

## WESTERN SECTION PROGRAM

FRIDAY, JANUARY 31, 2003

4:00 - **Registration** - Tuscany Foyer  
7:00

3:00 - **Speaker Ready Room** - Board Room  
9:00

6:00 - **Welcome/Presidents Reception** - Piazza  
8:00

SATURDAY, FEBRUARY 1, 2003

6:00 - **Speaker Ready Room** - Board Room  
9:00

7:00 - **Registration** - Tuscany Foyer  
Noon

7:00 - **Poster Viewing** - Tuscany Foyer  
1:00

7:00 - **Breakfast/Business Meeting (Members Only)** - Venetian  
7:50

7:00 - **Continental Breakfast with Exhibitors** - Tuscany I & II  
7:50

8:00 - **Scientific Sessions** - Tuscany III  
Noon

8:00 **Welcome and Introduction of Roger L. Crumley, MD\*, President**  
Gerald S. Berke, MD\*, Los Angeles, CA

8:05 **Presidential Address**  
Roger Crumley, MD\*, Irvine, CA

8:15 **Introduction of Guest of Honor, Harold C. Pillsbury, MD\*, Chapel Hill, NC**  
Gerald S. Berke, MD\*

**Guest of Honor Lecture: Revision Cochlear Implantation: The Role of the Audiologist and Surgeon in Decision Making**  
Harold C. Pillsbury, MD\*, Chapel Hill, NC  
Carol Gilmer, Audiologist, Chapel Hill, NC

**MODERATOR: WILLARD E. FEE, JR., MD\*, PALO ALTO, CA**

8:30 **Perioperative Parathyroid Hormone Levels in Thyroid Surgery**  
Frank M. Warren, MD, Portland, OR  
Peter E. Andersen, MD, Portland, OR  
Mark K. Wax, MD, Portland, OR  
James I. Cohen, MD, PhD, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the utility of perioperative PTH levels to identify patients at low risk of post-operative hypocalcemia.

**OBJECTIVES:** To determine the utility of perioperative parathyroid hormone measurement for identification of patients at low risk of postoperative hypocalcemia after thyroid surgery that places total parathyroid function at risk. **STUDY DESIGN:** Prospective case series. **METHODS:** Twenty-four patients undergoing total or completion thyroidectomy had blood samples for PTH measurement drawn prior to dissection, 10 minutes after the specimen removal and again in the post-anesthesia care unit (PACU). Serial ionized calcium levels were measured in the post-operative period. Preoperative, postoperative and PACU PTH levels were compared to postoperative ionized calcium levels. **RESULTS:** The average pre-, post-operative and PACU PTH values were 64.6 pg/ml (range 13-163), 37.3 pg/ml (range 0-120) and 34.5 (range 7-79), respectively. The incidence of hypocalcemia was 13% (3/24). The rate of hypocalcemia was significantly higher (38%) in patients with a post-resection PTH < 15 pg/ml relative to patients with post-resection PTH > 15 pg/ml (6%) in this setting (P=0.05). In addition, the rate of hypocalcemia was significantly higher in patients with a PACU PTH < 11 pg/ml (50%) relative to patients with PACU PTH > 11 pg/ml (10%)(P=0.05). Among these patients, an increasing PTH level in the PACU relative to the post-resection value predicted normocalcemia without calcium supplementation (P=0.04). **CONCLUSIONS:** This study demonstrates that the immediate post resection and PACU PTH values can help predict those patients who are at highest risk for post-operative hypocalcemia.

8:40 **Swallowing Function and Tracheotomy Dependence After Combined Modality Treatment Including Free Tissue Transfer for Advanced Stage Oropharyngeal Cancer**  
Judith M. Skoner, MD, Portland, OR  
Peter E. Andersen, MD, Portland, OR  
James I. Cohen, MD, PhD, Portland, OR  
John J. Holland, MD, Portland, OR  
Eric J. Hansen, BS, Portland, OR

Mark K. Wax, MD, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the time to initiation of oral intake, final swallowing status and time to decannulation in patients with advanced oropharyngeal cancer treated with combined modality therapy including free tissue transfer.

**OBJECTIVES:** There are many treatments available for advanced oropharyngeal cancer. Organ sparing protocols reserve surgery for salvage and are felt to provide adequate rehabilitation. Surgical resection with free tissue transfer may also provide adequate functional rehabilitation. Our objective is to describe the time to initiation of oral intake, posttreatment swallowing status and time to decannulation in a series of patients treated with combined modality therapy including free tissue transfer reconstruction. **STUDY DESIGN:** Retrospective review. **METHODS:** Patient data was obtained from hospital records of 46 patients with Stage III/IV oropharyngeal carcinoma treated with surgery and postoperative radiation at a tertiary academic center from 1985 - 2001. Twenty of these patients had free flap reconstruction and >6 month follow-up, with the following variables identified: age, type of free tissue transfer, perioperative feeding, length of time to oral intake, post-treatment swallowing status and time to decannulation. **RESULTS:** Of 20 patients identified, free flap reconstructions included 13 radial forearm fasciocutaneous, 5 fibula osteocutaneous, 1 ulnar fasciocutaneous, and 1 jejunal free flap. Two patients underwent total laryngectomy, and the remaining 18 were decannulated. Average time to decannulation was 16.6 days postoperatively (range 7-41); no patient required recannulation. All patients were NPO immediately postoperatively and received tube feedings. After surgery and prior to radiation (average 42 days), 12 patients initiated oral intake at an average 18.5 days postoperatively (range 7-28); 6 required no additional enteral supplementation. By 6 months postoperatively, following radiation therapy, 11 patients still required tube feeding supplementation; 9 were also taking recreational oral intake; 2 who had gastrostomy tubes preoperatively had no further deterioration in swallowing function. **CONCLUSIONS:** Combined modality treatment including surgical resection with free tissue transfer for advanced stage oropharyngeal cancer may provide reasonable functional rehabilitation with respect to postoperative airway and swallowing function.

#### 8:50 Numeracy and the Shortcomings of Utility Assessment in Head and Neck Cancer

Seth R. Schwartz, MD, MPH, Seattle, WA  
Jennifer A. McDowell, MS, Seattle, WA  
Bevan Yueh, MD, Seattle, WA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain that utility assessment is an alternative method for measuring quality of life in head and neck cancer patients, and to discuss the concept of numeracy and how numerate patients may respond differently to utility measures than non-numerate patients.

**OBJECTIVES:** Because survival differences between surgical and non-surgical treatment for head and neck cancer (HNC) are hard to detect, increasing focus has been placed on quality of life (QOL) differences after treatment. Utility assessment is increasingly used to measure QOL. Evidence suggests that a patient's comfort with numerical concepts ("numeracy") may influence utility measures. We hypothesize that patients who are non-numerate provide inconsistent utility data in QOL studies. **STUDY DESIGN:** Cross sectional cohort. **METHODS:** New HNC (n=26) patients were recruited to participate. Patients completed a numeracy questionnaire, a utility assessment, and a global QOL questionnaire. Higher scores reflect better function. Interviewers rated the functional level of each patient. For both numerate and non-numerate patients, utility scores were compared to global QOL (good vs. poor) and observer-rated function. **RESULTS:** Eleven of 26 patients were numerate (43%). Numerate patients who rated their QOL as good had significantly higher utility scores than patients with poor QOL (0.95 vs. 0.43, p=0.03). In contrast, non-numerate patients with good QOL had lower utility scores than patients with poor QOL (0.45 vs. 0.77, NS). Utility scores for numerate patients correlated well with observer rated function ( $\kappa = 0.41$  to  $\kappa = 0.57$ ) while those of non-numerate patients did not ( $\kappa = -0.16$  to  $\kappa = 0.06$ ). **CONCLUSIONS:** The majority of our patients were not numerate. QOL evaluation through utility assessment may provide inaccurate and contradictory data about patient functioning for non-numerate patients. This may confound QOL assessment when interpreting utility data.

#### 9:00 Reversal of Laryngotracheal Separation: A Detailed Report With Long-Term Follow-Up

Steven D. Pletcher, MD, San Francisco, CA  
Aditi H. Mandpe, MD, San Francisco, CA  
Mark I. Block, MD, Charleston, SC  
Steven W. Cheung, MD, San Francisco, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the Reversibility of Laryngotracheal Separation.

**OBJECTIVES:** To demonstrate the reversibility of laryngotracheal separation with detailed long-term follow-up. **STUDY DESIGN:** Case report. **METHODS:** We review the case of a 62 year-old man who underwent successful surgical restoration of swallowing and voicing functions through reversal of a laryngotracheal separation performed for intractable aspiration. A five year follow-up, including sequential videoscopic barium swallow and laryngeal videostroboscopic examinations are presented. **RESULTS:** The patient developed life-threatening aspiration following a mid-brain stroke. He recovered substantially from the cerebrovascular insult but remained enteral tube dependent for alimentation and developed a laryngeal stump leak that soiled the tracheal stoma. Preoperative assessment revealed a paretic left vocal fold and tight upper esophageal sphincter. The patient's glottic function was restored by first performing a cricopharyngeal myotomy to restore oral alimentation. The continuity of laryngotracheal conduit was then re-established in a second procedure. The patient has excellent swallowing and voicing functions at long-term follow-up. **CONCLUSIONS:** Laryngotracheal separation can be successfully reversed with restoration of normal swallowing and voicing abilities.

#### 9:10 Mycobacterial Infection in the Field of Otolaryngology and Role of Surgery in Drug Resistant Tuberculous Cervical Lymphadenitis

Bo S. Kao, MD, Taipei, Taiwan ROC  
Shih H. Lo, MD, Taipei, Taiwan ROC (Presenter)  
Yen L. Chang, MD, Taipei, Taiwan ROC  
Jin S. Hong, MD, Taipei, Taiwan ROC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to know TB can emerge from a variety of region in ENT field with or without pulmonary involvement. We share our experience of Tuberculosis distribution in ENT field, including lymphadenitis, laryngeal TB, submandibular TB, nasopharynx TB, parotid TB, tonsil TB, and nasal TB. Surgery, including neck dissection, plays an important role for the cases poor response to anti-TB medication.

**OBJECTIVES:** Tuberculosis (TB) infection has afflicted human for thousands of years until advent of anti-mycobacterial agent. However, infection due to tuberculosis has increased in recent years. Tuberculosis also has a wide variety of distribution and seems to become more resistant to medication nowadays. Distribution of TB in the ENT field and role of surgery in TB infection were discussed. **STUDY DESIGN:** Tracing back cases diagnosed as tuberculosis (pathologic standard was caseous granulomatous necrosis) in the ENT field by either biopsy or operation from 1996 June to 2001 June, 31 cases were found. **METHODS:** Cases were analyzed according to distribution in ENT field, concomitant pulmonary tuberculosis, acid-fast stain positive rate, and role of surgery. **RESULTS:** Tuberculosis in the ENT field were: TB lymphadenitis 15 cases (48.4%), laryngeal TB 5 cases (16.1%), submandibular TB 4 cases (12.9%),

nasopharynx TB 3 cases (9.7%), parotid TB 2 cases (6.5%), tonsil TB 1 case (3.2%), nasal TB 1 case (3.2%). 3 cases received diagnostic aspiration but none revealed TB. 12 cases (38.7%) revealed pulmonary TB in chest film. Pathologic findings revealed acid-fast bacilli in 10 cases (32.3%). Surgical management included: regional neck dissection in 6 cases, neck mass extirpation in 5 cases (in cases with single neck mass), laryngoscopic surgery in 5 cases, submandibular tumor extirpation in 4 cases, neck mass excisional biopsy in 4 cases (in cases with multiple neck mass), nasopharynx biopsy in 3 cases, parotidectomy in 2 cases, nasal tumor excision in 1 case, tonsil biopsy in 1 case. All cases were referred to TB center for treatment after operation. Postoperative follow-up revealed 4 cases with residual neck mass unresponsive to anti-TB medication for 1 year. All these 4 cases received further regional neck dissection and 3 cases revealed necrotic TB lymphadenitis, 1 revealed mixed tumor. None revealed recurrence in the follow up. **CONCLUSIONS:** TB nowadays can emerge primarily from a variety of region in ENT field without pulmonary involvement. Management of drug-resistant TB should include surgery and non-tuberculosis pathology should be considered.

#### **9:20 Outpatient Endoscopic Zenker's Diverticulotomy**

Neil D. Gross, MD+, Portland, OR  
James I. Cohen, MD, PhD, Portland, OR  
Peter E. Andersen, MD, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the safety and morbidity of outpatient endoscopic, staple-assisted Zenker's diverticulotomy.

