SUNDAY HEAD AND NECK

7:00 AM - 7:05 AM

RM47 Occlusal and Dental Outcomes Following Facial Allotransplantation

Cleveland Clinic, Cleveland

Presenter: **Fatma Betul Tuncer, M.D.**

Fatma Betul Tuncer, M.D.(1), Bahar Bassiri Gharb, MD, PhD(1), Risal Djohan, MD(1), Brian Gastman, MD(1), Steven Bernard, MD(1), Mark Hendrickson, MD(1), Graham Schwarz, MD(1), Raffi Gurunluoglu, MD PhD(1), Maria Siemionow, MD PhD DSc(2), Frank Papay, MD(1) and Antonio Rampazzo, MD, PhD(1)

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Background

Successful outcomes that were achieved following initial face transplantations encouraged plastic surgeons to include maxilla and/or mandible in the transplant organ. Most of the reports of face transplantation have been focused on immunological, functional or psychological aspects of this state-of-the-art procedure. The dental or orthognathic outcomes were underreported although occlusion and mouth opening is an important part of the function. The aim of this study is to review all dental, orthognathic and skeletal results of the maxilla and/or mandible containing face transplants and discuss the techniques to prevent unfavorable outcomes.

Methods

A literature search for all face transplantation cases was performed. The cases that were not reported in the literature are further extracted from media coverage, abstract books or in-person interviews. Among all face transplants, composite allografts containing maxilla and/or mandible with dental arch were analyzed in detail. All the dental and orthognathic complications documented in the literature were recorded. Clinical pictures, plain X-ray images or computed tomography scans included in the papers were further analyzed for skeletal and occlusal relationship when these outcomes were not reported. Long-term dental and skeletal outcomes of our three patients were also analyzed in detail.

Results

Forty-one face transplantations were performed so far. Among these, 23 patients received allografts containing maxilla and/or mandible. The distribution of these allografts is as follows: 8 containing only maxilla, 2 containing only mandible and 13 containing both maxilla and mandible. Documentation was not available for 4 patients. All documented patients had at least one dental/occlusal complication or revision surgery. The most common dental/occlusal complications were limited mouth opening (47%), tooth decay and extraction (36%), anterior open bite (26%), skeletal class II relationship (42%), skeletal class III relationship (26%) and nonunion at the osteotomy sites (10%). Limited mouth opening was more common when the mandible was transplanted (42%). Skeletal class II relationship was more common when the maxilla was transplanted only(62%). Three patients underwent surgical release of the temporomandibular joint after the transplantation to improve mouth opening. Revision surgeries

such as Lefort I, Lefort III or mandibular osteotomies were performed in order to correct the malocclusion in four patients.

Conclusion

Dental and orthognathic complications and revision surgeries are extremely common and underreported after facial allotransplantation containing a single or double jaw. The risk of malocclusion increases when both maxilla and mandible are transplanted. Craniofacial principles and advanced surgical planning should be utilized to improve the occlusion and facial balance following face transplantation.

7:05 AM - 7:10 AM

RM48 The Pedicled Internal Mammary Osteomyocutaneous Chimeric Flap (PIMOC) for Salvage Head and Neck Reconstruction

State University of Campinas - Brazil, Campinas

Presenter: **Guilherme Cardinali Barreiro, MD, PhD**

Guilherme Cardinali Barreiro, MD, PhD(1,2), Chelsea C. Snider, MD(3) and Luiz Henrique Silva Borges, MD(4)

(1)Plastic Surgery, State University of Campinas, Campinas, Brazil, (2)Medical Assistance Institute for the Public Server, Sao Paulo, Brazil, (3)Institute for Plastic Surgery, Southern Illinois University School of Medicine, Springfield, IL, (4)State University of Campinas, Campinas, Brazil

The Pedicled Internal Mammary Osteomyocutaneous Chimeric Flap (PIMOC) for Salvage Head and Neck Reconstruction **Background** With advances in head and neck cancer management, there has been a rise in the vessel-depleted, radiated neck with higher rates of fistulas and failed reconstructions. These cases present unique challenges to the reconstructive surgeon. Unconventional microsurgical techniques have been described to overcome these complexities. We describe a novel technique, the pedicled internal mammary artery osteomyocutaneous chimeric flap (PIMOC), its surgical rationale and clinical application for salvage head and neck reconstructions. **Methods** Seventy flaps in 35 cadavers were dissected to investigate the internal mammary vascular pedicle and its perforators to the ribs and distal division into the rectus abdominis muscle. The PIMOC flap was designed to include a 6th or 7th rib osteomyocutaneous and rectus abdominis myocutaneous component. Vessel length and caliber were measured. Flap composition, surgical technique, and arc of rotation were standardized. The anatomic study was translated to the clinical setting for salvage head and neck reconstruction. **Results** The caliber of the main arterial pedicle and its branches was homogeneous with regard to laterality and gender in all cadaver dissections. The caliber of the internal mammary artery ranged from 1.5 to 2.4 mm; the vein 2.0 to 3.6 mm. The pedicle length from origin to the 6th or 7th rib osteomyocutaneous flap component ranged from 18.5 to 21.6 cm, providing adequate length for flap rotation to the face. The rectus abdominis myocutaneous component was able to be rotated to reach the occiput in all cases and supplied the deep inferior epigastric vessels for additional anastomosis as necessary. The PIMOC flap was utilized in a series of five patients for salvage head and neck reconstruction. Four flaps contained a rib component; two with the 6th rib and two with the 7th. All flaps contained a rectus abdominus myocutaneous component. The donor site was closed primarily and there were no major complications within an average follow-up of 6 months. There were no total flap losses and the patients regained adequate facial contour, speech and swallow. **Conclusion** The PIMOC flap is based on a single vascular pedicle and can be used as a salvage procedure in complex head and neck reconstruction, where there are limited recipient vessels and significant radiation or iatrogenic sequelae. It is a reliable and reproducible flap that provides substantial donor tissue and long pedicle length.

