Sculpting FACES AND FUTURES

Silicone noses, facial masks, acrylic eyes ... No, we’re not in a costume shop. Welcome to the world of facial prosthetics, where art, science, and technology are restoring dignity to victims of trauma, cancer survivors, and others

BY Rhona Lewis

It was a job that sounded like it came straight out of a spy novel: create disguises for the agents of the CIA. But in this real-life scenario, the stakes were sky high. Altering an identity could be the difference between life and death.

“Before I issued a disguise, I asked myself two questions: ‘Will this keep the agent alive? Will it attract or detract attention?’” says Robert Barron, who used to work for the CIA. Today, Barron is asking those same two questions, but in a different context. As a highly acclaimed facial prosthetic specialist, he has designed hundreds of facial parts for cancer survivors, children born with congenital defects, and victims of burn and trauma, helping them regain their dignity and return to normal life.

“I figured that if I could put people in hiding, I could take them out of hiding. If I could give a person a new identity, I could give back an identity.”
Cloak and Dagger

From his office in Ashburn, Virginia, Barron comments, “I can make silicone look like skin.” If this sounds like the boast of an artist, it is perhaps because art was where his journey to becoming a professional facial prosthetist (known as a maxillofacial prosthetist in the UK and an anaplastologist in the US) began. When he was young, Barron once spent weeks perfecting a painting of the Grand Canyon. It was so realistic that on the opening day of the state fair he found it hanging in the photo gallery. He won a blue ribbon.

While studying commercial art in college, Barron set his heart on working for Hallmark. But instead of just cheering up people with his greeting cards, he was destined to save lives. He found work first at the Pentagon and then at the CIA where, as a senior forger, he reproduced vital documents. Then, in an effort to maximize his artistic talent, he approached the director and moved into the disguise department. Using traditional materials such as beards, mustaches, wigs, and clothing, he helped keep agents safe in the shadowy world of espionage.

When the need for more sophisticated disguises arose, Barron attended a conference of the Association of Biomedi cal Sculptors. There he was introduced to a different world, the world of those who were survivors of disease and trauma, and he knew that his second career would involve helping these people. But in the meantime he per formed the art of disguise, successfully sending case officers into dangerous terrain with their new look.

Ten years later, Barron retired from the CIA and embarked on a new career as a designer of prosthetic facial devices (eyes, ears, and noses) and digits. What made him choose this field over the film industry in Hollywood, where an expert in disguise can make a fortune? “The film industry doesn’t need my standards. If you’re not helping someone, what is life?” Reflecting on the influence of his childhood, he adds, with the slightest touch of nostalgia, “I was brought up going to church and Sunday school. I owe quite a bit of what I am to my grandparents and parents. I believe that God gave me a gift and that I am using it the way He wants me to use it. I thought I had found my purpose in the CIA, but there is no better feeling than knowing you can make a difference in a person’s life.”

A Disastrous War

While Barron and other facial prosthetists usually help civilians, the field actually had its beginnings during wartime. World War I, with its gas and shrapnel of artillery warfare, had proved disastrous to those who survived. Thousands of soldiers withstood the terrors but were left with shattered faces, missing eyes, noses, and ears.

While skin grafting and plastic surgery were already options, these could not replace missing facial parts. In March 1916, during the height of the war, a sculptor named Francis Wood, who had enlisted as a private in the Royal Army Medical Corps, set up a mask-making unit in the Third London General Hospital. His aim was to construct lightweight copper masks for irreparably facially disfigured soldiers. “My work begins where the work of the surgeon is completed,” Wood commented.

A mask-making unit in the Third London General Hospital

The hardest job was painting the mask to match the skin hue of the wearer. At first, Ladd used oil paint, but because this chipped easily, she changed to hard enamel that was washable and looked more like skin. Eyebrows, eyelashes, and mustaches were usually made from real hair. By the end of 1919, Ladd had produced 185 masks; Wood probably produced an estimated 20,000 facial prostheses. By 1920, both studios had closed. Even though the masks lasted for only a few years before they began to look battered, it’s hardly surprising that the former soldiers continued to wear them. After all, a mask allowed the wearer to reenter society with a small measure of dignity. Tragically, most of these maimed soldiers quietly passed away.

The Art of Facial Restoration

Noted sculptress Kathleen Scott (swallow of famed Antarctic explorer Captain Robert Falcon Scott) volunteered to help pioneer plastic surgeon Sir Harold Gillies in the 1950s, and was known to have declared, “Men without noses are very beautiful, like antique marbles.” Not surprisingly, people who have actually lost part of their faces do not share this view. Becoming a recluse is often a result of loss of their personal identity, which a man blew off half of his face with a shotgun. “I had to go to the nursing home and take an impression. Using this...”

Creating a Silicone Facial Prosthesis

According to Sharon Haggerty, it takes four to five visits to create a facial prosthesis. The process is as follows:

- First an impression of the affected area is taken using a soft dental material.
- This image is reversed in wax or clay and the prototype is checked for fitting.
- Prosthetic silicone material is matched to the patient’s skin tone.
- The sculpture is then molded and cast in silicone.
- The prosthesis is hand-painted to blend with the surrounding anatomy. All prostheses wear out with regular use and exposure to skin oils, UV light, environmental contaminants, adhesives, and removers. On average, silicone prostheses last about two years, but repairs and touch-ups can extend their life a bit. A replacement prosthesis can be created from the patient’s master mold. This mold can withstand multiple castings and last for up to ten years. Children may outgrow their prosthesis, so a new impression, sculpture, and mold will need to be made to obtain a prosthesis that fits properly and achieves proper symmetry.