**OBJECTIVES:** Staple-assisted, endoscopic Zenker's diverticulotomy has been shown to decrease both cost of treatment and length of convalescence when compared to the standard open approach. Although the endoscopic technique is generally considered to be safe, the feasibility of outpatient endoscopic Zenker's diverticulotomy has never been reported. **STUDY DESIGN:** Retrospective cohort study of 24 endoscopic, staple-assisted Zenker's diverticulotomy procedures performed between 1998 and 2002 on an outpatient basis. **METHODS:** Medical charts were reviewed for indications, demographics, operative findings, complications and resolution of symptoms. **RESULTS:** Twenty-four Zenker's diverticula were treated endoscopically with the intent of outpatient management. Twenty cases were primary surgeries and 4 cases were revision treatments. The average patient age was 66 years (range: 35-91) and the mean follow-up was 4.5 months (range: 1-15). Two (8.3%) technique-related complications were noted early in the study period on primary cases. These two patients underwent uncomplicated suture repair of small upper esophageal mucosal tears encountered intraoperatively and required overnight hospitalization. The remainder of patients were fed immediately and discharged home on the day of surgery. No other perioperative complications were noted. The entire cohort reported partial or complete resolution of symptoms. **CONCLUSIONS:** Patients undergoing endoscopic, staple-assisted Zenker's diverticulotomy can be managed safely on an outpatient basis. The need for conversion to inpatient monitoring is low.

#### **9:30 Reconstruction of Total Parotidectomy Defects**

Willard E. Fee, Jr., MD\*, Stanford, CA  
Lynn E. Tran, MD, Stanford, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to know the technique and outcome of reconstruction of parotidectomy defects using an inferiorly based sternocleidomastoid muscle flap.

**OBJECTIVES:** To compare and contrast the functional and cosmetic outcome of patients who underwent total parotidectomy with and without reconstruction. **STUDY DESIGN:** Retrospective review. Twenty-four patients who underwent a complete total parotidectomy; 15 patients were reconstructed with an inferiorly based sternocleidomastoid muscle flap and 9 patients received no reconstruction. **METHODS:** Clinical examination was performed independently by two head and neck surgeons and one aesthetician for cosmetic outcome, presence of gustatory flushing and or sweating, and return of facial nerve and greater auricular nerve function. **RESULTS:** With the mean follow-up of 22 months, the reconstructed group showed a better cosmetic outcome compared to the non-reconstructed group. Objective testing for Frey's syndrome demonstrated gustatory sweating in 20% of the reconstructed group versus 22% in the non-reconstructed group. There was no difference in length of operation, hospital stay, or facial nerve function. Objective testing of facial sensation revealed that only 40% in the reconstructed group had normal sensation to light touch compared with 78% in the non-reconstructed group. **CONCLUSIONS:** The inferiorly based sternocleidomastoid muscle flap offers improved cosmetic results in those patients undergoing total parotidectomy. There is, however, a decrease return of greater auricular nerve function probably due to relocation of the nerve stump anteriorly. Benefit was not seen in prevention of Frey's syndrome.

#### **9:40 The Impact of Malignant Pathology on Facial Nerve Function After Parotidectomy**

Todd W. Ellingson, MSIV, Portland, OR  
Peter E. Andersen, MD, Portland, OR  
James I. Cohen, MD, PhD, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to determine the impact of malignant histology on facial nerve outcome in parotid surgery.

**OBJECTIVES:** To determine whether the presence of benign or malignant histology influenced facial nerve outcome in patients with normal preoperative facial nerve function undergoing parotidectomy for parotid mass. **STUDY DESIGN:** Retrospective cohort study of consecutive patients undergoing superficial parotidectomy between 1995--2002. **METHODS:** House-Brackman (HB) grade was recorded or assigned at the first post-op visit. For patients with a HB grade  $\geq 3$ , the time to final resolution of facial nerve weakness was recorded. Chi-square analysis for independence was figured between those patients with HB  $\leq 2$  and HB  $\geq 3$  and final pathology (benign vs. malignant). Mean and median time to resolution was figured for HB  $\geq 3$ . Time to resolution of VIIth nerve weakness between benign and malignant pathology for those with HB  $\geq 3$  were compared. **RESULTS:** 65 patients with benign disease and 56 with malignant were included. 93.8% of patients with benign disease had HB  $\leq 2$  at first post-op visit (mean 11.5 days) compared to 78.6% of patients with malignant disease (12.5 days)  $p < 0.05$ . For those patients with facial weakness postoperatively, the median time to resolution was 254 days for benign disease and 138 for malignant ( $p = 0.83$ ). 3 patients in the malignant group had unresolved dysfunction with 1 patient for  $> 2$  years. **CONCLUSIONS:** Patients with malignant pathology have a much greater chance of having facial weakness immediately following surgery. However, time to final resolution of facial weakness is not related pathology.

#### **9:50 VICE PRESIDENT'S AWARD**

##### **The Expression of P73 and DNP73 in Thyroid Cancer**

Weg M. Ongkeko, MD+, PhD, San Diego, CA  
Jessica Wang-Rodriguez, MD, San Diego, CA  
Lisa Orloff, MD, San Diego, CA  
Jean Wang, PhD, La Jolla, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand that p73 and  $\Delta$ Np73 exists in thyroid cancer

and they should discuss its potential role in oncogenesis and apoptosis.

**OBJECTIVES:** To determine the presence of the p53 family member, p73 and  $\Delta$ Np73 in thyroid cancer. **STUDY DESIGN:** Having cloned the human  $\Delta$ p73, a p73 isoform lacking the amino-terminal end using a thyroid cancer cell line, we wanted to investigate if indeed p73 and  $\Delta$ Np73 exist in other thyroid cell lines. Expression of these two genes was also determined in follicular and papillary thyroid cancer tissue. **METHODS:** Reverse-transcriptase polymerase chain reaction (RT-PCR), Western blot analysis and immunofluorescence were performed on several thyroid cancer cell lines. Immunohistochemistry was performed on thyroid cancer tissue samples. Antibodies generated from our laboratory, which either detect all isoforms of p73, or one which is specific for  $\Delta$ Np73 were used for the Western blot, immunofluorescence, and immunohistochemistry. **RESULTS:** RT-PCR analyses of the thyroid cancer cell lines indicate that p73 is present in several papillary cancer cell lines (4A-1, DR-15, and NPA), and also in an anaplastic cell line (ARO).  $\Delta$ Np73 is present in 4A-1 and DR-15. Western blot analyses indicate that p73 protein is expressed in ARO as well as CA-301, a papillary cell line. Immunofluorescence confirmed that p73 is expressed in 4A-1 and DR-15, and that  $\Delta$ Np73 is expressed also in 4A-1 and DR-15. Immunohistochemistry revealed that at least p73 is present in follicular and papillary thyroid cancer tissue. **CONCLUSIONS:** The p73 gene belongs to the p53 tumor suppressor family. Because of their structural homology, it has been hypothesized that this gene may act as a substitute when p53 is mutated or inactivated, thus still providing a mechanism by which cells which have sustained mutations can undergo apoptosis. We have cloned the human  $\Delta$ Np73, which in contrast to the full-length p73, has been shown to block p53-mediated apoptosis as well as act as an oncogene. Since the function of p73 is multi-factorial, and the role of p73 in thyroid carcinomas has not been studied we wanted to investigate the presence of p73 in thyroid cancer. In this study, we have demonstrated that p73 as well as  $\Delta$ Np73 are expressed in thyroid cancer. Using several cell lines, we have not only shown the presence of RNA, but more importantly, we have demonstrated protein expression in these thyroid cancer cell lines. We have also demonstrated by immunohistochemistry that p73 is expressed in follicular and papillary thyroid cancer tissue.

#### 10:00 DISCUSSION

10:10 Break/Poster Presentations/Visit with Exhibitors - Tuscany I-II, Tuscany Foyer

**MODERATOR: DAVID F. WILSON, MD\*, PORTLAND, OR**

10:30 **SHIRLEY BARON RESIDENT RESEARCH AWARD**  
**Comparison of Revision Stapedotomy and Stapedectomy**  
Michelle M. Inserra, MD+, Stanford, CA  
Patricia J. Yoon, MD, Seattle, WA  
Joseph B. Roberson, MD, Palo Alto, CA  
Rodney C. Perkins, MD, Palo Alto, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to compare the outcomes and possible differences of revision surgery for primary stapedotomy and stapedectomy cases.

**OBJECTIVES:** To compare the outcomes of revision stapedotomy and revision stapedectomy cases. **STUDY DESIGN:** Retrospective review of 104 consecutive revision stapes surgeries performed between 1994 and 2000. This review consisted of 56 primary stapedotomy cases and 48 primary stapedectomy cases. **METHODS:** Preoperative and postoperative air and bone conduction pure tone averages were obtained. Post operative air-bone gap, degree of closure of air-bone gap, and change in bone conduction were evaluated for the two surgery groups. Repeat revisions were also analyzed. **RESULTS:** A postoperative gap of <10 dB was achieved in 59% of the revision stapedotomy cases and in 33% of revision stapedectomy cases. Comparison of postoperative air-bone gap and closure of gap was statistically better in the revision stapedotomy group (p=0.01 and 0.04, respectively). There was no difference in the change of bone conduction level between the two groups. Also, there was no significant difference noted with increasing revisions. Sensorineural hearing loss >10 dB occurred in 3 cases (2.8% total) with no profound hearing loss. **CONCLUSIONS:** While both revision stapes groups provide good gap closure, the revision stapedotomy cases show statistically better scores with regard to postoperative air-bone gap and degree of gap closure. Multiple revisions did not adversely affect outcomes and the risk of sensorineural hearing loss was quite low.

10:40 **VICE PRESIDENT'S AWARD**  
**Unbiased Stereologic Hair Cell Counts in Normal Human Utricles**  
Quinton Gopen, MD+, Los Angeles, CA  
Ivan Lopez, PhD, Los Angeles, CA  
Gail Ishiyama, MD, Los Angeles, CA  
Robert W. Baloh, MD, Los Angeles, CA  
Akira Ishiyama, MD, Los Angeles, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to compare stereologic counting techniques to traditional counting techniques and discuss utricular hair cell counts.

**OBJECTIVES:** The objective of this study was to use stereologic counting techniques to estimate the number of Type I and Type II hair cells in human utricles from patients with normal vestibular function. **STUDY DESIGN:** Cross-sectional observation study. **METHODS:** Microdissected human utricles were mounted in plastic and cut into 2 $\mu$ m sections throughout the entire utricle. Two consecutive sections every 100 $\mu$ m were magnified, photographed and printed. The physical fractionator, an unbiased stereologic counting technique, was then applied to determine quantitative estimates for both Type I and Type II hair cells. **RESULTS:** Type I and Type II hair cell counts were obtained for ten patients ranging from 42 to 96 years old with a mean age of 82 years old. The average number of total hair cells was 27,508 (CV=0.11) with 17,326 (CV=0.11) Type I hair cells and 10,182 (CV=0.13) Type II hair cells. **CONCLUSIONS:** Stereologic counting can be utilized for efficient, unbiased quantitative analysis of human utricles. The data compares well with prior hair cell counts from Wantanabi and Schuknecht (1976) who found 30,700 total hair cells and Rosenhall (1972) who found 33,100 total hair cells. This study represents the first unbiased stereologic estimate of hair cell counts within the human utricle.

10:50 **Meningioma of the Jugular Foramen: Glomus Jugulare Mimic and Surgical Challenge**  
M. Erik Gilbert, MD+, Salt Lake City, UT  
Clough Shelton, MD\*, Salt Lake City, UT  
Andre MacDonald, MD, Salt Lake City, UT  
Karen R. Salzman, MD, Salt Lake City, UT  
H. Ric Harnsberger, MD, Salt Lake City, UT  
Pramod K. Sharma, MD, Salt Lake City, UT

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the typical clinical presentation of a jugular fora-

men tumor; differentiate the three major lesions of the jugular foramen by imaging characteristics; discuss the potential surgical approaches and intraoperative management of the facial nerve; anticipate the common complications and sequelae of resection, and the management thereof.

**OBJECTIVES:** Meningiomas involving the jugular foramen are rare lesions, with approximately 34 cases reported in the English literature. Clinically these tumors mimic the more common glomus jugulare tumor. Following surgical resection, meningiomas have worse cranial nerve outcomes and higher recurrence rates than glomus tumors. There is controversy about the selection of surgical approach, particularly with regard to management of the facial nerve. A reliable means of accurate preoperative diagnosis would help surgical planning and patient counseling. **STUDY DESIGN:** We present a series of 6 consecutive large jugular foramen meningiomas resected by a single surgeon from 1996-2002. **METHODS:** Retrospective case series (chart review). **RESULTS:** The preoperative diagnosis was correct in all cases, based on the characteristic imaging findings seen with a combination of temporal bone dedicated CT and high resolution enhanced MRI. A combined Transcochlear- Infratemporal Fossa approach with posterior and lateral facial nerve rerouting was used in four cases. Total tumor removal was accomplished in 83%. One patient suffered recurrence over a mean follow up period of 2.5 years. New postoperative vocal cord palsies occurred in 60% of patients, all required vocal cord medialization. At one year, 100% of patients had normal or near normal (House-Brackmann I or II) facial function. Postoperative cerebrospinal fluid leaks occurred in two patients, both eventually required ventriculoperitoneal shunts. **CONCLUSIONS:** Meningiomas involving the jugular foramen are surgically challenging tumors that pose unique diagnostic issues. The majority of these lesions can be completely resected. A relatively high postoperative complication rate, which can be controlled with appropriate intervention, is seen with these surgeries.

