



# Maxillofacial News

AMERICAN SOCIETY OF MAXILLOFACIAL SURGEONS

## ANNUAL MEETING REVIEW ASMS Program Ray of Sunshine in Smokey San Diego Meeting

Despite the smoke and haze of San Diego's forest fires, Plastic Surgery 2003 was a huge success. With final registration figures just in, 3,300 surgeons and their families braved the ash and smoke to take part in the educational and social components of the meeting.

The annual meeting kicked off on Friday, Oct. 24 with an all-day ASMS/PSEF pre-symposium on Perioral Plastic Surgery. Symposium Chair, A. Michael Sadove, MD organized a successful conference for nearly 200 attendees. The symposium focused on such topics as analysis of perioral aesthetic units, skeletal surgery for the correction of perioral problems, augmentation of perioral soft tissues, as well as aesthetic reconstruc-

· tive surgery of the  
· perioral area. The  
· program also included  
· a special lecture on  
· cosmetic dentistry in  
· the perioral region by  
· Dr. Ronald Goldstein,  
· DDS. We will again  
· be offering the pre-  
· meeting symposium  
· next year under the  
· leadership of Dr.  
· Gregory Evans, with a  
· focus on mid-face aesthetic and  
· reconstructive surgery.

· Michael Sadove, MD and the program  
· committee developed an excellent ASMS  
· Day agenda for the 2003 meeting. The  
· scientific program consist-  
· ed of abstracts, a presenta-  
· tion of two panels,  
· "Aesthetic and  
· Reconstructive Nasal  
· Surgery," chaired by Dr.  
· Gregory Evans and  
· "Controversies in Cleft  
· Palate Care," chaired by  
· Dr. Michael Sadove.



Dr. Persing and wife Susan (left), together with Dr. Salyer and wife Luci greet guests at the ASMS Presidents Reception at the Manchester Grand Hyatt.

### New Member Benefit

#### ASMS Rolls-Out Enhanced Member Page Project

The use of the World Wide Web is commonplace now for members of the general public to educate themselves about medical procedures, new medical research, and to locate medical specialists and surgeons in their neighborhood.

ASMS has taken a proactive approach in providing the public with access to sources of information only we can provide, through the enhanced member page. Our goal is to make the web site more accessible and user friendly for the general public while providing you with a powerful marketing tool to profile your area of expertise, practice or educational setting. We will also establish links to our unique areas of specialty such as chin

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Dr. Kenneth E. Salyer (left), Dr. Bahman Guyuron (center), and Dr. Kant Lin (right) participate in the 2002-2003 ASMS Board of Trustees Meeting, Friday, Oct. 24.

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## Education is Our Mission

Education has long been a fundamental mission of the ASMS. With the Winter issue, the ASMS Newsletter will be back on track to support this mission as we resume the teleconference symposia. These symposia are conducted by a forum of experts in the field, and bring panel discussions relevant to practicing maxillofacial surgeons. The following symposia are scheduled for the upcoming year: Different Techniques in Cleft Palate Repair and their Outcomes, Moderated by Dr. Bob Havlik, and Techniques of Microtia Reconstruction, Moderated by Dr. Charlie Thorne. A list of symposia which have previously



Our goal is to keep the ASMS Newsletter an informative and useful resource for our membership.

been published in our Newsletter is also provided. These symposia can be obtained from the ASMS office by

writing to: Peggy O'Carroll, Administrative Manager, ASMS, 444 East Algonquin Road, Arlington Heights, IL 60005.

A \$5 fee will be charged for each symposia to defray reprint and mailing costs. Should you have suggestions for future symposia, please contact our office with recommendations for the topic and one to three suggested moderators. Moderators should be authorities in the area of discussion. We will make an effort to incorporate these suggestions. Our goal is to keep the ASMS Newsletter an informative and useful resource for our membership. **M**

### Now you can order reprints of ASMS newsletter panel discussions.

AMERICAN SOCIETY OF MAXILLOFACIAL SURGEONS PANEL DISCUSSION ORDER FORM			
HOW MANY	TITLE	COST PER	SUBTOTAL
	1999, vol. 15, #1 - A Current Approach to Mandibular Reconstruction (Drs. G. Evans, J. Coleman, N. Jones, P. Neligan)	\$5.00	
	1999, vol. 15, #2 - Distraction vs Conventional Osteotomies: What Will We Be Doing in 2000? (Drs. C. Vander Kolk, S. Cohen, J. Marsh, J. Posnick)	\$5.00	
	1999, vol. 15, #3 - New Technologies (Drs. M. Miller, B. Loftin, C. Patrick, J. Rosen, M. Siemionow)	\$5.00	
	2000, vol. 16, #1 - Facial Traumas (Drs. B. Robertson, C. Lee, P. Manson, M. Yaremchuk)	\$5.00	
	2000, vol. 16, #2 - Aesthetic Plastic Surgery of the Face (Drs. A. Sadove, B. Guyuron, J. Jacobs, D. Ousterhout, K. Salyer)	\$5.00	
	2000, vol. 16, #3 - Part I: The Use of Biomaterials in Facial Reconstruction (Drs. A. Gosain, M. Habal, R. Havlik, P. Hobar, M. Miller, H. Vasconez)	\$5.00	
	2001, vol. 17, #1 - Reconstruction of the Perioral Area (Drs. J. Little, B. Guyuron, V. Lambros)	\$5.00	
	2001, vol. 17, #2 - Orthognathic Surgery (Drs. J. Ferraro, J. Jacobs, H. Kawamoto, S. Schendel)	\$5.00	
	2002, vol. 17, #3 - Part II: The Use of Biomaterials in Facial Reconstruction (Drs. A. Gosain, M. Habal, R. Havlik, P. Hobar, M. Miller, H. Vasconez)		
<b>GRAND TOTAL</b>			

**RETURN WITH PAYMENT TO:**  
**ASMS, 444 East Algonquin Road, Arlington Heights, IL 60005**  
*orders will be shipped within 2-4 weeks*

“Face to Face: A Maxillofacial Forum” was first introduced in 1999. These discussions have provided a forum for experts to discuss diverse topics relating to aesthetic and reconstructive maxillofacial surgery.

\_\_\_\_\_  
Name

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Address

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(U.S. funds payable to ASMS)

## A Hard Act to Follow

I would be remiss in my opening remarks as your newly elected President, if I did not acknowledge the remarkable leadership of our Immediate Past President Dr. John A. Persing, and Past President Bahman Guyuron. Dr. Guyuron was instrumental in leading the Society on a fiscally responsible path. Dr. Persing took this lead and provided tremendous leadership in fulfilling our mission as the education and research leader in craniomaxillofacial surgery. It was during John's tenure that four inaugural craniofacial fellowships were established and fulfilled. John also initiated improvements to our Society web site. These improvements provide additional benefit to our members via the enhanced member home page project. Dr. Persing also initiated a major revision of the Basic Maxillofacial Course. As President, I have already taken steps to continue in this effort. The first Basic Course review meeting will take place Feb 21-22 in Chicago. During calendar year 2004 we will conduct an unprecedented 3 Basic Maxillofacial Courses. The first course will be held Jan. 15-17 in San Francisco, the second course will be held in mid-summer in Chicago, and the third course will be held in Nov/Dec. at the University of Virginia.