7:10 AM - 7:15 AM

RM49 Immediate Dental Implantation in Oncologic Jaw Reconstruction: Workflow Optimization to Decrease Time to Full Dental Rehabilitation

Memorial Sloan Kettering Cancer Center, New York

Presenter: **Robert J Allen, Jr., MD**

Robert J Allen, Jr., MD(1), Deana S Shenaq, MD(1), Evan Rosen, DMD, MPH(2), Snehal Patel, MD(3), Ian Ganly, MD(3), Jay O Boyle, MD(3), Jonas Nelson, MD(4) and Evan Matros, MD MMSc MPH(1)

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Background: Full dental rehabilitation following segmental mandibulectomy or maxillectomy for oncologic tumor ablation should be the goal for every patient. But despite advances in technology and reconstructive techniques, many patients do not achieve timely or complete oral rehabilitation. Recognizing this fault, we recently adopted an innovative workflow (Figure 1) to increase the number of patients undergoing dental restoration, irrespective of tumor pathology or need for adjuvant radiotherapy. **Methods:** Preoperatively, every osseous jaw reconstruction undergoes virtual surgical planning to incorporate the placement of endosseous implants into the fibula osteocutaneous free flap. The dental implants are then placed intraoperatively at the time of tumor ablation and reconstruction. Four-to-six weeks following the initial surgery, the patient returns to the operating room for vestibuloplasty and exposure of the dental implants. Within 3 days of the vestibuloplasty, a temporary dental prosthesis is placed in the dental clinic, and the patient can then begin radiation therapy if needed. Following adjuvant radiation therapy, the temporary prosthesis can be replaced with a permanent one. **Results:** Immediate dental implants were placed in 23 patients between June 2017 – May 2018. Average number of implants placed per patient was 2.6 (range 1 – 5 implants). Thirteen patients underwent postoperative radiotherapy. There have been no implant failures. Average time to final prosthesis placement was 61.7 days (n = 10). **Conclusion:** At our institution, this innovative workflow has allowed for earlier aesthetic restoration of the jaw and greatly expanded the number of patients able to achieve oral rehabilitation following oncologic tumor ablation.

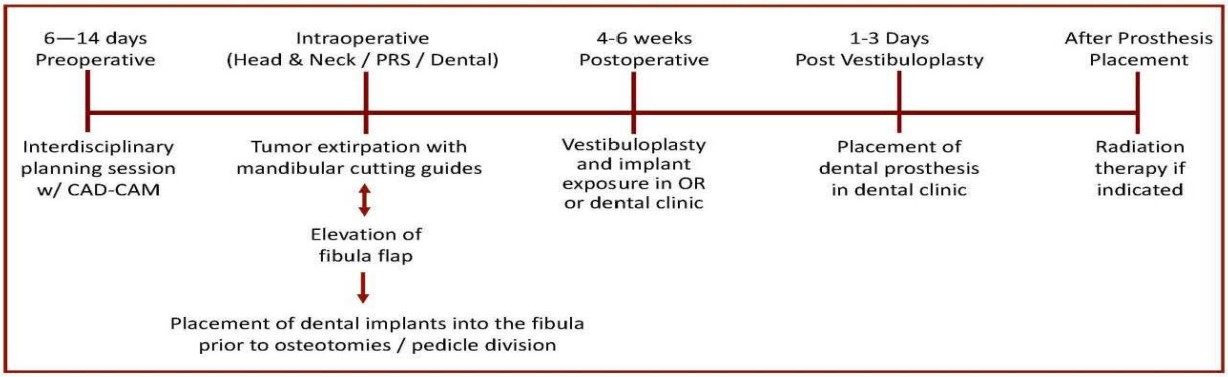


Figure 1. Workflow for dental rehabilitation in oncologic osseous jaw reconstruction. [CAD-CAM = Computer aided design and computer aided modeling; PRS = Plastic & reconstructive surgery].

7:25 AM - 7:30 AM

RM51 Customized Reconstruction Plates: The Latest Innovation in Mandibular Reconstruction with Free Fibula Flaps

Z-Hye Lee, New York

Presenter: **Z-Hye Lee, MD**

Z-Hye Lee, MD(1), David Daar, MD(1), John T Stranix, MD(1), Amanda K. Silva, MD(2), Adam S. Jacobson, MD(3) and Jamie P. Levine, MD(3)

(1)NYU Langone Medical Center, New York, NY, (2)Plastic and Reconstructive Surgery, University of Chicago Hospitals, Chicago, IL, (3)NYU Langone Health, New York, NY

Background

The free fibula flap remains the workhorse for mandible reconstruction. The advent of virtual surgical planning (VSP) has contributed to a number of technical advancements allowing for more complex and sophisticated procedures. We present our experience on the latest modification of this technology: the use of a preoperatively customized reconstruction plate for fixation.

Methods

A retrospective chart review was performed on all patients undergoing mandibular reconstruction with virtually planned free fibula flaps at a single institution between 2008 and 2018. Patient demographics, perioperative characteristics and postoperative outcomes were reviewed. Reconstructions utilizing traditional fixation methods were compared to those utilizing pre-fabricated, patient-specific reconstruction plates.

Results

A total of 131 patients underwent mandibular reconstruction with free fibula flap. The average age was 50.9 +/- 23.1 (range 10-84) and 40.5% were male. The mean follow-up time was 19.9 months. 58.8% of reconstructions were performed for malignancy. The most common benign diagnosis was ameloblastoma (24.4%). The mean number of segments was 2.33 with 38.9% and 37.4% utilizing two and three segments respectively. 26.0% of reconstructions utilized double-barreling technique and 26.7% of reconstructions crossed midline. A customized plate was used in 42.0% of cases with 87.4% of all cases utilizing this method since its initial development. The average operative time was 673 +/- 144.4 minutes. Reconstructions utilizing the patient-specific plates had significantly shorter total operative times compared to reconstructions utilizing non-customized fixation methods (636.8 vs. 713.7 minutes, p=0.008). Hardware complications occurred in 4.6% (n=6, 2 exposures, 4 hardware failure) of patients, all in non-customized fixation methods while were no hardware complications for any reconstruction utilizing the patient-specific customized plates (p=0.033). There was a trend towards lower flap failure rates in the customized plate group compared to traditional fixation method group (1.8% vs. 9.2% respectively, p=0.14).

Conclusion

Compared to traditional fixation methods, patient-specific plates are associated with overall shorter operative times and significantly reduced hardware complications. The use of customized

reconstruction plates is an important component in increasing efficiency and accuracy and it represents the latest technological innovation in mandibular reconstruction.

