2018

American Academy of
CranioMaxilloFacial Surgeons

Annual Meeting
May 4 – 5, 2018

THE NINES • PORTLAND, OREGON

Improving the health and quality of life for patients with acquired craniomaxillofacial disorders by advancement of knowledge, science, and art of craniomaxillofacial surgery.

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Welcome...

AACMFS SCIENTIFIC PROGRAM

Friday and Saturday, May 4 – 5, 2018

The Nines | Culture & Fashion Ballrooms

To Earn CME Credit

- Participate in the Scientific Program.
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Planned and Developed by Academy Members of AACMFS The American Academy of CranioMaxilloFacial Surgeons

Overview

The mission of the AACMFS is to improve the health and quality of life of patients with congenital and acquired CMF disorders by the advancement of knowledge of the science and art of CMF surgery. Keynote speakers will address approaches for assessing behavioral and innate talents, which can lead to optimal fit during a physician's medical career. Fellows of the Academy who have submitted abstracts will present current research and innovations in practice in the areas of pediatric craniomaxillofacial surgery, trauma, head and neck oncology, reconstruction and education and training. The goal of this activity is to bring together experts in their respective fields to share information regarding patients with craniomaxillofacial disorders and discuss options for improving patient care.

Target Audience

This scientific session is for oral and maxillofacial surgeons and dentists who are Fellows of the AACMFS who have come together to advance their field of practice and are interested in sharing experiences and setting future direction.

Professional Practice Gaps

Fellows of the AACMFS are individuals who are involved in developing and working in OMS training programs. It is essential they stay abreast of the decisions being made that impact the length of training programs as well as the content. As the practice of medicine evolves in this specialty, Fellows need access to the latest research of their colleagues, so they can improve OMS patient outcomes.

Assessment of Need

A survey conducted by the American College of Maxillofacial Surgeons revealed that training programs are changing and there is a steady and continual erosion of the basic science curricula. There is a concern regarding adequately preparing surgical residents for the complexities of patient care, as well as for medical and/or specialty board examinations, if the core sciences are minimized to the point of omission. At issue is creating a continuum of training that focuses on allowing residents to train to their level of interest and competence, while utilizing optimal resources based upon regional politics and access to clinical material. Consideration should be given to having fellowships and residencies accredited by the ACGME and the ACS, to alleviate concerns over the integration of dentistry into health education.

Methodology-Format

This course is structured to be highly interactive, where Fellows present five minute abstracts with a ten minute discussion period. Keynote speakers will also present lectures followed by audience discussion. Abstracts are printed for reference at the meeting and are available post meeting.

Objectives

Upon completion of this scientific session the attendee should be able to:

1. Discuss challenges in maxillofacial reconstruction, and methods to overcome them.
2. Assess research abstracts and studies as they relate to craniomaxillofacial patient populations, pathology and treatment options, and the implications for changes in practice.
3. Describe innovative techniques to assess innate talents and behaviors, which may assist candidates and decision makers during medical career transitions.
4. Evaluate potential academic and curricular modifications to enhance knowledge, competency and improve relevancy.
5. Examine contemporary interdisciplinary and cross-functional patient care delivery models with respect to your clinical setting.

Physician Credit

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of Medical Education Resources (MER) and the AACMFS. MER is accredited by the ACCME to provide continuing medical education for physicians.

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HIPPA Compliance

Speakers strive to be in compliance with HIPPA. To protect patient privacy, faculty and participants have been requested to de-identify patient related material.

Commercial Support

Neither grant funds, nor in-kind support were provided for this CME meeting.

Exhibitors

We gratefully acknowledge the exhibitors:
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Julian J. Wilson, DDS
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No conflicts of interest

Robin T Wu, BS
Yale School of Medicine
No conflicts of interest

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Professor and Vice Chair, Medical Informatics & Clinical Epidemiology

Senior Associate Director, Oregon Clinical and Translational Research Institute

Oregon Health & Science University
No conflicts of interest

John D. Bradley, MDiv, DHL
President, IDAK Group Inc.
No conflicts of interest

Agenda

FRIDAY, MAY 4

7:00 – 7:45 am **Registration & Breakfast / Exhibits**

7:45 – 8:15 am Welcome and Opening Statements – State of the AACMFS
Eric J. Dierks, MD, DMD - President

Abstract presentations are 5 minutes, followed by 10 minutes of audience discussion.

8:15 – 11:30 am **ABSTRACTS - Pediatrics, Craniofacial and Orthognathic Surgery**
Moderators: *Bonnie Padwa DMD, MD & Derek Steinbacher, DMD, MD*

8:15 – 8:30 A Pilot Study of Outcomes of Temporomandibular Joint Procedures in Surgical Patients with Fibromyalgia
Karen Carver, DDS, MPH

8:30 – 8:45 Replacing Implanted TMJ Prostheses with Titanium in Patients with Acquired Metal Allergy
Andrew Henry, DMD, MD

8:45 – 9:00 Cleft Palate Repair Performed in High Volume Centers are Associated with Better Short-Term Outcomes and Socioeconomic Disparities
Robin T Wu, BS

9:00 – 9:15 Rhinoplasty for Cleft Lip & Palate Patients
Angelo Cuzalina, MD, DDS

9:15 – 9:30 A National Analysis of Racial Disparities in Cleft Palate Repair
Connor J Peck, BS

9:30 – 9:45 Conformity of the Actual to Planned Result in Orthognathic Surgery
Kyle Gabrick, MD

9:45 – 10:00 Redo Orthognathic Surgery: Single Surgeon Experience Over 7 Years
Robin T Wu, BS

10:00 – 10:30 am **Break & Exhibits**

10:30 – 10:45 Orthognathic Surgery and Rhinoplasty: Should They Be Simultaneous or Staged?
Alexander Sun, BS

10:45 – 11:00 Splintless Orthognathic Surgery
Edward Ellis III, DDS, MS

11:00 – 11:15 Midface Advancement and Contour Bone Grafting: The Precursor to Definitive Cleft Lip and Palate Revision
Timothy A Turvey, DDS, FACS

11:15 – 11:30 Imatinib Use in Patients with Cherubism
Pat Ricalde, MD, DDS, FACS

11:30 – Noon	**ABSTRACTS - Craniomaxillofacial Trauma Surgery** ***Moderators:*** *Ashish Patel, MD, DMD & Martin Steed, DDS*
11:30 – 11:45	Transantral Approach to the Orbital Floor without Need for an Endoscope is a Practical Technique *Akshay Govind, MD, DMD, MPH*
11:45 – Noon	15-Year Retrospective Evaluation of Helmeted vs Non Helmeted Motorcycle Crashes and Facial Injuries Sustained at Two Level 1 Trauma Centers *Mikhail Daya, DMD*
Noon – 1:00 pm	**Luncheon & Exhibits**
1:00 – 3:30 pm	**ABSTRACTS – Head and Neck Oncology** ***Moderators:*** *Jasjit Dillon, MD, DDS & R. Bryan Bell, MD, DDS*
1:00 – 1:15	Denosumab for the Treatment of Symptomatic Noonan-like Giant Cell Lesion Syndrome *Biraj Shah, DDS, MD*
1:15 – 1:30	Squamous Suture Craniosynostosis – A Case Report and Surgical Strategies Including Virtual Surgical Planning *Anthony Massaro, MD, DMD*
1:30 – 1:45	Minor Salivary Gland Tumors of the Oral Cavity – Report of 300 Consecutive Cases: Indications for Neck Dissection *Robert A Ord, MD, DDS, FACS*
1:45 – 2:00	STINGBLADE: Targeting the Surgical Site with STING Agonists to Clear Minimal Residual Disease in Head and Neck Squamous Cell Carcinoma *Jason R Baird, PhD*
2:00 – 2:15	Survival Outcomes of Mucosal Melanoma in the Head and Neck *Felix Sim, MBBS, FRACDS*
2:15 – 2:30	The Prevalence of Nevoid Basal Cell Carcinoma in Children with Odontogenic Keratocysts *Bonnie L Padwa, DMD, MD*
2:30 – 2:45	Planning Resection Margins using CAD-CAM in Head and Neck Pathology: A 10 Year Retrospective Analysis *Peter Dennis, MD, DMD*
2:45 – 3: 00	Correlation Between Tumor Characteristics and Margin Status in OSCC *Sergei Kuznetsov, DDS*
3:00 - 3:15	Depth of Invasion – Is Frozen Section Accurate? *Justine Moe, MD, DDS*
3:15 - 3:30	The ANOS Head and Neck Staging System and Its Application in Patients with Vascular Anomalies *Salim Afshar, DMD, MD, FACS*

3:30 – 4:00 pm	**Break & Exhibits**
4:00 – 5:30 pm	**ABSTRACTS - Education, Training and Research** ***Moderators:*** *Mark Engelstad, DDS, MD, MHI & Thomas Dodson, DMD, MPH*
4:00 - 4:15	Shining Sunlight on Industry Payments: The Sunshine Act *Yisi D Ji, BS*
4:15 - 4:30	The Effect of OMS Curriculum Design on USMLE Step 1 Performance *Adam P Fagin, DMD, MD*
4:30 – 4:45	Quantity and Quality of TMJ Disorder Education in OMS Programs *Thalia-Rae Criddle, DMD*
4:45 - 5:00	Pediatric Emergency Medicine Physician Comfort with Management of Oral and Maxillofacial Concerns *Shelly Abramowicz, DMD, MPH, FACS*
5:00 – 5:15	Impact of an Opioid Prescribing Protocol on Prescribing Behavior at University of Minnesota School of Dentistry *Harold Kai Tu, DMD, MD, FACS*
5:15 – 5:30	A High-Fidelity Simulation Intervention to Improve Operating Room Safety for Oral Maxillofacial Surgery Teams *Steven M Roser, DMD, MD, FACS*
6:00 - 7:30 pm	**Reception** **Departure Lounge**

SATURDAY, MAY 5

7:30 – 8:00 am	**Breakfast & Exhibits**
8:00 – 10:00 am	**Keynote Speakers** ***Moderator:*** *Eric Dierks, MD, DMD, FACS*
8:00 – 8:50	Handicapping Racehorses: Traditional and Non-traditional Ways to Select Medical Program Applicants *Cynthia Morris, PhD, MPH*
8:50 – 9:40	Lessons Learned from over 40 Years of Assessing Candidates *John D. Bradley, MDiv, DHL*
9:40 – 10:00	**Audience Discussion**
10:00 – 10:30 am	**Break & Exhibits**
10:30 – Noon	**Abstracts - Craniomaxillofacial Reconstructive Surgery** ***Moderators:*** *Allen Cheng MD, DDS, FACS & Ramzey Tursun, DDS*
10:30 – 10:45	Resection and Immediate Reconstruction of Mandibular Continuity Defects without a Microvascular Flap *Daniel Perez, DDS*
10:45 – 11:00	Management of Pathologic Fractures of the Irradiated Mandible without Microvascular Surgery *Julian J Wilson, DDS*
11:00 – 11:15	Association Between Mandibular Fractures and Cervical Spine Injuries *Esa Färkkilä, MD, DDS*
11:15 – 11:30	Reconstruction of the Lateral Craniofacial Defect in Previously Irradiated Patients: Potential Challenges and Pitfalls *Paul Covello, DDS, MD*
11:30 – 11:45	The Biaxial Double Barrel Flap – A Simplified Technique for Fibula Maxillary Reconstruction *Baber Khatib, MD, DDS, FRCD(C)*
11:45 – Noon	Mandibular Osteomyelitis Associated to Candida albicans in Marijuana and Heroin Abusers: Literature Review and Case Series *Mikhail Daya, DMD*
Noon – 1:00 pm	**Luncheon & Exhibits**
1:00 – 3:00 pm	**Abstracts - Craniomaxillofacial Reconstructive Surgery** ***Moderators:*** *Donita Dyalram, DDS, MD & D. David Kim, DDS, MD, FACS*
1:00 – 1:15	Nasotracheal Intubation: The Preferred Airway in Oral Cavity Microvascular Reconstructive Surgery? *Jordan Gigliotti, DMD, MD, CM*
1:15 – 1:30	Angioplasty to Achieve Three Vessel Patency in the Lower Extremity Planned as a Donor Site for Fibula Free-flap in Head and Neck Reconstruction *Roderick Y Kim, DDS, MD*

1:30 – 1:45	In Vivo Evaluation of Fluorapatite-Coated Polycaprolactone Scaffold for Osteoinductive Capabilities *Sharon Aronovich, DMD*
1:45 – 2: 00	CTA Perforator Localization for Virtual Surgical Planning of Osteocutaneous Fibular Free Flaps in Head and Neck Reconstruction *Kyle S Ettinger, MD, DDS*
2:00 – 2:15	Is Virtual Surgical Planning Accurate in Predicting Maxillary Position When Performing Mandibular Surgery First? *Biraj Shah, DDS, MD*
2:15 – 2:30	Immediate Allograft Outcomes of Long-Span Defects of the Inferior Alveolar Nerve with Ablative Mandibular Resection *Michael Miloro, DMD, MD, FACS*
2:30 – 2:45	Review of 200 Ameloblastomas: Evolution of Mandibular Reconstruction and When Enucleation may be a Viable Option *Robert A Ord, MD, DDS, FACS*
2:45 – 3:00	Does the Usage of Ketorolac (Toradol™), a Non-Steroidal Anti-Inflammatory Drug, Cause Increased Rates of Hematoma Requiring Surgical Intervention, in Patients who undergo Vascularized Free Tissue Transfer for Reconstruction of Head and Neck Defects? *Ed Pantzlaff, DDS*
3:00 – 3:30 pm	**Exhibits** **Scientific Meeting Adjourns**

Abstracts

This activity is jointly provided by Medical Education Resources
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Planned and Developed by Academy Members of AACMFS
The American Academy of CranioMaxilloFacial Surgeons

A Pilot Study of Outcomes of Temporomandibular Joint Procedures in Surgical Patients with Fibromyalgia

Authors Karen Carver, DDS MPH; Stephen Feinberg, DDS MS PhD; Sharon Aronovich, DMD; Daniel Harper, PhD; Christos Skouteris, DMD PhD

Institution University of Michigan

Presenter Karen Carver, DDS MPH

Introduction

The association between temporomandibular disorders (TMD) and fibromyalgia has been well established in the literature.[1] Both TMD and fibromyalgia can be classified as having a centralized component of pain[2] and the benefits of surgical intervention in this patient population may be difficult to establish. Case selection is critical to ensure that patients who may carry this diagnosis receive the most appropriate and beneficial treatment that is coincident with underlying pathology. This preliminary study aims to characterize the benefit of surgical procedures in patients with and without a diagnosis of fibromyalgia.

Methods

This is an ongoing prospective observational study which has been approved by the medical IRB. Individuals presenting to the University of Michigan for evaluation and treatment of temporomandibular joint disorders from May 2016 to November 2017 were evaluated for inclusion. Data was generated using electronic reporting via smart forms. Patients were included if they had both an initial evaluation and a TMJ lavage (arthrocentesis or arthroscopy) plus at least one follow up appointment in the same timeframe. Patients were excluded if they did not have a procedure or if they had incomplete data. Those patients meeting criteria for fibromyalgia were identified using the American College of Rheumatology's 2011 criteria,[3] including a widespread pain index and symptom severity score. Outcomes of interest included self-reported pain scores at rest, pain-related disability scores, Jaw Function Limitation Scale[4] and subscale scores, and mouth opening (both comfortable and pain free).

Results

A total of 24 patients were included in the study sample (mean age = 30.8 +/- 18.9 years). Median follow up time was 19 days. Five individuals met criteria for fibromyalgia, however two patients under 21 years old were also diagnosed with juvenile idiopathic arthritis. Among all individuals in the study, including both those who did and did not meet criteria for fibromyalgia, pain significantly decreased at rest from a mean of 4.38 to 2.46 ($p=.003$). Jaw functional limitation scores also decreased both overall ($p=0.007$) and in subscale measurements ($p=0.014$). Comfortable mouth opening increased at the post treatment visit as well ($p<0.001$). "Fibromyalgianess" (i.e. the degree of widespread pain and symptom severity in a patient) was not significantly correlated with pre- to post-treatment changes in any of the study outcome variables.