Those who know me know that I am passionate about my work. I will assume this same level of passion in my role as your President. I have many goals and objectives to achieve during my tenure as President. Each objective will be supported by a single theme: an increased awareness of reconstructive surgery as a vital part of plastic surgery.

### Integration and Unity

We can increase awareness of reconstructive surgery as a vital part of plastic surgery through integration of our sub-specialties under the umbrella of



"I have many goals and objectives to achieve during my tenure as President."

ASPS. All of our specialty societies need to work together with ASPS to preserve plastic surgery. It is imperative for the survival of our specialty to integrate with one another and work together through proper communication and dialogue. We cannot, in our various societies, continue to compete for the same dollars. We are sending mixed messages to industry, to our corporate partners and to our patients.

### Guided by Strategic Plan

As your President, I am guided by our strategic plan. A primary goal of the plan is education. We will continue to provide excellence in education and promote research in craniofacial maxillofacial surgery nationally and internationally for the good of all plastic surgery. We also need to educate the public, media, other health care providers, insurance companies and other organizations about plastic surgery, specifically the importance of excellence in craniofacial and maxillofacial surgery.

ASMS will continue to sponsor and seek industry support for much needed training fellowships. ASMS will work with PSEF and the International Task Force to support the International Scholar. This will allow us to pool together our applications and resources to promote maxillofacial/craniofacial surgery as an integral sub-specialty of

plastic surgery. There is a major need for our expertise in developing countries where we can provide technical training and infrastructure

This year we will welcome our first traveling fellowships. The Lorenz International Scholar Fellowship recipients are Dr. Hector Barbosa of Columbia, and Dr. Basant Kumar Mathema from Nepal. The Lorenz International Scholar Fellowship will allow these surgeons to travel to centers of clinical excellence in the United States to enhance their ability to deliver the most up-to-date care back in their home communities.

The ASMS CRANIO Fellowship recipients include Dr. Arshad R. Muzaffar, and Dr. John Ananda van Aalst. This fellowship will give them an opportunity to visit designated centers of excellence in craniofacial surgery throughout the United States in order to broaden their clinical approach and develop innovative surgical skills.

ASMS sponsored the Perioral Plastic Surgery Symposium immediately preceding Plastic Surgery 2003. The symposium, chaired by Dr. A. Michael Sadove, was enthusiastically received by nearly 200 attendees. Next year's symposium, Bony, Alloplastic and Autogenous Restoration to the Midface, will take place Oct. 8, 2004 in Philadelphia. The symposium, chaired by Dr. Gregory Evans, promises to be another stellar event.

### Legislative Issues

ASMS will work together with ASPS to define scope of practice for state legislatures. We will continue and renew our support for the coalition on children's deformities in Washington. The preservation of our specialty and delivery of excellence is dependant on passage of this vital legislation.

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### Web Presence

As I mentioned earlier, Dr. John Persing initiated improvements to our website. Our goal is to make the web site more accessible and user friendly for the general public while providing members with a powerful marketing tool to profile members' area of expertise, practice or educational setting. The enhanced web site will feature an index of members uniformly categorized by area of expertise and geographic region. To date, our executive office has received 64 responses. Look for your enhanced member page on-line Feb. 1, 2004.

### Membership Recruitment

The strength of our Society lies in the caliber and diligence of our members. I have initiated a membership recruitment drive to attract cranio/max-

illofacial surgeons both domestically and internationally. I will work with our membership committee to streamline the membership application process. We also need to develop an outreach program to program directors and senior residents.

As the preeminent society in maxillofacial and craniofacial surgery, we need to extol the membership benefits to all plastic surgeons. Benefits such as: access to the latest information and technology in maxillofacial and craniofacial surgery; educational opportunities and peer recognition in the field of maxillofacial surgery; advocacy and representation of maxillofacial and craniofacial surgery at the national level; reduced registration fees for the annual meeting and other symposia; subscription to this newsletter; research grant awards and videotape awards.

### Research Funding

Another one of my goals for this year is to increase funding for research. Through industry and individual support we can contribute to our profession by continuing to identify and reward our domestic research capabilities. The future of our specialty depends on it.

In closing, I would like to thank you again for the opportunity to serve you and my profession. Together we can preserve and advance craniofacial and maxillofacial surgery as an important and integral part of plastic surgery. **M**

## New Member Benefit

*continued from page 1*

augmentation, genioplasty, craniosynostosis and orthognathic surgery.

More than 60 of your colleagues already have their member page up and running on the ASMS website [www.maxface.org](http://www.maxface.org). If you would like to be included in this first year free, member benefit, complete the form on page 11 and return to Peggy O'Carroll, ASMS, 444 East Algonquin Road, Arlington Heights, IL 60005. **M**

## Look for Your New Membership Roster

A new ASMS membership roster will be available on-line in early February. If you have a new address or phone number, notify Peggy O'Carroll by Jan. 19th so that your correct information will be included in the Roster. **M**

### Maxillofacial News

The American Society of Maxillofacial Surgeons, the oldest American organization representing maxillofacial surgeons, is devoted to stimulating interest, advancing knowledge, and providing leadership and direction within the areas of maxillofacial and craniofacial surgery. Its members are dedicated to improving and promoting the highest level of patient care.

#### President

Kenneth E. Salyer, MD

#### Editor

Arun K. Gosain, MD

#### Administrative Manager and Managing Editor

Peggy O'Carroll

#### Writers

Kenneth E. Salyer, MD  
A. Michael Sadove, MD  
Arun K. Gosain, MD  
Mutaz Habal, MD

#### Subscription Rates

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The views expressed in articles, editorials, letters and other communications published by ASMS are those of the authors and do not necessarily reflect the opinion of the editors or the Society. Comments and questions should be sent to the Editor, *Maxillofacial News* (see address above).



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This year offered a new and interesting addition to the program: the video presentation. Drs. Court Cutting, Fernando Ortiz-Monestario, and Kenneth Salyer discussed their various approaches to nasoalveolar molding, as well as bilateral cleft lip and nose repair.

The afternoon session was highlighted by an invited lecture on "Distraction Osteogenesis" by Dr. Joseph McCarthy. Dr. Bahman Guyuron presented an additional invited lecture on "Profile Alignment: Maximizing Skeletal and Soft Tissue Techniques."