The cost of a prosthesis is subject to many variables, including number and type of body parts, method of retention, state, country of practice, etc. Typically 20 to 40 hours of clinical and laboratory work may go into the creation of a custom prosthetic restoration.

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Becoming a reclusive is often preferable to facing society with part of one’s face missing, and some people even consider suicide.

After a four-month healing period, a second surgery is performed: the surgeon punches through the healed skin and screws a connection point into the implant. This visible connection point protrudes through the skin. Depending on the type of prosthesis, the patient may have two or three implants to which the prosthesis is attached by clips, snaps, or magnets. But the seamless joint isn’t easy to achieve.

“It takes a lot of trial, error, experience, and scientific knowledge,” says Barron.

A Security Blanket for Kids

As with Barron, it was the combination of art and technology, in addition to an interest in sculpture, that drew Sharon Haggerty to the field. “While

I was studying medical illustration at the University of Illinois–Chicago, I heard about an elective course in facial prosthetics. When I saw the results in people’s lives, and I realized that I could do something for someone, it clicked and I realized, ‘This is who I am.’ “

Perhaps one of the most gratifying aspects of the job is helping children who look different feel like the rest of the kids in their class. For instance, microtia is a common birth anomaly that can make a child’s life miserable. A child with the condition is born with a malformed or undersized ear, and will sometimes be mercilessly teased by classmates, which can lead to a lowering of self-esteem and grades.

Although restorative surgery is an option, Barron comments that the results often don’t meet the patient’s expectations. “There simply isn’t enough bulk tissue to get the reconstructive ear to stand away from the head. The color of the tissue is a problem, as is scarring. The ears must match, and that’s impossible to achieve through surgery.”

Shlomo is a child from Brooklyn who was born with one ear smaller than the other. His mother, Ruchie, found Barron through an online support group.

At this point, all redness and swelling should have subsided, permitting a flush fit and correct color match.

“The method of attachment depends on the patient’s level of activity,” explains Sharon Haggerty, a successful facial prosthetist and public relations chairperson of the IAA, International Anaplastology Association. “An elderly or visually or mentally impaired person may opt for a prosthesis that is attached to a pair of glasses, or retained with a medical adhesive.”

An active person, on the other hand, usually chooses titanium implants, which offer more security. The implants, developed by Swedish surgeon Per-Ingvar Brånemark, are inserted by the surgeon. Amazingly, the surrounding bone fuses with the implant surface.
an extra three minutes to figure into the morning rush. And it absolutely does not look glued on."

Barron advises removing the prosthesis at night, to allow the skin to breathe.

Is It Real? Another area where facial prosthetists are making a big difference in people's lives is the aesthetic restoration of missing eyes. Depending on the case, there are one or two parts to the prosthesis: an orbital prosthesis and an ocular prosthesis (artificial eye). In cancer cases where the entire orbit has been removed, the orbital prosthesis replaces the missing eyelids and adjacent hard and soft tissues. Like a nasal prosthesis, the orbital prosthesis protects the exposed tissues and keeps them moist.

“The orbital prosthesis is designed to allow space behind it, so that the skin can breathe,” explains Haggerty. It also houses the ocular prosthesis, which the facial prosthetist either creates or has custom-made by an ocularist. Prosthetic eyes are manufactured in the ocularist's department at Hadassah Ein Kerem Medical Center. His team at the Maxillofacial Rehabilitation Center treats patients with congenital differences as well as survivors of cancer and trauma.

“When treating oncological patients, we take a CT scan of the person's jaw or nose before any surgery,” Professor Zeltser explains. “Based on this, we reconstruct a plastic model of the part that will be removed by surgery. Often, while the patient is undergoing surgery, a temporary prosthesis of the relevant part is constructed, so that he already has it when he awakens from the anesthesia. Since the surrounding tissue changes a lot after surgery, a more permanent prosthesis is built later. This is then tinted in the hospital's laboratory by a technician.”

Terror victims are an unfortunate part of the country's reality and of Professor Zeltser's expertise. “We are lucky to have a multidisciplinary approach. In most cases involving civilians or soldiers who have suffered explosions or high-velocity trauma, teams of doctors operate on the patient for six to 15 hours, depending on the severity of the case. The first step is to treat and repair the soft tissues and bones. Next the specialists move in. If there is a need, neurosurgery will be performed, followed by the maxillofacial surgeon and, finally, the ophthalmologist, the ENT, and the plastic surgeon.”

Like Barron and Haggerty, Professor Zeltser, who has worked in his field for 32 years, has always been drawn to art. “As a maxillofacial surgeon, I have the opportunity to combine art with science, to save people's lives. Who needs more than that?” He then adds, “I come from a family of dentists, so that probably also influenced my choice.” When asked how he copes with the pain that he faces regularly, he says, “I have a fanatical desire to express my professional skills. I dance to work every day.”

Are Robotics Next? Dr. David Franklin Hanson has developed human-like robots with realistic facial expressions and conversational abilities. Each face features Hanson's Frubber biometric skin that contracts and folds like facial muscles to create “millions” of possible expressions. Despite this, Sharon Haggerty is doubtful whether robotics will be able to offer realistic prostheses. “You're working with a very limited amount of space,” she says. “The prosthesis has to fit in with the normal facial contours, and I doubt there's enough room for robotics. Second, moving mechanical parts will cause more wear to the silicone, but if you use more durable materials, you will sacrifice the aesthetics. And the cost is prohibitive.”

Today we are reliant on art, science, and technology to heal the ravages of disease and trauma. We longingly await the day when Hashem Himself will heal all affliction.”

― MISHPACHA