

FEL Resident Research Day 2020

June 4, 2020

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- 6:55 Welcome Remarks – **G Har-El**
- 7:05 Introduction – **R Rosenfeld**
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- 7:31 Prospective Validation of the COACH score: A Novel Chronic Ear Grading System – **S Ho (PGY-5)**
- 7:45 Comparison of outcomes for total thyroidectomy in patients with Graves' disease and patients with multinodular goiters – **J Liang (PGY-1)**
- 7:59 Trends in Free-Flap Salvage and Management in Otolaryngology – **A Timashpolsky (PGY-4)**
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- 8:41 **Break**
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- 9:10 Increased survival in DBA/2J audiogenic seizure-prone mice after oxygen enrichment during specific seizure phases and the impact of a tracheal implant serving as a surrogate airway. – **A Kansal (PGY-3)**
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- 9:45 Case series of adult onset idiopathic auditory neuropathy – **M Weber (PGY- 2)**
- 9:52 Impact of Adenotonsillectomy on Homework Performance in Children with Obstructive Sleep Apnea (OSA) - **D Wu (PGY-5)**
- 10:06 Risk assessment in major head and neck oncologic surgery – **R. Irizarry (PGY-4)**
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Title: Systematic Review of Endoscopic versus Microscopic Stapedectomy for Stapes Fixation

Investigators: Sandra Ho, MD; **Daniel Ballard, MD**; Richard Rosenfeld, MD, MPH, MBS; Sujana Chandrasekhar, MD

Objectives: To compare outcomes between endoscopic and microscopic stapes surgery for stapes fixation.

Methods: Systematic review and meta-analysis comparing postoperative complications and hearing outcomes between microscopic and endoscopic stapes surgery for stapes fixation. Two investigators independently assessed study eligibility, rated the risk of bias using Methodological Index for Non-Randomized Studies (MINORS), and abstracted data for comparative analysis. A random-effects model was used for pooling data and heterogeneity was assessed using the I^2 statistic.

Results: Ten comparative studies with low to moderate risk of bias comprising 205 endoscopy and 255 microscopy patients satisfied inclusion criteria. Endoscopic surgery improved the air-bone gap (ABG) from 33.5 dB HL to 8.1 dB HL and microscopic surgery resulted in ABG improvement from 33.8 dB HL to 11.1 dB HL. Although both techniques had similar rates of ABG closure for <10 dB and <20 dB, the endoscopic group improved their ABGs by, on average, 2.7 dB more than the microscopic group, producing a large and significant effect size (standard mean difference: 1.06, 95% CI 0.32 to 1.8, $p=0.005$, $I^2=86\%$). There were no significant differences between the interventions with regards to operative time ($p=0.06$), chorda tympani nerve transection ($p=0.83$) or manipulation ($p=0.19$), dysgeusia ($p=0.21$), or vertigo ($p=0.37$).

Conclusion: Endoscopic stapes surgery appears comparable to traditional surgery with regards to operative time, dysgeusia, chorda tympani nerve manipulation, and vertigo. Endoscopy may offer improved ABG reduction (about 3 dB), but the high heterogeneity and broad confidence intervals make this, at present, a preliminary finding that requires validation in future studies.

Title: Neonatal Ear Molding

Investigators: **Rahul Gulati, MD**; Nick Faraci, MD, FAAP; Sydney C. Butts MD, FACS

Faculty Mentor: Sydney C. Butts MD, FACS

Outcome Objectives: Evaluate the use of ear splinting as a safe and effective option for ear molding neonates.

Methods: Medical tapes were applied to the ears of a 2-week-old neonate with bilateral deformities resulting from effacement of the superior helical rim due to the presence of a

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third antihelical crus (Stahl's ear deformity). Splints that are more rigid can be fashioned with readily available materials and were successfully used in other cases.

Results: Normal anatomic curvature of the superior helix with appropriate concavity of the scaphoid fossa was restored. There was no evidence of skin breakdown, infection, or dermatitis at any point in treatment.

Conclusion: Our use of taping for ear-molding in a 2-week-old neonate demonstrates an efficient way to correct neonatal ear deformities. Medical tapes are widely available, with low rates of complications, and techniques can be readily taught to caregivers. Early ear molding may significantly ameliorate a congenital anomaly making later surgery unnecessary or less extensive. While not every contour anomaly is appropriate for molding, the option to lessen the severity of this problem may spare young children from teasing and bullying in their early lives.