The Monday afternoon session included the Kazanjian Lecture presented by Dr. Milton Edgerton on "Early U.S. Efforts in Craniofacial Surgery/A Personal Historical Perspective." This session also included presentation of the ASMS Synthes Research Grant Awards (see page 9).

The Society sponsored three International lecturers. Dr. Dov Goldenberg and Dr. Nivaldo Alonso



Dr. Persing (left), acknowledges International Speakers from the Brazilian Plastic Surgery Society. Dr. Dov Goldenberg (center), Dr. Nivaldo Alonso (right).

from the Brazilian Plastic Surgery Society and Dr. Gabriel Malco, MD from France spoke during separate programs on Sunday.

The ASMS Annual Business

Meeting and Luncheon was held on Oct. 27th. During the Business Meeting, Dr. Persing presented an overview of the past year. Dr. Persing acknowledge the hard work of AGRM

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Dr. Persing addresses members during the 2003 ASMS Annual Business Meeting and Luncheon.



Dr. Milton Edgerton, the 2003 ASMS Kazanjian Honorary Lecture presenter with his wife Pat.

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and Tom Fise's management group. He introduced Peggy O'Carroll, the new administrative manager of ASMS. He explained that the switch in management services was necessary so that the ASMS Executive Office would be physically located at the ASPS headquarters in Arlington Heights, IL. He noted that the change will allow for greater efficiency, cost management and ease of communication between ASPS and ASMS.

Dr. Persing detailed his initiative for a significantly upgraded web site. The web site includes an offering of a personalized homepage to all ASMS members at no cost to members for the first year. A major review of the Basic Maxillofacial Course course is underway. Dr. Warren Schubert will be spearheading this initiative.

Speaking next, Dr. Kenneth E. Salyer indicated that as incoming President he will focus on integration, increased visibility of ASMS, international outreach and aggressive support of legislative issues affecting the specialty.



Dr. Persing (left), presents Dr. Douglas Ousterhout with a plaque acknowledging his support of the two 2003 CRANIO Fellowships.

Dr. Salyer encouraged active participation of the membership in the upcoming year's activities, especially in the ASMS committees.

While the luncheon was being served, officers provided reports, new officers were elected for 2003-2004

and 13 new members were welcomed into the Society.

The Annual ASMS President's Reception, originally planned for Treetops Restaurant, at the world-famous San Diego Zoo had to be "rearranged" due to the smoke from

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Dr. Persing (left), acknowledges the generous support of W. Lorenz Surgical for sponsorship of the 2003 Lorenz International Fellowship Awards. Receiving the plaque of appreciation are Joel Pratt (center), and Jim Cavanagh from W. Lorenz Surgical.



ASMS is also indebted to Synthes Maxillofacial for their support in many aspects of the Society including, Synthes Research Grants, and Basic Course sponsorship. Pictured above is Steve Murray (left), President of Synthes Maxillofacial and Dr. John Persing.

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Dr. Steve Buchman, (left), Dr. McKay McKinnonn (center) and Dr. Norman Rappaport chat during the ASMS Presidents Reception.



Dr. Victor Lewis and wife Jayne pose for a photo during the ASMS Presidents Reception.

the fires. Dr. Persing and his wife, Susan, hosted a beautiful reception in their luxurious Presidential Suite at the Hyatt Manchester Hotel.

We are indebted to our industry sponsors, Stryker Leibinger, Synthes Maxillofacial, W. Lorenz Surgical, KLS-Martin, L.P. and Medtronic, Inc.

· for underwriting important portions  
· of the ASMS educational and social  
· activities.

· Planning has already started for  
· Plastic Surgery 2004 in historic  
· Philadelphia. ASMS is sponsoring a  
· symposium chaired by Gregory Evans,  
· MD on October 8, on Plastic Surgery

· of the Mid-Face. We are looking for-  
· ward to an equally exciting educational  
· experience of this subject. Everyone is  
· encouraged to attend. Please set your  
· calendars now for Oct. 8-13, for what  
· promises to be yet another superb edu-  
· cational experience. Hope to see you in  
· Philadelphia. **M**



Dr. John Persing (left), welcomes the Society's members and guests to the ASMS Presidents Reception.

## 2003-2004 Board of Trustees

### **PRESIDENT**

Kenneth E. Salyer, MD

### **PRESIDENT-ELECT**

A. Michael Sadove, MD

### **VICE-PRESIDENT**

Gregory R.D. Evans, MD

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### **TREASURER**

Seth R. Thaller, MD

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Henry C. Vasconez, MD

### **IMMEDIATE PAST**

#### **PRESIDENT**

John A. Persing, MD

### **MEMBERS-AT-LARGE**

Louis C. Argenta, MD

Kant Y. Lin, MD

Robert J. Havlik, MD

Arun K. Gosain, MD

### **PARLIAMENTARIAN**

David Genecov, MD

### **HISTORIAN**

Mimis N. Cohen, MD



ASMS Members in attendance at the Board of Trustees Meeting, Friday, October 24. Standing from left Dr. Kant Lin, Dr. Joseph Serletti, Dr. Arun Gosain, Dr. Henry Vasconez, Seated from left, Dr. Seth Thaller, Dr. Gregory Evans, Dr. Kenneth Salyer, Dr. John Persing, Dr. A. Michael Sadove, Dr. Bahman Guyuron.

## 2003-2004 Committees

### **ADVISORY BOARD**

Persing, John, Chair

Guyuron, Bahman

Borah, Gregory

Ferraro, James

Rappaport, Norman

Schendel, Stephen

### **AUDITING**

Jacobs, Jonathon, Chair

Guyuron, Bahman

### **BEST PAPER**

Phillips, Linda, Chair

Argenta, Louis

Cordeiro, Peter

Shenaq, Saleh

### **BIOMATERIALS**

Habal, Mutaz, Chair

Fix, R. Jobe

Hobar, Craig

Papay, Francis

Vasconez, Henry

### **CONSTITUTION & BYLAWS**

Serletti, Joseph, Chair

Davis, Glenn

Jacobs, Jonathon

Steinberg, Barry

Sterman, Harris

Losee, Joseph

### **EDUCATION**

Schubert, Warren, Chair

Colon, Gustavo

Morales, Louis

Narayan, Deepak

Papay, Frank

Argenta, Louis

### **ETHICS**

Dufresne, Craig, Chair

Daw, Joseph

Phillips, Linda

Wainwright, David

Yokoo, Karen



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## 2003-2004 Committees

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### FELLOWSHIP REVIEW

Bartlett, Scott, Chair  
Denny, Arlen  
Gruss, Joseph  
Wolfe, S. Anthony  
Morales, Louis

### FELLOWSHIP GRANTS

Gosain, Arun, Chair  
Bartlett, Scott  
Yu, Jack

### FINANCE

Vasconez, Henry, Chair  
Hoffman, William  
Sadove, Michael  
Thaller, Seth  
Linton Whitaker