#### **11:00 Reversible Canal Wall Down Mastoidectomy for Acquired Cholesteatomas: Preliminary Results**

John T. McElveen, MD\*, Raleigh, NC  
Andy T. Chung, MD, Durham, NC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss a new technique to manage acquired cholesteatomas and compare this with standard approaches used for cholesteatoma removal.

**OBJECTIVES:** To determine the feasibility of using a new approach, the reversible canal wall down approach, in conjunction with bone cement to remove acquired cholesteatomas and potentially preserve the ossicular chain. **STUDY DESIGN:** Retrospective review of two patients with acquired cholesteatomas who underwent reversible canal wall down surgery. The patients consisted of two males, ages 47 and 53. **METHODS:** A reversible canal wall down mastoidectomy approach was used in both patients. In one of the patients the ossicular chain was preserved. **RESULTS:** Both patients had dry ears postoperatively. One patient initially had granulation tissue forming on the posterior ear canal. This eventually resolved. In the patient who had his cholesteatoma removed and the ossicular chain preserved, his postoperative audiogram was consistent with his preoperative scores. **CONCLUSIONS:** Using the reversible canal wall down approach in conjunction with bone cement, one is able to obtain excellent exposure of the cholesteatoma and potentially preserve the ossicular chain. This approach may be particularly useful in revision cholesteatoma surgery or in acquired cholesteatomas in which the surgeon may be able to preserve the ossicular chain.

#### **11:10 Intratympanic Dexamethasone in Diabetics With Sudden Sensorineural Hearing Loss: Effects and Side-Effects**

Jennifer L. Maw, MD, San Jose, CA  
Donna S. Reilley, MA, San Jose, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the effects and side effects of intratympanic dexamethasone therapy in diabetics with sudden sensorineural hearing loss.

**OBJECTIVES:** To evaluate the systemic side effects, complications and effectiveness of intratympanic dexamethasone therapy in diabetic patients with sudden sensorineural hearing loss. **STUDY DESIGN:** Case series and retrospective review. **METHODS:** Seven diabetic patients with idiopathic sudden sensorineural hearing loss underwent intratympanic administration of 9.6 mg of dexamethasone. Blood sugar levels were monitored and recorded. Their audiometric results (PTA, 4000 Hz thresholds, discrimination scores and percent recovery) were compared retrospectively via a chart review to 16 non-diabetic patients with sudden sensorineural hearing loss. **RESULTS:** Six of the 7 diabetic patients had documented rises in blood sugar levels for 2-4 days following treatment. Insulin requirements were temporarily increased by 10-30 percent. None of the 3 type I diabetics had a significant recovery in hearing while 2 of the 4 type II diabetics had a significant improvement. No patients lost hearing after intratympanic dexamethasone therapy. When compared to non-diabetics, there was no statistically significant differences in demographics, pre-treatment or post-treatment hearing or percent recovery of hearing. **CONCLUSIONS:** Intratympanic dexamethasone therapy can cause hyperglycemia in diabetic patients but recovery of hearing can be achieved in some with sudden sensorineural hearing loss.

#### **11:20 A Clinical Study of the Auditory Profile of Individuals With Cleidocranial Dysplasia**

Ann Marie B. Visosky, MD, San Francisco, CA  
Jacob Johnson, MD, San Francisco, CA  
Becky Bingea, MA, San Francisco, CA  
Theresa Gurney, San Francisco, CA  
Anil K. Lalwani, MD\*, San Francisco, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the otolaryngologic manifestations of cleidocranial dysplasia, as well as the common head and neck manifestations associated with the syndrome.

**OBJECTIVES:** Cleidocranial dysplasia (CCD) is an autosomal dominant skeletal syndrome characterized by open skull sutures with bulging calvaria, hypoplasia or aplasia of the clavicles, wide pubic symphysis, dental anomalies, and vertebral malformation. CCD results from a mutation in the transcription factor CBFA1, required for osteoblast differentiation and normal bone formation. While hearing loss may be expected, auditory function in patients with CCD has not been characterized. The objective of this study was to evaluate the auditory function as well as head and neck manifestations of patients with CCD. **STUDY DESIGN:** Case study of patients with CCD. **METHODS:** CCD patients evaluated in the Craniofacial Clinic were invited to give developmental history, undergo general physical examination with special attention to the head and neck and a complete audiologic evaluation. **RESULTS:** Four families with eight total affected individuals and one sporadic case were studied. The patients showed highly variable expression of abnormalities. Head and neck examination demonstrated abnormal cranial sutures, broad nasal root, hypoplastic or aplastic clavicles permitting apposition of the shoulders, and abnormally high arched palate. Surprisingly, recurrent otitis media in childhood was not common. Hearing was normal in most patients, with only one having a 40 dB conductive hearing loss (CHL) and another showing mild CHL. **CONCLUSIONS:** Although most patients exhibited a high arched palate, recurrent otitis media is uncommon. This finding suggests that this is primarily a bone abnormality without muscular involvement. Due to the substantial CHL found in one patient, it is recommended that a screening audiogram be part of routine CCD patient care.

#### **11:30 Ramsey-Hunt Syndrome: Its Pathology and Treatment**

Jack L. Pulec, MD\*, Los Angeles, CA  
Michael J. Patterson, PhD, Los Angeles, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to determine the nature of pathology of the facial nerve in cases of Ramsey-Hunt Syndrome and to offer the most effective treatment.

**OBJECTIVES:** Demonstrate the pathology by electronmicroscopic study of biopsy specimens of the facial nerve in cases of Ramsey-Hunt Syndrome and document the results of surgical decompression. **STUDY DESIGN:** Retrospective. **METHODS:** Forty six patients were treated by facial nerve decompression by one author for Ramsey-Hunt Syndrome (herpes zoster oticus) in a tertiary referral center, private otology practice, over a period of 38 years. They all received thorough diagnostic examinations and total or partial facial nerve decompression depending upon the symptoms and findings. Biopsy of segments of fascicles of the facial nerve was made during surgical decompression, the segments were preserved in glutaraldehyde, examined by electron microscopy and the results were correlated with the clinical findings. **RESULTS:** Examination of the nerves revealed typical and unquestionable involvement by herpes zoster virus as well as variations in the neuraxons and supporting cells from normal to severe degeneration. Untreated, the condition results in more severe symptoms than Bell's Palsy and more often results in incomplete recovery. Involvement of the labyrinthine segment of the nerve requiring total facial nerve decompression occurs in 2/3 of patients with herpes zoster oticus compared to 15% of patients with Bell's Palsy. The area of edema and need for total decompression in patients with a dry eye was confirmed at surgery. **CONCLUSIONS:** The optimum treatment of Ramsey-Hunt Syndrome would seem to be intravenous antiviral medication and prompt surgical decompression of the involved portion of the facial nerve.

**11:40 Ossicular Chain Reconstruction: Titanium vs. Plasti-Pore**

Todd A. Hillman, MD, Salt Lake City, UT  
Clough Shelton, MD\*, Salt Lake City, UT

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the advantages of ossiculoplasty using titanium prostheses and to compare hearing and complication results with that of Plasti-Pore prostheses.

**OBJECTIVES:** To compare the complication rate and hearing results of a new, lightweight, titanium ossicular replacement prosthesis with Plasti-Pore prostheses. **STUDY DESIGN:** Retrospective. **METHODS:** Charts were reviewed for type of operation, type of prosthesis used, extrusion rate, prostheses failure rate, and hearing thresholds at multiple frequencies and at multiple follow-up points. The dependent variable for hearing results was the four-frequency average air bone gap. **RESULTS:** There were 84 patients undergoing tympanoplasty with the Plasti-Pore prosthesis and 53 with the titanium. There was one extrusion in the titanium group and none in the Plasti-Pore. There was an additional single incidence of prosthesis failure in the titanium group. Overall hearing results were better in the Plasti-Pore group with an air bone gap average of 19.3 dB compared to the titanium group with an air bone gap of 22.0 dB ( $p = 0.04$ ). Sixty percent of patients had a postoperative air bone gap of  $\leq 20$  dB in the Plasti-Pore group. In the titanium group 45.3% achieved a  $\leq 20$  dB postoperative air bone gap. Plasti-Pore had a lower air bone gap than the titanium when a canal wall down operation was performed (17.8 vs. 23.9 dB) or when a total ossicular prosthesis was needed (22 vs. 27 dB) ( $p < 0.05$ ). **CONCLUSIONS:** The titanium prosthesis is a new ossicular replacement prosthesis that provides excellent visualization during insertion, and provides hearing results that are comparable to Plasti-Pore. The Plasti-Pore prosthesis performed better in canal wall down mastoidectomy situations and when a total ossicular replacement prosthesis was needed.

**11:50 DISCUSSION**

**12:00 Adjourn**

**1:00 Golf Outing - Bus Departs Hotel**

**1:30 Palm Springs Excursion - Bus Departs Hotel**

**6:00 - Cocktail Party and Poster Reception - Tuscany Foyer**

**8:00**

6:00 - **Speaker Ready Room** - Board Room

12:00

7:00 - **Registration** - Tuscany Foyer

12:00

7:00 - **Breakfast/Business Meeting (Members only)** - Venetian

7:50

7:00 - **Continental Breakfast with Exhibitors** - Tuscany I & II

7:50

8:00 - **Scientific Sessions** - Tuscany III

12:40

8:00 **Poster Discussion and Awards**

**POSTER AWARD - BASIC SCIENCE**

**POSTER AWARD - CLINICAL SCIENCE**

**MODERATOR: MARILENE WANG, MD\*, LOS ANGELES, CA**

8:15 **Endoscopic Vertical Partial Laryngectomy**

R. Kim Davis, MD\*, Salt Lake City, UT

Kevin S. Hadley, MD, Salt Lake City, UT (*Presenter*)

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain the significant differences between endoscopic cordectomy and endoscopic vertical partial laryngectomy.

**OBJECTIVES:** 1) To evaluate the efficacy of endoscopic vertical partial laryngoscopy (EVPL) on T1b and T2a glottic squamous cell carcinoma and 2) to evaluate EVPL with postoperative irradiation in T2b glottic cancers. **STUDY DESIGN:** Retrospective chart review of twenty-six consecutive patients undergoing endoscopic vertical partial laryngectomy for T1b and T2 glottic cancer at the University of Utah Health Sciences Center. **METHODS:** Twenty-six patients seen at the University of Utah Health Sciences Center between 1987 and 2000 with T1b or T2 squamous cell carcinoma of the glottic larynx underwent endoscopic vertical partial laryngectomy. T1b and T2a glottic cancer patients received surgery alone while T2b patients received surgery followed by planned postoperative irradiation. **RESULTS:** Survival for the total group was 96.2%, and local control of 92.3%. Two recurrent patients were salvaged by total laryngectomy. Anterior commissure involvement was seen in 57.7%. Thirteen T2b carcinoma patients underwent combined therapy. 61.5% of these patients had anterior commissure invasion. Two patients were upstaged at surgery, one to T3 and one to T4. Local control was 84.6%. Thirteen patients were treated by surgery only, with five having failed previous irradiation. Survival and local control in this group was 100%. This group included two T1b patients, nine T2 patients and two patients who were upstaged to T4 based on extension beyond the subglottis to the anterior wall of the trachea. Anterior commissure involvement was seen in 53.8% of these patients. **CONCLUSIONS:** Endoscopic vertical partial laryngectomy (EVPL) controlled all T1b and T2a glottic cancer patients, even when greater than 50% had anterior commissure involvement. EVPL coupled with planned postoperative irradiation resulted in an 85% local control rate in clinically staged T2b (including the three upstaged patients).

8:25 **Tissue Engineered Human Nasal Septal Cartilage Using the Alginate Recovered Chondrocyte (ARC) Method**

Stanley H. Chia, MD+, San Diego, CA

Barbara L. Schumacher, BS, San Diego, CA

Eugene J. Thonar, PhD, Chicago, IL

Koichi Masuda, MD, Chicago, IL

Robert L. Sah, MD, San Diego, CA

Deborah Watson, MD, San Diego, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the use of the alginate recovered chondrocyte (ARC) method of tissue engineering for human nasal septal neocartilage formation.

