

Technical Note

Cosmetic Hand Prosthesis—A Case Report.

A 60-year-old woman, who had lost her right hand in an accident involving a corn-picking machine, was referred to the Facial Prosthetic Laboratory, University of Iowa, for the fabrica-

tion of a hand prosthesis. The remaining part of her hand (Fig. 1) had been covered with grafts raised from the abdomen, and it felt soft and spongy. The patient insisted that she be provided with



Fig. 1. The stump and contralateral hand.



Fig. 2. The wax skin invested to its widest diameter in dental stone in a metal flask.

a cosmetic prosthesis that would match her own left hand. She agreed to remove the prosthesis when working around the farm and in the kitchen if one were provided.

Arrangements were made for her to be available for four consecutive days. A lady whose right hand matched the patient's left hand in size, length and thickness of fingers, approximate shape of fingernails, and overall age-appearance agreed to serve as a model for the cast.

An Alginate¹ impression was taken of the donor's hand and lower arm up to the intended length of the prosthesis. The impression was filled and emptied repeatedly with a mixture of 50 percent beeswax and 50 percent paraffin until a wax "skin" with an even thickness of approximately one mm was obtained. An Alginate-impression was also taken of the patient's stump and lower arm and filled with dental plaster.

After the wax skin made from the impression of the donor's hand and arm was split on the under side of the arm and

through the palm area, it was softened carefully in warm water, pushed over the patient's stump, and molded to the shape of the stump. The position of the wax skin was corrected to match accurately the position of the patient's own hand while it was in the "hanging" position. The wax skin was then removed and placed onto the plaster replica of the stump. The missing wax skin in the palm was added and sculpted. Characteristics of the patient's left hand, such as shape and size of fingernails, protruding veins, etc. were now reflected exactly in the wax model of the right hand.

The wax skin was then invested along its long axis in dental stone in a metal flask up to the point of widest diameter of arms and fingers (Fig. 2). After a separator was applied to the dental stone, the upper half of the flask was filled with dental stone. The wax was softened by immersing the flask in boiling water before it was opened (Fig. 3). Copper wires were fixed into the plaster stump model (Fig. 3) to serve as armatures for the

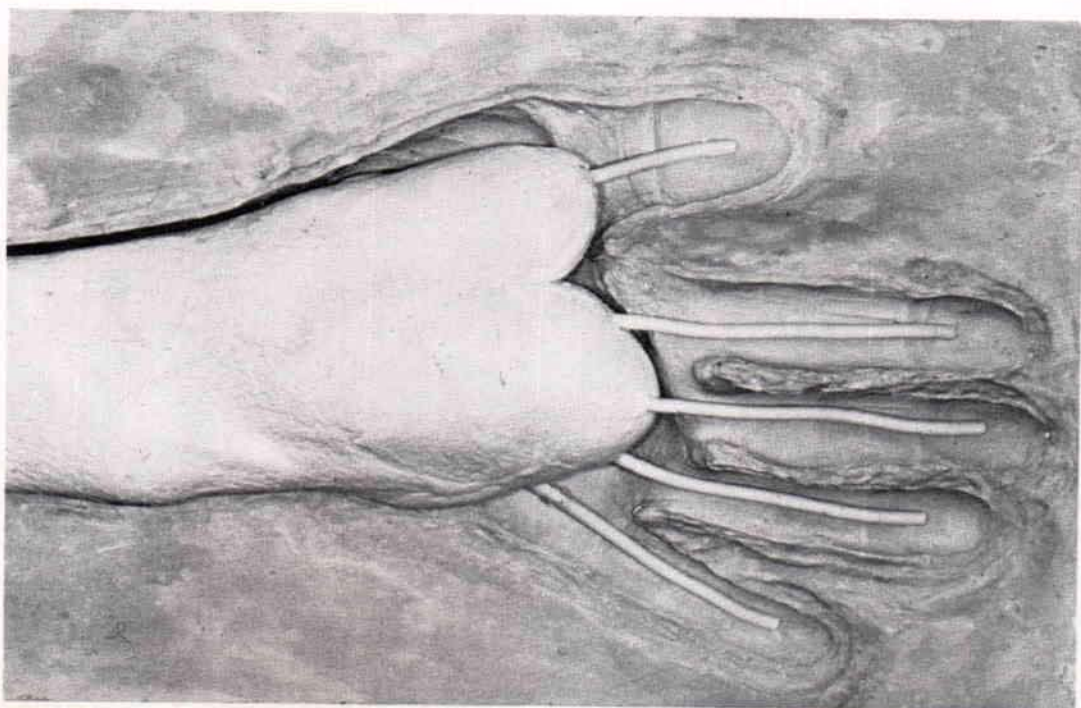


Fig. 3. The plaster model of the stump in the lower half of flask after the wax has been removed and the copper wire armatures have been inserted.