### MAXILLOFACIAL NEWS

Gosain, Arun, Chair  
Barone, Constance  
Burnstein, Fernando  
Daw, Joseph  
Denny, Arlen  
Goldstein, Jeffrey  
Kay, Stephen

### MEMBERSHIP

Buchman, Steven, Chair  
Barone, Constance  
Barcelo, Carlos R.  
Hall, Craig  
Gosain, Arun  
Polley, John  
Papay, Frank  
Genecov, David

### OUTCOMES

Vasconez, Henry, Chair  
Reece, Gregory  
Robb, Geoffrey

### PRACTICE

#### PARAMETERS

Pensler, Jay, Chair  
Beals, Stephen  
Billmire, David

### RESEARCH

Buchman, Steven, Chair  
Forrest, Christopher  
Goldstein, Jeffrey  
Narayan, Deepak  
Hoffman, William  
Shin, Joseph

### SCIENTIFIC PROGRAM

Evans, Gregory, Chair  
Genecov, David  
Havlik, Robert  
Dufresne, Craig  
Gosain, Arun

### SOCIOECONOMIC

Herber, Steven, Chair  
Genecov, David  
Mehrof, Austin  
Michelow, Bryan  
Pham, Duc

### WEB PAGE

Shin, Joseph, Chair  
Roser, Steven  
Canady, John  
Pensler, Jay  
Schubert, Warren

## 2004 ASMS Synthes Maxillofacial Grant Recipients

Grant winners were acknowledged during ASMS Day at the ASPSP/PSEF/ASMS Annual Meeting in San Diego. ASMS wishes to thank Synthes Maxillofacial for their continued support of the ASMS research project.

### Bernd Spiessel Recipient

#### James Smartt, Jr.

*Awarded \$6,500*

Influence of Hydrostatic Compression on Fetal Dural Cells, Calvarial Osteoblasts, and Developing Cranial Sutures.

### Best Paper Award

#### Joseph J. Disa, MD, Andrea L. Pusic, MD, MHS, David A. Hidalgo, MD, Peter G. Cordeiro, MD

*Awarded \$1,000*

Microvascular Reconstruction of the Hypopharynx: Defect Classification, Treatment Algorithm, and Functional Outcome Based on 165 Consecutive Cases

### Research Grant Recipients

#### Serhat Totan, MD

*Awarded \$6,315*

Heat Shock Proteins as Endogenous Modulators of Bone Formation: A New Aspect of View to the Molecular Mechanisms of Distraction Osteogenesis

#### Timothy Johnson, MD

*Awarded \$10,000*

Flexible Tissue Engineered Cartilage using Culture Expanded Chondrocytes and Swine Intestinal Submucosa

#### Artur Gevorgyan, MD

*Awarded \$7,000*

Radiation-induced craniofacial bone growth inhibition: *In vitro* investigation of the molecular mechanisms and cytoprotection

#### Robert D. Galiano, MD

*Awarded \$10,000*

Gene Therapy of Free Flaps to Treat Tumors of the Head and Neck

## ASMS CALENDAR OF UPCOMING MEETINGS AND EVENTS

**January 15-17, 2004**

**Basic Maxillofacial  
Principles & Techniques**  
San Francisco, CA

**Mid-Summer 2004**

**Basic Maxillofacial  
Principles & Techniques**  
Chicago, IL

**October 8, 2004**

**Bony, Alloplastic  
and Autogenous Restoration  
to the Mid-Face**  
Philadelphia, PA

**October 9-13, 2004**

**Plastic Surgery 2004**  
Philadelphia, PA

**November/December 2004**

**Basic Maxillofacial  
Principles & Techniques**  
Charlottesville, VA

**ASMS/PSEF**

**BONY, ALLOPLASTIC AND  
AUTOGENOUS RESTORATION  
TO THE MID-FACE**

Immediately preceding  
the 2004  
ASPS/PSEF/ASMS  
Annual Meeting

**October 8, 2004  
Philadelphia, PA**

**Course Chair  
Gregory R.D. Evans, MD**

**8 CME Hours**

An experienced and diverse faculty will present their techniques for correction of congenital, traumatic and aesthetic defects of the osseous and soft tissues areas of the mid-face. Treatment approaches to clinical problems involving the zygoma, buccal fat, cheek, chin, dental structures and underlying osseous framework will be explored. New paradigms will feature the latest techniques for approaches to the mid-face for facial rejuvenation. Proven and popular new techniques preferred by an experienced faculty will be critically evaluated and discussed. Didactic lectures, panel discussions and audience participation provide the format for this in-depth course.

## ASMS Enhanced Member Form

Name: \_\_\_\_\_

Address: \_\_\_\_\_

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E-Mail: \_\_\_\_\_

Practice Philosophy: (Not more than 100 words) \_\_\_\_\_

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Location/Office Hours: \_\_\_\_\_

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Specialties: \_\_\_\_\_

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Board Certification: \_\_\_\_\_

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Education: \_\_\_\_\_

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Society Memberships: \_\_\_\_\_

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Insurance/Managed Care: \_\_\_\_\_

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Surgical Facilities: \_\_\_\_\_

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Hospital Affiliations: \_\_\_\_\_

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Consultation: (What to expect) \_\_\_\_\_

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Other Links: i.e. your website, your local society of plastic surgeons \_\_\_\_\_

\_\_\_\_\_

## Biomaterials Review

### Moderator:

Mutaz B. Habal, MD, FRCS, FACS  
Director, Tampa Bay  
Craniofacial Center  
Research Professor, University  
of South Florida  
Adjunct Professor of Material  
Science, University of Florida,  
Tampa, Florida

### Panelists:

Scott P. Bartlett, MD  
Associate Professor of  
Surgery (Plastic)  
University of Pennsylvania  
Director, Craniofacial Program,  
Childrens Hospital of Philadelphia  
Philadelphia, Pennsylvania

Bob Havlik, MD  
Associate Professor of  
Surgery (Plastic)  
Section of Plastic Surgery  
Riley Hospital for Children  
Indiana University School  
of Medicine

Larry Hollier, Jr., MD, FACS  
Department of Plastic Surgery  
Baylor College of Medicine  
Houston, Texas

Henry C. Vasconez, MD, FACS  
Professor of Surgery  
and Pediatrics  
Chief of Plastic Surgery  
University of Kentucky  
Lexington, Kentucky

*Through this informal panel discussion, we hope to provide the readership with a better understanding of implantable devices for craniofacial skeletal fixation.*

*Our distinguished panelists will provide information about the process, the complications, and the appropriate age usage. Eight years ago, the first application of this material was allowed by the FDA and clinical applications described.*

*We now have good long term experience with the devices as well as problems.*

*We have to remember that not all the devices are the same.*

– Mutaz B. Habal, MD, FRSC, FACS

**Dr. Habal:** I would like to start with Dr. Hollier. Tell us, Larry, how long have you used these devices and what is your experience with the fixation devices. What do you think about the learning curve? You are working in a teaching institution, correct? How easy is it to teach the younger generation to utilize this new equipment?