Conclusions

At present, our preliminary study suggests that a patient's degree of fibromyalgianess may not correlate with amount of improvement experienced following TMJ lavage; however, effect sizes may be limited by small sample size and variable periods of follow up.

1. Costa Y.M., Conti P.C.R, de Faria F.A.C, and Bonjardim L.R. Temporomandibular disorders and painful comorbidities: clinical association and underlying mechanisms. Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology 2017. 12(3) 288-297.
2. Harper D.E., Schrepf A., and Clauw D.J. Pain mechanisms and centralized pain in temporomandibular disorders. Journal of Dental Research 2016. 95(10) 1102-1108.
3. Wolfe, F., Clauw D.J., Fitzcharles M., Goldenberg D.L., Häuser W., Katz R.S., Mease P., Russell A.S., Russell I.J., Winfield J.B. Fibromyalgia Criteria and Severity Scales for Clinical and Epidemiological Studies: A Modification of the ACR Preliminary Diagnostic Criteria for Fibromyalgia 2011. 38(6) 1113-1122.
4. Ohrbach R, Larsson P, List T. The jaw functional limitation scale: development, reliability, and validity of 8-item and 20-item versions. J Orofac Pain 2008. 22(3) 219–230.

Replacing Implanted TMJ Prostheses with Titanium in Patients with Acquired Metal Allergy

Authors Andrew Henry, DMD MD Eric Granquist, DMD MD

Institution University of Pennsylvania School of Dental Medicine

Presenter Andrew Henry, DMD MD

Purpose of the Study

Temporomandibular joint replacement is a widely accepted method of treatment for patients with end-stage deterioration of the joint. While the vast majority of TMJ replacements do well, removal of the prosthesis may be necessary in cases hypersensitivity, most commonly to the nickel component. The symptoms associated with a hypersensitivity reaction to an implanted metal may include a profound dermatitis in the skin overlying the prosthesis, urticaria, pain, swelling, vasculitis and potential for loss of the device secondary to osteolysis and loosening of the implant[1]. The orthopedic literature advocates for the removal of the inciting implant with replacement with a non-allergenic alloy, typically titanium [2]. Despite this, we are unaware of any documented outcomes of replacement of a prosthesis with a titanium implant following acquired nickel hypersensitivity in the TMJ. This pilot study evaluates the outcomes of patients with an acquired nickel sensitivity following removal and replacement of their implant with a titanium alloplastic joint replacement (MoP).

Materials and Methods

This retrospective case series used CPT codes for joint replacement cross-referenced with documented nickel allergy to identify patients who underwent temporomandibular joint replacement and had a suspected nickel allergy. A chart review was then carried out revealing those patients that underwent removal of their original nickel containing implant and replacement with the all titanium prosthesis. All surgical procedures were performed by a single TMJ surgeon assisted by residents at the Hospital of the University of Pennsylvania from July 2011 through October of 2017. Primary outcome measures were postoperative pain level and presence of swelling and/or erythema at the implant site. Results are descriptive given the rare nature of this disease process and lack of a large treatment population.

Results

A total of three patients were identified that underwent exchange of stock joint with an all titanium prosthesis. All patients experienced pain and swelling as their primary symptoms prior to the revision. All patients showed improvement in pain level with two patients exhibiting a complete absence of pain (at rest or with function). Another patient had her pain level improve to a 3/10 from 6/10 pre-operatively. All patients showed a complete resolution of swelling and erythema at one year post operatively. Additionally, all patients showed an improvement in their maximal incisal opening (MIO) with an average of 13 mm improvement at one year.

Conclusion

This early pilot study demonstrates improvement in patient symptoms with acquired nickel sensitivity when their devices are exchanged for all titanium implants.

References

1. Hallab NJ, Jacobs JJ. Biologic effects of implant debris. Bull NYU Hosp Jt Dis 2009; 67 182-8

2. Thomas P, Schuh A, Ring J, Thomsen M. Orthopedic surgical implants and allergies: joint statement by the implant allergy working group (AK 20) of the DGOOC (German Association of Orthopedics and Orthopedic Surgery), DKG (German Contact Dermatitis Research Group) and DGAKI (German Society for Allergology and Clinical Immunology). Orthopade 2008: 37: 75–88. **IRB Approval:** 828859

Cleft Palate Repair Performed in High Volume Centers are Associated with Better Short-Term Outcomes and Socioeconomic Disparities

Authors Robin T Wu, BS
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Institution Yale University School of Medicine

Presenter Robin T Wu, BS

Purpose

High volume centers (HVC) are commonly associated with increased resources and improved patient outcomes. An analysis of hospital volume and socioeconomic variables has not been reported for cleft palate repairs, widely performed yet difficult surgeries. The purpose of our study was to assess the efficacy and outcomes of high volume centers specifically for specific subtypes of cleft palate repair.

Methods

Primary, revision, older (>15months), and total cleft palate procedures were identified in the the Kids' Inpatient Database from 2003-2009. HVC were defined by 90th percentile of case volume or higher ($\geq$48 cases/year). Data were combed for demographics, perioperatives, complications, and hospital data. Charleston Comorbidity Index was calculated and compared. Bivariate and multivariate analyses analyses were conducted between high volume and non-high volume centers (NHVC) across all cohorts of cleft repair.

Results

4563 (61.7%) total cleft palate surgeries were performed in HVC and 3388 (38.3%) were performed in NHVC. NHVC treated a higher percentage of Medicaid patients, while HVC treated more patients with private insurance (p=0.005). Older and total patients treated at HVC were more often from higher income quartiles (p<0.001; p=0.018). HVC across all 4 groups had larger bedsizes (p<0.001), were more often government/private owned (p<0.001), and were more often teaching hospitals (p<0.001) located exclusively in urban settings (p<0.001).

Primary patients treated at HVC were repaired significantly younger (p=0.008) and were more often males (p=0.032). Across total, primary, and older patients, the most common diagnosis at HVC was complete cleft palate with incomplete cleft lip, while the most common diagnosis at NHVC was incomplete cleft palate without lip. In older patients, both HVC and NHVC patients were most commonly diagnosed with complete cleft palate with incomplete lip. In the primary, revision, and total cohort, significantly more concurrent procedures were performed in HVC (p=0.047; p=0.001; p<0.001).

Overall, primary, and revision length of stay (LOS) was significantly longer in NHVC (p=0.048; p=0.001; p=0.010) and approached significance in the older group (p=0.060). Overall, HVC were associated with a lower specific complication rate (p=0.042). Primary HVC experienced lower specific complication rates (p=0.023) and pneumonia rates (p=0.009). Revision HVC were associated with fewer cardiac complications (p=0.040) and older HVC with less wound disruption, approaching significance (p=0.050), but also more hemorrhage (p=0.040).

Conclusions

The majority of cleft palate cases nationwide are performed at the top 10% case volume centers. Our analysis revealed HVC are associated with better short-term outcomes across all patient groups and surgery types. HVC may be better equipped to handle complex patients, such as those with more extensive defects receiving multiple concurrent procedures. Despite strikingly positive results, HVC treated patients from higher income brackets with private insurance, while NHVC treated lower income patients paying with Medicaid. Among many factors, this may reflect the challenges faced by disadvantaged patients living in rural areas in accessing HVC, located exclusively in urban regions. We recommend future efforts to focus on equilibrating access to care for all patients seeking cleft palate surgeries, particularly to HVC.

Rhinoplasty for Cleft Lip & Palate Patients

Author Angelo Cuzalina, MD, DDS

Institution Tulsa Surgical Arts

Presenter Angelo Cuzalina, MD DDS

Background
There are countless children that undergo multiple surgeries from birth to high school for correction of issues from congenital cleft lip and palate. However, very few go on to have nasal correction after their early stage operations. This leaves most of these patients with significant residual nasal deformities into adulthood.

Methods
We reviewed the last 30 sequential septo-rhinoplasties on patients with unilateral and bilateral cleft lips and palates over the past 2 ½ years by a single surgeon. The review was on specific techniques that worked consistently well for these situations and problems that can occur from the various techniques. 29 of the 30 patients had autologous rib harvest for use as a large septal extension graft as well as batten grafts and pyriform rim grafting.

Results
Overall satisfaction rates for the patients were extremely high although the surgeons satisfaction scores were generally somewhat lower than the patients. Unilateral clefts typically were more challenging to obtain ideal symmetry particularly along the alar rim. Projection increase was very significant using the rib cartilage despite expected fibrotic limitations.

Conclusions
Septo-rhinoplasty for the cleft palate patient is complex but can be extremely rewarding. These are challenging nasal cases but can offer patients a wonder result and dramatic improvement in self-esteem and often functional breathing improvement when it is an issue.

A National Analysis of Racial Disparities in Cleft Palate Repair

Authors Connor J Peck, BS; Blake N Schultz, BS; Robin T Wu, BS; Derek Steinbacher, DMD MD

Institution Yale School of Medicine

Presenter Connor J Peck, BS

Purpose

Health care disparities linked to socioeconomics have been demonstrated in numerous medical disciplines. The role socioeconomic factors play in cleft palate repair, however, has not been reported. The purpose of this study was to analyze the impact of race and socioeconomics on patient presentation, hospital costs, and post-operative outcomes following cleft palate repair, with particular sub-analyses of primary repairs, revisions, and primary repairs in older cohorts.

Methods

Cleft palate surgeries were identified in the Kids' Inpatient Database (KID) between 2000-2009 by diagnosis and procedure ICD-9 codes. Analyses were limited to primary cleft palate surgeries, revisions, and primary surgeries in patients >15 months. Data were combed for demographics, perioperatives, complications, and hospital data. The Charleston Comorbidity Index (CCI) was calculated. Bivariate analyses were performed between races in each subgroup. Multivariate analyses were conducted for charge between all significant socioeconomic variables.

Results

3464 White, 1428 Hispanic, 413 Black, 398 Asian or Pacific Islander (PI), and 470 patients of other races were captured. Across all patients and sub-groups, Black and Hispanic patients were most likely to have the lowest income, while Asian/PI had the highest. Similarly, Black patients were most likely to pay with Medicaid, while Asian/PI and White paid with private insurance ($p<0.001$ for all analyses). Overall, Black patients were most likely to have emergent admissions (7.3%; $p=0.005$), while all other races were <2.4%. Primary Hispanic and Black patients were the oldest at surgery, while other and White patients were youngest, approaching significance ($p=0.053$).

Cost analyses revealed Black patients in the primary cohort and Hispanic patients in the older group accumulated the highest charges, while White patients accumulated the lowest ($p=0.032$; $p=0.019$). Overall, Hispanic patients accumulated the highest hospital charges ($19,069 per patient), followed by Black patients ($18,984), while White patients had the least costs ($14,885; $p=0.0194$). Multivariate analyses for charge yielded significance ($p<0.001$); after controlling for elective/non-elective, payer, and income quartile, race ($p<0.001$) and region ($p=0.024$) significantly contributed to monetary charges.

There was no difference in CCI across any groups. Overall, Black patients were most likely to experience unspecified complications and post-op fistula, approaching significance ($p=0.058$; $p=0.078$). Other races experienced the most wound disruption ($p=0.0037$) and Asian/PI patients experienced the most post-op infections ($p=0.003$). Subanalysis of revision surgeries showed that White patients had the fewest complications and Black patients had the most ($p=0.021$). Of these, wound disruption was most common in Black patients and least common in White patients ($p=0.001$).

Conclusions

Our analyses show that race is a contributory factor of cost and outcomes following cleft palate repair. Black and Hispanic patients were older age at the time of primary repair, accumulated increased hospital charges, and experienced higher complication rates. While costs are closely linked to income quartiles and insurance, multivariate analyses pinpointed race and geography as the main contributory factors. These results suggest the need for further action to combat socially derived health disparities, which influence even the youngest patients of our society.

	White	Black	Hispanic	Asian/PI	Other	P value
Age at Primary Repair (days)	858.5	987.1	1041.1	959.2	851.2	.0533
Hospital Charges	$14,885.21	$18984.63	$19069.42	$18505.81	$15591.98	.0194*
Admission Type						.0052*
Emergency	0.024	0.073	0.014	0.008	0.024	
Urgent	0.057	0.086	0.10	0.050	0.050	
Elective	0.918	0.840	0.885	0.942	0.926	
Payer						<.0001*
Medicaid	0.306	0.662	0.620	0.228	0.399	
Private	0.631	0.272	0.232	0.704	0.487	
Self-pay	0.005	0.008	0.011	0.010	0.038	
No charge	0.009	0.007	0.005	0.008	0.009	
Other	0.048	0.051	0.132	0.050	0.068	
Zip Income Quartile (%)						<.0001*
1	0.130	0.423	0.336	0.093	0.219	
2	0.268	0.254	0.270	0.131	0.273	
3	0.290	0.215	0.238	0.241	0.218	
4	0.313	0.108	0.157	0.535	0.291	
Overall Complications+						
Fistula	0.005	0.016	0.009	0.012	0	.078
Wound Disruption	0.004	0.007	0.008	0.008	0.015	0.037*
Non-specific NEC	0.006	0.017	0.003	0.009	0.004	0.058
Other Post-Op Infection	0	0.003	0	0.003	0.002	0.069

*significant
+only significant/approaching significant complications listed (subanalyses not included)

Conformity of the Actual to Planned Result in Orthognathic Surgery

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Presenter Kyle Gabrick, MD

Purpose
Virtual surgical planning (VSP) has improved the pre-operative planning, splint accuracy, and intra-operative efficiency in orthognathic surgery. The translation of the VSP to the actual result has not been adequately examined. Our chief aim was to examine the conformity of VSP to the post-operative result. We hypothesize the greatest conformity exists in the anteroposterior dimensions.

Methods
We examined patients who underwent Le Fort I maxillary advancement, bilateral sagittal split osteotomies, and genioplasty. The pre-operative VSP file and post-operative cone beam CT were registered in Mimics utilizing unchanged landmarks. We quantified the conformity to the VSP utilizing linear and angular measurements between bone surface landmarks. Results were compared utilizing t-tests with $p < 0.05$ considered statistically significant

Results
100 patients who underwent Le Fort I, bilateral sagittal split osteotomies, and genioplasty were included. Three-dimensional analysis showed significant differences between the plan and outcome for the following landmarks: A point (y, p=0.04; z, p=0.04), B point (y, p=0.02; z, p=0.02), Pg (y, p=0.04), Me (x, p=0.02; y, p=0.01; z, p=0.03), and ANS (x, p=0.04; y, p=0.04; z, p=0.01). Angular measurements SNA, SNB, and ANB were not statistically different.

Conclusion
Normal occlusion with restoration of aesthetic facial harmony is the ultimate goal of orthagnathic surgery. Our results demonstrate a high degree of conformity between the VSP and post-operative result, but with some minor vertical (maxillar), and sagittal (mandible, chin) deviations. 3D planning confers splint accuracy, and fidelity in repositioning of bony structures however the conformity to the VSP is not 100% perfect. As opposed plates, the intermediate and final splints offer the surgeon a margin of error to incorporate lip – incisal relationships, maxillary impaction/disimpaction, mandibular pitch alterations, and variations in condylar positioning to achieve the optimal surgical result. Ultimately precise occlusion and restoration of facial harmony rests in the hands of an experienced operator.

Redo Orthognathic Surgery: Single Surgeon Experience over 7 years

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Institution Yale University School of Medicine

Presenter Robin T Wu, BS

Purpose
While orthognathic surgery is considered curative, complications severe enough to warrant reoperation can be as high as 12.2%. Redo orthognathic surgeries, defined as complete re-osteotomy and jaw re-positioning, has received little attention in literature, with indications assumed to be relapse. The purpose of this study was to (1) detail redo surgeries over three time points (pre-past, pre-redo, post-redo surgery) (2) investigates causes/rationale for needing redo, and (3) outline technical challenges.

Methods
This was a retrospective review of redo surgeries operated over the last 7 years by the senior author. Data were combed for demographic, perioperative, and postoperative variables. Redos, defined as re-osteotomy Le Fort or BSSO with/without genioplasty, were compared to their respective past surgeries. Statistical analysis was performed using student T-tests, z-scores, and linear regressions.