Figure 1. Customized reconstruction plate for 3-segment double-barrel fibula flap (corresponding blue double-circles are shown on the fibula cutting guide and on the custom reconstruction plate on the neomandible)

7:30 AM - 7:35 AM

RM52 When in Doubt Take It out: Functional Resortation of Subtotal Hemimandibulectomy Defects Does Not Require Condylar Preservation

New York-Presbyterian Hospital - Weill Cornell Medicine, New York

Presenter: **Adam S Levy, MD**

Adam S Levy, MD(1), Daniel Lara, BS(2), Alexandra J Lin, BA(3), Christine Rohde, MD(4), David I Kutler, MD(1), Gwendolyn S Reeve, DMD(1) and Jason A Spector, MD, FACS(3)

(1)Weill Cornell Medical College, New York, NY, (2)Weill Cornell Medical Center, New York, NY, (3)Laboratory of Bioregenerative Medicine & Surgery, Weill Cornell Medical Center, New York, NY, (4)Division of Plastic Surgery, New York Presbyterian Hospital, Columbia University Medical Center, New York, NY

Background: Mandibular tumors or osteonecrosis may often involve a "hemi-mandible", though these pathologic processes usually spare the condyle, an integral component of the temporomandibular joint complex (TMJ). Subtotal resection of the hemi-mandible creates a complex reconstructive problem as the remaining condylar segment is small with questionable vascularity and insufficient surface area onto which hardware may be securely placed, increasing the risk of non-union and displacement. Alternatively, the uninvolved condylar segment may be resected with the specimen and a functional neo-condyle designed using pre-operative virtual planning. We reviewed our experience in those patients who underwent posterior mandibular reconstruction using vascularized fibula with or without condylar sacrifice and compared functional outcomes.

Methods: A retrospective chart review was performed of all patients undergoing free fibula reconstruction after hemi-mandible resection with and without condylar preservation between 2006-2017. Neo-condyles were designed with virtual planning to be seated 2-3 mm below the temporomandibular disc and were contoured intraoperatively to have a round shape. Post-operatively, patients who underwent neo-condylar reconstruction were kept in MMF for 4-6 weeks then placed in elastics. Outcomes measured included maximum interincisal opening (MIO), occlusion, and type of diet obtained.

Results: Of 85 total patients identified during the study period, fifteen underwent condylar resection with neo-condyle creation. Patient demographics were similar between groups of patients with and without condylar resection. Of patients that underwent condylar resection, 13/15 patients were able to tolerate regular diet at the time of follow up (mean 14 months). Two patients were unable to resume normal diet after 20 months and required long-term supplemental enteral feeding. Another three patients developed trismus/ankylosis with reduced MIO (10/15/20), of which two could only tolerate a soft diet. All three patients with trismus were radiated. The other 10 patients with neo-condyles retained normal occlusion and MIO distance. Rates of reduced MIO, occlusion and final diet were similar to the 70 patients that did not undergo condylar resection.

Conclusion: Fabrication of a neo-condyle using a vascularized fibula flap is a straightforward and reliable procedure that produces excellent outcomes. As the osteosynthesis of the condylar remnant to the fibula flap can be technically challenging, we propose routine discarding of the

condylar remnant in order to make surgical reconstruction of subtotal mandibulectomy a technically simpler procedure.

7:35 AM - 7:40 AM

RM53 Utilizing "Blackbone" MRI to Create Prefabricated Surgical Implants: A Means to Reduce Radiation Exposure with Accurate Surgical Outcomes

Mayo Clinic, Rochester

Presenter: **Marissa Suchyta, BA**

Marissa Suchyta, BA(1), Waleed Gibreel, MD(1), Christopher H Hunt, MD(1), M. Diya Sabbagh, MD(1), Krzysztof R Gorny, PhD(1) and Samir Mardini, M.D.(2)

(1)Mayo Clinic, Rochester, MN, (2)Plastic Surgery, Mayo Clinic, Rochester, MN

Background

From 1990 to 2007, the number of CT scans in the United States rose from 13 million to 72 million. Accurate bone imaging enables advances in reconstructive surgery, including the ability to design 3-D printed, prefabricated surgical implants. However, CT radiation exposure also increases carcinogenesis risk. The purpose of this project is to demonstrate that an MRI scanning technique that demonstrates bone clearly (BlackBone MRI) can be used instead of CT for prefabricated implant creation with comparable surgical accuracy outcomes.

Methods

This study included ten cadaver heads. A mock orbital floor reconstruction with prefabricated, cadaver-specific polyethylene implants was planned. Five of these surgeries were planned and implants were created utilizing BlackBone MRI, whereas the other five were planned and implants created using CT scans. After mock surgeries were performed and implants were placed, all specimens underwent a post-operative CT scan. 3d reconstruction of scans was performed and surgical accuracy and implant position compared to the virtual plan was assessed using GeoMagic Wrap, assessing average post-operative deviation and position of the orbital implants from plan.

Results

Ten mock orbital floor reconstructions were successfully performed. Subjective placement of implants was comparable between those created from BlackBone MRI and CT scans. Position of implants created from BlackBone MRI demonstrated high calculated accuracy in position to surgical plan. There was not statistically significant difference in average implant deviation from planned position and size when BlackBone MRI was used versus CT scanning to guide implant creation.

Conclusion

This study demonstrates that BlackBone MRI can be used with comparable accuracy to CT scans to create prefabricated surgical implants for facial reconstruction. This could dramatically reduce radiation exposure for patients. The successful segmentation, virtual planning, and 3d printing of accurate prefabricated implants from BlackBone MRI therefore demonstrates the potential to change the pre-operative planning standard of care.