**Dr. Hollier:** I have been using for approximately six years. I can speak best of these devices in the area of facial trauma. I will leave it for the rest of the experienced surgeons to speak on the pediatric craniofacial use.

Personally, I feel that for resorbable fixation to be of value to us in any arena it should be easier to use than titanium fixation with an equivalent outcome. Or it could be more difficult to use, but we'd have to have a better outcome. Along these lines, I just don't think that resorbable fixation has any role in facial trauma in the adult population. It is clearly not easier to use and does not provide superior fixation.

Additionally, when you talk about resident training, I think clearly it's something that can be taught quite

easily. Anybody can learn how to use this material. But I think the effort in teaching in facial trauma should focus on titanium as this clearly provides a more stable fixation.

**Dr. Habal:** What is your definition of adults and children? Where is your cut-off? Is it 12 years, 18 years, or six years?

**Dr. Hollier:** When we look at what we consider an adult, I think we have to consider facial growth. And of course that depends upon which area of the face we're looking at. If we're looking at the mandible, we're talking about 16 to 18 years for mandibular growth. I think if we're talking about the mid-face, 12-13 years of age.

I think another thing you need to factor in is whether or not a younger patient is going to require re-operation. And perhaps that is a role for resorbables in some cases. In this situation I might skew my use towards resorbables, even in a little bit older patient, if it's going to obviate the need to extract hardware to perform my second stage of a procedure.



**Dr. Habal:** Very good, Larry. So therefore if you have a child or if you have a patient around 18 years old, you'll probably be more skewed into using the bioresorbable, if you are an older person you will probably go ahead directly and use the implantable without looking into whether or not you have to remove them. The metallic implants do provide good outcome in patients with multiple injuries when they are in the older age group, correct?

**Dr. Hollier:** Right. I think the only theoretical advantage that you could give to resorbables in the adult population would be in the area of stress shielding, when using a large titanium implant. But I just don't see that that's a problem in the craniofacial skeleton.

I think it's different if you start talking about long bone fixation. And that's why you see so many orthopedic surgeons going back and removing their hardware. But how often in the adult population do you ever go back and remove your hardware? You just don't do it, because it's typically not an issue.

The pediatric situation is different. However, I really don't know that titanium devices have any substantial incidence of complications even in the pediatric population. I know we talk about screw migration and things like that, but I have never seen a reported case where migration of a titanium screw has caused a serious complication in the child. Sure, we've seen them in the dura, but it typically is not a serious problem. That having been said, I don't necessarily want to have titanium screws in the dura of my patients, and there is no question that resorbable fixation completely avoids this issue.

**Dr. Habal:** OK, let's move on to Dr. Havlik. I'd like to address those three issues in your population of patients in Indianapolis. Your practice is mostly pediatric. You're at a children's hospital, and they're mostly reconstruction and you have residents and fellows to teach, correct?

Tell us about how long you have been using resorbable devices, how easy is it to teach your residents, what's the outcome, and what is the age limit where you say it doesn't make a difference, and what is the age that you think you should use them?

**Dr. Havlik:** I've used resorbable plates for approximately 10 years. I've used them throughout their evolution over that time period. And I agree to some extent with Dr. Hollier and I disagree in some points also.

**Dr. Habal:** Would you tell us what you agree on and what you disagree on?

**Dr. Havlik:** I've used resorbable plating systems in a few hundred infant cranial reconstructions. I find that the fixation obtained using resorbable plating systems is adequate and sufficient in the vast majority of reconstructions of pediatric craniofacial skeleton to maintain the contours and shapes that I'm trying to achieve clinically. Furthermore, the stability is of adequate duration to allow bone healing to occur. There really is no need to have the duration of fixation extend beyond this time of bone healing. In the bioresorbable plating system that I have used primarily, I have had the opportunity to go back in secondary procedures in perhaps ten or twelve cases, either through re-operation or separate indications for surgery, and in these

cases at six to nine months the plates are completely resorbed. There is no trace of the plate. I think that it is important that surgeons understand that the time to complete resorption of the plates varies considerably with the polymeric composition of the plates, and my experience with complete resorption in re-operation may not extend to other plate systems. Therefore, the surgeon should consider the time of resorption when selecting plating systems for specific applications. Certain systems may have characteristics that may be more appropriate for specific applications.

I think that when I look at the issues regarding absorbable plates versus metallic plates, my trade-off might be a little bit younger than you think. My trade-off is somewhere around three or four years of age. I feel that the position of an implant is dynamic with relation to the bone. I do perform adult reconstruction and in some cases I use a resorbable plate, in some cases I use metallic plates. I've had cases in which I've used metallic plates that have had major head injuries in which there's been a significant resorption of the reconstructed frontal bone after the effects of the head injury on the brain reach maturity with a diminution in brain volume. And, in fact, what happens in that situation is I've had to go back and remove the plates because they protrude above the surface of the bone. This is in contrast to the expanding cranial vault skeleton of the infant, where as you know, the plates can "migrate" intracranially. I think that the position of the implant is really a dynamic of what's going to happen in the surrounding environment. So based in part upon consideration of the change in these dynamics that occur

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with growth, I will start to routinely consider the use of titanium plates at three to four years of age. I find that in adult fracture management I would prefer to use a metallic plate for most applications, but use a resorbable plate for some applications. The specific applications would include orbital floor. And the issues there include re-operation.

**Dr. Habal:** We're going to come to the orbital floor in one minute.

**Dr. Havlik:** OK, all right.

**Dr. Habal:** Because we're going to ask each one of you to see if there is any controversy or differences in opinion.

**Dr. Havlik:** I'll just continue on in the comment in direct answer to what Dr. Hollier said. He is not aware of a complication from the intracranial migration of a metallic screw, and I agree with him. I am not aware of a documented permanent problem arising from the intracranial migration of a metallic screw. However, if you have the situation in which you re-operate on a child and the titanium plate and the screws are intracranial, the chances of injury to the dura, but not the brain, are significant, because you have to extirpate the dura around that invagination of the screw and the plate. This certainly makes the secondary operation technically more difficult. So in the infant's cranial vault, I think that there's a definite problem in terms of the routine use of titanium, and it should be used judiciously.

**Dr. Habal:** How about training your residents?

**Dr. Havlik:** My residents learn both techniques, absorbable plates and titanium fixation. And I haven't noticed a significant difference in their ability to use either technique.

