Facial Prosthetics Ease Cancer Patient Rehabilitation

Like the great Renaissance painter and sculptor Michelangelo, Armando Delgado, D.M.D., is an artist who makes his living by creating those eyes, noses, and ears that give humans individuality.

But the faces he creates are not the kind seen in art museums. They are those "saving faces" that restore the features disfigured by diseases like cancer or by life-saving surgery. Delgado is a dentist and a maxillofacial prosthetist, who, at the University of Alabama in Birmingham, makes cancer patients feel whole again.

One of his patients is 81-year-old Edward Broos of Mobile. In 1982, Broos was treated for lymphoma and, shortly afterward, for advanced basal cell carcinoma. Broos lost his upper teeth, the palate of his mouth, an eye, and more than half of his nose to the progressive disease.

Using old photographs of Broos as a guide, Delgado carefully constructed molds of Broos' face and mouth, and then made a dental plaster mold for the mouth. Delgado and his technicians delicately sculpted the facial prosthesis, making sure it matched the other side of Broos' face.

Matching Eyes

Meanwhile, one of Delgado's interns spent more than 6 hours creating a gray-brown eye to match Broos' other eye. The artificial eye, complete with tiny blood vessels in the sclera, rested in an eye socket made of silicone skin pigmented to match the patient's complexion.

Finally, a nose and the upper palate were reconstructed so Broos could breathe, talk, and eat. Because Broos' complexion is likely to change during the summer months, Broos must return "for color adjustment," Delgado said.

In all, it took more than 12 hours for Delgado's team to construct the prosthesis, which is held to the face with glue. Occasionally, snaps can be inserted in bone to hold a prosthesis firmly in place, Delgado said.

"They did a magnificent job, and I feel just great," said Broos, a retired roofer.

Far From Perfect

In spite of the substantial achievements now possible in facial reconstruction, prosthetic devices are far from perfect, and clinical and laboratory research is still needed.

Speaking to the National Cancer Advisory Board in May, Susan Mellette, M.D., an oncologist and cancer rehabilitation specialist from the Medical College of Virginia in Richmond, said, "there are still obvious problems with the color tone of the prostheses, which never quite matches up with the natural skin tones of the human face."

Another problem is that the self-adhesives used in the prosthetic devices do not always adequately anchor themselves to the face, and prosthetic eyes and eyelids do not move, resulting in a stark and often frightening facial appearance, she said.

Since the early 1960s, when researchers at the University of Texas M. D. Anderson Cancer Center, Houston, pioneered the present techniques of maxillofacial prostheses, most of these devices have been made with silicone. Dental prostheses, such as the palate of the mouth and lower jaw areas, are made of acrylic, which has been found to be stronger than silicone, Delgado said.

"The silicone material is not the same as human skin," said Barry Shipman, D.M.D., a maxillofacial prosthetist from Richmond. "It does not absorb light, reflect light, or become translucent
in the same manner that human skin does," he said.

Shipman added that, after repeated use, the silicone material also tears easily. "But we are now experimenting with new pigments and plastics — such as urethane plastic sheeting — that are more durable, give cleaner, more natural borders, and approximate the look more closely to the human face," he said.

Osseointegrated bone fixtures — some coated with synthetic bone — are now being used to improve the retention and stability of facial prostheses. Researchers on the West Coast developed an artificial device that can be attached to the patient's intraocular eye muscles to make eye movement appear more natural, Shipman said.

Money and Training

The biggest problem in developing these enhanced devices is money. Clearly, researchers say, not enough is being spent on federal or private research. Moreover, the plastics industry has been slow to donate its time and money to these projects that just may not be profitable enough, Shipman said.

The Medical College of Virginia had toyed with the idea of starting a program for artists to be trained in this field, but in the end, the funding never became available, Mellette said.

There are about nine fully accredited schools in the United States that offer courses in prosthetics, including four universities that offer full-time degree programs, said Ingrid Thomas, operations assistant for the American Board for Certification in Orthotics and Prosthetics in Alexandria, Va.

With reimbursement limited through private medical insurance, Medicaid, and Medicare, the cost of maxillofacial prosthetic devices has also become prohibitive to many patients.

An external facial prosthetic device, such as a jaw, for example, ranges between $1,800 and $2,500, Shipman said. But the only alternative to maxillofacial prosthetic rehabilitation is plastic and reconstructive surgery. This can cost three to four times as much and require multiple operations.

The National Center for Health Statistics does not track the number of patients who use prosthetic facial devices, but Shipman estimates that, in Virginia and Maryland alone, about 250 patients require facial prostheses each year.

Another major problem is that most patients with head and neck cancer do not know where to go for cosmetic help. Shipman said there are probably fewer than 20 full-time maxillofacial specialists in the country.

A number of major cancer centers and universities across the country have prosthetic centers specializing in facial work, including: Memorial Sloan-Kettering Cancer Center in New York, Roswell Park Cancer Institute in Buffalo, Indiana University in Indianapolis, the University of Chicago, University of California at Los Angeles, the University of Michigan, the University of Texas M. D. Anderson Cancer Center, and the Mayo Comprehensive Cancer Center in Rochester, Delgado said. But most of these centers are still not well advertised, Shipman said.

Expanded Rehab

Surgeons, speech therapists, and psychological counselors need to be re-educated about the prosthetic options, and oncologists need to become more sensitive to giving a patient coordinated care, according to Shipman, "so we can expand the long-term rehabilitation of patients with facial deformities."

— Francis X. Mahaney, Jr.