Results
Out of 354 orthognathic surgeries performed over 7 years, 15 were redo surgeries. Redo patients were on average 28.1 years of age and most were female (71%) and White (80%). Redo was required most often for newly created deformities (n=9; 60%), largely an outcome of bony malposition (89%) and one case of condylar hyperplasia. All new deformities presented with asymmetry (100%), 78% with malocclusion, and 33% with vertical excess. Relapse, which was less common, (n=6; 40%) was most often sagittal (83%) and asymmetric (33%).

Redos more frequently required all three osteotomies to correct deformities, compared to their respective past surgeries (33% vs 67%; $p=0.034$). Operation time was longer in redo surgeries compared to their past surgeries, approaching significance (326min vs 227min; $p=0.078$). 3D planning/VSP was more commonly used in redo surgeries (87% vs 27%; $p<0.001$) and hardware was removed in a majority (80% vs 27%; $p<0.001$). When compared to respective past surgeries, transverse problems such as asymmetry ($p=0.029$) and condylar change ($p=0.034$), and vertical problems such as gingival show ($p=0.034$) were more common in redo patients. The average follow-up was 607 days. Two patients experienced late infection and one patient had a palpable screw that was removed in the OR. Multiple linear regression for reoperation risk identified 3D planning as the only significant risk factor after controlling for operation type, operation time, and presence of malocclusion ($p=0.034$).

Conclusion
Redo orthognathic surgery is most often required for new/iatrogenic deformities, often due to malposition intra-operatively or shift postoperatively, all resulting in asymmetry. Redo surgeries often help fine tune transverse and vertical movements compared to their past surgeries. A lack of 3D planning before initial surgery is a predictor of reoperation. Scarring, bony alterations, hardware removal, and the need for increased multi-jaw osteotomies lead to greater technical difficulty, operating time, and late infections. Despite these challenges, outcomes and postoperative course are good. This study begins to shed light on the causes, challenges, and outcomes present in redo orthognathic surgery.

Orthognathic Surgery and Rhinoplasty: Should They be Simultaneous or Staged?

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Purpose
Orthognathic surgery can significantly impact the nasolabial envelope, and at times requires an adjunctive rhinoplasty. The purpose of this study is to evaluate nasal morphology in orthognathic patients, focusing on predictive variables, and the need for and timing of definitive rhinoplasty. Based on this data, an algorithm for the implementation of adjunctive rhinoplasty will be proposed.

Materials and Methods
A review of cases over a two-year period was completed. Demographic, diagnostic, operative details, nasal morphology, and use of rhinoplasty were compiled. Three-dimensional images were used to quantify anatomic variables using the Vectra 3D Imaging system (Canfield Scientific, Parsippany, NJ). Two-tailed z-tests were used to compare proportions with an alpha of 0.05.

Results
A total of 227 patients underwent orthognathic surgery during this time period. Of these, 163 fulfilled inclusion criteria for this study. The mean age was 23.3 years. Patients with no rhinoplasty either had no intrinsic nasal deformity or had improved results with orthognathic surgery alone. In total, 41.7% of orthognathic cases received an adjunctive rhinoplasty. Of these, 82.4% were staged and 17.6% were simultaneous. The average time between staged procedures was 208 days. When simultaneous, 16.7% of the orthognathic procedures had significant maxillary movement (advancement >4-5mm, impaction >2mm, alar base excisions); in comparison, 92.9% of staged cases had significant maxillary movement ($p<0.0001$).

Conclusions
Nasal and jaw deformities are intricately interlinked. In this series, we were able to identify patterns of adjunctive rhinoplasty use in the setting of orthognathic surgery. For patients who have no intrinsic or surgery-induced nasal deformity, no rhinoplasty is necessary. A simultaneous rhinoplasty can be successfully performed for symmetric and mild nasal deformity, and for procedures that do not involve significant maxillary movement, as defined above. Common maneuvers that can be performed in a simultaneous rhinoplasty target the tip, septum, and turbinates. The staged rhinoplasty, on the other hand, is ideal for surgery-induced nasal deformity or for orthognathic procedures involving significant maxillary movements. In these cases, a staged procedure allows for the nasal form to stabilize and for better prediction of the final outcome.

Splintless Orthognathic Surgery

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Planning bimaxillary surgery is much more complicated than planning in monomaxillary surgery. Whether using articulated models or virtual planning, a series of steps are necessary and each must be done accurately in order to prevent errors in positioning of the jaws.

The traditional way of performing bimaxillary surgery has always been repositioning the maxilla first, stabilizing it, and then repositioning the mandible. However, rigid internal fixation has allowed a change in this classical sequencing. There are some cases that are more appropriately and accurately performed in a sequence whereby the mandible is first repositioned and stabilized. No matter which sequence one chooses, the first jaw's position was always dictated by the other jaw through the use of an intermediate splint.

Technological advances have now allowed the development of a completely new paradigm in performing surgery. Instead of using the first jaw to help position the second, digital planning and the fabrication of custom drill/cutting guides and plates allows the repositioning of the first jaw without the use of the second jaw.

This is desirable because: The final position of the maxilla is based on a fixed reference point (the maxilla) instead of autorotation of the mandible. The surgeon will not have to bend four plates during surgery which saves time. The guides also guide the osteotomy and any required bony reduction. The guides can ensure the screws are placed in solid maxillary bone while avoiding tooth roots. The vertical position of the maxilla is controlled without having to make measurements during surgery. This presentation will demonstrate this new methodology.

Orthognathic surgery can be facilitated and/or enhanced by various techniques and procedures. This lecture will present several diverse orthognathic surgery topics that can be useful when treating patients.

Creating Maxillary Primate Spaces Prior to Surgery: A simple way to facilitate the best possible occlusion is to have the orthodontist make space between the upper lateral incisors and canines prior to surgery. This allows the attainment of a solid Class I canine relationship without interferences caused by the incisors.

Use Skeletal Wires to Pull Maxillary Segments in Splint after Segmental Surgery: Segmental maxillary surgery requires that a splint of sufficient rigidity be fabricated so that it will not warp when the tooth segments are wired into the splint. However, some times there is force needed to properly seat the teeth into the splint. If wires around the orthododontic brackets are used, the teeth can extrude from the supporting bone. Skeletal wires can prevent this from happening.

Maintenance of the Transverse Maxillary Dimension after Expansion with Segmental Surgery: The least stable surgical procedure is increasing the transverse dimension of the maxilla with segmental surgery. A method to retain the expansion will be presented.

Splitting along Inferior Border in SSRO: The Dal-Pont modification of the SSRO is commonly used in the United States. However, if the inferior border of the mandible and part of the lingual cortex remains attached to the proximal segment, a gap along the inferior border can occur after the mandible is advanced. This can occasionally result in a "notch" that is visible in thin people. The technique can be modified to achieve a split between the buccal and lingual cortices of the inferior border, preventing a gap after mandibular advancement. This will be demonstrated.

Fixation Requirements of the SSRO: Plates, screws, or combinations can successfully stabilize the SSRO. However, not all plates are created equally and functional deformation of the plates with resulting malocclusion can occur. Satisfactory techniques for fixation of the SSRO will be presented.

Treating Transverse Arch Incompatibilities in the Mandible: Most commonly, transverse arch incompatibilities are treated by maxillary expansion. However, for patients who are scheduled for isolated mandibular surgery, arch incompatibilities can just as easily be treated by narrowing the mandible. The technique will be presented.

Midface Advancement and Contour Bone Grafting: The Precursor to Definitive Cleft Lip and Palate Revision

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Presenter Timothy A Turvey, DDS FACS

Contemporary cleft habilitation requires a series of surgical interventions, which should be timed and sequenced methodically. These interventions should be coordinated carefully with orthodontic, speech, and other interdisciplinary considerations. Revision or refinement procedures done prior to addressing the skeletal issues may be well intended, but commonly results in compromise.

The purpose of this abstract is to demonstrate a series of cleft patients who completed comprehensive cleft care including definitive lip and nasal revisions in, what the author considers is, the best sequence.

Lip and palate surgery is usually staged and completed by the first year of life. The bone graft construction of the cleft maxilla is addressed next, between 5 and 8 years, depending on incisor development. If additional surgery for velopharyngeal incompetence is required, it should be done prn but can be combined with the bone graft providing that it is carefully planned and executed. Orthodontic intervention is next, followed by midface advancement and contour bone grafting. Orthodontic care should be completed prior to further lip and nasal surgery.

The contemporary goal of cleft care is to complete treatment without the need for a prosthesis. If prosthetic care is necessary it should be completed prior to final lip and nasal revision.

The definitive lip and nasal surgery must be tailored to the specific needs. Open structure rhinoplasty grafting of cartilage, bone, fat or dermal fat to the nose and/or lip in addition to mucosal, skin flaps or cross lip flaps maybe necessary.

A series of patients will be used to highlight each stage of construction.

Imatinib Use in Patients with Cherubism

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Introduction
Many patients with Cherubism have central giant cell granulomas that are self-limiting, and do not require intervention. On occasion, however, the lesions in children become so large they contribute to functional or psychologic distress. Issues may include obstructive sleep apnea, feeding problems, speech disorders, failure to thrive, or chronic pain. The purpose of this review was to utilize imatinib (Gleevec) to medically manage this condition in patients with severe forms of Cherubism.

Patients and Methods
Three patients were selected based on the extent of their jaw lesions, functional impairment, and parent interest to pursue treatment at this time. They were all offered embolization followed by surgical debulking, or medical management with imatinib (Gleevec). All had pretreatment imaging studies, laboratory studies, and biopsy of their lesions. After 4 months of treatment this information was repeated and the results reviewed.

Results
The medication was well tolerated by all 3 patients. Follow up has been challenging, but imaging studies and laboratory studies were carefully reviewed and will be presented.

Conclusions
Further multiinstitutional studies should be performed using imatinib (Gleevec) for medical management of central giant cell granulomas of the maxilla and mandible associated with Cherubism.

Transantral Approach to the Orbital Floor without Need for an Endoscope is a Practical Technique

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Purpose
To describe multiple techniques of reconstructing the orbital floor using an intraoral transantral approach without the use of an endoscope

Background
Fractures of the orbital floor can be approached in multiple ways, each with its own advantages and disadvantages. Depending on the position of the fracture, a transconjunctival incision may provide limited access and carries the risk of entropion. Transcutaneous incisions risk ectropion or hypertrophic scarring. The transantral approach has previously been described in multiple articles using endoscopic guidance, and those unaccustomed to using endoscopes may feel discouraged from attempting this approach altogether. The transantral approach provides reliable access to repair orbital floor fractures without changes to the eyelid, and it can be performed without endoscopic assistance.

This technique is particularly useful when the fracture is located posteriorly and medially within the orbit, an area that is difficult to visualize from the transorbital approaches. This paper reviews surgical technique for this approach, clinical pearls in shaping and placing reconstructive material, and presents a case where an initial attempt at repair of an orbital floor fracture through a transconjunctival approach was extremely difficult and eventually unsuccessful. When re-attempted through a transantral approach, the repair was quite straightforward and achieved the goals of restoring orbital volume and freeing entrapped periorbital contents.

Case study
JG is a 46 yo man with an isolated fracture of the left orbital floor with herniated orbital contents. His indication for surgery was diplopia on upward gaze and limited range of motion of the affected eye. We opted initially for a transconjunctival approach, and the orbital floor fracture was exposed and reconstructed with an anatomic plate. Post-operatively, the patient had quite obvious limitation of upward gaze on the affected eye. A CT scan was obtained, which showed at the posteromedial most aspect of the orbital floor, there was a small amount of herniated periorbital fat beyond the posterior extent of the plate. He was taken back to the OR one day later and the plate removed from the transconjunctival incision. A transantral approach was taken to approach the orbital floor, and herniated periorbital tissue was easily appreciated on the postero-medial aspect of the floor, reduced back into the orbit using a periosteal elevator and the defect repaired with a transantral reconstruction plate. The plate was fixated to the anterior wall of the maxillary sinus. Forced duction was performed and found definitively to have no restrictions. Intraoperative CT scan was taken, which showed favorable reconstruction of the contour of the orbital floor with reduction of the previously prolapsed periorbital tissues.

Results and Conclusions
This paper reviews clinical pearls for the transantral approach to the orbital floor, including operative technique modifications depending on the position of the fracture, the presence of other midface fractures, the desired reconstructive material, and multiple plating techniques. Importantly, it draws attention to the fact that this procedure can be performed without the use of an endoscope, despite many authors describing its use in the surgical literature.

15-Year Retrospective Evaluation of Helmeted vs Non Helmeted Motorcycle Crashes and Facial Injuries Sustained at Two Level 1 Trauma Centers

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Background

On July 1, 2000, Florida became the 30th state to amend its mandatory helmet law. Much attention has been placed on how amendment of law has affected death rates and head trauma rates. Although head trauma remains the number one reason for motorcycle crash related deaths, the survivors of motorcycle crashes also suffer from multiple other injuries to the head and neck region. These injuries result in an increase in hospital care provided and associated costs. The purpose of this review of trauma data is to study helmeted motorcyclists vs. non helmeted motorcyclists involved in crashes and compare the volume and types of facial and head injuries between the two groups, as well as other variables: hospital length of stay, cost, and final outcomes.

Materials and Methods

A retrospective chart review from January 2000 to December 2015 was obtained from the trauma registries at Broward General Medical Center and Memorial Regional Hospital, both level I trauma centers. The data collected included Glasgow Coma Scale (GCS), types of craniofacial injuries, Injury Severity Score (ISS), mortalities and cost of admission, which were compared between helmeted and non-helmeted motorcyclists involved in crashes.

Results

Between January 1st, 2000 and December 31, 2015 there were 3532 motorcyclists admitted with some type of bodily injury resulting from motorcycle accidents in Broward County. Patients received care at one of the two trauma centers in the area: Broward Health Medical Center (BHMC) and Memorial Regional Hospital (MRH). Out of 3532 patients registered, 1175 patients presented with some type of facial fractures or injuries; the helmeted (H) group contained 613 patients vs 1162 patients in the non-helmeted (NH) group. The results were further analyzed to compare craniofacial injuries, head injuries, GCS status, deaths and cost of admission between the two groups, when available. While there was not a significant difference noted in ISS rate and ICU admission, we found a significantly greater number of facial fractures and cranial fractures as well as an increase total cost of admission for those patients without helmet.

Conclusions

After reviewing the records from both level one trauma centers, a pattern was discovered when we studied various maxillofacial injuries of patients with helmet versus no helmet. Although both groups suffered injuries to the facial and head regions, the helmeted group showed a significant decrease in facial and head injuries compared to the non helmeted group overall. Considering today's cost of health care and its burden on our society, we found a significant increase in total cost of admission and care for patients without helmet. These factors should be taken in consideration by public entities to re-visit the laws and regulations for motorcyclist's helmet use.

Denosumab for the Treatment of Symptomatic Noonan-like Giant Cell Lesion Syndrome

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Presenter Biraj Shah, DDS MD

Central giant cell granuloma (CGCG) is a lesion of the jaw with an unknown etiology. Although CGCG is a benign lesion, it can be aggressive and locally destructive. The incidence of this in the general population is very low and patients are usually less than 30 years of age. Patients with cherubism, Noonan syndrome and neurofibromatosis type 1 (NF-1) have a higher predilection for developing such lesions. The majority of patients with CGCG have 1 lesion in a unilateral jaw; however, patients with cherubism, Noonan-like multiple giant cell syndrome and NF-1 can have multiple lesions of the jaw and can be bilateral. The most common therapy for CGCG is surgical curettage and potentially resection depending on histological and clinical findings. Surgical curettage can lead to undesirable damage to the jaw, teeth, and tooth germs, especially in patients with multiple CGCG where these undesirable outcomes are inevitable. Therefore, alternative therapies such as intralesional corticosteroids or subcutaneous/intranasal administration of calcitonin, interferon alpha or RANKL inhibitors are described in several case reports with variable success.

At the University of Maryland, we present two patients with Noonan syndrome who were found to have CGCG lesions. Considering clinical and radiographic findings, CGCG behavior, along with patient preference, non-surgical treatment was attempted with monthly injections of sub-cutaneous denosumab.