**Dr. Habal:** Very good. You came up from Indiana with the term "coupling," where you use a plate with metal screws. Do you think that particular idea is necessary now? Or do you keep it on the shelf for the young person? Which means you use a resorbable plate and you use the screws that are metallic. Or are you still using the coupling technique? And what are the indications if you're doing so?

**Dr. Havlik:** Well, the coupling technique largely developed prior to the ability to fabricate resorbable screws in a reliable fashion. We used the metallic screws in conjunction with resorbable plates. My experience with that in the limited number of cases in which I re-operated was that the plate would resorb, but the screw obviously would not. However, in contrast to what you might expect, the screw would not migrate intracranially but in fact would protrude from the bone almost as a post. With the availability of refinement in techniques for resorbable fixation, I no longer use that technique. I either make a decision about whether the reconstruction would benefit from a titanium plate or resorbable plate. Some of that discussion is really based upon the thickness of bone in which I'm going to place the fixation.

So, for example, the eggshell bone in the anterior maxilla, I would prefer to use a titanium fixation device if I need to fix small bone fragments. I think the precision there is a little bit higher in terms of your ability to grasp

the number of screw threads per depth of bone. Because, as we all know, the titaniums have more screw threads per given depth of the screw, and I feel can provide more accuracy and precision in selected applications with thin or small bone fragments.

But I think that the decision is an individual one in terms of application and the age of the patient and the bone that I'm trying to fixate. And it is either going to be titanium or resorbable, and I don't mix the resorbable and metallic plates within a single site of fixation, but I may mix them within a single case, using either metallic or resorbable at a single site depending upon the specific requirements of fixation at the individual site.

**Dr. Habal:** OK. Thank you very much. I think you clarified for us the sort of implementation and inclination – some people are saying that we can't use the screws, use the coupling technique. And our experience is the same as yours. I really don't know why they do not migrate. Very fascinating.

Scott, let's come to you in Philadelphia. You do sort of a mix, adult and children. Tell us about your cutoff age, where you feel the training of your residents and fellows, and how long you used the devices. And what are some pearls you'd like to give to the younger person.

**Dr. Bartlett:** I've used the devices since they first came out. I'm probably a senior person here, other than you, Mutaz. So I've tried everything. I've tried almost all of the resorbable systems, and I think that there was an enthusiasm about resorbable systems early on. It's still somewhere there, but it's been tempered. When I first began

using the resorbable systems, I thought of them as having the same mechanical characteristics of the metallic system. That's clearly not the case.

When you use a resorbable system of a similar size to a titanium system, you're not going to get the same degree of stability that you do with a titanium system. Early on we didn't know that, and we saw more relapse and more problems post-operatively, especially in the infants with craniofacial deformities. We have learned that you can use these systems to establish three dimensional relations, but often to get the stability one needs, you have to reinforce the area with bone graft.

Secondly, the use of these materials is hampered by the fact that you do have to drill and tap. Doing that with very mobile bone segments becomes much more difficult, especially in the trauma situation, such as a butterfly fragment on the interior orbital rim. Despite that I use a lot of resorbables, and I use them routinely.

My age for cut-off is probably around six. And again, it's based on what the others have echoed here. I don't think you're going to get appreciable migration transcranially after that point in time. If you're going to come back to an area, and have to cut through that area, it's nice not to have metallic pieces in the way of your future osteotomy. This is an indication for using resorbables in the older child.

One of the early disappointments with resorbables is the time taken to resorb. When they first came out, the manufacturer said "Oh, this will be gone in six months." And then they came back and they said "It'll be gone 12 months." And then it was 18 months. And now some of them are saying 24 months. Patients need to be informed



Bob Havlik, MD

that this is the case. With the newer resorbables, this should be less of a problem. I think trauma, like Larry, titanium is such a benign piece of material. It has almost no complications, it's well tolerated over the long-term, it's easy to use. That's my preference.

**Dr. Habal:** Yes. In our experience, and I don't do acute trauma per se, so I see acute trauma coming from elsewhere because of problems related to what they have mostly with cranial base involvement or when there are metallic implants that are placed inside-out and had to basically be removed by a diamond cutter to cut through those plates, either inside the skull when the plate is removed for multiple fragments or inside the bone graft on the nasal area. And that has been a problem.

The other issue here is that not all the plating systems are alike. We will be reiterating this in all our discussion and we have a unanimous agreement on this between the panel members. And for the young surgeons, they should look at the composition of those plating systems. And the standard today goes with the PDLA and a PLA. The more you have PLA, the more you have strength, the more you have DLA the resorption. And in a child you may

like to use the 50-50, and in an adult with stabilization you might go to the 20-80 and so forth. And that's how the systems are varying. So the important thing for the young plastic surgeon who is not familiar with the co-polymer composition, is that they should know that there are differences between the systems and these differences are very important, besides the differences in using heat or wet material to stabilize and to bend these materials.

Bob, you have something to say before we go to Henry?

**Dr. Havlik:** I'd just like to concur with Dr. Bartlett's comments. And I agree that even in the infant craniofacial surgery, you do have to modify technique in order to accommodate the use of the plates. And, in fact, you can use much larger implant than you could with the titanium. But I routinely will use two millimeter thick implants in structurally dependent areas. And I find that gives me a greater stability. As we know, the resorption of these implants is not linked to the thickness since it's not a surface related process. It's a process of internal hydrolysis. So I don't see a down side of using a thicker implant in the places where I need enhanced structural stability.

My experience is with implants with co-polymers, as you highlighted. And, in fact, I have gone back in a dozen times or so and they're gone in six months. But it depends exactly on what you highlighted, that the composition of the polymer dictates the resorption time here.

**Dr. Habal:** It's important to keep in mind that not all bioresorbables are the same. And an issue that was brought out about the use of those implants in

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different sites, it's also important to know that their use is also dependent on the bone healing. So a child, of course, heals much faster than an adult. So if they resorb faster, it may not make a difference. And I will come to three other specific points as we hear from Henry.

**Dr. Vasconez:** Thank you, Mutaz. Well, I've been using resorbable fixation, especially in the pediatric population, for about 15 years. But in the first seven or eight of those years it was using suture. And one thing that Scott mentioned, and I concur wholeheartedly, I was stimulated to do this because of the growth development characteristics of the infant and the young child. But I felt at first that the fixation would be adequate, and we are talking about small, delicate pieces of hard tissue. But there is no question that the fixation is not comparable to fixation that you get with plates and screws made of metal, titanium specifically, or even wires. And that is something that we've had to adjust and be flexible with. Conceptually I think the age consideration of when you use these fixation devices is extremely important. I tend to agree with the age limit of three to four years of age. Certainly the infant cranio-facial skeleton is growing extremely rapidly. And that's when I want to not be in a situation where I've placed rigid fixation, metal fixation devices, that will impede growth and development.