7:40 AM - 7:45 AM

RM54 Botulinum Toxin a Neuromodulation for Arterial Graft Spasm Prevention in Cerebral Revascularization Surgery

Keck School of Medicine, University of Southern California, Los Angeles

Presenter: **Erik M Wolfswinkel, M.D.**

Erik M Wolfswinkel, M.D.(1), Kristine Ravina, MD(1), Ben A Strickland, MD(1), Robert C Rennert, MD(2), Joshua Bakhsheshian, MD(1), Sebina Bulic, MD(1), Adrian J Correa, MD(1), Alice Chun, .(1), Arun Amar, MD(1), Jonathan J Russin, MD(1) and Joseph N Carey, MD(3)

(1)Keck School of Medicine, University of Southern California, Los Angeles, CA, (2)University of California at San Diego, San Diego, CA, (3)Plastic and reconstructive surgery, Keck School of Medicine, University of Southern California, Los Angeles, CA

Background:

Graft spasm is a formidable complication of bypass procedures and can result in ischemia and graft thrombosis. Limb arteries, typically utilized in cerebral revascularization due to the ease of access and harvest, are considered spastic due to the high abundance of myocytes and vasoconstrictor receptors. In cardiac revascularization literature, recently reported descending branch of the lateral circumflex femoral artery (DLCFA) and radial artery (RA) graft patency rates are about 98 and 92% in short and 94 and 81% in long term, respectively. RA graft occlusion/severe stenosis rate has been reported up to approximately 50% at mean follow up 1.5 years. Botulinum toxin A (BTX) neuromodulation presents a novel approach for arterial graft spasm prevention. We report our current institutional experience using BTX for EC-IC bypass graft spasm prevention.

Methods:

Retrospective review of a prospectively maintained, Institutional Review Board approved database was performed to identify all EC-IC revascularization patients whose interposition grafts were treated with BTX. Patient demographic data, surgical indications, recipient and donor site, surgical procedure details along with information on bypass patency were analyzed.

Results:

N=17 patients underwent EC-IC revascularization using a bypass graft treated with BTX *ex vivo* prior to anastomosis. Graft patency was evaluated at median (range) 11 (1-60) days postoperatively. The indications for the EC-IC bypass included ruptured intracranial aneurysm in n=5/17, medically refractory internal carotid artery (ICA) occlusion in n=4/17, unruptured intracranial aneurysm in n=2/17, ICA dissection in n=2/17, symptomatic middle cerebral artery (MCA) occlusion in n=2/17, ruptured intracranial aneurysm with bilateral ICA stenosis in n=1/17 and moyamoya disease in n=1/17 patients. Interposition graft types included DLCFA in n=12/17, RA in n=3/17 and posterior tibial artery in n=2/17 patients. The most common donor and recipient vessels were the superficial temporal artery and MCA, respectively, in n=13/17 patients. The bypass procedure was technically successful in all cases. No asymptomatic graft spasm was identified. Symptomatic graft spasm occurred in one (5.9%) patient treated with posterior tibial artery graft. Asymptomatic graft occlusion occurred in one (5.9%) patient during

short term follow up. Histopathological analysis of the treated vessels demonstrated no endothelial or vessel wall injury.

Conclusion s:

*Ex vivo*BTX treatment presents a promising method for EC-IC bypass graft spasm prevention. Initial cases have not revealed any clinical safety concerns and radiographic appearances have been markedly improved compared with prior clinical experience. Further studies are nevertheless needed to elucidate long-term graft patency rates in larger cohort of patients.

7:50 AM - 7:55 AM

RM55 Superficial Temporal Artery Perforator (STAP) Flaps for Intraoral Defects: Technique and Flap Design

Rutgers New Jersey Medical School, Newark

Presenter: **Jerette J Schultz, MD**

Jerette J Schultz, MD, Stephen L Viviano, M.D., Paul J Therattil, M.D. and Jonathan D. Keith, MD

Rutgers - New Jersey Medical School, Newark, NJ

Background

Intraoral defects after tumor resection are often reconstructed with free flaps. However, regional flaps based on the superficial temporal artery can be useful in patients who are not good candidates for free tissue transfer. Flaps based on the anterior branch of the superficial temporal artery have been previously described. Here, we present our novel technique to reconstruct intraoral defects with the superficial temporal artery perforator (STAP) flap either based on the anterior or posterior branch. The choice of which perforator to use was based on preoperative planning with external Doppler, SPY angiography, and FLIR thermal imaging.

Methods

A retrospective chart review was performed for STAP flaps used for intraoral defects by a single surgeon. External doppler, intraoperative indocyanine green laser angiography, and FLIR thermal imaging were used preoperatively to identify the best perforators and plan for flap design (Figure 1). The skin paddles were tunneled in a facelift plane and over the zygoma into the oral cavity for inset (Figure 2).

Results

Three patients underwent superficial temporal artery perforator (STAP) flaps for intraoral defects including the hard palate, buccal sulcus, floor of mouth, and retromolar trigone. All patients had either prior radiation or prior resection and reconstruction, making them poor free flap candidates. The mean age was 76 (71-84) and average follow up was 2 months. There were no flap losses and no donor site complications. One patient had partial flap necrosis that healed after revision in the operating room (Figure 3). Two donor sites were closed primarily, while one required a full thickness skin graft.

Conclusion

The superficial temporal artery perforator flap is a useful regional flap for intraoral defects after tumor resection. The benefits of this flap compared to free flaps are a decreased anesthesia time, less donor site morbidity, and no need for post-operative monitoring. External Doppler, intraoperative indocyanine green laser angiography, and FLIR thermal imaging are useful modalities to find the best perforators to design the flap.

Figure 1: Flap planning with FLIR thermal imaging. External Doppler signal previously marked with line and strong perforator from SPY angiography marked with circle.

Figure 2. **A.** Case 1: Intraoral defect with exposed mandible after resection of recurrent squamous cell carcinoma. **B.** STAP flap based on posterior branch perforator after dissection. **C.** Full coverage of intraoral defect after flap inset

Figure 3. **A.** Healed STAP flap after revision. **B.** Healed donor site.

7:55 AM - 8:00 AM

RM56 Breaking Down Silos: The State of Interdisciplinary Collaboration in Head and Neck Reconstruction

New York University Langone Medical Center, New York

Presenter: **Amanda K. Silva, MD**

Amanda K. Silva, MD(1), Eduardo D. Rodriguez, MD, DDS(2), Adam S. Jacobson, MD(3) and Jamie P. Levine, MD(3)

(1)Plastic and Reconstructive Surgery, University of Chicago Hospitals, Chicago, IL, (2)NYU Langone Medical Center, New York, NY, (3)NYU Langone Health, New York, NY

Background: Head and neck cancer patients often require complex reconstruction. Various specialties can undergo training to perform head and neck reconstruction, and each group provides a special background and skillset. Collaboration amongst these groups has the potential to lead to better quality care. The aim of this study was to determine the degree of focus on head and neck reconstruction at national meetings for each specialty and the degree of interdisciplinary collaboration. We additionally sought to define areas of expertise within each specialty and identify areas for potential collaboration.

