Global Burden of Craniomaxillofacial Diseases - a Four Country Cluster Randomized Study Using the Sosas Instrument

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**INTRODUCTION:** It is estimated that 11% of the global disability-adjusted life years (DALYs) are attributable to surgically treatable diseases, 66% of which are related to injuries, masses, and congenital deformities. When located within the head, face, and neck region, plastic surgeons are particularly trained to treat these conditions, however most low-income countries report less than 5 plastic surgeons for their entire country. The purpose of this study was to describe the disease etiologies of the head, face, mouth, and neck region. Furthermore, it aims to explore the proportion of people receiving care, barriers to receiving care, and the long-term disability attributed to craniomaxillofacial diseases.

**METHODS:** The Surgeons OverSeas Assessment of Surgical Need (SOSAS) instrument is a cluster randomized, cross sectional, country wide survey administered in Nepal, Rwanda, Sierra Leone, and Uganda from 2011 to 2014. The survey identifies demographic characteristics, etiology (e.g. burn / mass/ congenital deformity / trauma), timing of the disease, proportion seeking/receiving care, barriers to care, and disability.

**RESULTS:** Across the four countries 13,763 individuals were surveyed with 1,413 diseases of head, face, mouth, and neck region identified. Rwanda reported the largest proportion of children (age < 6, 13.94%) and elders (age >64, 7.96%) with craniomaxillofacial diseases while Nepal had the greatest proportion of working aged individuals (age 15–64, 73.2%) (p<.001). Across the four countries diseases of the head were the most common craniomaxillofacial region reported with masses (22.13%) and trauma (32.8%) as the most common etiology. Nepal reported the largest proportion of masses (40.22%) and Rwanda reported the largest amount of trauma (52.65%) (p<.001). Rwanda had the highest proportion of individuals seeking (89.6%) and receiving care (83.63%) while Sierra Leone reported the fewest (60% vs 47.77%, p<.001). Rwanda also had the highest proportion of individuals reporting disability from craniomaxillofacial disease while Nepal reported the highest proportion with no disability (43.68% vs 79.33%, p<.001).

**CONCLUSION:** This study is the largest of its kind evaluating craniomaxillofacial diseases from a multi-country population based perspective. Despite similar country socioeconomic make up there was significant variability across the four countries in demographic, craniomaxillofacial disease type, patterns of care seeking/receiving, and disability. These findings demonstrate the substantial burden of craniomaxillofacial diseases across four low-income countries and represents a call for increasing plastic surgery training in these countries.

**Reference Citations:**
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**Lengthening Temporalis Myoplasty Versus Free Gracilis Muscle Transfer with Cross Face Nerve Graft for Long-Standing Facial Paralysis in Children: An Objective Measure of Outcomes Using Oral Commissure Excursion**

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**INTRODUCTION:** Lengthening temporalis myoplasty (LTM) and cross face nerve graft with free gracilis muscle transfer (CFNG-FGMT) – have
become popular procedures to improve facial symmetry and dynamic facial reanimation. In this study we seek to look at oral commissure excursion as an objective measure of function and symmetry between these two dynamic facial reanimation procedures.

**METHODS:** A retrospective chart review was performed of patients with facial palsy who received either CFNG-FGMT or LTM from 2008–2016 at a single institution. Analysis of the normal and affected sides of the face, in repose and while smiling, in pre- and post-operative photographs was performed by using the Facial Assessment by Computer Evaluation (FACE-gram) software. Commissure displacement was measured in three vectors. Statistical analysis included Wilcoxon rank sum, Fisher exact test, and multi-level mixed-effects regression.

**RESULTS:** Five patients with LTM and 11 with CFNG-FGMT met inclusion criteria. Overall outcomes for these 16 patients based on univariate analysis showed that there was an improvement in symmetry based on oral commissure excursion while smiling preoperative 14.85±5.19, postoperative 4.39±7.75mm (p=0.0001). Mixed regression analysis controlling for time showed that surgery causes a 7.56±2.49mm improvement from preoperative to postoperative (p= 0.002). Using a mixed regression that controlled for time, CFNG-FGMT showed an overall 10.03±5.10mm asymmetrical difference in commissure excursion when compared to LTM in postoperative smile of paralyzed relative to normal side. For LTM, there was a significant postoperative improvement of excursion at rest and while smiling (22.53±8.31mm and 17.54±8.90mm, p= 0.01 and 0.05, respectively.) Of note, for LTM statistically significant improvement in smile started within 3 months postoperatively (18.09±4.82 mm, p<0.01) While univariate analysis for CFNG-FGMT showed improved symmetry between the paralyzed to normal side between preop 14.25±5.27mm to postop 5.33±6.88mm (p<0.01), after controlling for time, the significant difference was removed. A statistically significant improvement in facial symmetry was not seen until the 3–6 months postoperatively 7.28±2.32 mm, (p<0.01).

**CONCLUSION:** Our results show that overall commissure excursion improves postoperatively for both LTM and CFNG-FGMT. However, LTM had a greater improvement in excursion and symmetry at rest and during smile. Results are significant within the first 3 months post operatively. While CFNG-FGMT shows overall improvement in postoperative commissure excursion during smile, significant improvement takes greater time, with less overall excursion and symmetry than LTM.

**Reference Citations:**

1. Bray D, Henstrom DK, CheneyML, Hadlock TA. Assessing outcomes in facial reanimation: evaluation and validation of the SMILE system for measuring lip excursion during smiling. Arch Facial Plast Surg. 2010;12(5):352–354.

**The Influence of Age and Etiology on Operative Outcomes in Facial Palsy after Cross Face Nerve Graft with Free Gracilis Muscle Transfer**

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**INTRODUCTION:** Facial palsy etiologies are classified as congenital or acquired. Treatment strategies are based on the subject’s age, severity of disease, and surgeon experience. It is unclear whether etiology affects outcome. Herein, we seek to compare outcomes after two-stage free gracilis muscle transfer (CFNG-FGMT) for long-standing facial palsy between patients with congenital versus acquired disease.

**METHODS:** A retrospective chart review was performed of all patients with facial palsy who received unilateral two-stage facial reanimation surgery from 2008–2016 at a single institution. Surface EMG and Sunnybrook scores were recorded. Statistical analysis utilized Wilcoxon rank sum and fisher exact test for demographics and etiology. A univariate and multi-level mixed-effects regression analysis was performed to compare congenital vs. acquired patients who underwent CFNG-FGMT. Analysis of the normal and affected sides of the face, in repose and while smiling, pre- and post-operatively was performed by using the Facial Assessment by Computer Evaluation (FACE-gram) software. Commissure displacement was measured in three vectors.