**OBJECTIVES:** The objective of this study was to determine if tissue-engineered cartilage could be formed from isolated adult human nasal septal chondrocytes using the alginate-recovered-chondrocyte (ARC) method, with suspension in alginate as an intermediate step to generate cell-associated matrix formation. **STUDY DESIGN:** Basic science. **METHODS:** Chondrocytes were isolated from the nasal septums of five patient donors by enzymatic digestion, then expanded in monolayer culture. At confluency, a portion of cells were seeded at high density onto a semipermeable membrane (monolayer group) and cultured for 14, 21, or 28 days. Remaining cells were suspended in alginate and cultured until cell-associated matrix was formed. Cells and their associated matrix were released from alginate, seeded onto a semipermeable membrane (ARC group), and cultured as above. DNA (Hoechst 33258 Assay), glycosaminoglycan (GAG, dimethyl methylene blue assay), and collagen (hydroxyproline assay) were analyzed biochemically. Immunohistochemistry and histochemistry were performed to localize collagens Type I and II, and GAG (Alcian blue stain). **RESULTS:** ARC constructs, but not monolayer constructs, had substantial structural stability, and histological and gross appearance resembling native septal cartilage. ARC constructs demonstrated significantly greater GAG and collagen accumulation than monolayer constructs ( $p < 0.05$ ). Histological analysis of ARC constructs revealed uniform GAG and collagen type II distribution, and collagen type I accumulation at the superficial aspects. **CONCLUSIONS:** Tissue-engineered human nasal septal cartilage using the ARC method has a histological, gross, and biochemical composition resembling native cartilage. Monolayer constructs showed less similarity to native cartilage. This is the first report of human nasal septal neocartilage formation without the use of biodegradable scaffolds.

8:35 **Intralaryngeal Injection of Cidofovir**

Dinesh K. Chhetri, MD, Los Angeles, CA

Babak J. Parwar, MD, Los Angeles, CA (*Presenter*)

Steven D. Hart, MD, Los Angeles, CA

Sunita M. Bhuta, MD, Los Angeles, CA

Gerald S. Berke, MD\*, Los Angeles, CA

Nina L. Shapiro, MD, Los Angeles, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss intralaryngeal therapeutic uses of the antiviral drug cidofovir and gain further understanding of the short-term local and systemic toxic effects of this drug.

**OBJECTIVES:** The safety of intralaryngeal injection of cidofovir remains of concern. Our goal was to evaluate the local and some systemic effects of intralaryngeal injection of cidofovir. **STUDY DESIGN:** Animal study using a canine model. **METHODS:** Two sets of three young beagle dogs (6 vocal cords in each set) were used. Each vocal fold was injected at biweekly intervals with 0.5ml of 0, 5, 10, 20, 40, and 75mg/ml cidofovir for six months. Vocal folds were examined under direct laryngoscopy at each injection interval. White blood cell blood count and renal parameters were measured monthly. Histopathologic analysis of the vocal folds was performed at the end of the injection period from one set of animals, and after an additional 6-month interval from the other set. **RESULTS:** Dose dependent scarring and atrophy of the vocal folds was observed. Onset of vocal fold scar and atrophy was observed after 3, 7, and 11 injections at the 75 mg/ml, 40 mg/ml, and 20 mg/ml concentrations respectively. No scarring was present at the other concentrations. Blood analysis revealed no neutropenia or significant changes in renal parameters (BUN/Creatinine). **CONCLUSIONS:** Intralaryngeal injection of cidofovir leads to dose dependent scarification of the vocal folds. Lower concentrations should be used in intralesional therapies.

#### 8:45 The Accuracy of the Modified Evan's Blue Dye Test in Predicting Aspiration

Peter C. Belafsky, MD, PhD, La Jolla, CA  
Liza Blumenfeld, MA, San Diego, CA  
Amanda LePage, MA, San Diego, CA  
Kristen Nahrstedt, MA, San Diego, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate knowledge of our technique for conducting the modified Evan's blue dye test and display an understanding of the clinical accuracy of this test in predicting aspiration among tracheotomized patients.

**OBJECTIVES:** To evaluate the clinical accuracy of the modified Evan's blue dye test in predicting aspiration among tracheotomized patients. **STUDY DESIGN:** Prospective cohort. **METHODS:** All persons with a tracheotomy tube undergoing a bedside swallowing evaluation between 10/01/01 and 3/31/02 were prospectively evaluated. All individuals underwent a modified Evan's blue dye test (MEBDT) and a subsequent fiberoptic endoscopic evaluation of swallowing with sensory testing (FEESST) utilizing a standardized protocol. The sensitivity, specificity and predictive value of the MEBDT in predicting aspiration was determined. **RESULTS:** Thirty persons were evaluated. The mean age of the cohort was 65 (SD +/- 11) years. Sixty percent (18/30) was male. Thirty-three percent (10/30) was mechanically ventilated at the time of study. The sensitivity and specificity of the MEBDT in predicting aspiration with puree was 93 and 33% respectively. The sensitivity and specificity of the MEBDT in predicting aspiration with thin liquids was 86 and 43% respectively. The positive and negative predictive value of the MEBDT for puree was 57 and 83% respectively. The positive and negative predictive value of the MEBDT for thin liquid was 83 and 50% respectively. **CONCLUSIONS:** The MEBDT is a sensitive bedside diagnostic test to predict the prevalence of aspiration with puree and thin liquids. The limited specificity and predictive value of the MEBDT, however, precludes its use as a definitive study. These results support the use of the MEBDT as a screening tool for aspiration in tracheotomized patients. Persons who fail the examination should undergo further diagnostic studies such as FEESST or videofluoroscopy.

#### 8:55 Efficacy of Collagen Injection Based on Nature of Vocal Fold Incompetence

Jesse W. Tan, MD, Los Angeles, CA  
Ryan F. Osborne, MD, Los Angeles, CA  
Gerald S. Berke, MD\*, Los Angeles, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the reasons why collagen injection may have different degrees of efficacy in improving voice based on the underlying vocal cord disorder.

**OBJECTIVES:** This study examines the efficacy and duration of action of collagen injection in improving voice for patients with various causes of vocal fold incompetence. A discussion of the possible reasons for the differences in efficacy of the medialization procedure based on the underlying laryngeal pathology is discussed. **STUDY DESIGN:** A retrospective chart review and telephone questionnaire for each patient was performed to assess the efficacy and duration of action of collagen in improving voice. **METHODS:** Three hundred eighty-four patients with various causes of vocal fold incompetence were seen at the UCLA medical center from 1995-2000 and injected with Zyplast collagen. The same otolaryngologist (G.S. Berke) performed all procedures to exclude operator variability. 1-3 cc of Zyplast collagen was injected into the affected vocal fold using a 27 gauge needle passed through the cricothyroid membrane. Review of charts and a telephone interview were used to assess the results of the injection. Only patients receiving collagen for the first time were included in the study. Patients with previous laryngeal framework surgery were excluded from the study. **RESULTS:** Patients with glottic insufficiency secondary to Parkinson's disease, spasmodic dysphonia, or other neurologic disorders had a longer duration of benefit from collagen injection than those patients with unilateral vocal cord paralysis. Patient age did not have a significant effect on efficacy of the injection. **CONCLUSIONS:** Patients with glottic insufficiency had a longer duration of response to collagen injection compared to those with unilateral vocal cord paralysis.

#### 9:05 Comparative Analysis of Topical Medication Delivery Systems After Endoscopic Sinus Surgery

Timothy R. Miller, MD, Salt Lake City, UT  
Harlan R. Muntz, MD, Salt Lake City, UT  
Michael E. Gilbert, MD, Salt Lake City, UT  
Richard R. Orlandi, MD, Salt Lake City, UT

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to compare and contrast the distribution patterns of four topical delivery systems.

**OBJECTIVES:** To compare the distribution patterns of topical medication delivery systems in the sinonasal region and upper respiratory tract after functional endoscopic sinus surgery. **STUDY DESIGN:** Prospective descriptive evaluation. **METHODS:** Four topical delivery systems (aerosolized spray, atomizer, nebulizer, and bulb syringe) were studied. Using a dye solution as a marker, the four topical delivery systems were independently applied to a population of patients with chronic rhinosinusitis who had undergone functional endoscopic sinus surgery. The anatomic distributions were videotaped using flexible fiberoptic endoscopy. Three blinded observers independently rated the anatomic distribution of dye using a four-point scale. Statistical analysis was performed using ANOVA and Dunn posttesting. **RESULTS:** Seven participants completed the study. All participants had undergone bilateral maxillary antrostomies, bilateral total ethmoidectomies, and bilateral sphenoidotomies. Five sinonasal sites and the larynx were evaluated for dye deposition. Inter-observer agreement reached 95.6%. There was no statistical difference between the atomizer and aerosol spray. The bulb syringe was statistically superior to the nebulizer in all sinonasal sites and statistically superior to the atomizer/aerosol spray in the ethmoidal region. No statistical differences were found within the larynx. **CONCLUSIONS:** The delivery systems tested were shown to have significant differences in their capability to place dye in specific sinonasal areas. Since topical medications are commonly administered to postoperative patients, these differences may have important clinical implications.



### 9:15 Dimensional Change of Orbital Cavity After Luc's Operation

Po S. Kao, Taipei, Taiwan ROC  
Yen Liang Chang, Taipei, Taiwan ROC  
Pa Chun Wang, Taipei, Taiwan ROC

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to perform a quantitative evaluation of the dimensional change of orbital cavity after sinus surgery was done to elucidate the phenomenon.

**OBJECTIVES:** Enophthalmos and orbital asymmetry were observed in some cases receiving Luc's operation. Quantitative evaluation of the dimensional change of orbital cavity after sinus surgery was done to elucidate the phenomenon. **STUDY DESIGN:** Retrospective review of 10 patients who received unilateral Luc's operation. Compared the dimensional change of orbital cavity between operated and non-operated side preoperatively and postoperatively. **METHODS:** Orbital cavity volume was calculated using computerized volumetrics by summing the volumes of individual orbital slices which was calculated by multiplying the orbit slice area by the slice thickness (5mm). Longest vertical and horizontal axes were measured as well. **RESULTS:** Comparison of preoperative values between the operated side and non-operated side of orbital cavity didn't reveal significant difference. However, comparison of postoperative values between the operated side and non-operated side of orbital cavity revealed statistically significant difference no matter in orbital cavity volume, longest vertical axis and longest horizontal axis. **CONCLUSIONS:** Luc's operation may induce enophthalmos and downward displacement of orbit due to enlargement of volume of orbital cavity.

### 9:25 Electromechanical Reshaping of Septal Cartilage

Ki-Hong K. Ho, BS, Irvine, CA  
Sergio H. Diaz Valdes, PhD, Irvine, CA  
Dmitriy E. Protsenko, PhD, Irvine, CA  
Guillermo Aguilar-Mendoza, PhD, Irvine, CA  
Brian J. F. Wong, MD, Irvine, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the dielectric and electromechanical properties of cartilage, how they determine tissue shape, and how "electroforming" may be used to reshape tissue during surgery.

**OBJECTIVES:** This study describes the process of tissue electroforming and how shape changes in cartilage can be produced by the application of direct current (DC) electric fields with nominal heat generation. The dependence of shape change on voltage and application time is explored as well. **STUDY DESIGN:** Basic investigation using ex vivo porcine septal cartilage grafts and electromechanical analysis focused on development of new surgical technique. **METHODS:** Uniform flat porcine nasal septal cartilage specimens were mechanically deformed between two semicircular aluminum electrodes. DC current was applied to establish charge separation and establish an electrical streaming potential. Voltage (1-20 V) and application time (1-10 minutes) were varied, and shape change was measured using an analytic representation. Temperature during reshaping was monitored with a thermocouple, and surface features were evaluated using light microscopy. **RESULTS:** Reshaped specimen demonstrated mechanical stability similar to native cartilage tissue, and shape retention strongly correlated with increasing voltage and application time. Only a small current (<1 A) through the circuit was measured. Temperature change was less than 2 deg. Celsius during electroforming. Surface features indicated that electrodeposition may occur depending upon standard reduction potentials of electrodes used. **CONCLUSIONS:** The capacitive properties of cartilage appear to be dominant, thus limiting current flow through the specimen. These findings demonstrate that cartilage can be shaped through the process we have described as "electroforming" by generating intrinsic differences in charge separation with little heat production.