Methods: Oral abstracts for the past 5 years at the main academic meeting in reconstructive microsurgery or head and neck surgery in the disciplines of Plastic Surgery (PRS), Otolaryngology (ENT), and Oral Maxillofacial Surgery (OMFS) were reviewed.

Results: The American Society for Reconstructive Microsurgery (ASRM) has had the greatest proportion of abstracts with a head and neck or general microsurgery focus (N=185/684, 27.0%) followed by the American Association of Oral and Maxillofacial Surgeons (AAOMS) (N=42/239, 17.6%) and American Head and Neck Society (AHNS) (N=127/1077, 11.8%). However both ASRM and AAOMS have shown a decline in this focus compared to AHNS, which has held a steady percentage (Figure 1).

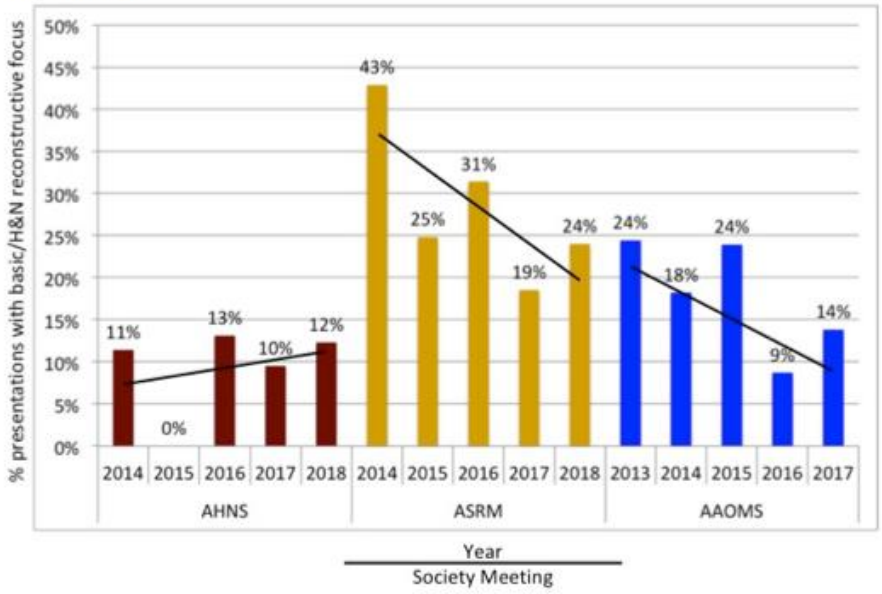
PRS and ENT surgeons presented mainly at their own society conference (96% and 98.8% respectively), but OMFS authors were more likely to present outside their specialty (27.9%). AAOMS represented a higher rate of interdisciplinary collaboration at U.S institutions (N=5/27, 18.5%) compared to ASRM (N=6/55, 10.9%) and AHNS (N=5/49, 10.2%). Thirteen U.S. institutions have participated in interdisciplinary collaboration over the past 5 years (Table 1). Of the U.S. institutions presenting at the national meetings, 40% (22/55) at ASRM, 36.7% (18/49) at AHNS, and 48.1% (13/27) at AAOMS have potential collaborators at their institution in the other specialties; representing 23 institutions where collaboration could occur.

Abstracts focused on education/special interest, flap anatomy/physiology, microsurgery technique, nerve, and advanced flap techniques were significantly more often presented at ASRM. Abstracts focused on dental implants and temporomandibular joint were most often presented at AAOMS. Abstracts focused on perioperative management and specific location reconstruction were significantly more often presented at AHNS (Table 2).

Conclusion: The rate of interdiscliplinary collaboration for head and neck reconstruction within U.S. institutions is low compared to what is possible. PRS, ENT, and OMFS focus on different

areas of head and neck reconstruction research, and therefore have much to gain from working together.

Figure 1. Proportion of presentations with basic or head and neck reconstructive focus over time



AHNS - American Head and Neck Society, ASRM - American Society for Reconstructive Microsurgery, AAOMS - American Association of Oral and Maxillofacial Surgeons

Table 1. U.S. Institutions with interdisciplinary collaboration

Mayo Clinic
Memorial Sloan Kettering Cancer Center
Montefiore Medical Center
New York University
Northwell Health
Oregon Health & Science University
University of Iowa
University of Kansas
University of Maryland
University of Michigan
University of Pennsylvania
Weill Cornell Medical Center
Yale

Table 2. Representation of research topics at each meeting

	AHNS		ASRM		AAOMS		p-value*
Topic	N	%	N	%	N	%	
Basic science	5	16.7%	17	56.7%	8	26.7%	0.439
Dental implants	4	23.5%	2	11.8%	11	64.7%	0.169
Economics	6	60.0%	4	40.0%	0	0.0%	0.656
Education/special interest	3	11.1%	24	88.9%	0	0.0%	<0.001
Experience with a flap	19	63.3%	11	36.7%	0	0.0%	0.070
Flap anatomy/physiology	2	10.0%	18	90.0%	0	0.0%	<0.001
Innovation	2	66.7%	1	33.3%	0	0.0%	1.000
Microsurgery technique	4	19.0%	17	81.0%	0	0.0%	<0.001
Nerve	1	5.3%	16	84.2%	2	10.5%	<0.001
Outcomes	13	52.0%	10	40.0%	2	8.0%	0.258
Perioperative management	41	60.3%	25	36.8%	2	2.9%	0.003
Preoperative planning	9	37.5%	13	54.2%	2	8.3%	0.773
Special population	2	16.7%	7	58.3%	3	25.0%	0.684
Specific location reconstruction	14	53.8%	7	26.9%	5	19.2%	0.002
Temporomandibular joint	0	0.0%	1	14.3%	6	85.7%	0.290
Advanced flap techniques	2	13.3%	12	80.0%	1	6.7%	0.003

AHNS - American Head and Neck Society, ASRM - American Society for Reconstructive Microsurgery, AAOMS - American Association of Oral and Maxillofacial Surgeons
*Fisher's exact test

8:00 AM - 8:05 AM

RM57 Outcomes Following Transmaxillary Endoscopic-Assisted Insetting of Free Flaps for Reconstruction of Large Anterior Skull Base Defects

Uppsala University Hospital, Uppsala

Presenter: **Andres Rodriguez, MD, PhD**

Andres Rodriguez, MD, PhD(1), Maria Mani, MD, PhD(2), Adnan Lidian, MD, PhD(2) and Jerker Stigare, MD(2)

(1)Department of Plastic and Maxillofacial Surgery, Uppsala University Hospital, Uppsala, Sweden, (2)Uppsala University Hospital, Uppsala, Sweden

Background

Minimally endoscopic approaches continuous to evolve in the management of anterior skull base tumors allowing for resection of large tumors with less morbidity. However, to be able to perform an adequate insetting of a free flap after large defects in the anterior skull base that include duramater, it is usually necessary to have a wider surgical approach including a craniectomy. Herein we present the surgical technique and preliminary outcomes of an innovative approach for insetting of free flaps in anterior skull base reconstruction through a transmaxillary endoscopic-assisted insetting (TEI).

