Facial and Orbital Asymmetry in Oculofacial Surgery Patients

Jennifer Lira, MD; Nicole Langelier, MD; Abigail Lepsch, MD; Sanja G. Cypen, MD; Roshni Ranjit-Reeves, MD; Julie Woodward, MD

RESIDENT PEARL
• A small degree of asymmetry is normal and more common than perfect symmetry.

Facial symmetry traditionally has been associated with beauty, and we typically strive for symmetry in surgery. However, the subtle degrees of asymmetry are natural and perhaps even more common than perfect symmetry. We retrospectively reviewed photographs of 100 oculofacial surgery patients without history of unilateral or orbital pathology or diplopia to describe the occurrence of facial asymmetries, including larger hemiface, hemiface with stronger seventh cranial nerve (measured by smile excursion and increased dynamic periorcular rhytides during smile), hemiface with more pronounced rhytides at rest, difference in vertical globe height compared to interpupillary distance (IPD), higher earlobe, and higher lip. We found that most patients had static and dynamic facial asymmetry. Our data highlight the importance of counseling patients about preexisting facial asymmetry and establishing normative values for asymmetry.

Methods
One hundred oculofacial surgery patients without unilateral or orbital pathology or diplopia were included in this retrospective evaluation of static and dynamic facial asymmetry via facial photography (100 participants). Three graders were provided standard frontal and frontal smiling photographs with overlying facial grids to aid in assessing larger hemiface and hemiface with stronger seventh cranial nerve, which was judged in smiling photographs by assessing the excursion and the vector of motion; more rhytides at rest; higher globe; higher earlobe; and higher lip. Difference in globe height was measured relative to interpupillary distance (IPD) and as photoaging. Cosmetic and reconstructive surgical procedures strive to achieve facial symmetry. Patients often are unaware of their preexisting facial asymmetry. Anecdotally, we have found patients tend to be more cognizant of preexisting facial asymmetry following a notable change in facial appearance (eg, surgery). In counseling patients who are considering reconstructive or cosmetic surgery, it is beneficial to identify any preexisting facial asymmetries and discuss if they are within normal limits. The current literature, however, lacks thresholds for what is considered normal in many cases. In this study, we reviewed 100 faces without unilateral or orbital pathology or diplopia to describe the occurrence of facial asymmetries, including larger hemiface and hemiface with greater excursion of motion upon smiling (interpreted to signify stronger seventh cranial nerve), hemiface with more rhytides at rest, higher globe, higher earlobe, and higher lip.

IN COLLABORATION WITH COSMETIC SURGERY FORUM
Jennifer Lira, MD
Top 10 Fellow and Resident Grant Winner at the 8th Cosmetic Surgery Forum

Correspondence: Julie Woodward, MD, Duke University Medical Center, 234 Crooked Creek Pkwy, Durham, NC 27713 (Julie.woodward@duke.edu).
Results
One hundred photographs were analyzed including 82 women aged 42 to 85 years and 18 men aged 22 to 88 years (overall average age, 61.64 years). The average difference in globe height was 1.2% of IPD; the maximum was 4.4% of IPD. The difference in globe height was verified by 3 graders via 2 different methods. Fifty-four patients were found to have a larger right hemiface, 36 had a larger left hemiface, and 10 had symmetrically sized hemifaces. Nearly half of patients were judged to have greater seventh cranial nerve action on the left (n = 47), approximately one-quarter had greater action on the right (n = 28), and another quarter were judged to have equal action (n = 25). Most patients had static facial asymmetry; 72 had rhytides more pronounced on one hemiface compared to the other, 79 with a difference in globe height, and 68 with a difference in lip height. In approximately 40% of photographs, the graders were unable to judge earlobe height difference; therefore, this data was not analyzed. There was no correlation among the 6 variables.

Discussion
Facial asymmetry has long been a topic of interest in the plastic and reconstructive surgery fields. Ercan et al.7 used statistical shape analysis to study facial asymmetry in young healthy subjects and found the left hemiface to be larger than the right hemiface in both sexes. Smith4 evaluated facial asymmetry in healthy college students and found the left hemiface to be larger in males and the right hemiface to be larger in females. Our group was predominantly female, but we found the right hemiface to be larger in both sexes and males, similar to the findings of Lepich et al.8

We also found that most patients had static and dynamic facial asymmetry despite knew unilateral pathology. The present literature lacks normative values to help determine what degree of asymmetry should be considered pathologic. Vertical orbital dystopia is defined as an inequality in the horizontal levels of the whole orbits.9 It has been hypothesized that most vertical dystopia is caused by congenital malformations, but no threshold has been set for the difference in height that qualifies as dystopia.10 Regarding the difference we found in globe height relative to IPD, if one takes the mean IPD of 63.36 mm (based on a study of 3976 American adults aged 17–51 years)11 and makes the assumption that our patients have this IPD, then one can extrapolate that on average there was a difference of 0.76 mm between the 2 globe heights. Likewise, nearly all patients (n=96) had less than a 2-mm difference (21 had symmetric globe heights, 46 had a difference in globe height of <1 mm, and 29 had a difference of >1 mm and <2 mm). Four patients had a difference greater than 2 mm, with the largest difference being 2.75 mm. A limitation of this retrospective study is the need to extrapolate these distances, as our patients were not photographed with rulers.

Hafezi et al.12 looked at the facial asymmetry in patients without history of trauma or nasal fracture who were seeking rhinoplasty. They noted vertical orbital dystopia in this patient population, but the degree of dystopia was not quantified.12 We believe our data highlight the importance of counseling patients about preexisting facial asymmetry with normative values in mind. Patients may be dissatisfied by new or preexisting asymmetry following surgery, even if such asymmetries are less objectively apparent than in the patient's preoperative appearance. Even when patients are already acutely aware of their facial asymmetries, they should learn that facial asymmetries, to varying degrees, are natural and not necessarily unattractive. In fact, a 2006 study of ocular adnexal asymmetry in 102 models with magazine photograph analysis found small amounts of asymmetry to be the norm. Specifically, the authors found an average difference in globe height of 1.2 mm, slightly greater than the average found among our patients.13 Our data will help to establish normative values for asymmetry in normal faces.

REFERENCES