Title: Prospective Validation of the COACH score: A Novel Chronic Ear Grading System.

Investigators: Sandra Ho, MD; Ryan Tabtabai, MD; Daniel Ballard, MD; Matthew Hanson, MD

Faculty Mentor: Matthew Hanson, MD

Outcome Objectives: Currently, there is no standard way of grading a chronic ear, especially one with cholesteatoma. The COACH score, developed by the principal investigator of this study, attempts to provide otolaryngologists with a status of the chronic ear. We sought to determine if there is a change in COACH scores in patients that undergo surgery for cholesteatoma and if there is any correlation between the preoperative COACH score and the Middle Ear Risk Index (MERI).

Methods: Prospective cohort study. Patients enrolled undergoing surgery for chronic ear disease from 12/1/18 to 12/1/19 at SUNY Downstate Medical Center. Preoperative COACH scores calculated and correlation with MERI and CES assessed.

Results: 10 patients were included in the study. There were 9 males and 1 female with 5 surgeries performed left and right ears each. The mean preoperative COACH score was 2.7 (range 0-7, SD 2.1). The mean MERI score was 5.2 (range 2-9, SD 2.6) and mean CES was 39.4 (range 20-55, SD 10.8). Preoperative COACH score was negatively correlated with MERI score (spearman's rho = -0.75, p = 0.012) and CES (spearman's rho = -0.70, p = 0.035).

Conclusion: The COACH score is a novel chronic ear grading system that can become a standardized instrument for evaluating a chronic ear. We have demonstrated that patients who have had surgery for cholesteatoma have COACH scores that negatively correlate with scores for MERI and CES. This finding suggests that the COACH score is predictive of the health and functional status of the middle ear.

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Title: Comparison of outcomes for total thyroidectomy in patients with Graves' disease and patients with multinodular goiters

Investigators: Jennifer J. Liang, MD; Rachel Irizarry, MD; Lousette Saint Victor, MPH, Lori A. Hoepner, DrPH, MPH; Natalya Chernichenko, MD

Faculty Mentor: Natalya Chernichenko, MD

Objective: Total thyroidectomy for treatment of Graves' disease is controversial due to concern for complications. The aim of our study is to evaluate the morbidity of total thyroidectomy in patients with Graves' disease as compared to nontoxic multinodular goiter.

Methods: A retrospective cohort study using the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database from 2007-2017 categorized thyroidectomy patients in two groups: patients with Graves' disease and patients with nontoxic multinodular goiter. Perioperative outcomes were analyzed using T-test, Pearson's Chi-Squared test and calculation of odds ratio.

Results: Our study identified 5,642 patients with Graves' disease and 25,515 patients with nontoxic multinodular goiter who underwent total thyroidectomy. Patients with Graves' disease who underwent thyroidectomy were noted to be significantly younger (42.6 vs 53.9, $p < 0.001$) and fewer were diagnosed with hypertension (34.4% vs 45.3%, $p < 0.001$) or diabetes (7.2% vs 16.0%, $p < 0.001$) despite more smoking (30.3% vs 16.7%, $p < 0.001$) than patients with nontoxic multinodular goiter. These patients had a significantly higher rate of readmission (OR 1.78, CI 1.46-2.18) as well as rate of returning to the operating room (OR 1.44, CI 1.15-1.81) in comparison to patients with nontoxic multinodular goiter. They also had a significantly higher rate of commonly tracked complications after surgery (OR 1.43, CI 1.18-1.73) such as wound infections and reintubation. For thyroidectomy-specific outcomes, patients with Graves' disease had a significantly higher rate of post-operative hypocalcemia (OR 2.18, CI 1.58-3.00), as well as hematoma (OR 1.86 CI 1.17-2.96) and hemorrhage (OR 5.82, CI 2.17-15.64), both of which required return to the OR. However, there was no significant difference in rates of post-operative vocal fold paralysis between the two groups.

Conclusion Patients with Graves' disease undergoing total thyroidectomy are at higher risk of complications as well as readmission and return to the OR in comparison to nontoxic multinodular goiter patients, likely due to sequelae of the disease. These risks should be addressed when presenting thyroidectomy as therapeutic option to a patient with Graves' disease.

