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Introduction

Recent innovations in laser scanning technology provide a potentially useful technique for accurate three-dimensional documentation of the face. In this study, linear and area measurements of the facial contour and facial units have been recorded in a variety of chosen facial postures using surface laser scanning combined with three-dimensional lighting techniques on seven healthy volunteers and three patients with facial nerve paralysis.

methods

Three-dimensional surface measurement of the face was taken using a laser light scanner(Cyberware Laboratory 3030/SP), which projects a low-power laser beam onto the face of the subject. Computer graphics lighting techniques were used to produce facial images constituted by highlights and shadows, which emboss facial contour and units. The quantitative measurement of changes in facial angles and areas were made to analyze morphological changes of the face accompanying facial expression.

Results

Changes of angles and widths of the cheek units were found to be associated with dimensional changes imposed by the action of the underlying mimetic muscles.

Discussion

One of the characteristic advantages in our study is that the facial images, observed from any angle with the light projected from any location, can be obtained with only one scanning, and this technique allows simulation of the facial contour and units that we would actually encounter in daily life.