A Modified Template for Microtia Reconstruction
Tested by Surgical Simulation on Ipomoea batatas

Sir:

Microtia reconstruction is a challenge for plastic surgeons because of its variable clinical presentation and difficult surgical reconstruction. Although several reconstructive methods have been proposed, reconstruction with autologous costal cartilage, as elaborated and modified by Tanzer, Brent, and Nagata, remains the best option with which to obtain favorable results with fewer complications than other reconstructive options.

The three-dimensional topography of the external ear accurately reflects the shape of the internal cartilaginous skeleton. Reproducing anatomical and structural details of the external ear is a challenge for any plastic surgeon and requires a high level of surgical skill and training to fulfill the patient’s expectation. Surgical simulation allows development of these skills, reducing mistakes, shortening surgical time, and improving results in vivo. We performed a surgical simulation experimental study, evaluating traditional and modified auricular templates as guides for carving ear frameworks on Ipomoea batatas, comparing and analyzing the obtained results.

The traditional templates were based on sheets of paper and sketched lines representing the main structures of the external ear (i.e., helix, antihelix, tragus, antitragus, triangular fossa, scaphoid fossa, and concha) (Fig. 1). The proposed modified templates were based on paper sheets, with lines representing the main structures and markings detailing the depths of each of these structures as follows: whole painted, striped, and unpainted (meaning deep, not deep, and elevated, respectively). The striped lines, at the same time, represented more depth when drawn closer together (Fig. 1).

Ipomoea batatas, also known as sweet potato, was used because of its similarity in consistency and flexibility to human rib cartilage. Each sweet potato model was referred to as an individual case. Five common carving tools with different curves and angles were used to sculpt the models. Eight novel surgeons were tested; half of them used the traditional template and the other half used the modified template. The exercise was repeated twice. The resulting auricular sculptures were evaluated based on aesthetic results, ranked according to resemblance to the real ear model, being classified as poor, fair, or good results.

Aesthetically different auricular frameworks were obtained using the two different types of templates. Better definition of three-dimensional structures (i.e., helix, antihelix, tragus, antitragus, scaphoid fossa, triangular fossa, and concha) and better aesthetic results were obtained using the modified template (n = 16).

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The authors’ results suggest that the traditional auricular template is not as effective at guiding the inexperienced ear reconstructive surgeon as the modified auricular template, which facilitates sculpting three-dimensional structures. Participants reported ease of use and better pattern guide, resulting in more aesthetically appealing three-dimensional experimental ear frameworks (Fig. 2). Although some surgeons prefer to obtain a three-dimensional plastic model of the contralateral healthy ear to aid in sculpting the new one, this modified template provides a simple, efficient, and economical method of surgical guiding for external ear reconstruction. Accurate sketching of anatomical individualities in the initial template is fundamental for obtaining adequate results. Our study highlights the importance of surgical simulation for training and improvement of surgical techniques.

DISCLOSURE

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REFERENCES


Ocular Findings in Children with Orbital Hypertelorism

Sir:

Orbital hypertelorism is a congenital anomaly of the skull characterized by an increased distance between the medial orbital walls.\(^1,2\) Abnormal ocular findings include strabismus, optic atrophy, blepharophimosis, microphthalmos, and amblyopia.\(^3\) However, detailed description of strabismus or stereopsis in these patients has not been documented. This study was performed to analyze in detail the ocular findings in Asian patients with orbital hypertelorism.

Medical records of five consecutive Asian patients with orbital hypertelorism with an interocular distance greater than 30 mm measured with orbital computed tomography were reviewed retrospectively. All patients were boys with an average age of 5.8 years (range, 3 to 9 years) at the initial ophthalmologic examination (Table 1). The average interorbital distance was 37.8 mm (range, 32 to 48 mm). All patients had exotropia of 40 to 80 prism diopters. Patients 2 through 5 could not recognize any of the figures, animals, or dots of the Randot stereotest; patient 1 could not perform the Randot stereotest because he was too young to understand how to perform it.

All of the patients showed epiblepharon with multiple punctate corneal epithelial erosions. Four had “with-the-rule” astigmatism greater than 0.50 D, and three patients had astigmatism greater than or equal to 2.00 D. Patients 2 and 3 showed anisometropia greater than or equal to ±1.00 D and amblyopia (Table 1). None of them had brain abnormalities, developmental delay, or deafness.

Patient 1 was a 3-year-old boy who was born prematurely at week 37 of gestation with a birth weight of 2.52 kg. On ophthalmologic examination, he fixed and followed a 5-inch object at near with each eye. He had

Fig. 2. Comparison of sculpted ear and real model.