricants
      b. Pang-type sutures (full-thickness sutures from superior fornix through the skin crease)
      c. Excise the prolapsed conjunctiva

E. Lash ptosis
   1. An inadequate skin crease requires reformation.
   2. However, if the skin crease is satisfactory, then an anterior lamella reposition is indicated.

F. Ectropion and entropion, lash ptosis
   1. This may occur if:
      a. The levator is sutured too low / high onto the anterior surface of the tarsus, or
      b. If placement of the sutures during skin crease reformation is too high / low
      c. Very lax lids in conjunction with above
   2. To correct the ectropion / entropion, the sutures need to be repositioned.

G. Late droop
   Redo brow suspension, preferably with autogenous fascia lata to minimize risk of further late droop.

H. Exposure and corneal ulcer
   1. Main causes
      a. Overcorrection
      b. Lagophthalmos
      c. Myotonic dystrophies
   2. Management
      a. Intensive lubrication and topical antibiotics if mild / punctal plugs / massage
      b. Reoperation if severe

I. Exposure of the sling suture
   1. The knot is not buried deep.
   2. Passage of the suspending material is too superficial.
   3. Infection
   4. Management
      a. Redo surgery
      b. Burying the knot
J. Peaking
   1. Occurs mainly when the tension of the knots are not equally distributed or the knots are placed at different level.
   2. Management
      a. Wait and mild massage if mild to moderate
      b. Reoperation if doesn’t correct by itself

Selected Readings
The Complications of Blepharoplasty Surgery – Part 1

By James Oestreicher, MD, FRCSC

Cosmetic surgery is becoming much more of a consideration for a greater number of people. Women and men, regardless of age, occupation, or socio-economic level, are interested in maintaining a youthful persona and optimizing their appearance. The incidence of cosmetic eyelid operations is increasing exponentially, being performed by many different specialties. However, when complications occur, it is the ophthalmologist who is called upon for help.

Because of the myriad of possible complications, it is crucial to understand the problems that may occur and the available and advisable treatment. Dr. James Oestreicher, a leading Canadian Oculoplastic Surgeon, has covered the whole of this extensive topic and, because of the complexity of the subject, his presentation has been divided into two parts. Part 1 is featured in this issue of Ophthalmology Rounds and Part 2 will be in the next.

Jeffrey Hurwitz, Editor, Ophthalmology Rounds

"Blepharoplasty" is an operation to change the shape, appearance, or configuration of the eyelids, as its Latin roots suggest. Generally, the goals are to restore youthful contours by removing redundant skin, fat, and muscle, tightening supporting structures such as the canthal tendons and, occasionally and more importantly, correcting associated abnormalities such as ptosis, brow ptosis, entropion, ectropion, or eyelid retraction.

Complications may be minor or serious, but can be considered from opposite viewpoints by the surgeon and the patient. Trust and communication are key, as with any doctor-patient relationship, but possibly, they are even more important in a completely elective, esthetic procedure associated with high expectations and standards. The surgeon's confidence (but not overconfidence) and experience are essential in the postoperative period. Most patients merely need reassurance; however, some complications may need intervention “down the line” if the problem (usually asymmetry) does not resolve. The surgeon must be aware of the natural history of certain postoperative appearances, bearing in mind how the actual surgery went. He or she must avoid being pressured into premature corrective action by an anxious or demanding patient, while assuring that effective corrective action will be available at an appropriate time in the future. In other words, the surgeon must be there for his patient and put their outcomes foremost. By doing so, the trust built preoperatively will continue through the critical postoperative period (Figure 1).

Preoperative assessment

In the initial consultation (and subsequently, if required), patients are encouraged to voice their desires and concerns regarding the esthetic and functional appearance of their eyelids. Privacy and the use of a suitably-sized hand mirror are key. If patients cannot describe or demonstrate the changes and the final results they desire, it
Section VI: Challenges and Complications

It is important to elicit the particular concerns of each individual patient as these can vary widely. Examples include a particular dislike of lateral hooding, a fear of blindness, a “staring” or “overdone” look (very common), a desire to avoid a sunken look (a common concern in younger patients), and concerns about the length of the recovery period, as well as intraoperative and perioperative pain. This is when the surgeon must recognize unrealistic expectations, e.g., patients who want no upper lid fold at all, post-op patients (who may already appear over-corrected) desiring further “improvement,” those who plan to return to high-demand occupations the day after surgery, and others who make travel arrangements within the first week of the operation. Patients who view cosmetic surgery as a commodity rather than a medical procedure with attendant risks should not be operated on. While some unrealistic patients can be educated and subsequently operated on with confidence, others cannot.