Methods

A retrospective chart review was performed in 6 patients that received 7 free flaps using the TEI approach for reconstruction of large anterior skull base defects between june 2016 and January 2018. We present the surgical technique and review the clinical outcomes.

Results

Seven free flaps (4 vastus lateralis, 1 adipofascial ALT, 1 adipofascial radial, 1 fibula flaps) in six patients (5 males, 1 female) were performed for anterior skull base reconstruction using the TEI approach. The average age was 44 yo (Range 3 to 71 yo). All flaps survived but one that presented a vascular thrombosis day 6 postoperative after cheek abscess. In 2 cases, is was necessary to reposition the flap postoperative and in 1 case due to permanent CSF leak a second free flap was needed to seal the dura defect from the contralateral side. In all cases stable coverage of the brain was achieved with a mean follow-up of 12,8 months (Range 1 to 22 months)

Surgical Technique : an intraoral mucosal incision is perform and the anterior wall of the maxilla is removed with attention to preserve the dental roots; next, communication between the oral cavity and the skull base is performed with an endoscope; the facial vessels are exposed at the neck level and a subcutaneous tunnel is perform for the vascular pedicle of the flap to reach from the enter in the maxilla to the neck; Finally the flap is inserted and vascular anastomosis are performed.

Conclusion

TEI of free flaps for skull base reconstruction is technically reliable approach and allows the transfer of large vascularize tissue to seal properly big defects in the anterior skull base by using a minimally invasive approach without the need of a craniectomy. Adequate flap positioning is one of technical challenges with this approach and therefore need a relevant learning curve.

8:10 AM - 8:15 AM

RM58 Microvascular Head and Neck Reconstruction in Hypercoagulable Patients: Is It Safe?

University of Kansas Medical Center, Kansas City

Presenter: **Katie Egan, MD**

Katie Egan, MD, Trang Nguyen, BA, Danielle Crowe, RN, Wojciech Przylecki, MD and Brian T Andrews, MD, MA

Plastic and Reconstructive Surgery, University of Kansas Medical Center, Kansas City, KS

Background: Inherited coagulopathies affect 15% of the general population and 1% of the US population has had a previous thrombotic event. Inherited coagulopathies and previous thrombotic events are considered contraindications by many surgeons to microvascular reconstruction. We hypothesize that with proper planning, head and neck microvascular reconstruction can be successfully performed in the hypercoagulable patient.

Methods: A retrospective review was conducted of subjects who underwent microvascular head and neck reconstruction at a tertiary medical center over a six year period. Hypercoagulable subjects were defined as having an inherited coagulopathy or previous thrombotic event. Peri-operatively, subjects were treated with individualized anticoagulation protocols. Outcomes studied were microvascular flap complications (arterial/venous thrombus and/or flap loss) and patient related complications such as hematomas and thrombotic events including deep venous thrombosis (DVT), pulmonary embolism (PE) and death.

Results:

A total of 137 head and neck microvascular reconstructive flaps were performed during the study period. A pre-operative hypercoagulable condition was identified in 24 subjects who underwent 28 flaps (20.4%). A pre-operative thrombotic event occurred in 23 of 24 subjects (95.8%): 18 of 23 subjects (78.3%) with a history of DVT, 5 subjects (21.7%) with a previous PE, and 5 subjects (21.7%) with a thrombotic stroke before age 50. The majority of thrombotic events were attributed to malignancy or trauma. An inherited coagulopathy was identified pre-operatively in 5 of 24 subjects (20.8%), including 2 subjects with heparin induced thrombocytopenia and 1 subject each with Factor V Leiden, methylenetetrahydrofolate reductase gene mutation (MTHFR), and elevated Factor VIII. Reconstruction was completed for malignancies in 19 of 28 flaps (67.9%), trauma in 7 flaps (25.0%) and cranial osteomyelitis in 2 flaps (7.1%). All flaps were successful; however, 2 flaps required salvage from thrombotic events (1 arterial and 1 venous) on post-operative day 1. In addition, 2 of 28 flaps (7.1%) had partial flap necrosis that did not compromise reconstruction after flap advancement. Patient related complications occurred in 7 of 24 subjects (29.2%): 5 hematoma (20.8%), 2 PEs (8.3%), 1 DVT (4.2%), and 1 death (4.2%) from an undetermined cause in a subject with persistent glioblastoma.

Conclusion: In our experience, microvascular head and neck reconstruction can be successfully performed in hypercoagulable subjects. The use of customized anticoagulation protocols may reduce the risk of thrombotic events; however, patient related complications remain a concern in these subjects.

8:15 AM - 8:20 AM

RM59 The Free Lateral Forearm Flap in Head and Neck Reconstruction: An Attractive Alternative to the Radial Forearm

MD Anderson Cancer Center, Houston

Presenter: **John Shuck, MD**

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Background:

The lateral forearm flap, in contrast to the lateral arm flap, is a thinner flap harvested directly over and distal to the lateral epicondyle. It excludes the distal upper arm and is a non-perforator-based flap supplied by the axial, end-perfusion of the anterior branch of the posterior radial collateral artery. Although the radial forearm flap is a workhorse for head and neck reconstruction, it creates considerable donor site morbidity. The lateral forearm flap is an attractive alternative, providing equivalent pedicle length and primary donor site closure. Initial cadaveric and clinical case reports questioned the reliability of this flap. The purpose of this study is to assess the reliability of the free lateral forearm flap for head and neck reconstruction.