### 9:35 DISCUSSION

### 9:45 PANEL: WHAT'S NEW IN OTOLARYNGOLOGY: A DISCUSSION ON TOPICS OF NEUROLOGY, HEAD AND NECK SURGERY, PLASTIC SURGERY, GENERAL OTOLARYNGOLOGY, LARYNX

**MODERATOR:** Gerald S. Berke, MD\*, Los Angeles, CA

**PANELISTS:** John W. House, MD\*, Los Angeles, CA  
Elliot Abemayor, MD\*, PhD, Los Angeles, CA  
Corey S. Maas, MD\*, San Francisco, CA  
Robert C. Bone, MD\*, LaJolla, CA  
Stanley M. Shapshay, MD\*, Boston, MA

### 10:05 DISCUSSION

### 10:15 Break/Poster Presentations/Visit with Exhibitors - Tuscany I-II, Tuscany Foyer

**MODERATOR:** C. PHILLIP DASPIT, MD\*, PHOENIX, AZ

### 10:40 Treatment Options of Partial Recurrence of ADDSD After RLN Section

Herbert H. Dedo, MD\*, San Francisco, CA  
Krzysztof N. Izdebski, PhD, San Francisco, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to critically evaluate our methods of examining and treating partial recurrence of spasmodic voice in ADDSD patients treated previously by the unilateral nerve (RLN) resection.

**OBJECTIVES:** To provide efficacious methods of examining and treating partial recurrence of spasmodic voice in ADDSD patients treated previously by the unilateral (complete) left or right recurrent nerve (RLN) resection. **STUDY DESIGN:** ADDSD patients showing partial symptom recurrence were studied by lidocaine block, acoustic analysis, phonoscopy and EMG. Patients with clinically confirmed partial recurrence of symptoms underwent retreatment using either: 1) voice therapy, 2) Botox injection into the paralyzed vocal cord, 3) multi-stage CO2 laser thinning of the paralyzed vocal cord, or 4) surgical resection of the previously divided RLN. **METHODS:** Patients showing recurrence were examined clinically using acoustics, diagnostic voice therapy, phonoscopy, EMG and lidocaine block carried out above the area of original nerve resection. When judged as showing recurrence, or when Lidocaine block eliminated any recurrent symptoms four treatment options are reviewed: 1) voice therapy, 2) Botox injection, 3) CO2 laser thinning, and 4) RLN re-resection of the distal stump. **RESULTS:** Option 1: Voice therapy is recommended only for very mild partial spasticity recurrence. The outcomes are judged to be poor at best. Option 2: Botox injection into the paralyzed vocal cord using 5-10 units under EMG guidance eliminates recurrence up to 14 months. Option 3: CO2 Laser thinning of the paralyzed vocal cord may require up to three procedures to move the edge of the vocal cord far enough to eliminate overpressure. Option 4:

Re-resection of the RLN stump with removal of scar tissue, nerve mobilization and placement of a 2-0 silk ligature, shows elimination of symptoms in re-operated patients so far up to 48 months. **CONCLUSIONS:** Partial recurrence of ADDSD symptoms after full RLN resection occurred in 18% of our cases. The mechanism appears to be due to nerve regrowth without reanimation. Recurrence is treated most successfully by nerve re-resection, CO2 laser thinning or Botox injection and least successfully by voice therapy.

#### 10:50 Incidence, Etiology and Management of Cerebrospinal Fluid Leaks Following Transsphenoidal Surgery

Samuel G. Shiley, MD, Portland, OR  
Mark K. Wax, MD, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe factors associated with increased risk of postoperative CSF leaks following transsphenoidal surgery. Participants should also be familiar with the technique and efficacy of endoscopic management of postoperative CSF leaks.

**OBJECTIVES:** To determine 1) the incidence of CSF leak following transsphenoidal surgery, 2) demographic or intraoperative factors associated with postoperative leaks, and 3) techniques and efficacy of postoperative leak management at OHSU. **STUDY DESIGN:** Retrospective chart review. **METHODS:** The medical charts of all patients who underwent transsphenoidal surgery between 1994-2001 were reviewed. Demographic data, intraoperative findings and postoperative details were reviewed and analyzed. Statistical analysis was performed using student's t test and chi-square analysis where appropriate. **RESULTS:** 235 transsphenoidal surgeries were performed on 216 patients between 1994-2001. Follow-up data was available for 217 operations (92.3%) performed on 202 patients (93.5%). Postoperative CSF leaks occurred in 13/217 patients (6%). CSF leaks were significantly more common 1) following revision surgery versus primary surgery (14.6% vs. 4.0%,  $P = .0096$ ) or 2) if an intraoperative leak occurred (12.7% vs. 2.7%,  $P < .005$ ). The development of a postoperative leak was not affected if the sellar floor was reconstructed or not (4.0% vs. 2.1%,  $P = 0.50$ ) or by pathology (macroadenomas: 5.6% versus microadenomas: 4.6%,  $P = 0.77$ ). There were 13 postoperative CSF leaks. Two resolved with lumbar drainage. Eleven patients underwent operative management, with three requiring multiple operations. Of the three patients who required multiple operations, two had hospital courses complicated by meningitis and postinfectious hydrocephalus and ultimately required VP shunts. Endoscopic reexploration was successful in 87.5% (7/8) of cases in which it was used. **CONCLUSIONS:** CSF leaks following transsphenoidal surgery are significantly more common in the setting of revision surgery or when an intraoperative leak occurs. Endoscopic reexploration and packing is an effective technique in managing uncomplicated postoperative leaks. In the setting of meningitis and postinfectious hydrocephalus, more invasive techniques such as VP shunt may be necessary.

#### 11:00 Prognostic Value of Resection Margins in Supracricoid Laryngectomy

Andrea Gallo, MD PhD, Rome, Italy  
Maria Luisa Tropicano, MD, Rome, Italy  
Valentina Manciocco, MD, Rome, Italy  
Marilia Simonelli, MD, Rome, Italy  
Vincenzo Marvaso, MD, Rome, Italy  
Marco De Vincentiis, MD, Rome, Italy

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the importance of surgical resection margins.

**OBJECTIVES:** To assess the prognostic value of surgical margins involvement in patients treated for squamous cell carcinoma of the larynx. **STUDY DESIGN:** Retrospective study. **METHODS:** 253 patients treated with supracricoid laryngectomy between 1984 and 2001 were reviewed. The histopathologic study on the surgical resection margins had been performed in all cases. The incidence of local recurrence was correlated with the histological features of resection margins. **RESULTS:** Forty patients (15.8%) were identified as having positive margins: 29 (72.5%) had invasive carcinoma and 11 had dysplastic lesions. The remaining 213 had negative margins. Subsequent follow-up showed that nineteen patients out of 253 (7.5%) developed local recurrence. Nine of these had positive resection margins (6 with invasive carcinoma and 3 with dysplastic lesions) while 10 had negative resection margins. Post-operative radiation therapy was administered to eight patients (42.1%) out of 19: 75% of these patients failed to achieve local regional control and were managed with other treatment. Ten patients (53%) out of 19 underwent total laryngectomy. Forty percent of these patients achieved local regional control and is alive with no evidence of disease. The remaining patient (5.2%) out of 19 was treated with chemotherapy and died of disease. **CONCLUSIONS:** According to our results patients with positive resection margins develop significantly more local recurrence than those with clear resection margins ( $p < 0.0005$ ). Patients with dysplastic lesions develop local recurrence later than those with invasive carcinoma. Thus the prognosis is significantly worse for patients with positive resection margins, either with invasive carcinoma or dysplasia.

#### 11:10 Altrigenic Mechanisms Causing Secondary VIII Nerve Symptoms

Joseph R. Di Bartolomeo, MD\*, Los Angeles, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to make the otologist aware of the less known causes or events which may precede the onset of otologic symptoms, and the patient may consider irrelevant.

**OBJECTIVES:** At the conclusion of this presentation, the participants should be able to determine the etiologic diagnosis in a greater number of patients with previously diagnosed Ideopathic tinnitus, tinnitus or vertigo. **STUDY DESIGN:** A preliminary report of the apparently unrelated circumstances preceding the onset of cochlear vestibular systems. **METHODS:** An analysis of the common embryological derivatives and adult neuroanatomical pathways underlying the relationships and source of pathologic symptoms resulting from proximate extra-otologic disease or trauma. **RESULTS:** A better understanding of the broad spectrum of the potential pathologic processes insinuated by the presenting Symptom for which the patient complains. **CONCLUSIONS:** It is the Otolaryngologist or Otologist, that is medically astute and eternally curious, who should evaluate and manage those patients with cochlear vestibular complaints.

#### 11:20 Design of an Oscope Image Capture System With USB Interface: A Low Cost Instrument for Imaging the Middle Ear

Ryan P. Jackson, BS, Irvine, CA  
Roger L. Crumley, MD, MS, MBA\*, Irvine, CA  
Brian J. Wong, MD, PhD, Irvine, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the basic principles of optics that are required to focus an image of the middle ear viewed with an oscope on to a low-cost Universal Serial Bus (USB) web camera, and to be able to construct one for under \$100.

**OBJECTIVES:** Currently available middle ear imaging systems cannot be purchased by most specialist and primary care physicians. In this study, several optical designs were evaluated and a simple and inexpensive device was constructed to capture oscope images and transfer this data to a PC. **STUDY DESIGN:** Basic investigation focused on optical design and construction techniques for a low cost oscope image capture device. **METHODS:** The present device incor-

porated the following design constraints: 1) simple lens system, 2) widely available low-cost components, 3) little technical expertise to assemble, and 4) no modification to the Welch-Allyn otoscope used. Several digital and “web” cameras with USB interfaces were characterized. A 640 x 480 web camera was selected as a compromise balancing resolution and price. A single biconvex lens was used to image middle ear on to the CCD array in the camera and housed in a chassis that snapped onto the back of the otoscope. Images of various test patterns and the TM were recorded and compared with images obtained using commercial units. **RESULTS:** Multiple lens systems provided incremental improvements in image quality at a substantial increase in cost. The single lens instrument was compact, magnified the image, and allowed real-time observation on a PC monitor. Images of test patterns allowed estimation of image quality, which was slightly below that of commercial systems. Image quality depended heavily upon resolution of the web camera. **CONCLUSIONS:** This system is easy to construct and uses “off the shelf” components readily purchased at hardware and electronic stores. These results demonstrate that construction of a simple, low cost otoscope image capture system is feasible, and that image quality improves greatly with the resolution of the web camera.

#### **11:30 Extensive Skull Base and Calvarium Involvement With Acquired Cholesteatoma**

Jamie R. Steger, MD, Tacoma, WA  
Douglas D. Backous, MD, Seattle, WA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the pitfalls and demonstrate the ability to evaluate and surgically treat patients with acquired cholesteatoma involving the skull base and bones of the calvarium.

**OBJECTIVES:** Principles of disease eradication and reconstruction will be reviewed for patients with extensive skull base and calvarium involvement of acquired cholesteatoma. **STUDY DESIGN:** We present a prospective case review of three patients with acquired cholesteatoma and extensive skull base or calvarium invasion treated with one stage exteriorization and reconstruction of bony defects into the intracranial cavity. Outcome measures include disease control, hearing results, and facial nerve function. **METHODS:** A 68 year-old male presented with complete facial palsy and no hearing loss. A defect in the tegmen, diffuse involvement of the tympanic segment of the facial nerve and erosion of the cochlea were found on exploration. A temporalis muscle/fascia flap and split calvarial bone graft sealed off the intracranial cavity. A 30 year-old male with a prior modified radical mastoidectomy and ossiculoplasty presented 2 years later with a 3.5 cm mass over his temporalis muscle. Extensive calvarial erosion up to the coronal suture and to the lateral orbital wall medially was treated with a temporalis fascia flap and split calvarial bone graft to reconstruct the lateral skull defect. A 37 year-old male presented with a cholesteatoma eroding through the EAC and tegmen, which was reconstructed with split calvarial bone graft and primary ossiculoplasty. **RESULTS:** All three patients have no mastoid or intracranial recurrence and residual hearing with follow-up ranging from 39-52 months. **CONCLUSIONS:** Patients with extensive skull base and calvarium involvement of acquired cholesteatoma can successfully undergo single stage exteriorization and reconstruction with preservation/reconstruction of hearing.

#### **11:40 Long Term Results of Porcine Small Intestine Submucosa (Surgisis) for Facial Soft Tissue Augmentation**

Marc M. Kerner, MD, Encino, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the use of surgisis for facial augmentation.

**OBJECTIVES:** The objective of this study is to evaluate the use of porcine small intestinal submucosa (Surgisis) for soft tissue augmentation in the face. There are numerous materials available for soft tissue augmentation in facial plastic surgery. Surgisis has been used in hernia repair and soft tissue treatment in general surgery. There are no long-term published studies of its use in facial plastic surgery. **STUDY DESIGN:** Patients desiring either lip enhancement or effacement of nasolabial folds were offered surgisis as an alternative to gortex implantation, collagen, or fat transplantation. **METHODS:** This current study was undertaken in a community-based facial plastic surgery practice. 26 consecutive patients were treated with surgisis for lip augmentation or treatment of deep nasolabial folds. The endpoint was at least one year of follow-up to determine efficacy. Outcomes measures included pre- and post-operative photography and post-operative questionnaires. **RESULTS:** There were no complications or adverse reactions. 16 out of 20 lip enhancement patients graded their one year results as excellent, 2/20 graded their results as very good and 2/20 graded their results as good. Results for the 6 patients undergoing nasolabial enhancement were either very good or good. Results for nasolabial enhancement appeared more variable than lip enhancement. **CONCLUSIONS:** Surgisis is an excellent material for long-term soft tissue augmentation of the lips and a good material for nasolabial folds.