Case 1
An 8 yo boy with Noonan syndrome was initially seen at University of Maryland at the age of 6, when he noted to have multilocular bilateral mandibular radiolucent lesions. These lesions were thought to be Noonan-like multiple giant cell syndrome. He underwent genetic testing to confirm his diagnosis. Due to the size of the lesions and non-aggressive behavior in the presence of painful symptoms, the patient was referred for medical treatment with denosumab.

Case 2
A 19 yo male with known Noonan syndrome was initially seen at University of Maryland at the age of 15, when he was noted to have multilocular bilateral and anterior mandibular lesions. The anterior mandibular lesion was thought to have aggressive features; hence the lesion was enucleated and curettaged in 2014. The lesion recurred and again was enucleated in 2015. The lesion again recurred in 2016, and patient was sent to an endocrinologist for medical treatment with denosumab.

Method
Patient 1
Received 35 mg dose of denosumab subcutaneously every 28 days, started on 3/2017.
He is currently undergoing treatment with denosumab injections monthly with excellent radiographic response.

Patient 2
Received 120 mg dose of denosumab subcutaneously every 28 days, started on 8/2016.
After 1 year of therapy, injections were spaced out to every other month.
He is currently undergoing treatment with denosumab injections every other month

Results
Both patients underwent routine panoramic x-rays throughout denosumab treatment. In these cases, progressive consolidation of radioluscency and osseous regeneration were noted after starting denusomab therapy. X-rays of these cases show drastic radiographic improvement. Although denosumab is FDA approved for treatment of giant cell tumors of the long bones, a larger prospective study is needed to provide more comprehensive information about the long term benefits and possible adverse effects of treating CGCGs of the jaws with denusomab.

Squamous Suture Craniosynostosis – A Case Report and Surgical Strategies including Virtual Surgical Planning

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Purpose
Unilateral, non-syndromic frontosphenoidal with squamousal suture craniosynostosis is a rare form of synostosis, which results in a variable pattern of skull deformities. This paper reviews the spectrum of synostosis, including the involvement of the minor sutures. A case report of frontosphenoidal with squamous suture craniosynostosis is described and the merits of virtual surgical planning discussed.

Methods
Case report outlining a rare combination of craniosynostoses in a non-syndromic patient regarding review of clinical and radiographic exam findings, definitive diagnosis, surgical planning and definitive surgical intervention

Discussion
Patients presenting with unilateral fronto-sphenoidal and squamosal suture craniosynostosis with phenotypic attributes similar to unilateral coronal synostosis. The known clinical features of unilateral coronal synostosis (anterior plagiocephaly) include widening of the skull, ipsilateral frontal flattening with orbital retrusion, contralateral frontal bossing, anterior ear displacement and contralateral deviation of the nasal tip with ipsilateral deviation of the nasal root. GL presented at 6 months at the time of her initial diagnostic CT examination, yet definitive diagnosis of fusion of her left unilateral squamosal and left frontosphenoidal sutures was not readily diagnosed until her repeat CT scan at ~9 months of age. Her intracranial pressures were never elevated, her eye exam did not demonstrate papilledema and she was appropriately meeting all her developmental milestones. Her physical exam revealed a flattened left forehead with an ipsilateral retrusive supraorbital rim. Preoperatively, her case was planned using virtual surgical planning and CAD/CAM techniques. Bilateral fronto-orbital advancement was performed using templates created from her VSP. This aided in both the surgical osteotomies and frontal bone and frontal-orbital bandeau reconstructions.

Conclusion
The diagnosis of frontosphenoidal and squamosal craniosynostosis is difficult to differentiate clinically from unilateral coronal craniosynostosis and requires careful clinical examination and a detailed CT scan. Once the correct diagnosis is made, virtual surgical planning can aid in fabrication of models to help explain the surgery to the patient's family, decrease operative time and help plan a more precise surgical outcome.

Minor Salivary Gland Tumors of the Oral Cavity – Report of 300 Consecutive Cases: Indications for Neck Dissection

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Purpose

The purpose of this study was to establish guidelines for the management of the neck in Minor Salivary Gland Tumors (MSGTs) of the oral cavity by analysis of our case series and review of the literature.

Materials and Methods

This is a retrospective review of a cohort of 300 MSGTs of the oral cavity seen at the University of Maryland Department of OMFS from March 1991- October 2017, combined with a literature review. Although there are several large patient series examining the management of the N+ and N0 neck in major salivary gland malignancy especially the parotid gland the management of the neck is much less defined for MSGTs of the oral cavity.

Results

300 MSGTs were identified 73 benign and 227 malignant (75.7%). There were 188 females (62.7%) and the average age was 52.2 years (range 9-92 years. The commonest benign tumor was pleomorphic adenoma with 59 cases 19.7% of the total series. Three types of malignant tumors comprised 64% of the entire series and 84.6% of all malignant MSGTs. These three malignant tumors were Mucoepidermoid Carcinoma (MECA) 118 cases, Adenoidcystic Carcinoma (ACC) 38 cases and Polymorphous (Low Grade) Adenocarcinoma (PLGA) 36 cases.

In High Grade MECA 55.5% of patients (5/9) developed nodes whereas only 4.5% of patients with low or intermediate grade MECA had regional metastasis. In central low grade MECA of the mandible the figure for neck involvement was 37.5%. 4/38 (10.5%) of ACC developed nodal metastasis and only 1/36 (2.8%) of PLGA. It was found that for all malignant MSGTs with primary sites related to the upper jaw i.e., alveolus, hard and soft palate the cervical metastatic rate was 4.2%. 119/227 cases of malignant MSGTs (52.4%) occurred in the upper jaw.

Conclusion

Patients with MSGT and a clinically N+ neck should have a neck dissection and PORT. In the N0 neck High Grade MECA should have an elective neck dissection END and so should low grade central MECA of the mandible. In ACC tumors in sites related to the lower jaw and tumors with high grade malignant change should have END. In PLGA only papillary and cribriform subtypes should be considered for END. Palatal tumors do not require END unless high grade.

STINGBLADE: Targeting the Surgical Site with STING Agonists to Clear Minimal Residual Disease in Head and Neck Squamous Cell Carcinoma

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Introduction
Recently, we and others have demonstrated that novel agents containing cyclic dinucleotides (CDN), which activate the STimulator of INterferon Genes (STING), are strong inducers of type I interferon (IFN) and tumor necrosis factor-alpha (TNFα) and can cause rapid regression of a range of advanced tumors. We hypothesize that this approach may be used in combination with a biocompatible hydrogel as a strategy to boost immune-mediated tumor rejection of HNSCC following subtotal resection and thus reduce recurrence.

Methods
Immune competent C3H mice were challenged with SCCVII squamous cell carcinoma subcutaneously in the flank and subjected to partial tumor resection after 10 days. 20% of the tumor was left in place and treated with matrigel containing either phosphate-buffered saline (PBS) or CDN before wound closure. Some of these mice were also treated with anti-CD8 depleting antibodies immediately before resection to remove adaptive immune responses. These experiments were then repeated using the TC1 squamous cell carcinoma cell line in C57BL/6 mice, some of which were deleted for the genes for IFNAR1 or STING. Mice were followed for local tumor progression and wound healing was assessed.

Results
CDN-hydrogel prevented tumor progression in 100% of the mice, whereas all of the mice treated with PBS-hydrogel progressed. Control of tumor progression was initiated by Type I IFN, was CD8 dependent, and depended on host, not tumor expression of STING and IFNAR1. Punch biopsies and incisional tensile strength assessed at various time points following surgery demonstrated no difference in wound healing between the CDN and PBL treated groups.

Conclusion
We have demonstrated in two preclinical models of HNSCC that the delivery of CDN-impregnated hydrogels to a partial resection results in complete cure. This therapy requires direct administration to the tumor and may be a useful adjunct to surgery, either alone or combined with other immunotherapies for the treatment of HNSCC.

Survival Outcomes of Mucosal Melanoma in the Head and Neck

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Purpose
Malignant mucosal melanoma of the head and neck (MMHN) is an aggressive and rare neoplasm with poor long-term outcomes. The aim of this study is to evaluate the outcomes of patients treated by a single-institution head and neck multidisciplinary team.

Materials and Methods
In this retrospective case series, all MMHN cases treated at the Royal Melbourne Hospital from 1990-2017 were retrospectively reviewed. Patient demographic characteristics (eg, age), treatment offered, pathology, and outcomes were collected, tabulated, and correlated with outcomes. Survival outcomes were calculated by the Kaplan-Meier method. Comparison was made between oral and sinonasal melanomas.

Results
A total of 16 cases were identified. Two were excluded because of inaccessible data. Of the 14 remaining cases, 8 were sinonasal melanomas and 6 were oral cavity melanomas. Sinonasal tumor patients presented with epistaxis or visual impairment. Oral melanoma patients presented with pigmented lesions or ulceration. Follow-up ranged from 4 months to 11 years. In 2 patients, locoregional recurrences developed that were successfully re-excised. Six patients died of distant metastases despite clear surgical margins. Two patients with sinonasal melanomas died of extensive local disease with intracranial invasion. One patient died 4 years after diagnosis without disease. There were no failures in the neck. The 2- and 5-year overall survival rates were 63.3% and 31.7%, respectively, by the Kaplan-Meier method. The difference in survival between oral and sinonasal melanomas was not statistically significant.

Conclusions
Despite clear surgical margins, MMHN has a poor prognosis and most deaths are due to distant metastases. Systemic therapies such as those used in cutaneous melanoma treatment might be used in the future for MMHN.

The Prevalence of Nevoid Basal Cell Carcinoma in Children with Odontogenic Keratocysts

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Purpose

Odontogenic keratocysts (OKC) can occur in isolation or as part of the nevoid basal cell carcinoma syndrome (NBCCS). The specific aims of this study were to determine 1) the prevalence of NBCCS in children with OKC and 2) differences in demographic and presenting features between children with NBCCS and those with non-syndromic OKC.

Methods

This is a retrospective case series of children with OKC. Medical records were reviewed for age at presentation, sex, number and location of OKC, recurrence, personal and family history of NBCCS, and clinical features consistent with NBCCS. Descriptive data were summarized.

Results

The sample included 46 patients (21 females and 25 males) diagnosed with an OKC at a mean age of 11.5 $\pm$ 4.3 years (range 2-19 years); 37% (n=17) with NBCCS and 63% (n=29) with non-syndromic OKC. Patients with NBCCS were significantly younger at presentation (NBCCS 9.3 $\pm$ 4.2 years [range 4-14 years]; non-syndromic 12.8 $\pm$ 4.4 years [range 2-19 years]) and had more cysts at the time of diagnosis (NBCCS 1.7; non-syndromic 1.0) ($p<0.05$). The OKC in patients with NBCCS occurred more frequently in the maxilla (NBCCS 12; non-syndromic 10) and had a higher recurrence rate (NBCCS 1.1; non-syndromic 0.1) ($p<0.05$). Eight of the 17 patients (47%) with NBCCS had a family history at the time of presentation and in the remaining 9 patients (53%) the diagnosis of NBCCS was made after OKC was confirmed by pathology along with genetic testing and/or documentation of diagnostic criteria (palmer pits n=5; macrocephaly n=5; basal cell lesions n=5; frontal bossing n=3; meduloblastoma n=3).

Conclusions

Given the prevalence of NBCCS in children with OKC clinicians should have a low threshold for referral for genetic testing in children diagnosed with an OKC.

Planning Resection Margins using CAD-CAM in Head and Neck Pathology: A 10 year Retrospective Analysis

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Introduction

The surgical treatment of head and neck pathology often creates large volume defects which benefit from reconstruction using vascularized grafts. The fibula free flap remains the workhorse reconstructive option for bony defects of the jaws, with other options including the scapula and iliac crest. Frequently a two team approach can be used, allowing for simultaneous harvesting of the flap while the primary site is undergoing ablation. Computer-aided design and manufacturing (CAD-CAM) has been employed to provide custom or pre-bent reconstruction plates, cutting guides with predictive holes in both the resection and donor sites, and to better position the reconstruction for dental rehabilitation with endosseous implants. One often cited concern with the use of CAD-CAM in these cases is the pre-determination of the resection margins. Specifically, the concern is that depending on the time between imaging/planning and surgery, the width of the planned resection margins may be inadequate based on the aggressiveness of the disease. This study presents a 10-year case series of oral/head and neck cancer, locally aggressive benign jaw tumors, and osteonecrosis of the jaws with resection margins planned virtually.

Methods

This is a retrospective analysis of all the cases of oral/head and neck cancer, aggressive benign tumors, and osteonecrosis of the jaws (radiation or medication related) that have had surgical resection margins planned using CAD-CAM between November 2008 and the present. A list was obtained from 3D Systems (Littleton, CO, USA) of all the cases treated through Head and Neck Surgical Associates in Portland, OR using CAD-CAM. 511 cases were identified in total, of which 271 were excluded as being orthognathic cases. The remaining 240 cases were identified as reconstruction cases. Operative reports were reviewed and cases included in the final analysis if the primary diagnosis was a malignant tumor, aggressive benign tumor, or osteonecrosis of the jaws. The primary outcome evaluated was either deviation from the virtually planned margin, reoperation within 3 months for positive or close oncologic margins, or further die-back of bone beyond initial resection margins in the case of osteonecrosis.

Results and Discussion

Preliminary analysis suggests the practice of planning resection margins using CAD-CAM is safe, rarely leading to incomplete surgical treatment. Other variables analyzed include time between planning scan and surgery, primary diagnosis, OR time, ischemia time, and reconstructive failure. Due to the multitude of advantages in using CAD-CAM during complex reconstruction cases, including decreased ischemia and OR time, decreased operator frustration in shaping reconstruction plates and manipulating multi-segment bone flaps, and improved predictability of dental rehabilitation, CAD-CAM has become common in the planning of resection margins for oncologic disease and osteonecrosis of the jaws. This 10-year analysis illustrates our low rates of reoperation or deviation from virtually planned margins, thereby supporting the continued trend toward adopting CAD-CAM technology into the reconstruction of head and neck pathologic defects.

Correlation Between Tumor Characteristics and Margin Status in OSCC

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Introduction

Positive margins on final oral squamous cell carcinoma (OSCC) tumor microscopy complicates treatment planning, requires performing more surgery, adjuvant radiotherapy and chemotherapy, and carries worse overall prognosis and decreased survival (3,4). Risks of obtaining positive margins have been associated with higher T stage (1,3) and N stage (2). In this study we look at possible relationships between margin status and tumor characteristics to help further predict risk of obtaining positive margin.

Methods

53 adult patient records were included in analysis. All were diagnosed with OSCC and underwent tumor resection with appropriate neck dissection by one of the two surgeons at three hospitals. The tumors were processed by the respective pathology service. Margin status of each specimen was noted (negative, close, positive – based on AJCC guidelines of ≤2.0mm positive, 2.1-5.0mm close, ≥5.1mm negative). This was set as independent variable. Other corresponding tumor characteristics were recorded: stage, greatest dimension, lymphovascular invasion, perineural invasion, extracapsular extension. All of these were set as dependent variables. ANOVA and Fisher's exact test were performed for association relationship between the independent variable and each of the dependent variables.

Results

There was a statistically significant correlation between stage T and margin status: of the twenty-four stage T1 tumors, 2 had positive margins and 15 had negative margins; of the seven stage T2 tumors, 0 had positive margins and 5 had negative margins; of the three stage T3 tumors, there were 2 positive and no negative margins; of the nineteen T4 tumors, 11 had positive margins and 4 had negative margins ($p=0.0009$). There was a statistically significant correlation between tumor largest dimension and margin status: mean greatest dimension of tumors with negative margin was 2.20cm (St Dev 1.48cm), with positive margin – 4.76cm (St Dev 2.57cm), with close margin – 2.85cm (St Dev 1.80cm) ($p=0.0008$). Stage N and margin status also demonstrated statistically significant relationship: approximately one quarter of N0 tumors were associated with positive margins and approximately one third of N2 tumors were associated with positive margins ($p=0.0112$). Stage I-IV and margin status also showed significant correlation: of the 22 stage I tumors there were 2 with positive margin and of the 26 stage IVA tumors, there were 11 with positive margins ($p=0.049$). There was not a significant relationship between: 1) margin status and perineural invasion status, 2) margin status and lymphovascular invasion status, 3) margin status and extracapsular extension.