The surgeon should systematically inquire about cardiac and thyroid disease, hypertension, diabetes, bleeding diathesis, medications, allergies, and keloid scar formation. Patients should stop taking aspirin, anticoagulants, nonsteroidal anti-inflammatory agents, vitamin E, gingko, and other herbal medications up to 3 weeks preoperatively, if possible.

The surgeon must look for ophthalmic and periorbicular disease by taking a history and performing a full eye examination. The examination should include assessment of vision, motility, strabismus, orbital or eyelid asymmetry, dry eye, ptosis, lid retraction, exophthalmos, lid fold height, lid laxity, inferior scleral show, entropion, ectropion, brow ptosis, and asymmetry. A slit lamp examination and Schirmer’s test are necessary in this author’s view.

Surgical planning includes whether upper or lower eyelids, or both will have surgery. Technique (steel blade versus CO₂ laser, transconjunctival versus external lower blepharoplasty) must be decided, along with adjunctive procedures. Adjunctive procedures include brow ptosis repair (internal transblepharoplasty, direct, coronal, or endoscopic), ptosis repair, lacrimal gland suspension, eyelid lengthening, and lower eyelid tightening or lateral canthopexy. Another key decision is to perform lower eyelid skin excision or laser resurfacing (or neither).

This author favours CO₂ laser blepharoplasty with a transconjunctival lower lid approach. CO₂ skin resurfacing is useful to address skin redundancy and festoons (in patients with appropriate skin types). Brow elevation surgery is overrated and undone. Lower lid fat removal is preferable rather than fat repositioning. Mid-face elevation is also a risky overrated procedure.

Complications

Orbital hemorrhage with vision loss

This complication is at the top of every surgeon’s list although, statistically, most will never see it. The incidence is estimated to be 1 in 2,000 to 1 in 25,000. Risk factors obviously include hypertension, anticoagulant or antiplatelet medication use, prolonged complicated surgery, and re-operation through scarred tissue. The etiology is a form of compartment syndrome, with the orbit bounded by four bony walls and the orbital septum acting as the compartment. With an acute hemorrhage, intraorbital pressure rises abruptly and the blood supply to the optic nerve is cut off. Hence, any concomitant rise in intraocular pressure is secondary and treating it will not affect outcome. Use of the CO₂ laser has likely decreased the incidence of this complication, since it coagulates as it cuts and avoids excess traction from clamping the fat prior to cautery and cutting.

Recognition of this complication is key, as is a rapid response. The surgeon will note proptosis, decreased motility, increased orbital tension and, usually, associated bleeding. The patient will have
loculated undrained hematoma is found only rarely. Usually, streaking hemorrhage and air are visualized that are more likely to be hallmarks of surgical trauma.

Unfortunately, beyond 1 to 6 hours of total or near-total vision loss, treatment is unlikely to be effective. Up to 24 hours, cantholysis and pressure release (if the orbit is still tense) and steroid treatment can be utilized. Beyond this time period, however, one may be over-treating the patient and exposing them to additional complications with very little prospect of improvement. After 24 hours of “spinal-trauma” dose levels of steroids (solu-medrol 30 mg/kg bolus over 15 minutes followed by 5.4 mg/kg per hour) without response, the drug should be discontinued, possibly after repeat imaging. Since time is of the essence, it should be recognized that an experienced oculoplastic surgeon is not essential to perform a bedside canthotomy/cantholysis and pressure release. All ophthalmologists should feel comfortable treating orbital hemorrhage with canthotomy and cantholysis.

Post-treatment admission to hospital is recommended, with close monitoring of visual acuity, head elevation, ice water compresses, and intravenous steroids until vision is stable for 24 hours and CT scanning has been performed. Steroids can be stopped abruptly if administered for <3 days, even at extremely high doses. Topical and systemic antibiotics are utilized for the open wounds, with repair planned electively in 1 to 2 weeks, if they do not close on their own. Hospital staff or the patient should monitor the stability of improved vision for 1 to 3 days after treatment is stopped.
**Superficial ecchymosis and hematoma**

Every blepharoplasty patient will experience superficial ecchymosis and hematoma to some extent, so bruising is not really a complication so much as an expected side effect. However, if excessive, it can lead to a prolonged recovery, infection, cicatrization, and skin pigmentation. The use of the CO₂ laser will minimize bruising, as will continued avoidance of drugs with anticoagulant effects, control of hypertension, and avoidance of postoperative trauma, bending, and straining. It is important for the surgeon to be meticulous with cautery, either by defocusing the CO₂ laser or by performing bipolar cautery. This is one time when patients benefit from a surgeon’s obsessiveness with a dry surgical field. The trauma of cautery is less than the trauma of prolonged postoperative ecchymosis.