Methods:

We performed a retrospective review at a single center of all patients who received a free lateral forearm flap for head and neck reconstruction between 2016-2018. Patient demographics, defect type, intra-operative, and post-operative complications, including flap compromise and donor site morbidity, were recorded. Detailed, descriptive intra-operative flap characteristics were also compiled.

Results:

Twenty lateral forearm flaps were harvested for hemiglossectomy (n=13), floor of mouth (n=4), facial (n=2), and orbital exenteration defects (n=1) There were no partial or complete flap losses with an average follow up of 34.7 weeks. Average pedicle length was 13.6 cm, and average flap size was 7.6 cm by 4.7 cm. (Figures 1. and 2.) The average arterial and venous pedicle diameter was 1.6 mm and 2.8 mm, respectively. The posterior brachial cutaneous nerve was spared in all patients, while the lateral brachial cutaneous nerve was divided in 30% (n=6/20). All donor sites were closed primarily and there were no long-term limitations with patient reported function or sensation. Complications included one donor site seroma and one intraoral dehiscence.

Conclusion:

Contrary to what was historically reported about the free lateral forearm flap, it appears to be a reliable alternative to the radial forearm flap in head and neck reconstruction. It provides a thin, pliable, fasciocutaneous flap with excellent pedicle length and minimal donor site morbidity.

Figure 1.

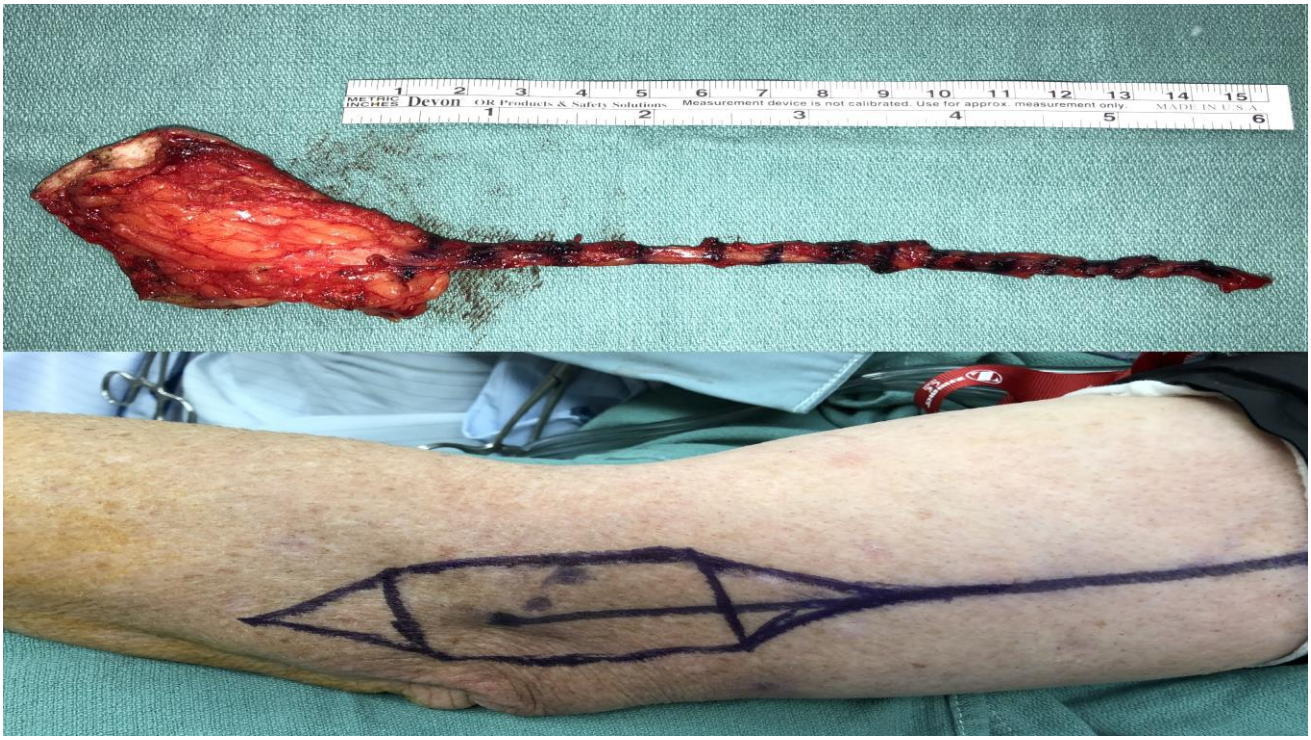
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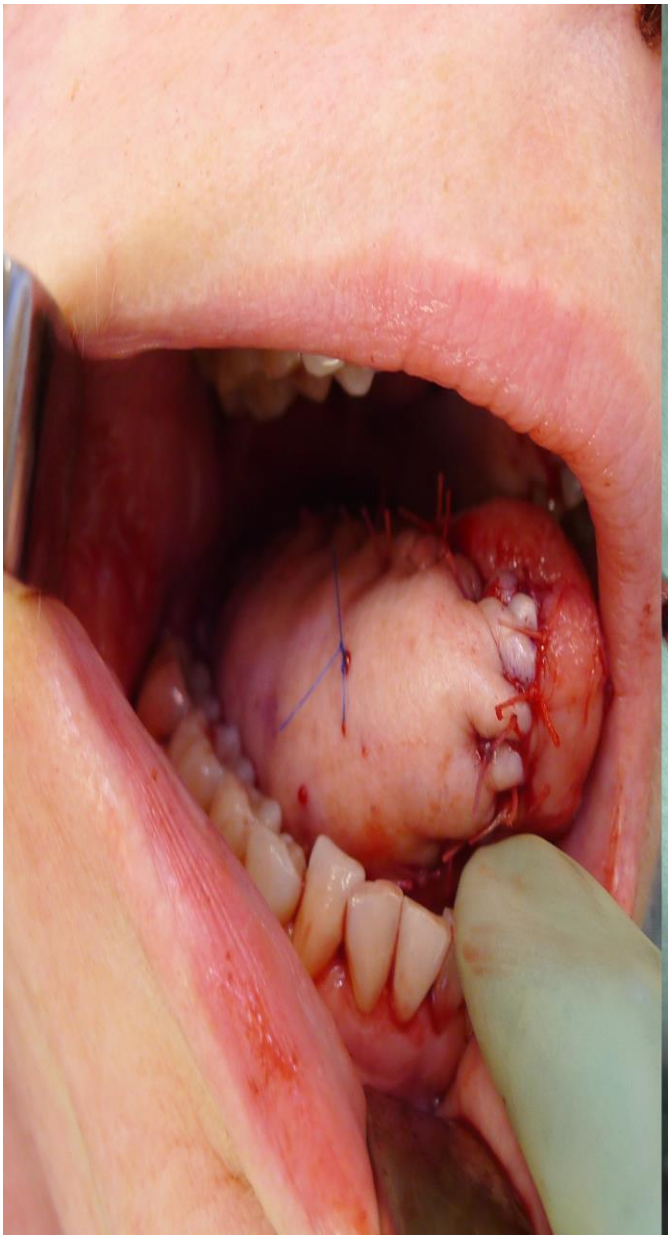
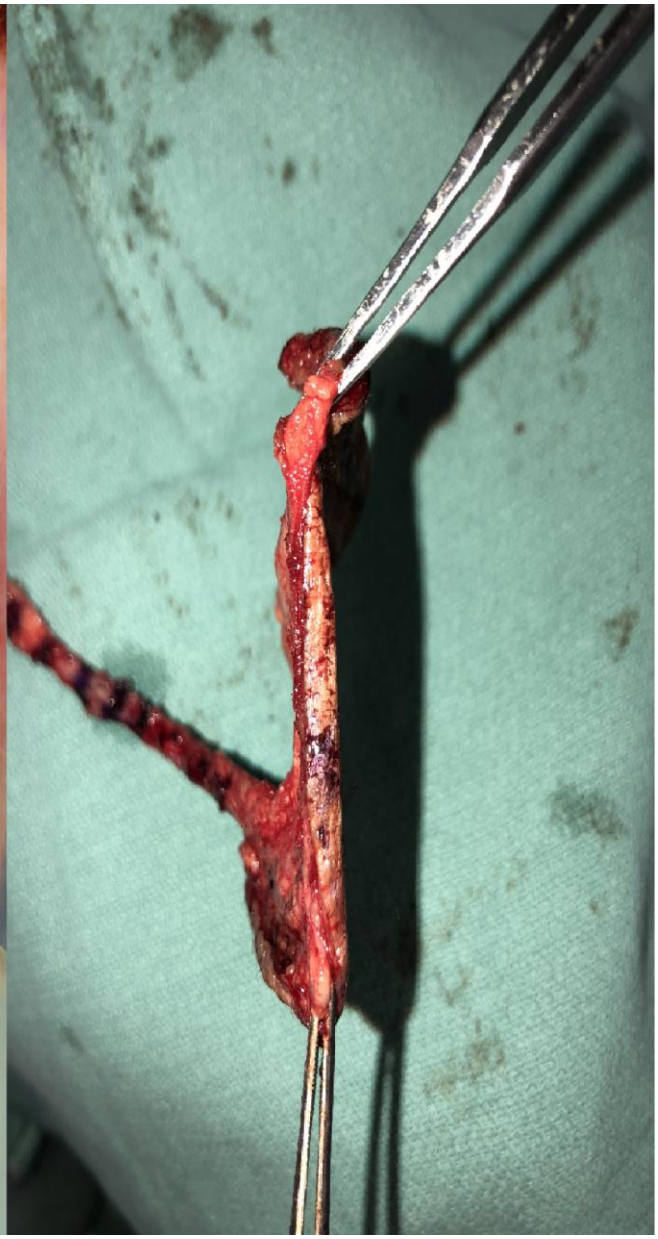
Figure 2.





