A Technique for Sculpturing the Orbital Prosthesis Using a Superimposed Images

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Abstract: Fabrication of an orbital prosthesis is difficult because the form of the eyelid in the orbital prosthesis needs to be balanced with the one on the healthy side and the master impression is usually made with the remaining eye closed. This article describes a technique for that can be to facilitate the sculpture and verification of the orbital prosthesis by making a superimposed image of the orbital prosthesis onto a image of patient's face.

After an ocular component on the patient's face is positioned, a photograph of the patient’s face is taken with a digital camera. Then the image of the remaining orbital portion on the healthy side is reversed and superimposed onto the image of the patient's face using a personal computer to verify the position of the ocular component and the image of the finished prosthesis. And the image of a wax pattern for the orbital prosthesis is also superimposed onto the above image to verify and adjust its contours. This technique results in a more esthetic prosthesis and it reduces clinical time.

Key words: epithesis, orbital prosthesis, superimpose, sculpture of wax pattern

Introduction

An esthetic orbital prosthesis should duplicate the contra-lateral anatomy. When using conventional techniques, a large amount of time is required clinically to make such an orbital prosthesis because the master impression is made with the eye on the remaining side closed. A suitable ocular component is chosen and properly positioned on the patient's face, and the orbital anatomy is sculptured and verified at chair-side. Some techniques have been proposed in an attempt to short these steps. Nusinov et al. described a technique for making an inverted anatomic tracing. Shimodaira et al.
described a method projecting a developed transparency onto a stone cast of the patient's face. However, using these techniques, it is difficult to create a prosthesis in the laboratory which provides consistent esthetic results.

This article describes a technique for making a superimposed image of the patient's face to facilitate the verification of the orbital anatomy on the prosthesis and the estimation of the prosthesis results.

**Technique**

1. Fabricate a stone cast including both orbits (Fig 1).

2. Position an ocular component on the patient's face. Make a picture of the patient's entire face with the patient the ocular component positioned and the remaining eye open and directed anteriorly (Fig 2). A series of photographs are taken from a predetermined distance with a digital camera.

3. Once the image of the patient's face is inputted into the computer, the image of the orbital anatomy on the nonsurgical side is duplicated, and then reversed and superimposed onto the image of the patient's face on the defect side (Fig 3). The position of the ocular component should be verified on this image. The iris is used as a landmark to locate the reversed orbital images.

4. Sculpture the orbital anatomy in wax on the cast by referring to the above image (Fig 4) and the convexity of the undissected side on the cast.

5. The image of the wax pattern photographed on the cast is superimposed onto the image shown in Fig 3 (Fig 5).

6. Verify the features and modify the orbital anatomy on the wax pattern. Steps 4 to 6 are repeated several times to adjust the orbital anatomy of the
closed allowing for little or no reference which would enable the development of an mirror-image of the orbit structures to be duplicated on the wax pattern of the prosthesis. It is also difficult to properly determine the position of the ocular component without any orbital anatomy. Superimposing the mirror-image of the remaining orbit onto the image of a patient’s face makes it easy to decide that location. Making these superimposed images on a computer is easy with existing software, and it requires only a short period of time. Therefore, superimposed images can be made repeatedly to compare the orbital contours developed in wax to the patient’s normal orbit, and to verify the symmetry of both orbits on the patient’s face. A photograph of the patient prior to surgery can also be used to make a superimposed image.

This technique enable the clinician to more easily develop the sculpturing of the orbital anatomy, and should reduce clinical time and improve the final result. Further research concerning how to make proper photographs of the patient’s face with the proper pose is required to improve this technique.

References