#### **11:40 Medial and Lateral Orbital Wall Surgery for Balanced Decompression in Thyroid Eye Disease**

Scott M. Graham, MD, Iowa City, IA  
Christopher L. Brown, FRACS, Iowa City, IA  
Keith D. Carter, MD, Iowa City, IA  
Alice Song, MD, Iowa City, IA  
Jeffrey A. Nerad, MD, Iowa City, IA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to compare different orbital decompression techniques and their influence on post operative diplopia.

**OBJECTIVES:** Diplopia remains a major potential complication of surgical decompression performed for thyroid eye disease. We sought to examine the effect of medial and lateral wall surgery with sparing of the orbital floor on the incidence of post-operative diplopia. **STUDY DESIGN:** Retrospective chart review of a consecutive surgical series. **METHODS:** Sixty three medial and lateral orbital wall surgeries were performed for decompression of thyroid eye disease between 12/96 and 5/02. This comprised forty patients. Patients' demographic data, indications for surgery, surgical approach, pre- and post- operative visual acuity, exophthalmos, palpebral fissure measurements and the presence of diplopia were recorded. **RESULTS:** The average patient age was 51 (range 14-83) years. The studied group was predominantly female(36:4). Indications were compressive optic neuropathy in 34 orbits, exposure keratopathy in 25 and aesthetic concerns in 4. The mean time since surgery was 32 (3-69) months. The medial wall was approached by a trans caruncular (59) or endoscopic (4) technique. Two subjects had fat removal. The average improvement in exophthalmos was 4.1 (0-10) mm. Two patients had CSF leaks during lateral wall surgery. These were diagnosed and repaired primarily. New onset diplopia occurred in four patients. Two of these four patients required strabismus surgery. **CONCLUSIONS:** A 10% new diplopia rate compares favorably with other surgical series. Medial and lateral wall surgery only, sparing the floor, may reduce diplopia after surgery for orbital decompression in thyroid eye disease.

#### **11:50 Hypothermia During Head and Neck Surgery**

Nishant Agrawal, MD, Baltimore, MD  
Duane A. Sewell, MD, Philadelphia, PA  
Michael E. Griswold, BA, Baltimore, MD  
Steven M. Frank, MD, Baltimore, MD  
Todd W. Hessel, BA, Baltimore, MD  
David W. Eisele, MD\*, San Francisco, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to evaluate the risks of hypothermia, understand the significance of intraoperative hypothermia and manage patients to avoid clinically significant hypothermia.

**OBJECTIVES:** Intraoperative hypothermia is associated with adverse clinical outcomes in general surgical patients, including a greater incidence of postoperative myocardial ischemia, an increased susceptibility to wound infections, increased surgical blood loss, and longer recovery times. To avoid adverse outcomes, it is important to determine the predictors of hypothermia, incidence of hypothermia, and potential complications of hypothermia in head and neck surgery patients. **STUDY DESIGN:** Retrospective analysis. **METHODS:** Patients were either not warmed (n=43) or actively warmed with forced-air warming (n=25). Clinical variables that were assessed as predictors of core body temperature included age, body mass, duration of procedure, estimated blood loss, amount of intravenous fluids administered, and the use of forced-air warming. The incidence of severe intraoperative hypothermia and potential hypothermia related complications were also examined. **RESULTS:** This study demonstrated that advanced age is a risk factor for hypothermia and decreased body mass is associated with lower final body temperatures in the non-warmed group. After adjusting for differences in the ages and weights between the two groups, the mean core body temperature was found to be 0.4 °C lower in the non-warmed patients. Severe intraoperative hypothermia occurred in 5 of 38 patients (11.6 %) in the non-warmed group and 2 of 23 patients (8.0 %) in the warmed group. The complications associated with hypothermia included delayed time to extubation, the development of neck seromas, and flap dehiscence. **CONCLUSIONS:** Patients undergoing head and neck surgery are at risk for the development of intraoperative hypothermia. Elderly patients and patients with low body mass are more prone to develop low intraoperative core body temperatures and need careful temperature monitoring. Active warming with forced-air warmers should be performed in patients at risk for intraoperative hypothermia and for those that develop hypothermia intraoperatively to avoid hypothermia related complications.

**12:00 Effects of Glutathione and N-acetylcysteine on Flap Survival**

Daphne A. Bascom, MD, PhD, Cleveland, OH

Judith K. Skoner, MD, Portland, OR

Mark K. Wax, MD, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to describe the effects of glutathione and N-acetylcysteine (NAC) on skin flap survival in the rat.

**OBJECTIVES:** 1) To examine the effects of antioxidant therapy on the ischemic tolerance of the rat fasciocutaneous flap, and 2) to examine the effects of antioxidant therapy on serum myeloperoxidase levels. **STUDY DESIGN:** Prospective animal study. **METHODS:** Thirty male Sprague-Dawley SPF rats weighing 250-300 grams were randomly assigned to one of three groups, control, glutathione or N-acetylcysteine. All animals received either the treatment drug or saline intraperitoneally 24 hours before flap harvest, at the time of flap harvest and 24 hours after reperfusion. The flaps were raised and the femoral vessels clamped for either 12 or 14 hours. Flap survival was then monitored over the course of 7 days. During the preoperative, intraoperative and postoperative periods specimens for colorimetric measurement of serum glutathione and myeloperoxidase were obtained. **RESULTS:** There was no statistically significant difference in flap survival among the three groups. There no clear trend in glutathione levels in amongst the treatment protocols. Mean glutathione in the control group was 14.4, 24.3 and 15.5 µM for the baseline, post-ischemic and 7 day time points. At similar time points the glutathione concentrations were 11.5, 16.2 and 10.8 µM in the glutathione treatment group and 16.7, 16.0 and 14.7 µM in the NAC treatment group. Mean myeloperoxidase levels in the experimental protocols were 39.2, 47.9, 43.0 µM in the glutathione group and 49.8, 24.3 and 15.4 µM in the NAC group for the baseline, post-ischemic and 7 day time periods, respectively. **CONCLUSIONS:** At the doses and intervals of the drugs administered in this protocol, we were unable to detect an effect of either glutathione or N-acetylcysteine on ischemic tolerance, glutathione levels or myeloperoxidase levels in the rat.

**12:10 DISCUSSION**

**12:20 Introduction of Vice President-Elect, C. Phillip Daspit, MD, Phoenix, AZ**

Gerald S. Berke, MD

**12:25 Closing Remarks**

**12:30 Adjourn**

## POSTERS

### 1. **Cavernous Carotid Injury—Case Presentations and Guidelines for Optimal Management**

Wadhwa K. Ashish, MD, Irvine, CA  
Brian J.F. Wong, MD, Irvine, CA  
Terry Y. Shibuya, MD, Irvine, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to 1) understand pertinent sphenoid and cavernous sinus anatomy, 2) evaluate cavernous carotid injury and understand its potential complications, and 3) have a treatment plan for managing the acute injury and the potential subsequent complications.

**OBJECTIVES:** Surgery in parasellar space is technically challenging due to the complex anatomic relationships between the sphenoid, cavernous sinus, optic nerve and carotid artery. Normal anatomic variations and pathologic changes can lead to disastrous outcomes including carotid artery injury. We present two cases of carotid injury managed at our institution during the past 2 years. One patient was emergently transferred to our medical center when brisk bleeding was encountered during FESS while the other case involved the endoscopic biopsy of a clival tumor encasing a friable carotid artery. Both were treated using balloons placed during angiography. Treatment strategies, pertinent anatomic and surgical considerations are reviewed, and a treatment algorithm is presented. **STUDY DESIGN:** Case report. **METHODS:** Review of literature. Review of case histories and courses. **RESULTS:** Treatment plan for cavernous carotid injury. **CONCLUSIONS:** Cavernous carotid injury is a serious potential complication of nasal surgery of the parasellar region. Appropriate and rapid treatment based on anatomic and critical care knowledge are pivotal to a favorable outcome.

### 2. **Supraglottic Myxedema Presenting as Acute Upper Airway Obstruction**

Rami K. Batniji, MD, Albany, NY  
Henry F. Butehorn III, MD, Albany, NY  
John J. Cevera, MD, Albany, NY  
John P. Gavin, MD, Albany, NY  
Peter E. Seymour, BA, Albany, NY  
Steven M. Parnes, MD\*, Albany, NY

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the evaluation and treatment of acute upper airway obstruction secondary to supraglottic myxedema.

**OBJECTIVES:** To report a case of supraglottic myxedema presenting as acute upper airway obstruction. **STUDY DESIGN:** Case report and literature review. **METHODS:** The study comprises a case report of a 69-year-old female without significant past medical history who presented with an acute episode of shortness of breath and hoarseness of voice. Physical examination revealed an obese female in respiratory distress. Examination demonstrated macroglossia and edematous soft palate. Palpation of neck did not reveal goiter or masses. Further examination showed findings consistent with hypothyroidism, such as pitting edema, periorbital and facial edema, thinning of outer halves of eyebrows, delayed return of deep tendon reflexes, and pleural and pericardial effusions. Laryngoscopy demonstrated supraglottic edema with upper airway obstruction. Computed tomography of neck confirmed diffuse edema of hypopharyngeal soft tissues, including pre-epiglottic space. Thyroid function tests confirmed primary hypothyroidism without elevation of microsomal or thyroglobulin antibodies. **RESULTS:** The patient required nasotracheal intubation and subsequent tracheotomy. During tracheotomy, thyroid biopsy was obtained and demonstrated atrophic thyroid tissue. The patient was started on thyroid hormone replacement therapy with intravenous levothyroxine. Subsequent thyroid function testing demonstrated euthyroidism; laryngoscopy revealed resolution of supraglottic myxedema. The patient was decannulated without difficulty 3 weeks after tracheotomy. **CONCLUSIONS:** Supraglottic myxedema is an uncommon cause of acute upper airway obstruction. Initial treatment includes control of the airway. The diagnosis relies upon high clinical suspicion based on thorough examination and thyroid function testing. In this patient, thyroid hormone replacement therapy resulted in resolution of supraglottic myxedema and subsequent decannulation.

### 3. **The Wu Scope—A New Tool to Secure the Difficult Airway**

David S. Cameron, MD+, Oakland, CA  
Ted T. Kim, MD, Hayward, CA  
Alison G. Cameron, MD, San Francisco, CA  
Raymond L. Hilsinger, Jr., MD\*, Oakland, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the application of this new laryngoscope, in securing difficult airways.

**OBJECTIVES:** The purpose of this paper is to introduce a new device, the WuScope, to the field of head and neck surgery. The WuScope is a bi-valved, tubular laryngoscope that is curved to fit the anatomy of the upper airway. The metal tube houses a diagnostic quality fiberoptic laryngoscope, the endotracheal tube, and a suction catheter through the lumen of the endotracheal tube. **STUDY DESIGN:** Retrospective chart review. **METHODS:** Cases demonstrating the utility of this device were solicited from the Head and Neck Surgery Department, and the Department of Anesthesia at Kaiser Permanente Medical Center-Hayward, CA. **RESULTS:** The WuScope was advantageous over other techniques for intubating these four patients. **CONCLUSIONS:** Because Head and Neck Surgeons manage difficult airways, we should be familiar with available resources to facilitate its management.

### 4. **Recurrent HSV Supraglottitis in a Pediatric Patient**

Vincent Y. Chen, MD+, Irvine, CA  
Gurpreet Singh Ahuja, MD, Irvine, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the presentation, treatment, and long-term outcome of HSV supraglottitis.

**OBJECTIVES:** This paper aims to familiarize the clinician with the presentation, endoscopic findings, medical and surgical management, and long term outcome of HSV supraglottitis. **STUDY DESIGN:** Case study of recurrent HSV supraglottitis in a pediatric patient at a tertiary care hospital. Comprehensive review of literature and previously published cases will be discussed. **METHODS:** We present a case report of an 11 month old male who presented with two episodes of fever, stridor, and acute respiratory distress. The airway was secured initially with intubation, and on his second presentation he required tracheotomy. Endoscopic examination revealed vesicles in the pharynx and supraglottis, marked supraglottic edema, and granulation tissue consistent with a viral supraglottitis. Cultures were positive for herpes simplex virus. The patient was treated with acyclovir prophylaxis for one year. The patient subsequently developed supraglottic stenosis and scarring. He underwent supraglottoplasty and was eventually able to be decannulated. **RESULTS:** HSV supraglottitis is an uncommon entity. There have been four reported cases of viral supraglottitis in pediatric patients. It may present as an acute airway obstruction, recurrence is possible,

and may lead to supraglottic stenosis. **CONCLUSIONS:** Management of HSV supraglottitis includes tracheotomy and long term therapy with antiviral medication. Further surgeries such as supraglottoplasty are successful in alleviating stenosis and achieving decannulation.

