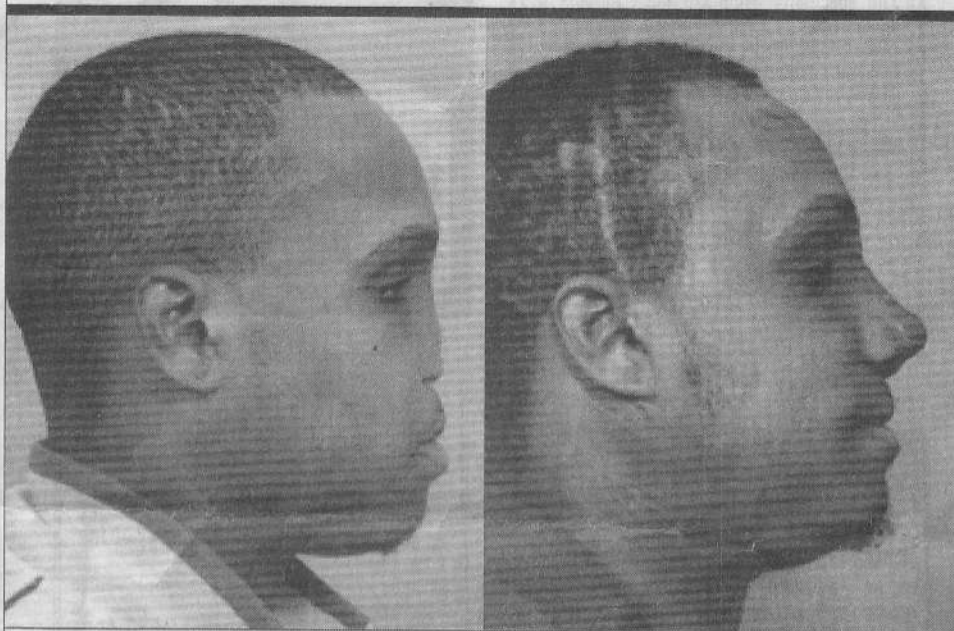


New Reconstruction Techniques

Used to rebuild soldier's nose

By David March



Senior airman Michael Fletcher before (left) and after his nasal reconstruction.

When his Humvee flipped over on a highway near Camp Bucca in southern Iraq in August of 2005, senior airman Michael Fletcher had body armor to blunt the force of impact. However, his gear was not strong enough to stop the wreck from crushing the rest of him. His left arm was gone, as was a sizeable chunk of his midface.

In a series of six operations over a year-long period that ended with the removal of the last sutures on May 2, facial plastic and reconstructive surgeons pieced together more than a dozen bits of bone, cartilage, skin, arteries and veins to rebuild Fletcher's nose. All of the materials were taken from spare or renewable parts of his body.

The new nose is completely functional. Fletcher, who is stationed at Andrews Air Force Base in Maryland, can breathe and sneeze through it, and he is expected to be sensitive to smell and touch soon. Scarring and swelling will reduce naturally for a

year, while minor sculpting and contouring procedures are done at an outpatient clinic, said lead surgeon Patrick Byrne, MD.

Aided by new advances in biomedical engineering and computer-assisted design, Dr. Byrne's team and the patient logged more than 40 hours in surgery. The first operation lasted eight hours.

Accompanied by his wife, Yolanda, Fletcher had more than 60 hospital check-ups and tests and needed three hospital stays, including a 16-hour emergency operation to deal with a wound infection.

"This soldier is fearless," said Dr. Byrne, an assistant professor in otolaryngology-head and neck surgery at the Johns Hopkins University School of Medicine in Baltimore, MD. "From the beginning his nasal reconstruction was not straightforward. He had tremendous scarring all over his face and head injuries so severe that I did not think he would go through it. But he did not want to wear a prosthesis. He wanted his nose rebuilt, even if all

the world was going to see his scars."

The effort involved more than 40 Hopkins clinical staff members. A team of U.S. military surgeons initially treated Fletcher in Kuwait and then at Walter Reed Army Medical Center in Washington, DC. A Walter Reed surgeon referred Fletcher to Hopkins in January of 2006 for the reconstruction.

The plan to rebuild Fletcher's nose was based on techniques used to help patients with nasal cancers. Complicating his case was a damaged facial skeleton, which had little bone structure to support a new nose and a sparse network of facial arteries to sustain the highly vascularized nasal tissues. Arteries supplying blood to the forehead had been slashed, potentially compromising the suitability of the skin for subsequent transplant to the nose.

The accident also had fractured Fletcher's skull, blinded his left eye, and widened the gap between his eyes, something surgeons had to correct to properly place the nose. Because the airman is an African American, surgeons sought to minimize the risk of scarring, which would contrast with his skin color.

Among the many procedures was the detachment of a forehead flap of skin that now makes up the outer skin of the new nose. Surgeons first cut the flap in upside-down profile on the center of Fletcher's forehead, cut out the top portion, turned the flap around clockwise, and laid it over the newly rebuilt nose. The outer skin covering was left attached to the center spot of the forehead for six weeks to secure its blood supply during recovery.

The inside nasal components were assembled in two operations, for the nostrils and tip, using skin transplanted from his arm and neck and bone and cartilage from his rib and ear. Creating an inside nasal lining was a complex procedure, requiring the transfer of soft skin from the underside of his arm. Neck arteries had to be rerouted to keep sufficient blood flowing to this part of the nose.

Anaplastologist Juan Garcia, MA, a medical illustrator who specializes in facial prosthetics, used pictures of Fletcher taken before his accident as a reference in designing his new nose.

"We know that our part in his recovery is just a single step forward," said Garcia, "but we are grateful to have been able to help. He is someone with a tremendous amount of courage." ■

David March is on staff at Johns Hopkins.