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BACKGROUND AND PURPOSE: The effects of maxillary advancement (MA) on velopharyngeal anatomy have been previously studied by means of cephalometric analysis. The purpose of this study is to compare the pre- and postoperative velopharyngeal port configuration modifications as measured on computerized tomographic scans. Changes in velopharyngeal port (VFP) volume and area do not seem to change significantly. These modifications do not seem to impact VPF.

METHODS: This was a retrospective cohort study of 44 patients with and without cleft lip and palate who were treated with MA for midface hypoplasia and secondary malocclusion at skeletal maturity. Pre- and postoperative computerized tomographic images were compared with respect to pre-established landmarks by 2 independent evaluators. Perceptual speech assessments were completed pre- and postoperatively.

RESULTS: Of the linear distances computed, the differences in the pre- and postoperative measures of the narrowest part of the nasopharynx, the narrowest part of the retropalatal airway space, and the retropalatal anteroposterior distance were statistically significant ($P < 0.05$). The retropalatal cross-sectional areas (pre: 129.82 ± 102.12 mm$^2$ versus post: 145.65 ± 99.90 mm$^2$), the nasopharyngeal cross-sectional areas (pre: 375.16 ± 120.58 mm$^2$ versus post: 370.38 ± 142.61 mm$^2$), and the volumetric assessment of the nasopharyngeal space (pre: 4.06 ± 2.26 cm$^3$ versus post: 4.34 ± 2.35 cm$^3$) showed no statistically significant difference ($P < 0.05$). There was no change in VPF following MA as reported by perceptual speech assessment.

CONCLUSION: Our results support the belief that although some structural modifications of the pharyngeal port are inherent to MA in cleft lip and palate patients, its surface area and its volume do not seem to change significantly. These modifications do not seem to impact VPF.

REFERENCE:
1. Aksu M, Taner T, Sahin-Veske P, et al. Pharyngeal airway changes associated with maxillary distraction osteogenesis in adult cleft lip and palate patients. J Oral Maxillofac Surg. 2012;70:e133–e140.

Indocyanine Green Lymphangiography: An Alternative to Blue Dye Detection for

Sentinel Lymph Node Biopsy in Cutaneous Malignancies of the Head and Neck

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INTRODUCTION AND OBJECTIVES: Sentinel lymph node biopsies (SLNBs) are the gold standard for staging of invasive cutaneous melanoma and other malignancies. Traditionally, preoperative lymphoscintigraphy with a radioisotope and intraoperative use of a vital blue dye is used to identify the sentinel node and draining nodal basin. SLNB for melanoma occurring in the head and neck (HN) region can be more challenging due to multiple draining lymph node basins, small size of cervical nodes, and the anatomic challenges of nodal removal. In addition, the proximity of the primary site to draining lymph node basins may preclude accurate tracer identification of the SLN. Previous studies have demonstrated complications with the use of blue dyes including anaphylactic reactions, wound infections, and inconsistent identification of sentinel nodes. Staining of the lymphatic basin by blue dye can obscure and complicate the dissection. Our objective is to evaluate the equivalence in SLN detection in HN malignancies with the use of intraoperative indocyanine green lymphangiography (ICG) instead of traditional blue dye.

METHODS: Ten consecutive cases of primary cutaneous melanoma or Merkel cell carcinoma of the HN without clinically evident regional metastasis undergoing SLNB with ICG and identification by the SPY-PHI Fluorescence Imaging Technology (Stryker Corp., Kalamazoo, Mich.) in association with a preoperative lymphoscintigraphy with Spect-CT were evaluated. A total of up to 1 ml of ICG was injected intradermally across 4 quadrants around the primary lesion. The identified nodes were confirmed through an enhanced fluorescence signal information with vivid white light images in real-time and subsequently with gamma probe and pathologic identification.

RESULTS: All sentinel lymph nodes identified preoperatively by lymphoscintigraphy with Spect-CT were correctly identified by the SPY-PHI system. In all cases, visual localization of the lymphatic drainage through the skin helped to detect the lymph node basin. Very bright appearance of the SLN has made identification easier and dissection from nearby structures safer. Confirmation via gamma probe and pathologic evaluation was 100%. There were no complications at the injection sites in any patients.