The patient can aid recovery with a few simple interventions. They should rest with their head elevated at least 45° to 60°. Ice water compresses should be utilized continuously for 3 days (except when eating or sleeping). Patients will recover faster when compresses are applied throughout most of the first night. Ice packs or frozen masks are too heavy and cold and may damage eyelid tissues or dehisce wounds. Preoperative and postoperative oral arnica (a herbal healing agent) has been claimed anecdotally to help, when given in normal doses.

**Ocular injury**

Obviously, blepharoplasty surgery is performed very close to the globe and the potential for injury exists. There is increased risk in the patient with proptosis, such as those with thyroid eye disease or a large or projecting glaucoma bleb. Globe injury can occur with the CO₂ laser, a steel scalpel, or local anesthetic injections.

Laser eye protectors are essential if the CO₂ laser is utilized, but there must be enough ocular lubrication to avoid a corneal abrasion when they are inserted or removed. The laser must always be directed away from the globe even though eye shields are in place. Visual acuity measurement and slit lamp examination are critical on the first postoperative visit (almost always the day after surgery) to rule out ocular injury and document its absence.

Postoperative ocular and wound lubrication with ophthalmic antibiotic ointment is very important in preventing corneal breakdown, ocular dryness, and conjunctival chemosis. This is because most patients will initially experience small amounts of lagophthalmos from the ongoing local anesthetic effect on the orbicularis, that causes both swelling and stiffness of the eyelids. A vicious cycle can develop wherein the chemotic conjunctiva dries out because it is swollen, and then swells because it is dry. This can also lead to corneal dellen formation, or a dry cornea can break down *de novo*. Patients should not drive for a week because of the blurriness caused by the ointment.

In the setting of blepharoplasty surgery, non-infected corneal abrasions are best treated with a bandage contact lens. This allows rapid relief of symptoms, rapid healing, the ability to monitor vision, and eliminates pressure on wounds caused by a patch. However, a contact lens requires daily or near-daily visits to the surgeon until the abrasion is healed and the lens removed. Any true globe injury must have urgent and appropriate treatment by an ophthalmologist.

**Diplopia**

Fortunately, diplopia after blepharoplasty is extremely rare. The commonest form is caused when local anesthetic is supplemented intraoperatively by direct fat injection once the conjunctiva (lower lid) or skin (upper lid) is open. There is a more rapid and wider diffusion of the local anesthetic agent that affects other structures such as the cranial nerves. The inferior oblique and levator should be identified (and preserved) during surgery, to ensure that they have not been injured. The diplopia is usually of a form suggesting extravasation of a local anesthetic, (eg, a partial third or sixth nerve palsy). If this is a concern, the patient should be observed until there are signs of improvement. Despite the use of a lidocaine/marcaine mix, this form of diplopia always resolves by the next day.

Injury to the inferior oblique or, less commonly, other extraocular muscles, is rare. One sign of imminent damage to the muscle is excess bleeding. The surgeon must stop the bleeding but, at the same time, avoid excess cautery or other trauma to the muscle. The oblique divides the medial lower fat pad from the central lower fat pad and, thus, it should be easily identified and protected. This is also a good way to ensure that the medial fat pad has not been “forgotten” in terms of fat removal.
Diplopia that persists beyond the first day will often resolve with eye movements or fusion exercises if there is no gross deficit. Occasionally, assistance from strabismus-oriented colleagues can be very helpful if the deficit persists. Finally, there are some patients who develop unrelated cranial nerve palsies some weeks or months after surgery, by chance alone. These should be investigated and followed in the normal fashion for such conditions.

Ptosis

It is quite common for patients undergoing upper lid blepharoplasty to exhibit varying degrees of ptosis the day after surgery. The experienced surgeon who has identified and preserved the levator muscle and aponeurosis during surgery will not panic. Eyelid edema and levator edema are common temporary causes of ptosis. The levator aponeurosis is the stage on which fat removal during upper blepharoplasty is played and it is natural for early postoperative dysfunction to be seen on occasion.