Conclusions

Relationship between stage I-IV and margin status shows that the higher the stage, the higher the chance of the margins to be positive in final specimen. Stage T and margin status relationship shows the same tendency. This is further demonstrated with the tumor size and margin status correlation – the specimens with positive margins tend to be larger in greatest dimension than the specimens with negative margins. It may be concluded further, after additional analysis, that specimens sized 4.76cm and above carry the highest risk of returning positive margin on resection. Our study also finds that tumors associated with higher stage N are more likely to have positive margins on final specimen.

Discussion

Correlation between OSCC T stage, N stage and margin status has been confirmed elsewhere (1,2,3). The multiple variables analyzed in this study against the independent variable of margin status help support our conclusions. By definition, as the tumor size is increased in greatest dimension, the stage T is increased, and overall tumor stage is higher. These three tumor characteristics directly correlate with margin status. The reason for these results may be that larger tumors are technically more difficult to access with adequate clear margins without sacrificing critical structures. This may also mean that larger carcinomas tend to have wider malignant transformation front microscopically at the periphery than smaller tumors. If that is the case, the surgeon may consider securing a larger cuff of normal tissue than recommended 2cm by NCCN Guidelines, when faced with larger carcinomas.

The independent direct relationship between stage N and margin status may suggest more aggressive biochemical tumor behavior, whereby the carcinoma has more aggressive microscopic invasion locally and simultaneously is enabled to metastasize to regional lymph nodes.

One major limitation of our study is focus on lower and higher stage OSCC tumors. Our study sample is bimodal, with 22 stage I tumors and 26 stage IVA tumors, with only 3 stage III, one stage II, and one stage IVB tumor. This fact prevents us from broadly generalizing about the behavior of the OSCC, yet it allows us to draw parallels with clinical reality of community-based OMS Head and Neck service, where a common presentation is an asymptomatic patient diagnosed at the early stage following a routine screening, or a much later presentation in disease process with significant symptoms. Validity of our results is also confirmed with the rates of positive margins for T1 (8%) that were observed in other studies, except for higher rates of positive margins in T4 (58%) (2).

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Depth of Invasion – Is Frozen Section Accurate?

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Purpose

Depth of invasion (DOI) is an important prognostic factor in T1N0 squamous cell carcinoma of the oral cavity and is used to determine the need for a neck dissection. The purpose of this study was to investigate the accuracy of DOI on intraoperative frozen specimen as compared to permanent specimen.

Materials and Methods

A prospective blinded clinical trial was completed from 2017 to 2018 comparing the accuracy of DOI on frozen versus permanent specimen evaluated by two head and neck pathologists.

Results

Thirty patients with T1N0 oral squamous cell carcinoma who underwent excision with or without neck dissection were included. The two head and neck pathologists demonstrated consistent results on frozen section with an average discrepancy 0.3 mm. There was no discrepancy in 16 cases, 0.5 mm in 10 cases, 1.0 mm in 3 cases and 1.5 mm in 1 case. The head and neck pathologists also demonstrated consistent results on permanent section with an average discrepancy of 0.5 mm. There was no discrepancy in 12 cases, 0.5 mm in 12 cases, 1 mm in 4 cases and 1.5 mm in 1 case and 2 mm in 1 case. Differences between frozen and permanent specimens for Pathologist #1 averaged 0.3 mm. There was no discrepancy in 22 cases, 0.5 mm in 5 cases, 1.0 in 1 case, 2.0 mm in 1 case and 2.5 mm in 1 case. Differences between frozen and permanent specimens for Pathologist #2 averaged 0.2 mm with no discrepancy in 25 cases, 0.5 mm in 2 cases, 1.0 mm in 1 case and 2.5 mm in 1 case.

Considering the standard DOI cutoffs for performing a neck dissection as reported previously by our group, frozen section was accurate 100% of the time in predicting the need for a neck dissection. No discrepancy between frozen versus permanent section changed the surgeon's decision to perform a neck dissection. No patient required reoperation due to a difference in frozen versus permanent section nor were any patients over-treated based on down-grading of DOI on final pathology.

Conclusions

In a prospective clinical protocol, DOI on frozen section guided the decision to perform a neck dissection with 100% accuracy. DOI on frozen section should be considered a reasonable instrument for intraoperative decision-making regarding indications for neck dissection.

The ANOS Head and Neck Staging System and Its Application in Patients with Vascular Anomalies

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Purpose

Current classification and staging systems in the head and neck focus on specific anatomic areas or conditions and do not readily apply to patients with head and neck vascular anomalies. The inability to communicate clinical findings and relevant severity has resulted in poor and inconsistent descriptive language amongst clinicians that has hindered management and research. The ANOS system captures severity of the anatomic or functional units involved (A for Airway, N for Neurologic, O for Orthopedic, S for Soft tissue) and a quantifiable system for documentation that enables clear communication for both patient management and research. Using the structured ANOS system data can be easily utilized in both patient care by developing management algorithms (i.e if A2 or greater, then ORL consult, etc) and in research where disease progression can be quantified and applied to measure outcomes of various interventions.

Materials and Methods

Pubmed database search was conducted to perform a systematic review of all the head and neck classifications systems that exist in the literature. Next a comprehensive framework was created for scoring and subsequent staging for lesions in the head and neck area in patients with vascular anomalies. The system was then applied retrospectively to current vascular anomalies database and tested for accuracy and consistency. The scoring and staging system encompasses all critical elements or anatomic features that would both impact clinical management of patient, as well as outcome measurements and disease progression over time. These elements included: A-Airway, N-Neurological, O-Orthopedic, S-Skin and soft tissue and +PLUS designating active disease such as bleeding, ulceration, or rapid expansion. Components within these key anatomic elements were derived from historical institutional and clinical experience.

Results

ANOS Grading and classification system for management of Head and Neck Vascular Anomalies demonstrates over 98% accuracy and enables clear cross disciplinary communication regarding severity of disease and progression. In addition, the ANOS system enables the accurate application of multidisciplinary patient care algorithms and protocols.

Conclusion

ANOS is a robust, easy to use, comprehensive scoring and staging system for head and neck lesions that can be applied successfully for patients with vascular anomalies. The ANOS system enables clear multidisciplinary communication, a framework in which clinical pathways can be applied, and a consistent reproducible process for capturing disease progression and outcomes from intervention.

Shining Sunlight on Industry Payments: The Sunshine Act

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Purpose

The purpose of this study was to describe the current state and types of industry payments to oral and maxillofacial surgeons (OMSs) and to determine the accuracy of the Centers for Medicare & Medicaid Services (CMS) Open Payments Databases.

Methods

This was a cross-sectional study of the Open Payments ***General*** and ***Research*** Payments Database publicly provided by CMS from January 1st, 2016 to December 31st, 2016 for all providers categorized as an 'oral and maxillofacial surgeon'. The ***General*** payments database includes charitable contributions, consulting fees, honoraria for speaking or other services, gifts, entertainment, food and beverage, travel, education, and others. The ***Research*** payments database includes payments associated with research. Outcome variables include number of OMSs who receive payments, type of and number of payments, total amount paid, and proportion of funding allotted to research. To assess the impact of industry support on research productivity, the h-index of research payment recipients was calculated.

The accuracy of payee categorization was determined by verifying a random selection of 5% of those categorized as 'OMS' in the database to publicly available data (websites, society databases, and addresses)

Results

The study revealed 6720 oral and maxillofacial surgeons who received some form of compensation from industry in 2016. The accuracy was 88% (297/336 confirmed to be an OMS) in the ***General*** Payments database. In the ***Research*** payments database, eight were listed as OMS – upon verification only four were confirmed to be OMSs (2 orofacial pain, 1 maxillofacial prosthodontist, 1 general dentist).

Total ***General*** payments for 2016 was $5,971,800.79. ***Research*** payments to OMSs totalled $23,592.17. The average number of payments per OMS was 1.01 payment, with an average payment amount of $1597.60. A total of 28460 payments (general and research payments) were made to OMSs in 2016.

Of payments made, food and beverage was most prevalent with 80.2%, followed by travel and lodging (5.83%), education (3.91%), compensation for services other than consulting (3.1%) gifts (3.03%), entertainment (1.64%), consulting fee (0.77%), honoraria (0.49%), royalty or license (0.33%), compensation for accredited CE (0.31%), compensation for non-accredited noncertified CE (0.16%), grant (0.15%), research (0.07%), and charitable contributions (0.01%).

There were a total of 21 research payments to 8 providers listed by CMS as OMS for a total of $23,592.17 representing 0.39% of value transferred, and 0.07% frequency of transfers made. The 4 verified OMSs received a total of $18,500. The average h-index of OMSs (n=4) who received research payments was 3.25 (range 0 to 8). The research payments were to study temporomandibular joint prostheses post-market surveillance (Zimmer Biomet, Warsaw, IN)(n=2 OMS, total = 3 payments) and bone-level tapered implants (Straumann Group, Basel, Switzerland) (n=2 OMS, total 4 payments).

Conclusion

Research funding from industry accounted for only 0.07% of total number of payments and 0.39% of value transferred in 2016 to OMS. The most frequent type of payments made by industry to OMS were for food and beverage followed by travel and lodging. Although the general payments database was generally accurate, half of the those listed as an OMS in the research payment database were mislabeled.

The Effect of OMS Curriculum Design on USMLE Step 1 Performance

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Purpose

Developing the knowledge to pass United States Medical Licensing Examination (USMLE) Step 1 is an important step for medical schools that integrate Oral and Maxillofacial Surgery (OMS) residents into an MD curriculum. Over the last decades, different curriculum approaches to MD/ OMS integration have evolved at different medical schools.

In 2013, the American Medical Association launched the ***Accelerating Change in Medical Education Consortium,*** which was tasked with modernizing medical school education. These changes eliminated many of the traditional pauses in the medical school curriculum where OMS residents were integrated into a medical school class. This has forced some OMS programs to redesign their entire OMS curriculum in response. In addition, OMS faces increasing anesthesia requirements as well as increased general surgery requirements to satisfy MD licensure.

The purpose of this study was to answer the question, "Does OMS/ MD curriculum design, specifically the entry point into the MD curriculum relative to the USMLE Step 1 exam, and the presence or absence of formal pre-clinical instruction affect USMLE Step 1 pass rates amongst OMS residents?"

Materials and Methods

The authors distributed an anonymous electronic survey focusing on the relationship between OMS curriculum design and performance on USMLE Step 1 over the past 10 years, from 2007 - 2017. The survey was emailed to all forty-six US based MD integrated OMS program directors.

Results

32 of 46 OMS/MD program directors (70%) responded. Of the responding programs, 25% have made a significant curriculum change in the past 10 years. Three programs (9%) complete the entire pre-clinical medical school curriculum before taking USMLE Step 1. Thirteen programs (41%) complete OMS rotations and some formal pre-clinical medical school prior to taking USMLE Step 1. Ten programs (31%) complete some time on OMS service prior to taking USMLE Step 1, but no formal medical school. Six programs (19%) complete USMLE Step 1 as the first step in their OMS curriculum. Data was gathered on 806 enrolled residents from 2007 – 2017. During these years the overall USMLE pass rate was 93%, which is comparable to the national pass rate amongst all US sponsored examinees, 94%. The pass rates amongst residents who completed formal pre-clinical medical school was 91%, preclinical medical school and OMS rotations was 95%, OMS rotations only was 89%, and as a first step was 94% ($p = 0.057$) Amongst all 806 residents, 6 had to leave the program due to inability to pass USMLE Step 1.

Conclusion

There does not appear to be a correlation between OMS curriculum design and USMLE Step 1 pass rate, which ranged between 89-94% across the different common types of OMS/ MD integrated curricula.

Quantity and Quality of TMJ Disorder Education in OMS Programs

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Purpose
Within the scope of OMS, management of TMD is unique to OMS. As such, the importance of TMJ education at the resident level, and reasons for the paucity of OMS surgeons offering TMJ services, has been evaluated in the literature. However, the current state of TMJ education has yet to be elucidated. The purpose of this study is to (1) define the current state of TMJ education in OMS programs, and (2) determine requirements to advance TMJ education and increase access to care by OMS providers.

Methods
An 18-item survey was emailed to 103 program directors of all CODA-accredited OMS residency programs. Two reminder emails were sent at eight-day intervals. Only completed responses returned within 3 weeks of the initial request were accepted for analysis.

Results
Completed responses were received from 34 OMS programs representing a return rate of 33.0%. A significant relationship was found between AAOMS district and type of education offered. 60% of respondents reported having designated TMJ faculty at their program. Diagnosis and management of TMJ disorders was taught via traditional didactic methods in all programs, with some programs also educating in outpatient clinics, cadaver labs, or workshops. The initial evaluation of non-surgical TMJ patients was performed by junior residents 52% of the time, and treatment recommendations offered included adjunctive and definitive referrals to oro-facial pain specialists. Surgical workup and execution of TMJ procedures was performed by senior OMS residents 83-88% of the time. TMJ procedures performed by respondents approximated the prevalence with which those procedures were offered with arthrocentesis being the most prevalent (15.68-16.09%) and disk replacement being the least prevalent (prevalence: 5.42-5.84%). When interpositional grafting occurred, it most commonly involved a fat graft (prevalence: 41.07%) but also included costochondral, temporalis flap, alloderm, auricular cartilage, and silastic sheets grafts. Most respondents use only custom TMJ prostheses for total TMJ reconstruction (prevalence: 55.81%) in their programs.

Conclusions
The majority of respondents reported having a designated TMJ practice. Most education on TMD is accomplished via didactic lectures with some programs introducing additional clinical and workshop experiences. Evaluation of nonsurgical TMJ patients is primarily done by junior residents with some programs definitively referring such patients to oro-facial pain clinics. Both workup and execution of surgical TMJ cases is overwhelmingly performed by senior-level residents. The current status of education in the diagnosis and management of both non-surgical and surgical TMJ cases in OMS programs may benefit from further discussion. The data identifies a wide range and diversity in the type of didactic and surgical educational experiences provided by OMS programs, and may provide a resource for OMS program directors to augment their TMJ curriculum.

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Pediatric Emergency Medicine Physician Comfort with Management of Oral and Maxillofacial Concerns

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Introduction

Pediatric Emergency Medicine (PEM) sub-specialists are required by the American Board of Pediatrics (ABP) to have specific knowledge and skills for diagnosis and management of oral and maxillofacial (OMS) concerns. The ABP offers guidelines for PEM maintenance of certification (MOC) examinations (e.g. oral anatomy, imaging, anesthesia techniques, dentoalveolar trauma, maxillofacial trauma, and facial infection). Few studies have assessed comfort levels with these requirements.

Purpose

To assess PEM attending physician and fellowship trainee comfort in managing pediatric OMS emergencies, focusing on content outlined by the ABP for MOC examinations. This would illustrate opportunities for additional education for PEM attendings and fellows in area of OMS.

Materials and Methods

A 20-question survey was sent electronically to all PEM attendings and fellows at Children's Healthcare of Atlanta where Emory University School of Medicine's PEM fellowship program is based. Participants were asked to assess their comfort level in diagnosis and management of common OMS injuries (scale of 1-3; not comfortable to extremely comfortable). Attendings were also asked to evaluate the skill set of fellows. Participants listed specific topics or procedures which they felt warrant additional education or training. Descriptive statistics were computed.

Results

Surveys were completed by 40 PEM attendings (40/45, 88%) and all 9 fellows from June to December 2016. There were 38 females and 11 males with average age 38.6 years old (range 31-60) and 1-5 years of experience (range <1->20). Majority consult OMS once a week (range 0-4).

Majority of attendings (32/40, 80%) and fellows (7/9, 85%) were 'somewhat comfortable' discussing oral anatomy with OMS consultants. Most attendings (35/40, 88%) and fellows (7/9, 85%) were 'somewhat comfortable' selecting the appropriate imaging. Majority of attendings and fellows felt that they do not have appropriate skill set to manage dental trauma (32/40, 80%; 7/9, 78%) or maxillofacial trauma (30/40, 75%; 6/9, 67%). Approximately half of attendings (22/40, 55%) and a third of fellows (3/9, 33%) felt comfortable managing facial infections.

Open ended responses showed attendings and fellows would like additional training, especially with local anesthesia techniques, dental splints, and draining facial abscesses.