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Title: Increased survival in DBA/2J audiogenic seizure-prone mice after oxygen enrichment during specific seizure phases and the impact of a tracheal implant serving as a surrogate airway.

Investigators: Ankit Kansal, MD; Sam Schild, MD; Richard Kollmar, PhD; Mark Stewart, MD, Krishnamurthi Sundaram, MD; Joshua Silverman, MD, PhD

Faculty Mentor: Richard Kollmar, PhD

Outcome Objectives: To measure the effects of atmospheric changes on survivability during induced seizures in DBA/2J mice, and to further narrow the periods during the seizure that a high oxygen atmosphere would create the greatest benefit. To compare how mice did in these different environments and during these phases both in the presence and absence of tracheal t-tubes.

Methods: Previous work done in this laboratory (Irizarry et al., *Epilepsia* 2020) has established the efficacy of tracheal t-tubes as a mechanism of preventing sudden death in epilepsy (SUDEP), with the hypothesis that SUDEP is caused by seizure induced laryngospasm and obstructive apnea lasting until respiratory arrest. Previous research (Willott and Henry, *J. Comp. Physiol. Psych.* 1976; Venit et al. *Epilepsia* 2004) established the survival benefits of high oxygen environments in DBA-2 mice during seizure episodes. We induced seizures in DBA/2J mice that had open tracheal t-tubes inserted vs unoperated controls, and then used a small box filled with oxygen at atmospheric pressure to enrich the animal's available oxygen at specific points during a seizure. The specific periods that were studied were (a) prior to induction of seizure, (b) from the start of the tonic phase to the end of the tonic phase, and (c) after the tonic phase until the end of a 30 second postictal period or the complete respiratory arrest of the animal. We also sought to compare how mice did in these different environments and during these phases both in the presence and absence of tracheal t-tubes.

Results: All animals that received oxygen immediately before the tonic phase survived. Animals with both a tracheal t-tube and that received oxygen during the tonic phase had a close to 100% survival rate. In contrast, either oxygen alone during the tonic phase or an open t-tube throughout the seizure conferred less of a survival benefit, as compared to control mice.

Conclusion: These findings provide additional evidence that early oxygen enrichment, even after the initiation of a seizure, can be protective against sudden death (see also Mooney et al. *Neurobiol. Dis.* 2020). The increased survival in animals with open tracheal tubes that started oxygen enrichment after the airway was presumably closed due to laryngospasm supports the idea that the open tracheal tube permits breathing during the period of obstructive apnea.

Title: Outcomes of Endoscopic Endonasal Surgery for Skull-base Chondrosarcoma: A Systematic Review

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Investigators: Prayag Patel MD; Rahul Gulati MD; Tristan Tham MD; Lee Kaplowitz MD

Background: Technical advances in endoscopic, endonasal approaches (EEA) to the clivus have allowed the median endonasal corridor to be used in the management of skull-base chondrosarcomas. Here, we systematically review the literature to report the surgical outcomes of such an approach.

Methods: An electronic search of PubMed, EMBASE and Web of Science was conducted. We included studies describing surgical outcomes of purely endoscopic, endonasal approaches for skull-base chondrosarcomas arising from the clivus or cranio-cervical junction. We performed dual, independent data extraction for outcomes of extent-of-resection (EOR), tumor recurrence during the follow-up period, resolution/improvement of pre-operative cranial nerve neuropathies, post-operative complications including CSF leak and new cranial nerve neuropathies.

Results: 6 studies comprising of 74 patients who underwent EEA for skull-base chondrosarcomas met the final selection criteria. The average age of the patients was 45.6 years with majority of the patients being female (52.8%). 23 (31.1%) patients were undergoing surgery for recurrence. Cranial nerve (CN) VI was noted to be the most common pre-operative neuropathy (61.3%). Gross-total resection (GTR) was obtained in the majority of the patients (70.2%) of the tumor while a sub-total resection (STR) was achieved in 8 patients. Post-operatively 6 patients (12.2%) had a CSF leak that required a surgical intervention while 81.9% had resolution of their pre-operative CN VI palsy. On the average follow-up duration of 32.4 months, 83.3% of patients who achieved a GTR had no recurrence. 54.5% of patients who obtained a near-total resection (NTR) underwent adjuvant therapy and had no further progression of disease while 80% of patients who obtained a STR underwent adjuvant therapy and had no disease on follow-up.

