

MYTHBUSTING IN PLASTIC SURGERY



By: Raymond
Tse, MD
Associate Professor



By: Ezgi
Mercan, PhD
*Director,
Craniofacial Image
Analysis Laboratory*



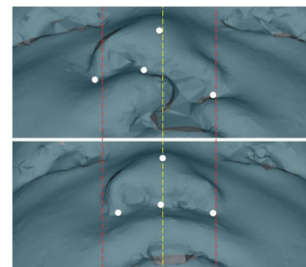
By: Russell
Ettinger, MD
Assistant Professor

Cleft lip and palate occurs in 1 in 750 newborns due to failure of fusion of embryologic components of the face. The degree of clefting can be variable in its involvement of lip, alveolus, hard palate, and soft palate, and the impacts include impairments in feeding, speech, hearing, hygiene, dental health, and appearance. The [Craniofacial Center at Seattle Children's Hospital](#) (SCH) serves the Washington, Alaska, Montana, and Idaho regions and provides comprehensive multidisciplinary care to children with these and other facial differences. Plastic Surgery is at the core of the team, providing surgical care from birth to adulthood and balancing patient needs with impacts of treatment on growth and development. While the clinical team is the largest and most comprehensive in North America, the research team continues to make strides in our understanding of cleft deformities.

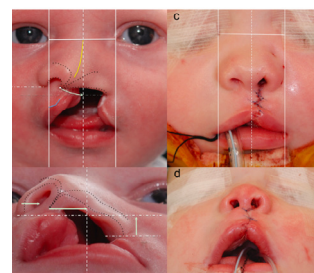
One of the fundamental principles of any reconstruction is a clear understanding of the deformity and the "normal ideal." Until now, descriptions of the cleft lip nasal deformity have been based upon subjective observations and, in turn, those descriptions have formed the basis of surgical goals that have been passed along as dogma for decades. With the use of 3D imaging, computer vision techniques, and collaboration with researchers in the Department of Computer Science and Engineering, the Plastic Surgery team at SCH has produced an objective model of the deformity. Their data-driven model has revealed misperceptions in previous descriptions and has revealed that previous goals of surgery have been misleading. Not only does their model re-define treatment objectives, it also provides insights into the cause of the deformity. The combination of a gap, an uncoupled growth center, and changes that occur in opposing manner can explain everything. With this newfound knowledge, the team is now redefining the objectives of surgery which will allow surgeons to improve outcomes for children with clefts.

The work is the product of a long-time collaboration of Drs. [Raymond Tse](#), Associate Professor, Division of Plastic Surgery, [Ezgi Mercan](#), Director, Craniofacial Image Analysis Laboratory and [Russell Ettinger](#), Assistant Professor, Division of Plastic Surgery, the latest addition to the team. Their work has most recently been conducted as part of the SCH [Craniofacial Image Analysis Laboratory \(CranIAL\)](#). The collaboration with Dr. Mercan started when she was a PhD student and continued with her addition to the Craniofacial Team as a dedicated researcher. Dr. Mercan is supported through donated funds and now manages and runs a diverse spectrum of projects involving multiple investigators in the broader Craniofacial Team.

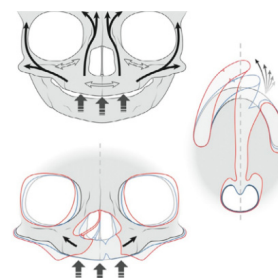
Although Dr. Tse and other members of the Craniofacial Team are involved in other NIH supported projects, funding via donations provides the means to conduct more free-form investigations. The lack of constraints affords freedom and creativity to engage in research in innovative and practical ways. The surgeon-engineer collaboration would not have been possible without this funding. The SCH team values the support they receive from the UW and other donors. They continue to strive to improve care here and abroad through the discovery of truths that impact care globally.



3D surface image analysis.



Correction of cleft lip and nose deformity with references to guide surgical objectives.



Conceptual model of the underlying pathology.