Conclusions

Not all PEM attendings and fellows are comfortable managing most common OMS concerns and felt additional training and instruction were warranted. Attendings and fellows in PEM may be consulting OMS for concerns that could potentially be managed independently. In our resource-limited healthcare environment, this presents an opportunity for initial and ongoing education for PEM physicians to manage OMS concerns.

Impact of an Opioid Prescribing Protocol on Prescribing Behavior at University of Minnesota School of Dentistry

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Presenter Harold Kai Tu, DMD MD FACS

The paper is a study that evaluates the use of opioid analgesics at the University of Minnesota School of Dentistry prior to and following implementation of an opioid prescribing protocol for acute post-surgical pain. The misuse of prescription pain relievers is the second most common form of drug abuse behind marijuana. Dentists are among the leading opioid prescribers and are responsible for the majority of prescriptions to minors.

To improve postoperative pain management and limit the misuse of opioid medication, the University of Minnesota School of Dentistry, Division of Oral and Maxillofacial Surgery introduced an opioid prescription protocol in February 2016. The protocol was based on evidence that acute postoperative pain can be effectively managed utilizing NSAIDS as the first pain management drug of choice.

Retrospective analysis compares the number of total opioid prescriptions and the number of tablets per prescription in the previous 10 quarters prescribed by the University of Minnesota School of Dentistry. Prescription data was collected from institutional electronic health record software. The results show an overall 47.1% decrease in the total number of opioid prescriptions in the 5 quarters after the initial Opioid Prescribing Protocol was approved by the Clinical Affairs Committee in February 2016. The results support the hypothesis that an opioid prescribing protocol would be successful in decreasing the total number of opioid prescriptions written and number of tablets dispensed per prescription.

A High-Fidelity Simulation Intervention to Improve Operating Room Safety for Oral Maxillofacial Surgery Teams

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Institution Co-management of Operating Room Emergencies (CORE) Research Group [1]
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Purpose

When rare but potentially devastating emergencies arise in the operating room, swift, effective action by the oral maxillofacial surgery (OMS) team backed by a robust patient safety program is critical. Studies show that OMS patients are vulnerable to risk in the inherently hazardous surgical environment, and that a growing number of interventions including team training can minimize medical error and adverse events (Moe JS, Abramowicz S, Roser SM. Oral Maxillofacial Surg Clin N Am. 29;2017:229-238). In the present quality improvement project, we pilot tested the feasibility and usefulness of adapting a monthly, 4-hour high fidelity simulation program in co-management of operating room emergencies (CORE) for interprofessional OMS teams.

Materials and Methods

A 7-member interprofessional OMS operating room team consisting of 2 OMS surgeons, 1 anesthesiologist, 1 anesthetist, 2 nurses, and 1 scrub technician participated in a half-day session including 3 immersive scenarios in a mock operating room and post anesthesia care unit simulating 3 crises: pulseless electrical activity following multiple extractions, power failure in the operating room during surgically assisted rapid palatal expansion, and malignant hyperthermia in a patient undergoing mandibular debridement and sequestrectomy. A confederate in the role of nursing supervisor communicated with other faculty via two-way radio transceiver. Materials and equipment in the mock operating room included a high-fidelity, interactive mannequin with display monitor operated by faculty in a control room with one-way glass. Scenarios were video-recorded for playback to augment debriefings; reflective debriefings were facilitated by a trained, 6-member interprofessional faculty team and a simulation operational specialist.

Results

During facilitated debriefings, participants identified actionable opportunities for improvements at individual, team, and system levels, e.g., test of an innovative text-message-based daily huddle, edits to the surgical checklist and time-out, and greater use of cognitive aids and crew resource management techniques. System-level issues were communicated and addressed bi-directionally with operating room quality and policy committees in closed loop fashion. Challenges include prospective investment in quality and patient safety; faculty development; and scheduled, concurrent release time for operating room teams. Participants reported high levels of engagement, e.g., “I wish we could do this every week.” Collectively, past CORE participants report experiencing greater effectiveness, confidence, and efficiency in performance than they would have demonstrated prior to simulation when subsequently faced with emergencies in the actual clinical environment.

Conclusions

Immersive simulation for OMS interprofessional teams is feasible and can provide a unique and useful complement to traditional quality and patient safety programs. The intervention may drive performance improvement in the operating room at individual, team, and system levels.

1. Mashman D, Patel S, Pettorini K, Sharma J, Sumler M.

Resection and Immediate Reconstruction of Mandibular Continuity Defects without a Microvascular Flap

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Reconstruction of the mandible following resection of pathologic lesions can be a challenging procedure. The anatomy of the mandible is complex, as it is a moveable bone, with two articulations to the cranium. In addition, the associated attached musculature and temporomandibular joint structures apply different force vectors. This makes controlling the segments in continuity defects a primary concern. Thus, restoration of the anatomy is critical. The main goals of reconstruction of the mandible are restoration of form and function, while regaining continuity.

When reconstructing continuity defects of the mandible after resection of benign and aggressive lesions, autogenous bone has long been considered the gold standard. Modern treatment options such as vascularized flaps, either microvascular or pedicled, are often chosen for large defects. These function well for oncologic resections or for defects over 10 cm, and can often be performed primarily, at the time of resection. A paucity of soft tissue is another indication for vascularized tissue transfer. Historically, smaller defects, including defects that result from benign lesions or trauma defects are reconstructed secondarily with free nonvascularized hard tissue once the intraoral wound has healed.

With the advent of BMP, transoral bony reconstruction now seems possible. The purpose of this abstract is to present an alternative approach to reconstruction using immediate intraoral resection and either autogenous free bone graft with BMP or bone marrow aspirate concentration and allogeneic bone supplemented with BMP. As long as all three criteria from the bone regeneration triangle are present (matrix, cells, signal) reconstruction can follow a relatively predictive course.

At the University of Texas Health Science Center at San Antonio, we have transorally resected and reconstructed 5 patients following primary resection for benign, aggressive lesions using this technique.

Advantages of this method include one stage approach and a better bone volume than a microvascular flap with less morbidity. The main purpose of this presentation is generate discussion among the group regarding intraoral reconstruction and resection.

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Management of Pathologic Fractures of the Irradiated Mandible without Microvascular Surgery

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Purpose
Management of fractures in the irradiated mandible can be challenging. Resection of non-viable bone, and replacement by non-irradiated autogenous bone using a free flap is a useful option for many patients. Some patients refuse such a lengthy surgical procedure. Other patients, due to advanced age or intercurrent medical problems, are poor candidates for a microvascular free flap. We have developed an algorithm for managing these patients without microvascular surgery, and present a case series.

Methods
Four patients were treated for pathologic fractures of the mandible between 2017 and 2018. The dose to bone in the affected area ranged from 6,000 to 7,000cGy. One patient was offered and refused a microvascular free flap. One had already been reconstructed with a free flap. Two were not considered for free flap reconstruction as the continuity defects were very small.

Treatment was staged, and included only very short surgical procedures.

1. Removal of non-viable bone and control of any associated infection.
2. Stabilization of fracture segments, often with an external fixator and pins placed in minimally irradiated bone.
3. Development of intact skin coverage and mucosal lining at the fracture site.
4. Plate reconstruction, with minimal dissection of irradiated tissues, and screw placement in minimally irradiated bone.

Results
All four patients treated using this algorithm have achieved excellent functional and esthetic results after 1 to 9 months. The outcomes taken into consideration for treatment success include: primary oral and cutaneous closure, elimination of infection, functional occlusion, acceptable esthetics, and mandibular continuity (via a rigid titanium plate).

Conclusions
Pathologic fractures of the irradiated mandible can be successfully managed using a staged approach, obviating the need for microvascular surgery.

Association Between Mandibular Fractures and Cervical Spine Injuries

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Purpose

The aims of this study are to determine: 1) the incidence of cervical spine injury (CSI) in patients evaluated and treated for mandibular fractures at Massachusetts General Hospital (MGH), 2) the sites of mandibular fractures most frequently associated with CSI, 3) the incidence of CSI in patients with mandibular plus mid-face fractures and 4) the most common mechanisms of injury in patients with concomitant mandibular fractures and CSI.

Materials and Methods

This is a retrospective cohort study including all patients, 18 years of age and older, evaluated and treated at Massachusetts General Hospital (MGH), from May 1, 2007 through June 30 2017, with mandibular fractures and/or cervical spine fracture or ligamentous injury. International Classification of Diseases, 9th & 10th Revision (ICD-9, ICD-10) codes were used to identify study subjects from MGH records. Patients were excluded if they were younger than 18 years or if the registry codes were not supported by clinical or radiographic data. Predictor variables were presence and type of CMF fracture. Outcome variables were presence of CSI and mortality.

Results

During the study period, 23,394 patients were listed in the MGH trauma registry by discharge diagnosis: 4435 (19%) had craniomaxillofacial fractures (CMF) and 1822 (7.8%) had CSI. Of patients with CMF, 1156 (26%) had mandibular fractures; 491(42%) were inpatients and 665 (58%) were managed as outpatients. Among all subjects with mandibular fractures, 4% (n=48) had concomitant CSI and all were inpatients. The sites most likely associated with CSI, in univariate analysis, were body and ramus. Of 311 subjects with body fractures, 19 (6.1%) had CSI and of 157 subjects with ramus fracture 14 (8.9%) had CSI (OR 1.9, 95% CI 1.1-3.5, p=0.03 and OR 2.8, 95% CI 1.5-5.3, p=0.0013, respectively). Among the 453 patients with para-symphysis fractures, 10 (2.2%) had CSI (OR 0.4, CI 0.2-0.8, p=0.014). Hospital admission was significantly associated with CSI (p<0.0001) and a mandibular fracture combined with any mid-face fracture significantly increased the risk of CSI in univariate analysis. (OR 16, 95% CI 8.7-30, p<0.0001). In the multivariate model, Lefort fracture combined with mandibular fracture and mandibular body and ramus sites were all independent risk factors for CSI (OR 3.8, CI 1.3-11.5, p=0.0177; OR 2.2 CI 1.2-4.1 p=0.0166; OR 2.2 CI 1.1-14.4,, p=0.0231, respectively).

Among inpatients, in descending order, assault (n=154), fall (n=128) and motor vehicle crash (MVC) (n=74) were the most frequent etiologies. MVC was a significant risk factor for CSI (OR 3.3, 95% CI 1.7 – 6.4, p=0.0002).

Mortality rate for all patients with mandibular fractures was 2.1% (24/1156); for patients with mandibular fracture and CSI, 17 % and without CSI, 1.4%. (OR Mand + CSI= 14, 95% CI 5.5 – 34, p < 0.0001).

Conclusions

Results of this study indicate that the incidence of CSI associated with mandibular fractures is related to specific sites of fracture, associated midface injuries and necessity for hospitalization. The mortality rate of trauma patients with mandibular fracture + CSI is significantly higher than those without CSI.

Reconstruction of the Lateral Craniofacial Defect in Previously Irradiated Patients: Potential Challenges and Pitfalls

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Purpose

Post-ablative defects of the lateral craniofacial complex are often challenging due to the size, location, and orientation of the tissue necessary to provide adequate coverage of vital structures. The cases presented review our institutional experience with complications that arise during the reconstruction of large defects utilizing a combination of free tissue transfer, pedicled tissue transfer, and local wound care.

Clinical Cases

Case 1 is a 63 year-old male who presented with a T2N0M0 cutaneous squamous cell carcinoma of the right pre-auricular area. He was initially treated at an outside institution with wide local excision and a full-thickness skin graft. Six months following the procedure, he experienced locoregional recurrence in the parotid gland with ipsilateral cervical lymphadenopathy, staged as a T2N1M0. He underwent wide local excision, including partial auriculectomy, radical parotidectomy, and ipsilateral modified radical neck dissection. The post-ablative defect, measuring 12 x 8 cm^2, was reconstructed immediately with an anterolateral thigh microvascular free tissue transfer. Adjuvant chemoradiation therapy was administered. The patient later presented with osteoradionecrosis of the temporal bone. Wide local excision, including fistulectomy, completion auriculectomy, temporal bone resection, and mandibular segmental resection. The post-ablative defect, measuring 15 x 10 cm^2, was immediately reconstructed with a cranial mesh, mandibular transosteal plate, and latissimus dorsi myocutaneous pedicled flap. Intra-operative SPY angiography was used to ensure viability of the flap margins. The post-operative course was complicated by early vascular compromise of the distal portion of the latissimus dorsi skin paddle. The patient was managed with interval wound debridements, negative pressure wound therapy, and split-thickness skin graft application. Complete wound closure was achieved.

Case 2 is a 65 year-old male who presented with a T4aN0M0 cutaneous squamous cell carcinoma of the right pre-auricular area, involving the zygomatic arch. Initially, primary chemoradiation therapy was administered with no significant change in the lesion. Wide local excision, including total auriculectomy, ostectomy of the zygomatic arch, radical parotidectomy, and ipsilateral supraomohyoid neck dissection was performed. The post-ablative defect measured 14 x 11 cm^2. Once final histopathological margins were confirmed, he underwent reconstruction with an anterolateral thigh microvascular free tissue transfer with a tensor fascia lata sling. The post-operative course was complicated by wound dehiscence at the superior margin and a surgical site infection. Initial management consisted of local wound care, antimicrobials, and antifungals. The patient eventually required multiple interval wound debridements and negative pressure wound therapy. The 9 x 6 cm^2 defect was eventually reconstructed with a latissimus dorsi myocutaneous pedicled flap. Intra-operative SPY angiography was used to ensure viability of the flap margins. The post-operative course was complicated by early vascular compromise of the latissimus dorsi skin paddle and subsequent late loss of the muscular flap.
The patient is currently being managed with interval wound debridements and negative pressure wound therapy.

Conclusions

A myriad of issues can arise during the reconstruction of post-ablative defects in patients who have been previously irradiated. The distance from the pedicle to the superiorly-positioned distal portion of the flap, the weight of tissue at the wound margins, the depleted vasculature of the surrounding tissues, the quality of remaining native skin, and the microbial environment following irradiation result in a similar pattern of wound dehiscence and surgical site infection in the patients presented.

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The Biaxial Double Barrel Flap – A Simplified Technique for Fibula Maxillary Reconstruction

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Purpose

The goals of reconstructing post extirpative maxillectomy defects should include separation of the oronasal cavities, provide adequate orbital support, recreation of midfacial contour and restoration of dentition.

The fibula free flap offers the advantage of a pliable soft tissue paddle, the ability to perform multiple osteotomies, the potential for a long pedicle length and adequate thickness for endosseous implants compared to other osteocutaneous/osteomyocutaneous free flaps.

Previously described techniques for microvascular fibula reconstruction of post extirpative maxillectomy defects are limited by their complexity, multiple osteotomies, limited pedicle length and inadequate reconstruction of the dental alveolus for endosseous implants. [3, 4] We describe a simplified technique for Brown class 2-4 defects which recreates premorbid facial form and function including dental rehabilitation while maintaining adequate pedicle length for microvascular anastomosis.

Methods

The investigators implemented a retrospective chart review of all patients with Brown class 2-4 post extirpative maxillary defects immediately reconstructed with a biaxial fibula flap technique at hospitals affiliated with the Head and Neck Institute, Portland, Oregon between May 2016 to September 2017. All subjects were evaluated at least one month after reconstruction for ectropion, 3-dimensional facial contour, nasal patency, neo-maxillary skeletal Angle class, deglutition, intelligible speech and intraoperative need for vein grafting.

Results

5 patients with post extirpative maxillectomy defects immediately reconstructed with the biaxial flap technique were identified. Average follow up was 8 months (range 2 – 20 months). Brown classification for defects included IIB (3), IIIB (1) and IVB (1) defects. Pathology included a hybrid odontogenic tumor, SCC (3), OR and a sinonasal melanoma with 3 patients receiving post-operative radiation. All five patients had excellent facial contour, malar projection, absence of ectropion, regular oral intake, 100% intelligible speech and a neo-maxillary skeletal class one relationship. 1 patient developed nasal synechiae and occlusion of her maxillary ostium 1 year post operatively requiring lysis and a endoscopic maxillary antrostomy. 2 patients received endosseous implants, 1 immediately one delayed, and 2 patients were reconstructed with non- implant supported removable prosthesis with excellent retention.