Conclusion: The preliminary results of this study suggest that EEA, in experienced hands, can achieve GTR of skull-base chondrosarcomas with resolution or improvement of pre-operative cranial nerve neuropathies and low rates of post-operative CSF leaks. Adjuvant therapy remains a viable option for patients who have residual tumor left after EEA although data on this is limited suggesting the need for larger well-developed, randomized trials with longer follow-up periods.

Title: ACE inhibitor prescribing habits of a providers serving a predominantly Afro-Caribbean population

Investigators: Hunter Hopkins MD; Natalya Chernichenko MD

Faculty Mentor: Natalya Chernichenko, MD

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Outcome Objectives: The primary objective of the current study is to gather ACE inhibitor prescribing habits of medical providers that care for a primarily Afro-Caribbean population, and, more specifically, to see whether these providers take into account the known side effect of these medications, angioedema, when deciding on anti-hypertensive regimens.

Methods: questionnaires were distributed via an online survey platform to providers affiliated with a tertiary-care hospital in East Flatbush, Brooklyn that prescribe anti-hypertensive medications. Survey results were then compiled. Trends in prescribing habits, as well as patient-related factors and medication-related factors that often play a role in prescribing decisions, were examined.

Results: distribution of survey was postponed due to the COVID-19 pandemic. However, now with the acuity of the pandemic in East Flatbush dissipating, the survey will be distributed, results compiled, and conclusions made

Conclusion: distribution of survey was postponed due to the COVID-19 pandemic. However, now with the acuity of the pandemic in East Flatbush dissipating, the survey will be distributed, results compiled, and conclusions made

Title: The timing of obstructive apneic events in DBA/2J audiogenic seizure-prone mice derived from plethysmography, behavioral analysis, and controlling the open or closed status of a tracheal implant

Investigators: Sam Schild, MD; Ankit Kansal MD; Krishnamurthi Sundaram MD; Joshua Silverman MD Ph; Richard Kollmar PhD; Mark Stewart MD PhD

Faculty Mentor: Richard Kollmar, PhD

Outcome Objectives: To determine the timing of obstructive apnea and respiratory arrest during seizure activity DBA/2J audiogenic seizure prone mice. To identify the seizure phase(s) during which a tracheal implant must be open for animal survival.

Methods: Previous work in this laboratory established the efficacy of tracheal T-tubes in DBA/2J mice as an intervention for preventing sudden death in epilepsy (SUDEP) (Irizarry et al., *Epilepsia* 2020), supporting the hypothesis that SUDEP is caused by seizure-induced laryngospasm and obstructive apnea leading to respiratory arrest. Using this model, we characterized the timing of sequential observable behaviors during a seizure event (running, clonic, tonic, respiratory arrest) with plethysmography and video analysis. We sought to define the behavior phase(s) during which an open tracheal implant was critical for preventing death by testing animals with open or closed tracheal implants in experiments where tubes would be “snipped” open or “sealed” closed at specific times during the behavioral sequence.

Results: Plethysmography and video analysis revealed the tonic phase of seizure to be the moment when the obstructive event occurred (i.e. lack of airflow in a closed tube). In

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the “snip-or-seal” experiments, there was a statistically significant increased survival in mice with open T-tube during the tonic phase compared to those without ($P_{\text{corr}} < 0.025$) with the following survival rates: closed T-Tube (4%, 1/27), open T-Tube until tonic start (0%, 0/18), open T-tube until tonic end (43%, 10/23), open T-Tube after tonic start (59%, 13/22), and open T-tube (44%, 21/48).

Conclusion: These findings indicate that airway protection during the tonic phase of the seizure in DBA/2J mice is critical for survival. While not a practical surgical intervention, the data refine our understanding of sudden death in this widely used mouse model and reinforce other evidence from our group that interventions can be initiated after a seizure starts.

Title: Experience with "Jaw in a Day" Technique

Investigators: Daniel Sukato; Daniel Hammer; Weitao Wang; Tom Shokri; Fayette Williams; Yadranko Ducic

Faculty Mentor: Yadranko Ducic

Outcome Objectives: The “Jaw in a Day” (JIAD) technique establishes immediate functional occlusion through a single stage maxillomandibular reconstruction with concurrent implant placement and provisional prosthesis delivery. Given the small number of patients described in the literature, we aim to add to the body of evidence by describing our two cases of JIAD.