CONCLUSION: In this pilot case series, the ICG via the SPY-PHI system proved as a safe and reliable alternative
for blue dye localization in SLNB of HN cutaneous malignancies. It showed easier SLN visualization and detection compared to blue dye injection and possibly a decreased complication profile. Longer-term studies are needed to accurately assess false-negative rates after undergoing SLNB via ICG lymphangiography.

**Surgical Workforce, Socioeconomic Status, and the Global Burden of Orofacial Clefts**

**Presenter:** Shane D. Morrison, MD, MS

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**PURPOSE:** Orofacial clefts are one of the most common congenital anomalies, but this disease burden is unevenly distributed worldwide. Our hypothesis is that most of this burden falls on the countries with the smallest surgical workforce or lowest sociodemographic indices, rather than the countries with the highest prevalence of disease.

**METHODS:** The Global Burden of Disease methodology was used to estimate prevalence and morbidity of orofacial clefting in 195 countries from 1990 to 2017. Disability-adjusted life years (DALY’s) and prevalence were compared over time, geographically, and against the sociodemographic index (SDI) and size of the national surgical workforce. Linear and logarithmic regressions were performed. Our international authorship hypothesizes on multiple factors contributing to this change based on their region's perspective.

**RESULTS:** From 1990 to 2017, the number of clefts worldwide decreased by 4.9% to 10.8 million and the burden of this disease significantly decreased by 70.2% to 652,084 DALY’s. In 2017, low- and middle-income countries experienced 83.5% of the DALY burden. The largest decreases in DALY were seen in East Asia and the Pacific (83.6% decrease) and Sub-Saharan Africa (73.1% decrease), whereas North America (14.2% decrease) and high-income countries (20.5% decrease) remained neutral. Prevalence was weakly positively associated with increasing SDI ($r = 0.43$; $r^2 = 0.18$), whereas DALY’s were negatively associated with SDI ($r = -0.79$; $r^2 = 0.48$). There was a logarithmic association between the estimated surgical workforce and the disease burden, with significantly fewer DALY’s in countries that had a surgical workforce of >6 providers per 100,000 population.

**CONCLUSION:** The burden of orofacial clefts has decreased significantly despite steady prevalence over the past 28 years. Most of the burden of orofacial clefting is carried by low- and middle-income countries, and the prevalence of orofacial clefting is not strongly correlated with the sociodemographic index. Strengthening the surgical workforce may aid in decreasing the life-long disease burden of orofacial clefting for any given country.

**Skull Base Reconstruction Using Free Flaps Following Extended Tumor Ablation: A Retrospective Study of 45 Cases**

**Presenter:** Yoshitsugu Hattori, MD

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**BACKGROUND:** Oncologic resections at the skull base often result in extended defects and exposure of the brain, dura, and adjacent structures, and sometimes patients suffer from fatal postoperative complications like meningitis and cerebrospinal fluid leak.1 The primary goals of skull base reconstruction involve separation of central nervous system from external or mucosal contamination, obliterating dead space, and restoring acceptable appearance and function when possible. Although small defects can often be successfully closed using local flaps or distant pedicled flaps, surgical resection frequently results in the creation of complex, large, and 3-dimensional defects, which can be reconstructed only through the use of microvascular tissue transfer.2,3

**METHODS:** A retrospective study was conducted of patients diagnosed with tumors infiltrating the skull base, who underwent extended tumor resection and primary microvascular free flap reconstruction between 2007 and 2017 at the University of Tokyo, Japan. The parameters investigated include demographics, tumor characteristics, preoperative therapies, reconstructive procedures, and above all, postoperative complications.

**RESULTS:** Forty-three patients underwent a total of 45 skull base free flap reconstruction during the study period. Twenty-eight males and 15 females were included in the study. Two patients developed a tumor recurrence and were treated with surgical skull base resection and a second microvascular reconstruction. The mean age was 55.8 years (range,