**5. Management of Isolated Extra-Pulmonary Tuberculosis Diagnosed in Pregnancy**

Perrin C. Clark, MD, Portsmouth, VA  
Myron W. Yench, MD, Portsmouth, VA  
Kristina E. Hart, MD, Portsmouth, VA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to demonstrate an understanding of the pathological process of cervical tuberculosis and its related entities. One will be able to compare treatment options and discuss how they may vary in the pregnant individual.

**OBJECTIVES:** The worldwide incidence of tuberculosis (TB) is increasing largely as a consequence of both the rising prevalence of human immunodeficiency virus (HIV) and the emergence of drug-resistant strains. The pulmonary system is typically the primary site of involvement by this infectious disease. However, extra-pulmonary disease does occasionally occur. Though uncommon, TB can involve the neck. The usual presentation is bilateral adenopathy from pulmonary dissemination. Tuberculous cervical adenitis in the absence of pulmonary findings is rare. A concurrent diagnosis of pregnancy complicates the treatment of the infected patient. We present a case of isolated, unilateral tuberculous cervical adenitis diagnosed in a pregnant patient and discuss the multi-disciplinary approach necessary for the appropriate management of this unique situation. **STUDY DESIGN:** Case report. **METHODS:** Retrospective analysis of treatment arms considered in treatment of pregnant patient with isolated cervical tuberculosis. **RESULTS:** Fine needle aspiration of the cervical lymph nodes is the most reliable method to confirm the organism causing lymphadenopathy. Excisional biopsy may be necessary in the non-diagnostic lymph node. Individuals with cervical tuberculosis, including pregnant patients, may be treated with chemotherapy for cure. **CONCLUSIONS:** The incidence of isolated cervical tuberculosis is increasing in the United States. Pregnant patients diagnosed with isolated cervical tuberculosis may be treated with standard combined chemotherapy regimen.

**6. Bilateral Sudden Pediatric Sensorineural Hearing Loss**

Sumana Jothi, San Francisco, CA  
Kristina W. Rosbe, MD, San Francisco, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain the typical workup of pediatric sensorineural hearing loss.

**OBJECTIVES:** To review the current literature on pediatric SNHL and discuss a possible autoimmune etiology. **STUDY DESIGN:** Case report. **METHODS:** Chart and literature review. **RESULTS:** A 4 year old Hispanic girl presents with sudden onset rapidly progressive bilateral sensorineural hearing loss (SNHL). The patient was hospitalized twice in the prior 2 months for multiple joint pain and effusions accompanied by fevers and weight loss. Her past medical history is significant for recurrent otitis media. She has a normal developmental history and is up to date on immunizations. She does not take any medications and has no known allergies. Her family history is negative. Physical exam was significant for mildly retracted tympanic membranes and left scleral injection. She had a nonfocal neurologic exam. Initial audiogram revealed profound bilateral SNHL. The patient was initially placed on prednisone at 1 mg/kg/day. An audiogram while on the steroids revealed worsening hearing so steroid therapy was discontinued. Laboratory workup was significant for an elevated ESR (80) and a positive rheumatoid factor of 29. Initial MRI showed bilateral cochlear enhancement. Repeat MRI demonstrated diffuse CNS involvement. The patient is currently being evaluated for a cochlear implant. **CONCLUSIONS:** Sudden SNHL in children is rare. The routine workup of pediatric SNHL includes audiologic evaluation, hematologic studies including CBC, glucose, BUN/Cr, TSH, ANA, RF, and ESR, imaging studies, electrocardiogram and ophthalmologic evaluation. Very little is reported in the literature on pediatric autoimmune SNHL. Retrospective studies of patients with fluctuating autoimmune SNHL implicate antibodies to inner ear antigens. Other studies link hsp 70 with autoimmune SNHL. With this case report, we review the current literature on pediatric SNHL and discuss the possibility of an autoimmune etiology.

**7. Intraoperative Consideration of a Rare Cause of Endotracheal Tube Obstruction**

Amir M. Karamzadeh, MD, Irvine, CA  
William B. Armstrong, MD, Irvine, CA  
Elizabeth C. Behringer, MD, Irvine, CA  
John C. Chang, MD, Irvine, CA  
Jason T. Van Tassel, MD, Irvine, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to recognize intraoperative sources of endotracheal tube obstruction and manage them appropriately.

**OBJECTIVES:** Acute airway obstruction during general endotracheal anesthesia is an unusual occurrence, and poses an unanticipated risk to the patient. Initial management decisions focus on common causes such as mucous plugging, excessive secretions, or tumor. When these are determined not to be causative factors, other causes must be excluded in order to resolve this life-threatening emergency. Mechanical obstruction from tube kinking, compression or blockage must be assessed. **STUDY DESIGN:** Case report and literature review. **METHODS:** We present a case in which herniation of the endotracheal cuff (Laryngoflex) over the tip of the tube resulted in near complete airway obstruction approximately five hours into surgery. **RESULTS:** During general anesthesia, there is slow diffusion of Nitrous Oxide gas (NO) from the pulmonary airway (high partial pressure) into the endotracheal cuff (low partial pressure). Herniation results from increased cuff volume and pressure following the influx of NO across a semipermeable membrane combined with localized weakness of the cuff material. Early recognition can prevent significant complications. **CONCLUSIONS:** Methods for identifying, preventing and managing this problem are discussed and previous reports of this uncommon complication are reviewed.

**8. Actinomycosis of the Hard Palate: Report of Case and Approach to Management**

Amir T. Karamzadeh, MD, Irvine, CA  
Parag P. Parikh, MD, Irvine, CA  
Quoc A. Nguyen, MD, Irvine, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the definition, clinical findings, diagnostic approaches and therapeutic management of Actinomycosis of the hard palate and other sites in the head and neck.

**OBJECTIVES:** Actinomycosis of the hard palate is an infrequently described condition. In this location, these lesions pose difficult diagnostic and therapeutic challenges. **STUDY DESIGN:** Case report. **METHODS:** We report a case of a single actinomycosis lesion involving the palate of a 50 year old male. **RESULTS:** An idiopathic Actinomycosis infection of the hard palate that was treated with aggressive surgical debridement and IV antibiotics. **CONCLUSIONS:** We discuss the definition, clinical findings, diagnostic approaches and therapeutic management of Actinomycosis of the hard palate.

**9. The Use of Autologous Platelet Gel in Craniomaxillofacial Surgery**

Marc M. Kerner, MD, Encino, CA  
Robert G. Hale, DDS, Northridge, CA  
Kim A. Silva, Northridge, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to understand the preparation, introduction, use, and biophysical properties of autologous platelet gel in craniofacial surgery.

**OBJECTIVES:** The purpose of this initial prospective study is to evaluate the use of autologous platelet gel in patients undergoing surgery for facial fractures. **STUDY DESIGN:** The study consisted of an open-label, prospective, nonrandomized assessment of autologous platelet gel use in patients undergoing either craniomaxillofacial surgery for trauma or orthognathic surgery. **METHODS:** The study was undertaken on patients admitted to a community medical center which services approximately 1.2 million patients. Eighteen consecutive patients undergoing surgery for various combinations of maxillofacial and/or mandible fractures were enrolled in the study. The intervention consisted of the use of autologous platelet gel administered to the fracture or operative sites and into the soft tissue envelopes after surgical correction of the fractures or defects. The main outcomes measures consisted of photographic evaluation, and patient and physician assessment of postoperative swelling, bruising, and pain. **RESULTS:** All patients undergoing surgery and administration of platelet gel had decreased swelling, bruising, pain, and no drains were required for coronal flap patients. **CONCLUSIONS:** It appears in this initial phase study, platelet gel is a useful adjunct to craniomaxillofacial surgery, as it may reduce postoperative swelling and pain, accelerate time to healing, improve bone graft viability, and shorten the postoperative recovery period.

**10. Endoscopic Management of Rhinocerebral Mucormycosis—A Case Study**

Paul D. Kim, MD, Loma Linda, CA  
Mark R. Rowe, MD, Loma Linda, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain how invasive fungal sinusitis is traditionally treated. They should also be able to discuss under which circumstances an endoscopic approach may be viable as a treatment option.

**OBJECTIVES:** To present a case study for endoscopic management of invasive fungal sinusitis. Presentation, radiographs, surgical management, and postoperative management are discussed. **STUDY DESIGN:** Case study and literature review of endoscopic management of sinonasal mucormycosis. **METHODS:** A patient presenting with a brain abscess from ethmoid sinusitis underwent endoscopic management. Upon pathologic evaluation of the tissue a diagnosis of invasive mucormycosis was made. The patient was taken back to the operating room where all tissue appeared healthy and biopsies revealed no further fungal elements. **RESULTS:** The results of this case study indicate that in select cases endoscopic management of sinonasal fungal disease is appropriate. **CONCLUSIONS:** Rhinocerebral mucormycosis has long been recognized as a fulminant, potentially aggressive and commonly fatal fungal infection. The classic presentation is involvement of the nasal mucosa with invasion into the paranasal sinuses, orbit, and facial tissue. Mucormycosis is most commonly seen in patients who are immunosuppressed. Treatment consists of surgical debridement, antifungal therapy, possible hyperbaric oxygen treatment, and control of comorbid factors. The surgical debridement has traditionally been radical excision of all involved tissue. This resection would continue until healthy bleeding tissue was found. The morbidity has remained high despite any advances in treatment. We believe that in highly select cases, endoscopic management of rhinocerebral mucormycosis is a viable surgical option.

**11. Breast Carcinoma Metastasis to Upper Cervical Lymph Nodes**

Doris Lin, MD, San Francisco, CA  
Mark I. Singer, MD\*, San Francisco, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the incidence, treatment and prognosis of patients with breast carcinoma metastasis to the upper cervical lymph nodes, skipping the lower cervical lymph nodes.

**OBJECTIVES:** To report a case of breast carcinoma metastatic to a lymph node nine millimeters inferior to the parotid gland that initially presented with sudden onset contralateral vocal cord paralysis for two months. We also discuss the incidence, treatment, and outcome of breast cancer metastasis to the upper cervical lymph nodes. **STUDY DESIGN:** This is a report of a single case of a breast carcinoma metastasis to a parotid region lymph node. We also reviewed the literature for reports of breast carcinoma metastasis to the upper cervical lymph nodes. **METHODS:** A review of the patient's history and physical, cytology, CT, MRI, PET and panendoscopy was done. In addition, a literature review of published reports dating back to 1939 of breast carcinoma metastasis to lymph nodes of the head and neck region was performed. **RESULTS:** Only one other case of a metastatic adenocarcinoma of the breast to the high cervical lymph nodes, skipping the lower cervical nodes was found. A subsequent head and neck examination found a metastatic mass in her nasopharynx. In our patient, staging panendoscopy found no other lesions. The hoarseness was attributed to metastasis in her mediastinum impinging her left recurrent laryngeal nerve. Both cases were found to have diffuse metastatic disease treated with palliative care. **CONCLUSIONS:** Breast carcinoma metastasis to the upper cervical lymph nodes bypassing the lower cervical nodes is a rare occurrence with a poor prognosis, deserving a thorough head and neck examination and metastatic workup.

**12. Use of the VAC in Enhancing Closure of a Massive Skull Defect**

Umesh S. Marathe, MD, Honolulu, HI  
Joseph C. Sniezek, MD, Honolulu, HI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the reconstructive options for large scalp vertex lesions that include the cal varium. Participants should also be able to employ the VAC to assist wound healing in complex extirpative or traumatic defects of the head and neck.