Conclusion

Compared to other described techniques for post extirpative maxillary reconstruction, the biaxial double barrel fibula technique, allows for superior reconstruction of the dental alveolus, while maintaining facial contour, intelligible speech, deglutition, orbital support, separation of the oronasal, orbital and antral cavities, and obviating the need for vein grafting.

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Mandibular Osteomyelitis Associated to Candida albicans in Marijuana and Heroin Abusers: Literature Review and Case Series

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Background
Osteomyelitis of the mandible is most commonly caused by bacterial infections and is rarely linked to fungal infections. Friedman et al. studied the relationship of multiple drugs including marijuana, opioids, nicotine and alcohol, and its effect on the immune system. It is important to consider potential risks and complications of patients who are immunocompromised and present a history of substance abuse. These complications include infections and osteomyelitis which can be associated with multiple microorganisms; such as fungus. Candida albicans is commonly found in skin and mucosa of healthy individuals, however it has been proven to cause disease in individuals who are immunocompromised.

Case Presentation
Two cases of mandibular osteomyelitis after routine dental extractions and a history of drug abuse, including heroin and marijuana, are presented in this case series. These specific infections were resistant to multiple antibiotic therapy and grew Candida albicans species in cultures collected. These cases were treated with irrigation and debridement or mandibular resection; in combination with antimicrobial treatment and fluconazole leading to complete resolution.

Conclusion

Although, osteomyelitis is most commonly caused by bacterial infections, special attention must be given to patients with medical histories of immunosuppression and IV drug use. Patients who do not respond to broad spectrum antibiotics might benefit from bacterial and fungal cultures and sensitivity. In cases of positive fungal microorganisms, anti-fungal treatment with an antifungal agent such as oral fluconazole is indicated if fungal organisms are yielded in the culture.

Nasotracheal Intubation: The Preferred Airway in Oral Cavity Microvascular Reconstructive Surgery?

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Purpose
To describe the safety and effectiveness of nasotracheal intubation (NTI) in a cohort of patients undergoing reconstruction of oral cavity defects with free tissue transfer (FTT).

Methods
The authors implemented a retrospective cohort study and enrolled a sample composed of consecutive patients undergoing FTT reconstruction of oral cavity, maxillary, or mandibular defects between 2013 and 2017. These patients were all subject to a newly developed Enhanced Recovery After Surgery (ERAS) protocol. As a part of our ERAS pathway, we have implemented a protocol involving NTI, overnight sedation and extubation in the ICU on post-operative day one. The protocol limits elective tracheostomy to patients that are undergoing two free flaps, a "bulky flap" (i.e. anterolateral thigh, scapula or latissimus dorsi) or have severe pre-existing medical comorbidities that would potentially affect ventilator weaning and/or extubation. The primary outcome measurement was hospital length of stay (LOS). Secondary outcome variables were the duration of mechanical ventilation, ICU LOS, need for gastrostomy, and airway-related complications directly associated with either NTI or tracheostomy. Descriptive statistics and a multivariate logistic regression analysis were completed.

Results
The sample was composed of 141 patients that had undergone oral cavity FTT for both benign and malignant diseases (NTI, n=111; tracheostomy, n=30). Patients managed with NTI had a statistically significant shorter hospital LOS (8 vs.15.5 days; $P<0.0001$), ICU LOS (1 vs. 2 days; $P=0.0006$), and a decreased requirement for gastrostomy (17.1% vs. 76.7%; $P<0.0001$). Airway-related complications were rare in both the tracheostomy (13.3%) and NTI (3.6%) groups. Multivariate analysis demonstrated that patients undergoing tracheostomy were 3.14 ($P=0.004$) times more likely to have a prolonged hospitalization and 10.4 ($P<0.0001$) times more likely to require a gastrostomy. A sensitivity analysis of patients' with malignant diagnoses only had similar statistically significant results. The delayed tracheostomy rate in the NTI group was 3.6%.

Conclusion
To date, this is the largest study to evaluate the use of NTI in patients undergoing oral cavity reconstruction with FTT. Our results suggest, that in the appropriate institutional setting, the majority of patients can be safely managed with NTI. This approach results in a decreased hospital and ICU LOS and an earlier resumption of oral intake with less need for gastrostomy.

Angioplasty to Achieve Three Vessel Patency in the Lower Extremity Planned as a Donor Site for Fibula Free-flap in Head and Neck Reconstruction

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Presenter Roderick Y Kim, DDS MD

Purpose

For the reconstruction of many head and neck bone defects, the fibula free flap is the first choice at many institutions. One contraindication for fibula harvest is the lack of three vessel run-off, and concerns of post-operative vascular compromise of the lower extremity and pedal ischemia[1]. Atherosclerosis is a common disease which can limit the use of this donor site. We report the outcome of preliminary cohort of patients following angioplasty allowing safe usage of the free fibula free flap in head and neck reconstruction.

Materials and Methods

A single institution retrospective case review of adult patients that received fibula free flap for head and neck reconstruction from 2015-2017 was done. Inclusion criteria was patients with fibula free flap that obtained conventional angiography and required angioplasty. There were no specific exclusion criteria.

Results

We identified 2 subjects who underwent preoperative angioplasty of the superficial femoral artery, and one patient who also underwent posterior tibial artery angioplasty. Mean age was 65, and both patients underwent resection and reconstruction for mandibular squamous cell carcinoma. Both fibulas were from the left lower extremity and included skin paddles. The fibula flaps survived and the donor sites healed without vascular compromise. One patient had poor take of their split thickness skin graft. No long term functional deficit was noted.

Conclusions

Conventional angiogram and angioplasty may be a viable method to re-establish vascular flow and three-vessel run-off for select patients initially unable to undergo fibula free flap harvest.

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In Vivo Evaluation of Fluorapatite-Coated Polycaprolactone Scaffold for Osteoinductive Capabilities

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Presenter Sharon Aronovich, DMD

Introduction

Ideally, a non-autogenous material used for bone regeneration should have osteoconductive and osteoinductive properties. Currently, high costs and regulatory barriers limit options available to patients and clinicians. Preliminary in vitro data shows that a Fluoroapatite–coated polycaprolactone (FA-coated PCL) biodegradable scaffold shows osteoinductive properties as assessed by the induction of osteogenic differentiation and mineralization markers. In vitro, FA coating of etched metal surfaces stimulates the mesenchymal stem cells to differentiate and mineralize secondary to its osteoinductive properties. Mechanistically, FA crystals have been shown to stimulate expression of a set of pro-osteogenic transcripts and bone mineralization phenotypic markers from adipogenic stem cells as well. The aim of this study was to determine if FA-coated PCL scaffolds exhibit osteoinductive properties in critical-sized calavarial defects.

Methods

This study was approved by the University of Michigan University Committee for the Use and Care of Animals. To determine the osteoinductive capabilities of FA-coated PCL scaffolds, seventy-two adult SD rats underwent bilateral 5 mm diameter critical sized calvarial defects (Bosch C et al. 1998). Each defect was randomized to receive a FA-coated PCL scaffold (experimental), a PCL scaffold (control), or no scaffold (negative control). Animals were sacrified at 8, 12 and 16 weeks. Analysis of bone regeneration was carried out using micro-computer tomography (μCT) and routine histologic examination via H&E staining.

Statistical analysis

Means and standard deviations were computed. The data was analyzed with one-way ANOVA to assess any observed differences between the different implants, and two-way ANOVA for comparison of both treatment effects and different time points. SAS 9.4 was used to conduct repeated measure analysis of variance to account for correlation between measures obtained from the same rat. The overall effect of treatment, while accounting for the effect of time, was assessed by pairwise comparisons using differences of the least squares means. A Tukey's multiple comparison test was performed to analyze the differences between the groups in terms of bone volume. $P<0.05$ was considered statistically significant.

Results

The mean bone volume increased incrementally over the three time points for all three groups, and the 12 and 16 week time points had significantly greater bone density than the 8 week time point. At 8 weeks, the control group had a significantly greater bone volume compared to the PCL group (12.6 vs 7.7 mm3; P=0.0011). There was no significant difference between control and FA-coated PCL groups at the 8-week (12.6 vs 10.4 mm3, P=0.1208), 12-week (12.9 vs 10.2 mm3 ,P=0.0771) and 16-week (13.2 vs 11.7 mm3, P=0.3606) time points. However, there was a trend for greater bone volume in the control group. When accounting for the effect of time (difference of least square means with Tukey-Kramer adjustment), the control treatment had significantly more bone volume than FA-PCL (Adjusted P=0.0164) and PCL (Adjusted P=0.0001) treatments.

Conclusion

Overall, the negative control group demonstrated greater quantities of bone regeneration (higher bone volume on micro CT and histological analysis) than the PCL group at 8 weeks. No significant difference was observed between the FA-PCL and PCL groups. This in vivo study does not support the use of FA-coated polycaprolactone for use in bone regeneration.

Literature Cited

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2. Liu J, Taocong J, Chang S et al. The effect of novel fluorapatite surfaces on osteoblast-like cell adhesion, growth, and mineralization. Tissue engineering: Part A. 2010, 16;9.
3. Liu J, Wang X, Qiming J et al. The stimulation of adipose-derived stem cell differentiation and mineralization by ordered rod-like fluoroapatite coatings. Biomaterials. 2012, 33: 5036-5046.
4. Williams, JM, Adequnmi A, Schek R, Flanagan CL, Krebsbach PH, Feinberg SE, HollisterSJ, and Das Suman. Bone tissue engineering using polycaprolactone scaffolds fabricated with selective laser sintering. Biomaterials 2005, 26;4817-4827.

CTA Perforator Localization for Virtual Surgical Planning of Osteocutaneous Fibular Free Flaps in Head and Neck Reconstruction

Authors Kyle S Ettinger, MD DDS Rui P Fernandes, MD DMD
Kevin Arce, MD DMD

Institutions Mayo Clinic and Mayo College of Medicine, Rochester
University of Florida College of Medicine, Jacksonville

Presenter Kyle S Ettinger, MD DDS

Virtual surgical planning (VSP), computer aided design (CAD)/computer aided modeling (CAM), and 3D printing are three distinct technologies that have become increasingly employed within head and neck oncology and microvascular reconstruction. While each of these technologies have long been utilized for treatment planning within other surgical disciplines such as craniofacial surgery, trauma surgery, temporomandibular joint surgery, and orthognathic surgery, its widespread use within the field of head and neck reconstructive surgery remains a much more recent advent.

In response to the growing trend of VSP being employed for the planning of fibular free flaps within head and neck reconstruction, some surgeons have questioned the technology's implementation on the basis of its inadequacy in addressing other reconstructive considerations beyond hard tissue anatomy. Detractors of VSP for head and neck reconstruction highlight its lack of capability in accounting for multiple reconstructive factors such as recipient vessel selection, vascular pedicle reach, need for dead space obliteration, and skin paddle perforator location. It is with this premise in mind that that we report a simple technique for anatomically localizing peroneal artery perforators during virtual surgical planning for osteocutaneous fibular free flaps where both bone and a soft tissue skin paddle are required for ablative reconstruction.

The technique allows for anatomical perforator localization during the virtual surgical planning session solely based on data existent within the preoperative computed tomographic angiography (CTA) and does not require any modifications to preoperative clinical workflows. It is our presumption that many surgeons within the field are unaware of this planning capability within the context of modern VSP for head and neck reconstruction. The primary purpose of this abstract is to introduce and further familiarize surgeons with the technique of CTA perforator localization as a method of improving intraoperative fidelity for virtual surgical planning of osteocutaneous fibular free flaps.

Is Virtual Surgical Planning Accurate in Predicting Maxillary Position when Performing Mandibular Surgery First?

Authors Biraj Shah, DDS MD; John Caccamese, MD DMD; Sean Edwards, DMD MD; Evan Koenig

Institutions University of Maryland, University of Michigan

Presenter Biraj Shah, DDS MD

Virtual surgical planning (VSP) has transformed the planning of orthognathic surgery. It has promoted more accurate planning of osteotomies in all three dimensions of space. Advantages of this technique include more accurate diagnosis and treatment of asymmetries, assessment of surgical feasibility, evaluation of relevant anatomy, and a decrease in the amount of surgical preparation time. It also allows the surgeon to easily move between performing maxillary or mandibular surgery first, as it has eliminated the cumbersome process of reverse model surgery.

We performed a **pilot study in 2017** based on our clinical observation that maxillary osteotomy gaps were smaller than the VSP planned gaps when performing mandible surgery first. The pilot study showed that VSP can be accurate in predicting maxillary position when mandibular surgery is performed first; but the data also showed that the mandible first group was consistently under advanced at the buttresses (pyriform and zygomaticomaxillary) and upper incisors. To further support the above findings, we are currently performing a study with a larger number of patients from two different institutions with additional exclusion criteria. The goal of our study is to further corroborate the findings of the pilot study that VSP is accurate in predicting maxillary position when performing mandibular surgery first, but to also understand why the maxilla was consistently under advanced in these cases.

Methods

Fifty consecutive patients from 2 institutions were evaluated with either maxillary or mandibular surgery first. Postoperative CBCT scans were obtained within 6 weeks of surgery and overlays were performed with the VSP plan. Specifically, maxillary and mandibular osteotomy gaps were measured, along with incisor position and they were compared for accuracy.

Results/Conclusions

While there was some variability in all of the maxillary gaps that were measured, there was consistent under advancement of the maxilla at the buttresses and upper incisors in the mandible surgery first group. This variability was less than 3mm, suggesting that VSP is still accurate in predicting maxillary position when performing mandible first surgery. This variability may be due to the changes in the vertical positioning of the maxilla to adjust tooth show, or from bowing of the mandibular plates when used as an isolated method of fixation.

Immediate Allograft Outcomes of Long-Span Defects of the Inferior Alveolar Nerve with Ablative Mandibular Resection

Authors Michael Miloro, DMD MD FACS; Michael R Markiewicz, DDS MPH MD; Alexandria Hawkins, DDS; David Salomon, DDS

Institutions University of Illinois College of Dentistry; Yale-New Haven Medical Center

Presenter Michael Miloro, DMD MD FACS

Statement of the Problem
Contemporary management of ablative jaw defects includes not only hard and soft tissue reconstruction, but must also address restoration of neurosensory function. The goal of this study is to determine the outcomes of immediate reconstruction of long span defects (≥40 mm) of the inferior alveolar nerve (IAN) following ablative mandibular resection using processed nerve allografts (PNA).

Materials and Methods
A retrospective cohort study of subjects who underwent immediate reconstruction of IAN gaps ≥4 cm with PNA (AxoGen Avance, Alachua, FL) at a single academic medical center by a single surgeon (MM) from September 2013 to September 2017 and who met the inclusion criteria was completed. The demographic and clinical data was collected for each patient and analyzed using clinical neurosensory testing at 3, 6, and 12 months (or more), and outcomes were reported using the Medical Research Council Scale (MRCS) for functional sensory recovery as the primary outcome variable. In addition, patient subjective perception of neurosensory recovery was recorded using a Visual Analog Scale (VAS). Additionally, demographic and clinical data examined including patient age, gender, comorbidities, pathology, length of PNA, perioperative complications, and follow up period.

Results
Of 27 nerve repairs, a total of 22 subjects met the inclusion criteria. The average age was 35.4 years (range: 11 to 67 years) and 59.2% were male subjects. All IAN defects resulted from resection of mandibular pathology (21 benign (12 ameloblastoma, 5 osteomyelitis), 1 malignant (low-grade mucoepidermoid carcinoma) lesions) involving the IAN, without presurgical nerve paresthesia. 15 of the 22 IAN defects were reconstructed with a 70 mm PNA, with a mean PNA length of 61.5 mm (range: 4-7 cm). Mean follow up time was 17.5 months (range: 10-37.5 months). Mean VAS reported was 6.7 (range: 3-10). 89.7% of subjects displayed functional sensory recovery (S3 or greater). 22.0% showed return of some superficial pain and tactile sensation without over-response (S3), with 45% displaying good stimulation localization (S3+), and 33% showing complete recovery (S4). 50% of subjects achieved S3 by 3 months, and only age was a significant variable ($p<.05$).