8:20 AM - 8:25 AM

RM60 Utility of the Descending Branch of the Lateral Circumflex Femoral Artery As a Conduit for Extracranial-to-Intracranial Bypass

Keck School of Medicine, University of Southern Californi, Los Angeles

Presenter: **Erik M Wolfswinkel, M.D.**

Erik M Wolfswinkel, M.D.(1), Kristine Ravina, MD(1), Mark J. Landau, Ph.D.(1), Ben A Strickland, MD(1), Robert C Rennert, MD(2), Alice Chun, .(1), Jonathan J Russin, MD(1) and Joseph N. Carey, M.D.(3)

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Background:

Extracranial-intracranial (EC-IC) bypass remains an important tool in cerebrovascular surgery. The choice of donor vessel and interposition graft depends on the recipient and donor vessel size and accessibility, the desired blood flow amount, the nature of the operation (emergent or elective), revascularization site anatomy and the pathology treated. The descending branch of the lateral circumflex femoral artery (DLCFA) is frequently utilized in microvascular surgery given its ease of harvest for most microvascular surgeons. DLCFA has a diameter of 2-3 mm and an average conduit length of approximately 9 cm. Unlike the radial artery, the DLCFA tends not to taper and is less prone to atherosclerotic changes and vasospasm.DLCFA use in cerebral revascularization has been rarely reported. We present the largest case series to date of EC-IC bypass utilizing the DLCFA interposition graft.

Methods:

Data from all patients undergoing EC-IC revascularization using a DLCFA graft was retrospectively obtained from an institutional review board-approved database. Patient demographic data, surgical indications, recipient and donor site, surgical procedure details along with information on bypass patency, neurologic outcomes and complications were analyzed.

Results:

Over the 26-month period since the introduction of DLCFA into cerebral revascularization at our institution, n=15 patients underwent EC-IC bypass using this interposition graft. The indications for the EC-IC bypass included ruptured intracranial aneurysm (n=7/15), unruptured intracranial aneurysm (n=3/15), internal carotid artery (ICA) dissection (n=2/15), medically refractory atherosclerotic ICA and middle cerebral artery (MCA) occlusion (n=2/15 and n=1/15, respectively). The most common donor and recipient vessels were the superficial temporal artery and MCA, respectively, in n=10/15 (66.7%) patients. N=3/15 (20%) patients suffered bypass surgery related complications in the form of graft harvest site hematoma (n=1/15), cerebrospinal fluid leak (n=1/15) and graft stenosis by an adventitial band (n=1/15). Asymptomatic graft spasm was identified in n=2/15 (13.3%) patients. Graft occlusion occurred in n=1/15 (6.7%) patient during short term follow up secondary to robust collateral circulation and was asymptomatic. Long-term follow-up data at median (range) 2 (1 – 2) months was available for n=8/15 patients.