**OBJECTIVES:** Describe a novel technique for reconstructing the cranial vertex without the use of free tissue transfer. **STUDY DESIGN:** Case report, literature review, and discussion format. **METHODS:** A 50-year-old woman presented from a remote Pacific Island with a 12cm by 14 cm necrotic, grossly contaminated eccrine gland carcinoma of the cranial vertex that extended through the cal varium but did not invade the dura. Following tumor extirpation, the resulting bony defect measured 10 cm x 12 cm with a concomitant scalp defect of 14cm x 16cm. Free tissue transfer was impossible due to severe intimal peripheral vascular disease, posing a challenging reconstructive dilemma. After tumor resection, the bony edges were covered with local scalp flaps and the VAC was placed over the wound at a constant setting of negative 50mm Hg. The VAC was changed 3 times per week for 3 weeks. **RESULTS:** A thick bed of granulation tissue (1 cm) developed over the dura, allowing temporary coverage by a split thickness skin graft, and the scalp defect decreased in size by approximately 25%. The patient did not develop meningitis, headache, or localized infection due to VAC placement and tolerated the VAC very well. After a requisite period of healing, tissue expanders and calvarial reconstruction will be performed. **CONCLUSIONS:** The VAC is a safe and reliable adjunct in the closure of large cranial defects with exposed dura and offers a novel reconstructive option for complex defects of the head and neck.

**13. Liposarcoma Overlying the Parotid Gland: A Case Report and Review of Literature**

John D. Nguyen, BS, Irvine, CA  
John C. Chang, MD, Irvine, CA  
Mai Y. Gu, MD, Irvine, CA  
Brian J. F. Wong, MD, PhD, Irvine, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to compare the similarities and differences in the diagnosis and management of liposarcoma in the head and neck versus elsewhere.

**OBJECTIVES:** While liposarcoma may be the second most common soft-tissue sarcoma in adults, the incidence of the tumor within the head and neck is exceedingly rare. To date, less than 100 cases have been reported in the literature over the past 100 years. We report a case of primary well-differentiated liposarcoma of the dermis over the parotid region in a 77 year old man. As literature regarding liposarcoma in the head and neck region is limited, we will provide a review along with a summary of the diagnosis and management of this uncommon tumor. **STUDY DESIGN:** Case report. **METHODS:** History, physical examination, FNA, MR images, pathology and operative report were reviewed. A review of the literature regarding liposarcoma in the head and neck was done. **RESULTS:** A 3.5 x 3.0 x 2.0 cm well-demarcated mass was excised via a facelift incision. A distinct tissue plane separated the mass from the lateral lobe of the parotid. Clear margins were obtained. Pathology showed a well-differentiated liposarcoma with myxoid and sclerosing features. The patient has remained disease and symptom free in the four months since excision. **CONCLUSIONS:** Recommended treatment consists of wide local excision, as the well-differentiated variety of liposarcoma when located superficially rarely metastasizes. Additionally, because spread to lymph nodes is rare routine lymph node dissection is unnecessary. Post-operative radiation therapy may be of benefit in selected cases, especially for those of the myxoid type. Chemotherapy, however, has not been demonstrated to be of significant benefit. Five year survival for the well-differentiated and myxoid variety is excellent (75-100%), while local recurrence rate is only 50%. This excellent prognosis has prompted the introduction of the term "atypical lipoma" as a new diagnosis replacing the diagnosis of "liposarcoma".

**14. Synovial Sarcoma of the Mandible in a Child, Complicated by Sickle-Cell Disease: A Case Report and Literature Review**

Paul T. Russell, MD, Loma Linda, CA  
Mark R. Rowe, MD, Loma Linda, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to explain the incidence of head and neck synovial sarcoma as well as the rarity of occurrence in the mandible. The participants should also be able to explain the current treatment recommendations for mandibular synovial sarcoma in children, particularly in those children with sickle-cell disease.

**OBJECTIVES:** To present the management options in the treatment of synovial sarcoma of the mandible in children. Reconstruction options will also be thoroughly discussed and explained. Children with sickle-cell disease present difficult management questions. The preoperative evaluation as well as surgical treatment for a child with sickle-cell disease as well as mandibular sarcoma is presented. **STUDY DESIGN:** Chart review of a case of synovial sarcoma in a child with sickle-cell anemia. **METHODS:** Collect all preoperative data as well as surgical management of a child with synovial sarcoma. The postoperative recovery and well as adjuvant therapy were collected for presentation. **RESULTS:** The case of synovial sarcoma in a child with sickle-cell disease was treated with composite resection and postoperative radiation therapy. The patient underwent delayed repair of the defect with composite graft. Follow-up with the patient has revealed that the patient is doing very well with good cosmetic recovery. **CONCLUSIONS:** Children with sickle-cell disease and synovial sarcoma present difficult management questions. Treatment of synovial sarcoma is wide resection to obtain wide margins. Reconstruction can usually be performed at the time of resection, however in children with sickle-cell disease this may not be possible. Due to the need for postoperative radiation and the increased risk of immediate reconstruction because of sickle-cell disease, delayed reconstruction is a viable and preferred method of treatment. We demonstrate the successful treatment of synovial sarcoma in a child with sickle-cell disease.

**15. Functional Outcomes After Surgery of the Anterior Skull Base (ASB)**

Terry Y. Shibuya, MD, Irvine, CA  
William B. Armstrong, MD, Irvine, CA  
Gurpreet S. Ahuja, MD, Irvine, CA  
Roger L. Crumley, MD\*, Irvine, CA  
Robert H. Mathog, MD\*, Detroit, MI  
George H. Yoo, MD, Detroit, MI

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be familiar with a variety of surgical approaches to the anterior skull base and understand the surgical outcomes related to each.

**OBJECTIVES:** We review our experience accessing tumors extending along the ASB via 4 different approaches (trans-zygomatic, trans-maxillary, subfrontal, or submandibular) and measure the pre- and post-operative function of patients who had undergone surgery. **STUDY DESIGN:** Prospective clinical outcomes study. **METHODS:** Tumors of the ASB frequently extend along the infratemporal fossa (ITF), pterygomaxillary space (PMS), nasopharynx (NP), or retro-mandibular (RM) region. A single or combination of surgical approaches was used for accessing these areas to optimize exposure and minimize morbidity. Eighteen cases were examined over a 4-year period and the number of surgical approaches was calculated. Patient pre- and post-operative function was measured including mastication, speech, swallowing, cranial nerve function, pain and cosmesis. **RESULTS:** Tumors were accessed via 4 different approaches or combinations (trans-zygomatic, trans-maxillary, subfrontal, or submandibular). Seven patients required only one surgical approach, 10 required two and 1 required three, respectively. No significant differences in mastication, speech, swallowing, cranial nerve function or cosmesis were identified between pre- and post-operative function. There was a significant reduction in pain post-operatively. **CONCLUSIONS:** Multiple surgical approaches for accessing tumors extending along the ASB have been used successfully with minimal morbidity to cranial nerve function and cosmetic outcome. An algorithm for accessing tumors extending along the ASB has been devised. Resection of tumors in this region has reduced postoperative pain significantly.

**16. Short-Term Functional Donor Site Morbidity in Radial Forearm Fasciocutaneous Free Tissue Transfer**

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Daphne A. Bascom, MD, PhD, Pittsburgh, PA  
James I. Cohen, MD, PhD, Portland, OR  
Peter E. Andersen, MD, Portland, OR  
Mark D. Healy, MS, Portland, OR  
Mark K. Wax, MD, FRCS, Portland, OR

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss the short-term functional donor site morbidity associated with radial forearm fasciocutaneous free tissue harvest.



**OBJECTIVES:** The existing literature on post-operative donor extremity function describes a spectrum of morbidity in the long-term (> 3 mos post-operatively). The general consensus, however, is that there is minimal to no impact of flap harvest on patients' actual daily living activities. No previous reports have examined functional donor-site morbidity in the early post-operative period; such may affect patients' overall perioperative progress, especially with respect to dominance of the donor extremity. Our objective is to quantitate functional morbidity of the donor site in radial forearm fasciocutaneous free flaps during the early post-operative period. **STUDY DESIGN:** Retrospective case series review. **METHODS:** Patient data was obtained from hospital records of 12 patients who underwent head and neck reconstruction with radial forearm fasciocutaneous free flaps over a 6-month period at a tertiary academic medical center. Functional results of each patient's donor extremity obtained pre-operatively and at 5 to 8 days post-operatively were determined by forearm supination/pronation, wrist flexion/extension, and sharp/dull hand sensation in radial, median and ulnar nerve distributions. **RESULTS:** Mean patient age was 57 years (range 42-71). The non-dominant extremity was the donor site in 9 out of 12 patients. Using the paired two-tailed t-test, statistically significant differences were demonstrated in pre- versus post-operative forearm supination ( $p<0.032$ ), pronation ( $p<0.006$ ), wrist flexion ( $p<0.000$ ) and extension ( $p<0.000$ ). Three out of 12 patients demonstrated diminished sharp sensation in the anatomic "snuffbox" distribution. **CONCLUSIONS:** We describe statistically significant functional forearm and wrist range of motion morbidity associated with the harvest of a radial forearm fasciocutaneous free tissue flap in the early post-operative period.

17. **Dermatofibrosarcoma Protuberans of the Head and Neck: Results of Mohs Surgery With Inverted Horizontal Paraffin Sections**  
William D. Tom, MD, Oakland, CA  
Charles P. Hybarger, MD, San Rafael, CA  
Barry M. Rasgon, MD, Oakland, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation, the participants should be able to discuss Dermatofibrosarcoma Protuberans, its pathologic features, and how they pertain to a high recurrence rate in the head and neck after wide local excision with 2-3 centimeter margins. They should be able to demonstrate the benefits of accurate margin analysis by Mohs surgery, and show that inverted horizontal paraffin sectioning is more accurate than Mohs frozen sections. They will be able to explain that this technique results in a much higher control rate than the current practice of wide local excision.

**OBJECTIVES:** This study describes the results of DFSP of the head and neck treated with Mohs surgical techniques where margins were evaluated with inverted horizontal paraffin sections. The margin of resection necessary to achieve tumor free borders in this lesion are also identified. **STUDY DESIGN:** Retrospective study involving 9 patients. **METHODS:** Mohs surgery was performed with inverted horizontal frozen section analysis until tumor free margins were achieved. These tumor free margins were then reprocessed by inverted horizontal paraffin sectioning on a rushed basis and the pathology compared between the two techniques. Additionally, preoperative lesion size was compared to postoperative defect size to describe the required margins of resection to achieve tumor free margins. **RESULTS:** Paraffin section analysis revealed persistent tumor in 7 of the 9 patients cleared by frozen sections. Tumor free margins were achieved in all patients with one additional excision. Pathologic tumor spread beyond clinical margins was quite extensive, requiring an average minimum of 3.7 cm around gross tumor (range 2.5-6cm). Long-term patient followup revealed no local, regional or distant recurrence at an average of 43 mos. (range 19-74 mos.) **CONCLUSIONS:** DFSP of the head and neck is a tumor that extensively infiltrates beyond gross margins, resulting in residual tumor and recurrence after wide local excision with 2-3 cm. margins. Analysis of margins by horizontal inverted paraffin sections revealed that larger margins are required to pathologically clear patients of disease. Our experience has shown that accurate margin analysis by Mohs surgery with rush paraffin sections results in complete tumor removal and excellent control rates. This method should be considered the treatment of choice for DFSP of the head and neck.

18. **Granulomatous Inflammation and Nerve Necrosis in a Case of Apparent Idiopathic Vocal Cord Paralysis—Report of a Case**  
Behrooz A. Torkian, MD, Irvine, CA  
Roger L. Crumley, MD, MBA\*, Irvine, CA

**EDUCATIONAL OBJECTIVE:** At the conclusion of this presentation the participants should be able to discuss recurrent laryngeal nerve pathologic findings in one case of apparent idiopathic vocal cord paralysis, and discuss the scientific and clinical relevance of these novel findings.

**OBJECTIVES:** We will present clinical and pathologic findings of the recurrent laryngeal nerve of a 54 year-old man with apparent idiopathic vocal cord paralysis. **STUDY DESIGN:** Our presentation is in the format of a case report with emphasis on the clinical, intraoperative, histologic, and neuropathologic findings. **METHODS:** A 54 year-old man presented to a tertiary referral center with a two year history of vocal cord paralysis following an upper respiratory infection. Radiographic and lab data had confirmed no causative lesions or conditions. The patient had previously undergone collagen injection and medialization thyroplasty, each with only temporary improvement of voice. The patient underwent ansa cervicalis—recurrent laryngeal nerve anastomosis. **RESULTS:** Intraoperative dissection revealed an indurated and thickened section of nerve approximately fifteen millimeters in length, located at the beginning of the intralaryngeal segment, near the cricothyroid joint. Segments of this nerve were submitted for histologic evaluation revealing necrosis with granulomatous inflammation. Neuropathologic consultation felt this histology to be compatible with syphilis, tuberculosis, sarcoid, leprosy, or fungal disease, but not compatible with herpes neuritis—commonly regarded as the main etiology of idiopathic RLN paralysis. **CONCLUSIONS:** The diagnosis of "idiopathic" vocal cord paralysis likely represents a number of pathologic entities that remain undiscovered. This case likely represents a unique pathologic entity consisting of recurrent laryngeal nerve granulomatous inflammation with necrosis and ensuing vocal cord paralysis.