Conclusions
Immediate reconstruction of the IAN with PNA of long span defects (≥4 cm) during ablative mandibular resection and reconstruction is a viable and predictable option to achieve useful functional neurosensory recovery, and should be considered as a current standard in clinical practice.

Review of 200 Ameloblastomas: Evolution of Mandibular Reconstruction and When Enucleation may be a Viable Option

Authors RA Ord, MD DDS FACS D Dyalram, MD DDS JL Lubek, MD

Institution University of Maryland

Presenter Robert A Ord, MD DDS FACS

Purpose

The two purposes of this study were; 1 to review the evolution of mandibular reconstruction for benign ameloblastoma of the mandible in our unit and; 2 to see whether the "non-best practice" treatment of enucleation has any utility.

Methods and Materials

This is a retrospective chart study of a consecutive series of ameloblastomas seen at the University of Maryland from 1991-2017. Demographic data gathered includes gender, race, age, site method of treatment and reconstruction. Only mandibular ameloblastomas were included in the final analysis (maxillary tumors were excluded) and malignant ameloblastomas were also excluded.

Results

There were 200 total patients average age 44.3 years (range 8-93), with 30 (15%) pediatric cases (<20 years). 127 patients were male 58.5% and 91 were African American (45.5%). 161 tumors occurred in the mandible (80.5%) and 39 were maxillary (19.5%). 6 cases (3%) were malignant. 179 of the patients had primary untreated tumors, while 21 were recurrent having been initially treated elsewhere. Excluding malignant tumors 112/155 mandibular ameloblastomas were treated with segmental resection (72%), and 67 (59.7%) were reconstructed primarily with free flaps. Free flap usage has increased in our unit and is currently 89% in our most recent quartile of patients. There were no recurrences in the segmental resection cohort.

Five patients treated primarily by our unit recurred, 4 following enucleation and 1 following marginal resection, representing 5/155 (3.2%) of all cases and 5/43, (11.6%) of the patients not treated by segmental resection. A small cohort of patients treated elsewhere with enucleation for symphyseal tumors continued with this treatment modality and despite multiple recurrences maintained function and good quality of life.

Conclusions

Segmental resection remains the gold standard for cure in mandibular ameloblastoma. Enucleation is probably indicated in non-mural unicystic ameloblastoma and carefully selected ameloblastomas of the mandibular symphysis. Microvascular reconstruction with a fibular flap has become the reconstruction of choice in our unit.

Does the Usage of Ketorolac (ToradolÔ), a Non-Steroidal Anti-Inflammatory Drug, Cause Increased Rates of Hematoma Requiring Surgical Intervention, in Patients who undergo Vascularized Free Tissue Transfer for Reconstruction of Head and Neck Defects?

Authors Roderick Youngdo Kim, DDS MD; Ed Pantzlaff, DDS; Manan Patel, BDS DDS; Brent Benson Ward, DDS MD

Institution University of Michigan

Presenter Ed Pantzlaff, DDS

Purpose
There is limited data available in head and neck literature regarding concerns that ketorolac's anti-platelet activity may increase the risk for excessive postoperative bleeding. This study assesses the incidence of hematomas that require surgical intervention, in free tissue reconstruction with microvascular anastomosis in the head and neck region, with and without ketorolac.

Methods
A retrospective chart review was conducted for patients over 18, receiving free tissue transfer with microvascular anastomosis for the treatment of oral, maxillofacial, and head and neck defects, between July 2014 and June 2017. Patients who had baseline coagulopathies or on therapeutic anticoagulation were excluded from the study. (IRB ID: HUM00135694).

Results
We identified 97 patients who met the inclusion criteria. Ketorolac was administered to 33 (34%) patients and 64 (66%) patients did not receive ketorolac. Hematoma requiring surgical intervention occurred in 10 (10.3%) patients. Hematoma development occurred in 2 (6.1%) patients receiving ketorolac and in 8 (12.5%) patients not receiving ketorolac. There was no statistical significance in this outcome (P = 0.49). Both incidences of hematoma requiring surgical intervention, in patients receiving ketorolac, had fibula donor sites and initial placement of Penrose drains.

Conclusions
A decreased incidence of hematomas was observed amongst patients receiving ketorolac postoperatively, which was not statistically significant. Larger prospective studies would be required to confirm these outcomes.

Notes

Evaluation Form

Medical Education Resources and American Academy of CranioMaxilloFacial Surgeons respects and appreciates your opinions. To assist us in evaluating the effectiveness of this activity and to make recommendations for future educational offerings, please take a few minutes to complete this evaluation form.

If you wish to receive acknowledgement of participation for this activity, please* PRINT *in your contact information and return this form to the program monitor upon your departure.

Name		Specialty
Organization		
Degree	❒ MD ❒ DMD ❒ DDS ❒ PhD ❒ Other _____	
Mailing Address:	❒ Hospital/Academic/Office ❒ Home	
Address:		
City:	State:	Zip:
Telephone:	Fax:	Email:

I certify my actual time spent to complete this educational activity to be:

❒ I participated in the entire activity and claim 15 credits.

❒ I participated in only part of the activity and claim _____ credits.

Please answer the following questions by circling the appropriate rating:

5 = Outstanding **4** = Good **3** = Satisfactory **2** = Fair **1** = Poor

Extent to Which Program Activities Met the Identified Objectives

After completing this activity, participants should be able to:

1. Discuss challenges in maxillofacial reconstruction, and methods to overcome them.	5 4 3 2 1
2. Assess research abstracts and studies as they relate to craniomaxillofacial patient populations, pathology and treatment options, and the implications for changes in practice.	5 4 3 2 1
3. Describe innovative techniques to assess innate talents and behaviors, which may assist candidates and decision makers during medical career transitions.	5 4 3 2 1
4. Evaluate potential academic and curricular modifications to enhance knowledge, competency and improve relevancy.	5 4 3 2 1
5. Examine contemporary interdisciplinary and cross-functional patient care delivery models with respect to your clinical setting.	5 4 3 2 1

Please indicate if this activity was free from commercial bias. ❒ Yes ❒ No

If No, please indicate the topic(s) that were not free from commercial bias. _____

_____

_____

Effectiveness of the Individual Faculty Members 5 = Outstanding 1 = Poor

Speakers	Knowledge of Subject Matter	Effective in Presenting Material	Avoided Commercial Bias or Influence
Keynote: Cynthia Morris, PhD, MPH	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Keynote: John D Bradley, MDiv, DHL	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Shelly Abramowicz, DMD, MPH	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Salim Afshar, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Sharon Aronovich, DMD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Jason R Baird, PhD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Karen Carver, DDS, MPH	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Paul Covello, DDS, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Thalia-Rae Criddle, DMD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Angelo Cuzalina, MD, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Mikhail Daya, DMD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Peter Dennis, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Edward Ellis III, DDS, MS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Kyle S Ettinger, MD, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Adam P Fagin, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Esa Farkkila, MD, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Kyle Gabrick, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Jordan Gigliotti, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Akshay Govind, MD, DMD, MPH	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Andrew Henry, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Yisi D Ji, BS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Baber Khatib, MD, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Roderick Y Kim, DDS, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Sergei Kuznetsov, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Anthony Massaro, MD, DMD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Michael Miloro, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Justine Moe, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Robert A Ord, MD, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Bonnie L Padwa, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Ed Pantzlaff, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Connor J Peck, BS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Daniel Perez, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Pat Ricalde, MD, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Steven M Roser, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Biraj Shah, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Felix Sim, MBBS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Alexander Sun, BS			
Harold Kai Tu, DMD, MD	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Timothy A Turvey, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Julian J Wilson, DDS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Robin T Wu, BS	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1

Is there anything you would like to communicate directly to the speakers? _____

_____

_____

Effectiveness of the CME content

• Enhanced my current knowledge base	5 4 3 2 1
• Will help me improve patient care	5 4 3 2 1
• Provided educational material that I found useful	5 4 3 2 1
• Information was relevant to my practice and my educational needs	5 4 3 2 1

Please indicate any changes you plan to make in your practice of medicine as a result of information you received from this activity.

_____

_____

Please rate your commitment level to making these changes.	5 4 3 2 1

In what time frame do you anticipate making these changes?

❒ Immediately ❒ 1 – 2 months ❒ 3 – 6 months ❒ At some point in the future

_____

Based on my participation in this CME activity, I intend to consider/evaluate or incorporate the following new clinical, academic or administrative strategies in my practice setting:

❒ New approach, technique or technology to treat/manage craniomaxillofacial pathologies:

Describe/List: _____

_____

❒ Interdisciplinary or cross-functional patient care delivery model: _____

❒ Method for assessing healthcare providers' innate talents: _____

❒ I already do all these things

If you do not plan to incorporate the above clinical strategies, please list the factors acting as barriers.

_____

_____

This activity was designed to help the participant master the ABMS/ACGME core competencies—patient care and medical knowledge. How well did this activity address these competencies?	5 4 3 2 1

Please provide general comments regarding this activity and suggest how it might be improved:

_____

_____

_____

Medical Education Resources, Inc.
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Fax: 720-449-0217

Notes

AACMFS BUSINESS MEETING

May 5, 2018

OFFICERS:

Eric J. Dierks, MD, DMD-President

B. J. Costello, DMD, MD-Immediate Past President

Edward Ellis, III, DDS, MS-President Elect

David Kim, DMD, MD-Treasurer

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Sean Edwards, DMD, MD

John Caccamese, DMD, MD

Martin Steed, DDS

MEMBER AT LARGE:

Bonnie Padwa, DMD, MD

STAFF:

John Helfrick, DDS, MS-Executive Director

Brent Ward, DDS, MD-Asst. Executive Director

Julia Kneedler, EdD, RN-Executive Secretary

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Agenda

SATURDAY, MAY 5

3:30 – 5:30 pm **Culture Ballroom**

President's Address

President's Report – *Eric J. Dierks, MD, DMD*
State of the AACMFS
Actions taken by the Board during the past year

Treasurer's Report – *David Kim, DMD, MD*
Current Finances
Projected 2017-2018 expenses
Financial considerations for association/annual meeting

Secretary's Report – *Ramon L. Ruiz, DMD, MD*
Membership Report

By-Laws Report – *Brent Ward, MD, DDS*
Revision to by-laws

Announcement of Succession of Officers – *Eric J. Dierks, MD, DMD*
Election of Secretary
Election of Member at Large
Presentation of officers 2017-2018

2019 Meeting – *Edward Ellis III, DDS, MS*
Dates: May 9 – 10, 2019
Location: San Antonio
Venue: Omni La Mansion del Rio
Program

Presentation of New Fellows – *Eric J. Dierks, MD, DMD*
List of Fellows approved by the Board of Directors 2017-2018
Motion to accept Fellows
Certificate Presentation
New Business

6:30 – 10 pm **Black Tie Dinner**
Oregon Historical Society

AACMFS
Profit & Loss
July 2017 through March 2018

	Jul '17 - Mar 18
Ordinary Income/Expense	
Income	
Commission	3,568.80
Membership Dues	54,950.00
Total Income	58,518.80
Gross Profit	58,518.80
Expense	
Merchant deposit fees	1,850.66
Contract Services	
Accounting Fees	325.00
Audit and Legal Fees	340.00
Total Contract Services	665.00
Facilities and Equipment	
Annual Meeting Expenses	2,662.50
Total Facilities and Equipment	2,662.50
Operations	
Service Fee	4,006.00
Management Fee	7,000.00
Books, Subscriptions, Refere...	362.00
Printing and Copying	640.00
Total Operations	12,008.00
Travel and Meetings	
Conference, Convention, Meet...	5,348.10
Travel	2,630.86
Total Travel and Meetings	7,978.96
Total Expense	25,165.12
Net Ordinary Income	33,353.68
Net Income	**33,353.68**

AACMFS
Balance Sheet
As of April 1, 2018

	Apr 1, 18
ASSETS	
Current Assets	
Checking/Savings	
Wells Fargo - Operating Account	163,978.02
Total Checking/Savings	163,978.02
Accounts Receivable	
Accounts Receivable	-475.00
Total Accounts Receivable	-475.00
Other Current Assets	
Undeposited Funds	5,500.00
Total Other Current Assets	5,500.00
Total Current Assets	169,003.02
Other Assets	
Prepaid Expenses	5,000.00
Total Other Assets	5,000.00
TOTAL ASSETS	**174,003.02**
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Other Current Liabilities	
AACMFS Annual Mtg Fees	43,210.36
Total Other Current Liabilities	43,210.36
Total Current Liabilities	43,210.36
Total Liabilities	43,210.36
Equity	
Unrestricted Net Assets	97,438.98
Net Income	33,353.68
Total Equity	130,792.66
TOTAL LIABILITIES & EQUITY	**174,003.02**

Fellows

Shelly Abramowicz
Brian Alpert
Melissa Amundson
Kevin Arce
Sharon Aronovich
Shahid Aziz
Shahrokh Bagheri
Jonathan Bailey
Brian Bast
Richard Bauer
Dale Baur
R. Bryan Bell
James Bertz
George Blakey
Gary Bouloux
Nicholas Bournias
Vishtasb Broumand
Daniel Buchbinder
Tuan Bui
Kamal Busaidy
John Caccamese Jr.
Ron Caloss
Vincent Carrao
Allen Cheng
Radhika Chigurupati
Sung-Kiang Chuang
Joseph Cillo, Jr.
Bernard Costello
Larry Cunningham
William Curtis
Alessandro Cusano
Angelo Cuzalina
David Dattilo
Nagi Demian
Eric Dierks
Jasjit Dillon
Thomas Dodson
Bruce Donoff
Stephanie J. Drew
Sean Edwards
Edward Ellis III
Mark Engelstad
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Issa Hanna
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Alan Herford
David Hirsch
Martin Hoard
Jon Holmes
Bruce Horswell
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Jerry Lewis Jones
Leonard Kaban
Deepak Kademani
Steven Kaltman
David Kang
Richard Kapitan
Gerard Kearns
Beomjune Kim
David Kim
David Kirkpartick
Antonia Kolokythas
Deepak Krishnan
George Kushner
Edward Lahey
Zahid Lalani
Melanie S. Lang
M. Kinon Lecholop
Janice Lee
Benn Lieberman
Patrick Louis
Joshua Lubek
Nicholas Makhoul
Jose M. Marchena
Robert Marx
Joseph McCain
Daniel J. Meara
Pushkar Mehra
James Melville
Roger Meyer
Brett Miles
Michael Miloro
Anthony Morlandt
Wai Pong Ng
Robert Ord
Timothy Osborn
Bonnie Padwa
Ashish Patel
Zachary Peacock
Vincent Perciaccante
Daniel Perez Osorio
David Perrott
Phillip Pirgousis
Daniel Pituch
Tony Pogrel
Jeffrey Posnick
David Powers
Faisal Quereshy
Likith Reddy
Cory Resnick
Pat Ricalde
Gerardo Romeo
Steven Roser
Salvatore L. Ruggiero
Ramon Ruiz
Andrew Salama
Steven Schendel
Brian Schmidt
Harry Schwartz
Jonathan Shum
Kevin Smith
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Martin Steed
Derek Steinbacher
Barry Steinberg
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James Swift
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Scott Urban
Luis Vega
Peter Waite
Gary Warburton
Brent Ward
Fayette Williams
William B. Williams
David Wilson
James Wilson
Larry Wolford
Mark Wong
Simon Young
Waleed Zaid
Vincent Ziccardi

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Karl Cuddy
Renie Daniel
Donita Dyalram
Martin Hoard
Pamela Hughes
Baber Khatib
Hisham Marwan
Andrew Meram
Dieu Pham
Jason Portnof
Salam Salman
Brett Shirley
Barrett Tolley
Julian Wilson
James Xia
Melvyn Yeoh
Yedeh Ying
George Zakhary

2018 Post Graduate Members

Arshad Kaleem
Roderick Kim
Michael Markiewicz
James Murphy
Richard Tannyhill, III
Chi Viet

Emeritus Fellows

Leon Assael
James Hupp
James Johnson
John Kelly
Paul Lambert
Daniel Laskin
Joseph Piecuch

Honorary Fellows

Charles Bertolami
Bruce Epker
John Kent
Bruce MacIntosh
Jeffrey Moses

Distinguished Fellow

John Helfrick

Notes

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