There are several caveats, however. The surgeon must know his or her patient’s anatomy to distinguish septum from levator. The septum must be opened if fat is to be removed, but not the levator. The two fuse low in the upper eyelid, so the inexperienced surgeon is well-advised to open the septum higher up, where there is a good barrier of underlying pre-aponeurotic fat to protect the levator. The septum fuses with the orbital arcus marginalis so, if it is pulled on, it tightens when a finger is placed under the brow. Similarly, it will not move when grasped and the patient is asked to look up, but the levator will feel like a “trout pulling on a fishing line.” In addition, when the pre-aponeurotic fat is grasped and the septal attachments divided, it is possible to pull the superficial levator aponeurosis up with it. Hence, it is important to be gentle when freeing fat from the underlying levator since the latter can be damaged inadvertently. Similarly, when using the CO₂ laser to cut fat lobules free, a “backstop” is needed (usually a Q-tip) to absorb the transmitted laser energy and avoid damage to tissues that lie beneath (i.e., levator, Muller’s muscle, conjunctiva, and globe). The same principle applies for lower-lid fat removal to protect the inferior oblique.

If a definitelevator laceration is observed, it should be repaired if it is causing ptosis. It may be necessary to lighten the patient’s sedation to gain an accurate assessment of lid height; sitting the patient upright is also useful. In the absence of a definite levator laceration, persistent postoperative ptosis is usually followed for 3 months before being repaired since the majority will resolve during this period. The exception is the patient who has had a combined blepharoplasty and levator advancement ptosis repair and is obviously undercorrected after about a week. Their wound can be readily opened and the slipped levator suture replaced fairly easily. However, another option is to wait the 3 months and then perform a posterior Fasanella-Servat procedure, thus avoiding opening the anterior wound entirely. This is fast, predictable, and avoids overcorrection and scar abnormalities.

Avoidance of under- or overcorrection in ptosis repair, combined with blepharoplasty, is an entire topic unto itself. Careful dissection, light sedation, clear dry tissue planes, and careful suture placement are all key factors, but patients should be informed that there is a definite chance of re-operation in these more complex situations.

Wound dehiscence

Even minor postoperative trauma can result in wound dehiscence if the patient is unlucky. Infection and patients who are restless sleepers can be additive risk factors. Skin sutures with 6-0 prolene (that can imbricate levator or pre-tarsal tissues for crease formation) are preferred. Prolene is inert and ties cleanly, which is useful in precisely closing a wound. Absorbable upper lid sutures, either in the skin or buried, have a risk of tissue reaction or dehiscence. Silk in upper lid blepharoplasty wounds is less satisfactory. CO₂ laser incisions require 7 days to heal; therefore, sutures are removed on day 7 or 8. A running prolene suture, with several interrupted reinforcements, is useful. Patient discomfort from suture removal is minimized by using Jeweller’s forceps and sharp Vannas scissors.

The conjunctival incision made in a transconjunctival blepharoplasty never requires sutures; they cause more harm than good. It is often necessary to tighten the lower eyelid at the time of blepharoplasty. If a full tarsal strip procedure is required, the patient is rigorously cautioned about avoiding pulling or sleeping on the eyelid to avoid dehiscence. Deep (tarsus to periosteum) 5-0 prolene sutures and skin sutures of 6-0 silk are utilized, with the silk
sutures removed at 7 to 9 days. Slight dehiscence can be treated with topical and oral antibiotics, but a complete dehiscence needs prompt debridement and repair to avoid lower lid retraction and scarring. Milder eyelid laxity is treated by a form of lateral canthal tendon plication at the time of lower lid blepharoplasty. Dehiscence in this case is less common and milder and, therefore, can usually be managed supportively.

An examination of the complications of blepharoplasty surgery will continue in Part 2 in the next issue of Ophthalmology Rounds. Other problems such as scar and pigmentary abnormalities, epiphora and ocular discomfort, upper eye overcorrection, lower eyelid overcorrection and retraction, asymmetry, and Asian blepharoplasty will be examined.

References

University of Toronto
Department of Ophthalmology and Vision Sciences

Upcoming events
March 3, 2005
VPP – Dr. Kerry Bowman, Toronto, ON
Ethics of advertising

March 7-8, 2005
Jack Crawford Day – Hospital for Sick Children

March 17, 2005
MARCH BREAK

April 7, 2005
VPP – Dr. Paul Edward, Detroit, Michigan
Diabetic retinopathy

April 14, 2005
VPP – Dr. David Zee, Baltimore, Maryland
Congenital nystagmus – mechanism and treatment

April 28, 2005
VPP – Dr. Steve Baker, Victoria, BC
Management of orbital infection

May 5, 2005
VPP – TBA

May 19, 2005
Combined TOS/U of T meeting

Note: This year’s VPP Rounds will be held at St. Michael’s Hospital, 30 Bond Street, Toronto – Paul Marshall Lecture Theatre, B1 – Queen, Queen Street entrance (near Second Cup)
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