The other issue is about ease of use. I'd just like to talk about that. We teach our residents how to use different fixation devices. And I do think that the resorbable fixation does have a little bit larger learning curve. You do have to drill and tap the screw holes and then

have to learn how to bend the plates. But I think that with time, those learning skills are obtained pretty readily. So I don't think that is an issue in the long run. I think outcomes is a more important issue. What are you trying to accomplish once you have used one or another fixation. And as I mentioned, I think, in the young, certainly the infant population, growth and development for me is extremely important. Obviously shape and contour is as well.

This brings up the issue again of the type of polymer that you're using. And I do have a difference of experience with what Bob has said. I have on occasion gone back on some of these and admittedly, the ratio was not the best polymer ratio, but I have noticed that even at nine to 12 months I still see some residue of the resorbable fixation devices and even certain large chunks, in particular of the screw heads. And I don't know what eventually happens with that. I think we need more information, more research into the resorbability of these devices and which is the more appropriate ratio to use. And that then brings up, of course, the issue of once we have that information, then we can be selective. And for certain situations, certain age groups, when we're dealing with either an acute or a secondary problem, we can select the specific ratio that will give us the desired result.

**Dr. Habal:** That's a very good point. Because in my area, the hospitals are moving to try to see what company or manufacturer can give them the best deal. And that's not going to work that way. It's not like the other devices. In the future we're probably going to be looking at more selective utilization between children and adults. And I'm

very interested in seeing the difference in age group, we all have the same cut-off of the groups because of the healing process.

There are two more issues here that we need to discuss. First, I'd like a brief opinion from each one of you about what complications you have seen if you have seen any or none.

The second question is related to the healing of the bone, when you go back in a year's time and the resorbable, you can't even find a trace of them. They look like normal skulls to me, and I have seen many of them. Especially in the Crouzone's and Aperts. But you can always see the screw in the bone, it does not completely fill with bone. And I will come to that as my third issue when we talk about the bone engineering.

Let's start with Larry. What complications have you seen, Larry, in the last eight years? Can you list one, two, and three?

**Dr. Hollier:** Two pop to mind. The first is in the orbital floor. When I have taken the implant and contoured it over the orbital rim to fix it, I have seen patients with inflammatory changes in that thin lower eyelid skin. So obviously stopped contouring it anterior to the orbital rim.

Additionally, I have seen problems in patients where I've used it essentially as a spacer over a frontal sinus that was infected and in which debrided the anterior table of the sinus in anticipation of a secondary reconstruction. Fluid collections here have been a problem, and require repeated aspirations.

**Dr. Habal:** So you have seen a sort of sterile abscesses which are described in the literature.



**Dr. Hollier:** Yes.

**Dr. Habal:** OK. Very good. Have you seen any extrusion?

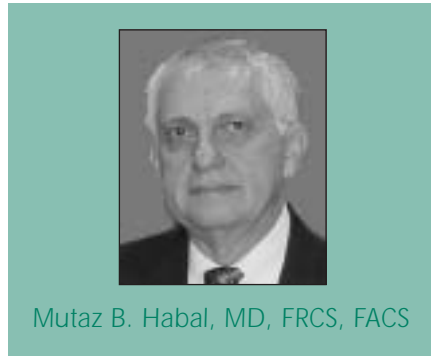
**Dr. Hollier:** No.

**Dr. Habal:** Bob?

**Dr. Havlik:** In my experience with resorbable plates in about two to three percent of the cases I do have extrusion – I don't want to say extrusion, but an inflammatory response around the implant that may become apparent in the suture line closure five to six months implantation. I am not certain which patients are susceptible to this. I haven't been able to differentiate any class that it happens in. That's taken into my consideration of choice of implant. I use the implants that have the fastest resorption time. But, still, there is an inflammatory occurrence in a small percentage of the population.

**Dr. Habal:** Henry?

**Dr. Vasconez:** Yes. The complications that I've seen, and I must indicate that they are few, but certainly present, are in a list form: loose screws, again, probably based on technical problems with how you drill the holes and then tap; fluid collection; and then in this regard, in the inflammatory response that has been mentioned, or sterile abscesses, that have also been reported; and then incomplete resorption of the material. As I mentioned, I think if they are not placed in a flush sort of way, many times they do maintain palpability and sometimes it's just like in the metal fixation devices, patients and families do not like that, and we've



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had on a few occasions, to go back and remove it.

**Dr. Habal:** Scott?

**Dr. Bartlett:** I've seen very few sterile abscesses. The problems I've seen include an occasional patient where the plate becomes exposed, such as over a coronal suture in a multiple previously operated patient, then it behaves just like a foreign material and you have to take that out. The palpability issue, as we've discussed, the new polymers may solve that. I've actually taken some of the plates when I've used them, such as around the orbital rim when I'm doing a transcranial procedure, and put the plate on the inside so it's not palpable and it's not an issue.

**Dr. Habal:** The last is we're going to discuss the oncological problem. The oncological problem is the radiologist or the radio therapists want you to use the resorbable plate in an older population. The older population, because they have no scatter and the healing gets compromised. So you see that the bone flap sinks right in afterwards. Do you have any experience with this, Bob?

**Dr. Havlik:** I have limited experience

in terms of oncologic reconstruction with resorbable plates. I think that you may highlight one of the potential advantages of the use of the resorbable plates in the adult population. But I think, as other people have expressed, my bias in adult oncologic reconstruction would be the use of metallic fixation.

**Dr. Habal:** Well, the last issue is the orbital floor. Today there are enthusiasts for using a titanium mesh and there are the enthusiasts for the resorbables in the orbit. In my own experience, I have taken a number of these titanium mesh from the orbit and I can tell you that really if you're talking about spending time with bleeding and cutting into the orbital, losing some of it, that is really one of them. And I have used either bone graft or I have used the resorbable plate, but let's hear from every one of you with that experience. I have not seen any problems.

The most of the problems I have seen as a complication was extrusion, but these were the long-acting materials, and some of those materials may not be with us for a long time. These are resorbable biomaterials, but as we all mentioned they are different, there are differences in the copolymers of these. Therefore there is a difference in the hydrolysis system that each one of them go through and the process of resorption

Larry, tell us about your orbital experience with the resorbable versus titanium versus other apolygous material.

**Dr. Hollier:** A while back I published a study of a large group of patients in which we had used resorbable sheeting in the floor for defects, even in some

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cases fairly large defects. Not complete floor reconstructions, but fairly large defects. There was no incidence of secondary enophthalmus in those patients from resorption of the material even when followed out for over a year. This is obviously the main concern that many people have about the use of resorbable sheeting in the orbit.