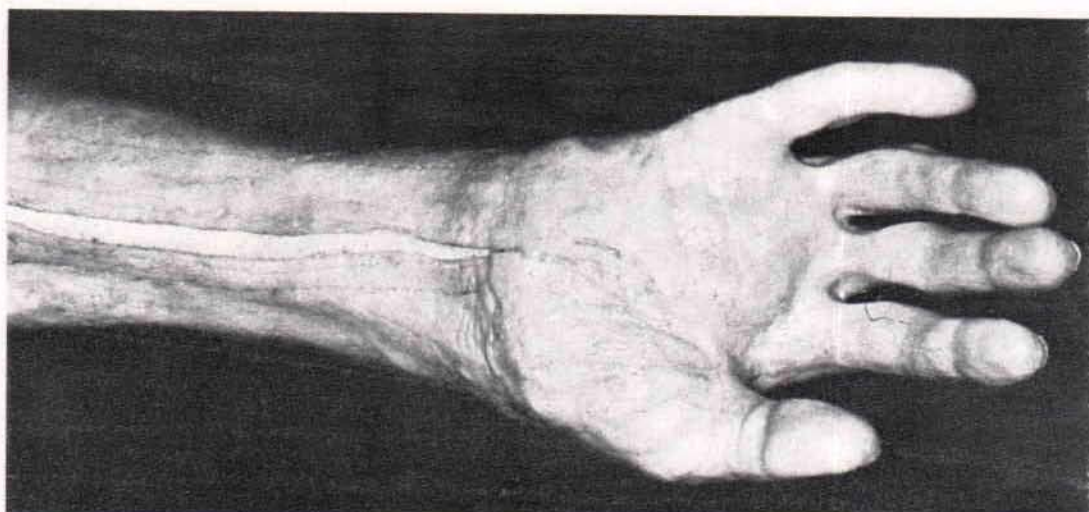


Fig. 4. A view of the prosthesis that shows the Velcro closure.

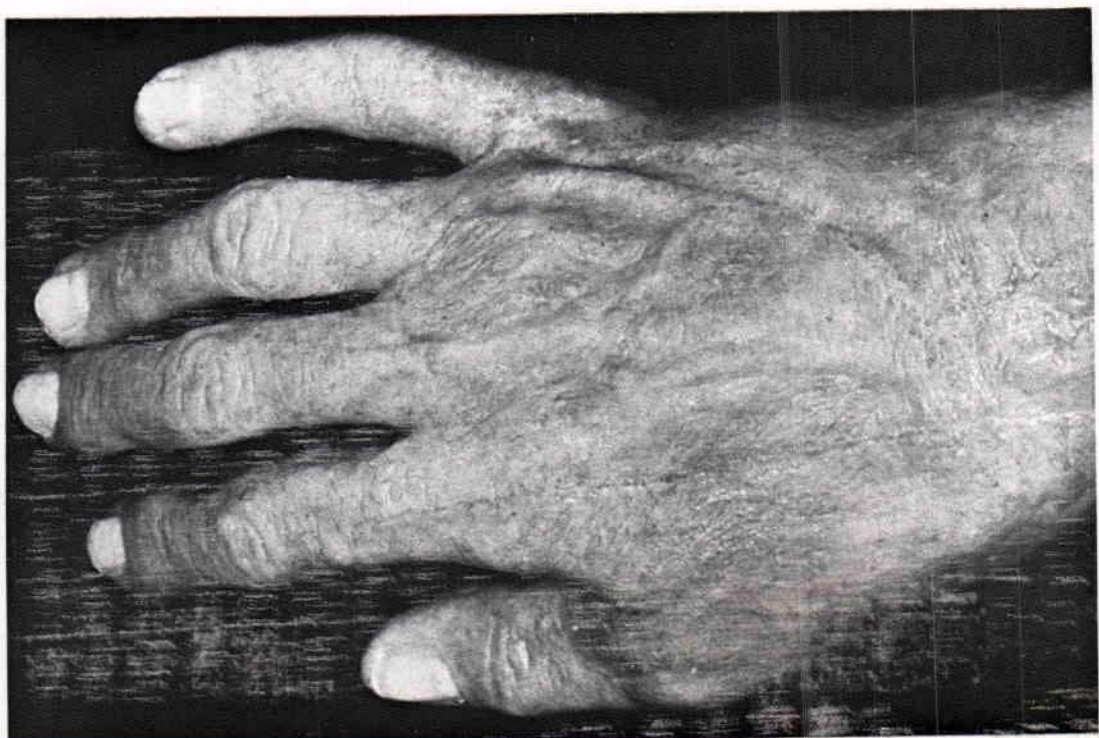


Fig. 5. A dorsal view of the finished prosthesis.



Fig. 6. The finished prosthesis in place.

fingers and thus allow the patient to bend the fingers of the finished prosthesis passively to any desired position.

The Silicone² material is colored with Rayon Flocking³ and then packed into the dental stone mold. The flask is closed and the material is polymerized. The Silicone skin is recovered from the investment stone and the plaster model of the stump, and then cleaned thoroughly.

It was necessary to slit the Silicone skin on the underside of the arm and palm area to the point of the largest diameter of the stump to allow the positioning without tearing of the Silicone material. A Velcro⁶ closure was sewn into the cut to give retention of the prosthesis (Fig. 4).

The arm, hand, fingers, and fingernails were colored on the outer surface to match the patient's unimpaired hand. A few hairs were incorporated into the arm (Fig. 5).

The patient was instructed in proper care of the prosthesis. The prosthesis in situ is shown in Figure 6.

According to the author's experience with facial prostheses, the Silicone material will outlast the material that has been used for years in factory-made hand prostheses. Silicone will resist discoloration and staining when cared for properly.

The photographs accompanying this note are the work of Ruben Barreras, for which we are grateful.

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Footnotes

¹The L.D. Caulk Company, Milford, Delaware

²Dow Corning Corporation, Midland, Michigan

³Claremont Flock Corporation, Claremont, New Hampshire