shorter lengths of stay (4.0 vs. 3.1 days; \(p > .001\)) and used fewer doses of opioids (91.77 vs. 54.52 morphine equivalents; \(p = .012\)). Rates of complications were similar between groups (23.9% vs. 13.5%; \(p = .145\)). Linear regression revealed lower pain scores on postoperative day (POD) 1 and 2 and patient being out of bed on POD1 were predictive of decreased total opioid use. Factors predictive of decreased length of stay included patient out of bed on POD1, decreased total opioid use, and participation in the ERAS protocol. Increased total opioid use was predictive of increased pain scores on day of discharge.

CONCLUSION: For microsurgical breast reconstruction patients, ERAS protocols may significantly improve and expedite the postoperative recovery experience without an increased risk of complications. The statistical models show various aspects of ERAS being predictors of decreased opioid use, decreased pain scores, and decreased length of stay.

CRANIOMAXILLOFACIAL/HEAD & NECK SESSION 3

A Prospectively-Validated Risk Stratification Tool for Adverse Perioperative Events in Patients Undergoing Cleft Palate Repair

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INTRODUCTION: Adverse perioperative events (APE) complicate 5–30% of cleft palate repairs, causing significant morbidity, distress, and prolonged hospitalizations. While syndromic diagnosis and young age have been implicated as APE risk factors in general anesthesia, individual risk remains difficult to predict. This study prospectively validates a previously-developed risk assessment tool which estimates individual risk for APEs after cleft palatoplasty.

METHODS: A prospective cohort of patients under 2 years having primary Furlow palatoplasty were reviewed for medical history and perioperative data. APEs were defined as laryngobronchospasm, accidental extubation, reintubation, obstruction, hypoxia, and unplanned ICU admission. Multivariate regression modeling, risk factor stratification, and model performance were assessed.

RESULTS: 190 patients averaging 11.7 months were included. Veau Cleft distribution included: Submucosal-13.9%, I-14.9%, II-31.4%, III-32.0%, IV-7.7%. Pierre Robin (PRS) (N=29) was the most prevalent syndrome/anomaly. 60% of patients received paralytic reversal and total narcotic dose averaged 0.17 mg/kg. APEs occurred in 31 patients (16.3%): hypoxia (11.6%), airway obstruction (6.3%), unplanned ICU (6.3%), laryngobronchospasm (2.1%) reintubation (1.1%). Adjusted regression analysis for APEs identified risk factors including higher perioperative narcotic administration (> 0.32 mg/kg OR=11.6, \(p = 0.004\)), abnormal airway anatomy (OR=4.52, \(p = 0.045\)), 2+ intubation attempts (OR=4.43, \(p = 0.006\)), history of reactive airway disease (OR=4.11, \(p = 0.029\)), and syndrome other than PRS (OR=2.74, \(p = 0.05\)). Protective factors included administration of reversal agent (OR=0.37, \(p = 0.05\)) and use of gelfoam packing (OR=0.25, \(p = 0.04\)). Patients were risk-stratified according to individual profiles as low (APE: 2.1%), average (APE: 5.7%), high (APE: 37.8%), or extreme risk (APE: 88.9%). Validation against our prior predictive tool found this prospective risk model was significantly more accurate with C-statistic=0.87 vs. C-statistic=0.74 (\(p = 0.002\)).

CONCLUSION: APEs occurred in 16.3% of palatoplasties. Higher opioid doses, multiple intubation attempts, and syndromes not including PRS imparted significant perioperative risk while use of paralytic reversal agents was consistently protective. Validated prospective risk-assessment tools such as this provide discrete strategies for reducing risk and may better inform patient selection and perioperative management in an evidence-based manner.

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**Assessing the Fisher, Millard, and Mohler Techniques of Cleft Lip Repair Surgery with Eye Tracking Technology**

**Presenter:** Jeffrey W. Kwong, BS  
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**PURPOSE:** Cleft lip is one of the most common congenital anomalies in the world that can have severe consequences on a child's social, functional, and emotional development. Eye-tracking technology offers an unbiased way to evaluate how viewers perceive the aesthetic outcome of cleft lip repairs. Here, we apply eye-tracking technology to compare how viewers with varying degrees of experience in plastic surgery assess the aesthetic quality of the Fisher, Millard, and Mohler cleft lip repair techniques.

**METHODS:** 17 subjects with plastic surgery experience ranging from layperson to attending plastic surgeon were shown 20 images (5 controls without cleft lip and 5 each of unilateral Fisher, Millard, and Mohler repairs). Viewers were instructed to examine the images, while eye-tracking equipment was used to track viewers’ gazes and analyze the distribution of attention during the task. Subjects were then asked to evaluate the overall aesthetic quality of each image on a 1-to-10 Likert scale. Eye-tracking equipment and software from Tobii Technology (USA) was used to track raters’ gazes and analyze the number of gaze fixations and time of fixation on different areas on the displayed faces.

**RESULTS:** On average, subjects demonstrated the highest number of gaze fixations for Fisher repairs (18.3), followed by Millard (16.8) and Mohler (15.8) repairs. Duration of time in fixed gaze followed a similar pattern, in which subjects looked longest at Fisher repairs (6.73 sec), followed by Millard (5.33 sec) and Mohler (5.30 sec) repairs. In evaluating the aesthetic quality of the three techniques, subjects also most preferred the Fisher repair (6.9), over the Millard (5.8) or the Mohler (6.5) repairs. The repair scar was the first area to catch viewers’ attention in only 4 out of 15 repairs (2 Fisher, 1 Millard, and 1 Mohler), but the area that held the longest duration of fixation on average in 6 out of 15 repairs (3 Fisher, 1 Millard, and 2 Mohler), as well as the area that garnered the highest number of fixations in 7 out of 15 repairs (4 Fisher, 1 Millard, and 2 Mohler).

**CONCLUSION:** Eye tracking provides a novel and objective way to evaluate viewers’ attention and to correlate gaze data with clinical aesthetic outcomes. In comparing the three techniques, the subjects’ attention indicated that they tend to prefer the Fisher repair, with these images receiving the highest number of fixations, longest time of fixation, and highest Likert score. Interestingly, viewers seem to first fixate on the philtrum to establish a reference of normal anatomy before moving to examine the repair scars, as none of the repair techniques typically caught viewers’ initial attention. However, viewers did tend to spend more time analyzing the scar than other areas of the face in about half of all repairs after first establishing a normal reference frame. This suggests that repair scars do capture viewers’ attention but only upon a closer inspection. Ongoing work includes testing these effects on craniofacial and non-craniofacial attending surgeons and exploring the impact of bilateral repairs of each technique.

**Single-Stage Primary Cleft Lip and Palate Repair: Analysis of Early Complications**

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**BACKGROUND:** Simultaneous primary cleft lip and palate (PCLP) surgery is controversial in the United States. As a result, most patients are treated with a staged approach including repair of the lip first, followed by palatal repair at approximately 1 year of age. In this study, we evaluate early postoperative complications of the single-stage PCLP