It is very attractive to use these implants that is, resorbables – because of ease of placement and the ease of re-operation. I agree with you that titanium is difficult to get out. If you use titanium meshes in the floor, you better get it right the first time because going back is a major issue. I would say the unresolved question is whether or not it's acceptable to reconstruct a very large subtotal defect in the orbital floor with a resorbable. In my opinion, it is probably not for two reasons. One, I do worry about secondary enophthalmus when that resorbable goes away and all you have essentially is a sheet of scar tissue. I think you probably will have some increase in the overall orbital volume, however small. And, two, it is hard for me to shape that implant appropriately in a large defect that perhaps goes up the medial wall. Personally, it is easier for me to do that with titanium than it is with a resorbable. But I think that is an unresolved issue – very, very large defects and what happens when they're resorbed. I think it's not an issue in smaller defects.

**Dr. Havlik:** I agree with Dr. Hollier's comments. I think that for the "routine" orbital floor fracture, I think the resorbable implants are very useful. I think that when you get into special applications or with reconstruction of the entire orbital floor, my bias would

be towards using titanium because of the ease of fabrication of the implants for the orbital floor. I've also had isolated, unusual fractures far posteriorly in the orbit, not where you would see routine orbital floor fracture. Then it is actually technically difficult to fabricate the resorbable plate with an acceptable contour because the malleability of the resorbable plate from heating is lost as you place it into the posterior orbit.

**Dr. Habal:** Scott?

**Dr. Bartlett:** Yes. I am somewhat of the old school and I tend to use bone in most of my reconstructions. I don't have a problem with using any of the resorbables in the orbit. Many of you are probably too young to remember the classic study that Joseph Ogura, who was an otolaryngologist did on orbital decompression for thyroid exophthalmopathy. He demonstrated that you can remove the entire orbital floor, and as long as you don't violate the periorbita. The globe position will remain unchanged. And so theoretically these implants are ideal because they're there long enough to allow that neoperiosteum and neo-support system to develop, and if they go away, so what. That should support the globe without anything else.

**Dr. Habal:** Well, that's – two things we notice from this panel. When you're looking at the experts, being a new biomaterial and new fixation device, we have some disagreement and we have some agreements between everybody. So therefore we do not agree on everything. And we don't disagree on everything, which is very great. And also if you look at the age cut-off where you

really should use it and you should not use the titanium, we find it's really they're almost near each other, there's not that much difference.

So on a last note before we close our panel today, I would like to ask everybody to give us a pearl about the use of the bioresorbable.

We start with you, Bob. You're smiling, so we can start with you. What is your pearl about the bioresorbables today?

**Dr. Havlik:** I think that that my pearl would be that you have to consider the application, the bone, and the age range. And all those factors are important in terms of choice of fixation. I think your point about the fact that there is no longer a single choice or single type of system that is optimal across the board is right on target. Optimal patient management requires the choice of not only a fixation system for an individual case, but possibly the selection of metallic or resorbable system depending upon the individual characteristics of the site of fixation within individual cases in those cases that are more complex. I think that depending on the age, depending on the application within the craniofacial field and depending upon the load that's borne by that device, you need to consider all those in terms of choice of fixation.

**Dr. Habal:** Scott?

**Dr. Bartlett:** I think the pearl would be don't ask the resorbables to give you the structural stability that titanium or alloys can, it's not there.

**Dr. Habal:** Very good point. So we're really, literally, in all of those devices,

they are not magic. We are depending on the healing power of the person we're putting it in. And we have to understand the healing of the person, bone, whether it's a younger child with a faster healing or an older child with a faster healing. Larry, what do you have for your pearl?

**Dr. Hollier:** I think probably one, I guess you could call it pearl, but something we never discussed is that there is no role for resorbables in a mandible.

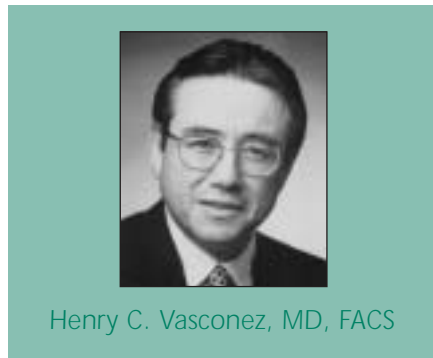
**Dr. Habal:** The resorbables are only approved for the mandible and above.

**Dr. Hollier:** Yes. I just feel there is no role for resorbable fixation in the mandible, for many reasons. And even in a child. If it is a fracture that can't be handled with a splint, then you ought to resort to resorbable fix or to titanium fixation and consider removal.

**Dr. Habal:** You brought a very interesting issue. When you use it, do you use the tension band at the same time? Because when you do the mandible, you cannot use one plate, you have to use a tension band. Which means you have to use one above and one below, otherwise they'll open up with the motion.

**Dr. Hollier:** I think, Mutaz, that in the majority of children a fracture can be handled conservatively. And that is either non-operatively or with a splint. And if you really need to resort to internal fixation, that is a situation that you should not rely on the resorbable for that degree of stability. One should resort to titanium.

**Dr. Habal:** Do you mean, that in an older patient, using the plating system



Henry C. Vasconez, MD, FACS

alone is not adequate. If you want to have that patient use a fixation device on the patient and want to bring the edges of the bones together, that's a different way. But they do not have the stability by themselves to use.

**Dr. Hollier:** The reason I bring it up is that I have seen practitioners say "it's a child, it's a fracture, I need to use a resorbable." The mandible is a different animal than the mid-face and the cranium. The need to provide stability is at a premium.

**Dr. Habal:** That's providing you're not producing fixation. That's going to be a whole issue by itself. In the children, use a monocortical or a bicortical because of the teeth. If you fix the teeth, they get ancurrosis.

Well, one thing we have not discussed here – and I hope this is something for the future is today it looks like the bioresorbable, which is a polylactite scaffold, is the basis for a lot of bone engineering and bone healing. And do any of you have just a yes or no experience with bone engineering and bone healing using the polylactice as a scaffold to seed in the stem cells, whether it's embryona or adults? Just say yes or no.

**Dr. Bartlett:** In our laboratory, Dr. Richard Kirschner and Dr. Joseph Losee have looked at the resorbables as a scaffolding for some of the new bio-ceramics, such as the calcium phosphates – and carbonated calcium phosphates – to see if there's any negative interaction. And neither in my clinical experience or in their experimental studies, does there appear to be a negative interaction. The future may hold adding stem cells or adding biologically active chemicals to that mixture. It doesn't appear that there are adverse reactions so far as we know.

**Dr. Habal:** We have used adult stem cells. I do not have experience with embryona stem cells. But it looks like from what I have looked at is the smooth surface of the polylactite may not be the ideal for bone engineering. And that's what the future will be, for bone engineering, there will be a different composition, composition that probably is short-living, at the same time it has to have a rough surface. Because the embryona and all the adult stem cells, they have an affinity to stick to these scaffolds and go from that scaffold in order to produce whatever structures we need. **M**



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