Methods: We describe 2 cases from a tertiary institution exemplifying the reconstructive principles of JIAD.

Results: One patient underwent mandibular reconstruction with the JIAD technique and another patient underwent JIAD with an optimized rapid sequence computer-aided design and computer-aided manufacturing (CAD-CAM) for composite maxillomandibular reconstruction. Immediate implant-borne prosthesis was fixated and all implants osseointegrated into the neomandible.

Conclusion: Although our patient outcomes are consistent with the literature, the published reports of JIAD remain limited, and further studies are required to assess the long-term functional and aesthetic outcomes as well as cost-effectiveness of this approach.

Title: Analysis of Anosmia During the Covid-19 Pandemic

Investigators: Ryan Tabtabai, MD, MPH; Sam Schild, MD; Marina Boruk, MD

Faculty Mentor: Marina Boruk, MD

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Outcome Objectives: To identify the incidence of anosmia and dysgeusia in COVID-19 positive patients, as well as duration/resolution of symptoms, within the unique, Afro-Caribbean predominant patient population in central Brooklyn.

Methods: The study design is a descriptive, cross-sectional survey of COVID-19 positive patients admitted to University Hospital of Brooklyn from March 1st, 2020 to present date. The study consists of the following: a patient completed survey as well as extraction of relevant demographic and treatment data from the electronic medical record.

Results: The study is ongoing. We expect prevalence of anosmia and dysgeusia to be at least consistent with previously reported rates of 50-70% amongst those positive for COVID-19 in European studies. Considering the higher rates of hospitalization seen among racial minorities within New York City as compared to white, non-Hispanic population, it is reasonable to expect that rates or duration of anosmia/dysgeusia may be higher amongst racial minorities as well.

Conclusion: Better understanding of the symptomatology of anosmia/dysgeusia associated with COVID-19 amongst the patient population in central Brooklyn will help define the natural course of the disease and may lead to improvements in risk stratification and care.

Title: Trends in Free-Flap Salvage and Management in Otolaryngology

Investigators: Billy Yang, BS; **Alisa Timashpolsky, MD**; Jennifer Liang, MD Nira Goldstein, MD; Eli Gordin, MD

Faculty mentor: Eli Gordin, Nira Goldstein

Objectives: There is a lack of standardization in microvascular free-flap salvage and management across practicing microvascular head and neck surgeons in the US and worldwide. This study investigates the preoperative, intraoperative, and post-operative management of free-flap patients amongst surgeons with varying levels and years of experience and aims to identify any trends in practice based on geographic distribution, years of experience, and volume of free-flaps performed.

Study Design: Cross-sectional survey study.

Methods: An online survey was sent via email to members of the American Head and Neck Society (AHNS). Questions included years of experience, surgical volume, geographic location and anticoagulation practices employed in the preoperative, perioperative, and postoperative periods of free-flap reconstruction.

Results: Of the 1391 members of the AHNS, 120 surgeons completed the survey, with an overall 8.6% response rate. Out of these 120, 108 (90.0%) routinely performed head and neck free-flap reconstruction and over 90% were located in the US. Anticoagulation

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was employed in uncomplicated cases preoperatively (9.3%), intraoperatively (17.8%), postoperatively (53.3%), or not at all (30.8%). The most commonly used medications for thrombosis prophylaxis included aspirin (57.0%), low molecular weight heparin (22.4%), and heparin (19.6%), although a significant portion of surgeons do not routinely administer systemic anticoagulation (21.5%). The data was then stratified based on surgical volume > 50 flaps a year and >10 years of experience, and it was noted that surgeons with greater experience employed antiplatelet therapy post operatively for a significantly longer period of time ($p=.02$) and were more likely to attempt another free-flap rather than a pedicled flap after an initial failure ($p=.02$).

Conclusions: Anticoagulation and management practices in microvascular free-flap management vary across surgeons with some variation in practice based on years of experience and surgical volume. Overall, trends vary widely with no standardized management.

Title: Case series of Adult onset idiopathic auditory neuropathy

Investigators: Michael Weber, MD; Sam Schild, MD; Matthew Hanson, MD

Faculty Mentor: Matthew Hanson, MD

Outcome Objectives: Describe a series of patients with a condition of adult onset auditory neuropathy minimally described in the literature.

Introduction: Auditory neuropathy (AN) is a disorder of hearing generally accepted to be characterized by poor speech discrimination and absent auditory brainstem responses (ABR) in the setting of normal outer hair cell function as demonstrated by normal pure tone averages and otoacoustic emissions. Many cases are due to genetic or perinatal causes, however, few cases of acquired adult AN have been reported. Amplification has been shown to not be beneficial in these cases, and cochlear implantation is currently being frequently used with good results reported in the literature.

Methods: A series of 3 case reports with review of literature. We performed a retrospective review of medical records of a series of 3 patients with auditory neuropathy seen at our academic medical center between December 2015 – December 2019.

Results: We describe 3 unique case of rapid onset, bilateral isolated adult acquired AN in adults without any evidence of other neurologic disorder. No underlying genetic, inflammatory or toxic cause has been identified in these patients. They all reported normal hearing prior to experiencing a rapid decline in speech discrimination. Each had audiograms with PTAs in the normal to mild range and normal OAEs along with absent ABRs. Each had a negative workup for underlying pathology. The first patient received a cochlear implant (CI) and did poorly following implantation. The second patient improved with high dose steroids,

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and remitted following steroid cessation. The third patient received a CI and has been doing well since implantation.

Conclusion: We describe a condition of adult onset isolated rapidly progressive idiopathic AN that has been previously minimally reported in the literature, unlikely due to genetic or systemic process

Title: Impact of Adenotonsillectomy on Homework Performance in Children with Obstructive Sleep Apnea (OSA)

Investigators: Nira Goldstein MD, MPH; **Derek Wu, MD;** Michelle Bernstein; Sylvia Horne BS; Billy Tang BS

Faculty Mentor: Nira Goldstein, MD, MPH

Outcome Objectives: The study aims to prospectively determine if adenotonsillectomy improves homework performance for children with OSA.

Methods: Variables to be examined will include the Pediatric Sleep Questionnaire (PSQ) score for measure of OSA severity, various parameters (Apnea-Hypopnea Index, oxygen nadir, etc) from a standard polysomnography (PSG), if indicated, and the parent version of the Homework Performance Questionnaire (HPQ-P). The change in the total HPQ-P score after surgery between the adenotonsillectomy and control subjects will be analyzed.

Results: ongoing project, thus pending

Conclusion: ongoing project, thus pending

Title: Risk assessment in major head and neck oncologic surgery

Investigators: **Rachel Irizarry MD;** Jennifer Liang MD; Lousette Saint Victor MPH; Lori A. Hoepner DrPH; Natalya Chernichenko MD

Faculty Mentor: Natalya Chernichenko, MD

Outcome objectives: Identification of patients at increased risk for perioperative adverse events (AE) is imperative to properly counsel those offered major head and neck oncologic surgery. Age, comorbidity, and frailty are well established risk factors for surgical morbidity. Yet, few large-scale studies have analyzed and compared their predictive value in head and neck cancer (HNC) patients specifically.

Methods: A retrospective cohort study using ACS National Surgical Quality Improvement Program (NSQIP) database (2007-2017) was performed. Surgically treated HNC patients were identified then stratified based on age: ≤ 40 , 41-64, 65-79,

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≥ 80 , American Society of Anesthesiologists (ASA) score, and Modified Frailty Index-5 (MFI-5) score and rates of postoperative AE including postoperative complications (POC), extended length of stay (LOS), reoperation (RO), or readmission (RA) were analyzed.

Results: Of the 4,414 patients included 1053 (24%) experienced AE. The odds of POC among all age groups was 3.5% higher in ASA 4 compared to ASA 3 (3.6% vs. 7.1%, $p < 0.05$). Similarly, for ages 40-69, RO and LOS rates were higher in ASA 4 compared to ASA 3, 0.75% (2.58 vs. 1.84, $p < 0.05$) and 4.1% (11.75 vs. 7.68, $p < 0.05$), respectively. As MFI-5 score increased there was a corresponding increase in POC from 1.43 to 1.61 to 2.77 ($p < 0.05$). No risk factor accurately predicted RA.

Conclusion: Although increased rates of major surgical complications occur in patients over 65 years of age, particularly those > 80 , our study shows age alone is not an independent predictor of post-operative AE in HNC patients. Conversely, both risk assessment indices, MFI-5 and ASA, were significant predictors of POC and therefore, should be used to counsel patients considered for major HNC surgery.