PREFACE

Historic Aspects of Ear Reconstruction

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Performing ear reconstruction is indeed one of my favorite pastimes within the art of plastic surgery. However, restoring auricular normalcy has not been a subject of reflection for thousands of years; maybe because one's attractiveness is not defined by the beauty of one's ears. The ear is a lateral structure and is often hidden by an ornament or hair. More importantly, this delicate convoluted structure is difficult to recreate and surgeons have been confronted by many obstacles, resulting in suboptimal results.

External ear defects at times have been created intentionally as part of a cultural tradition, such as those seen in Aztec masks of the 4th century or ear lobe stretching in Mursi people in Ethiopia; or as a means of identification, such as the mutilation of slaves in the Roman Empire. Although small defect reconstruction has been performed since ancient times, it became more common after the advent of anesthetic techniques and advancements in our understanding of sepsis and asepsis in the middle of the 19th century. The middle of the 20th century marked the introduction of modern techniques of partial and total ear reconstruction.

In the early attempts at ear reconstruction by many such as Ambroise Paré, attention was turned

toward making a substitute for the ear—an ear prosthesis. Despite a few isolated attempts for autologous ear reconstruction, such those made by Szymanowski, autologous reconstruction did not really develop until Gillies.

The prosthesis, first external and attached to a support or glued on, became internal with Cronin, but it fell out of favor. Autologous reconstruction with costochondral cartilage graft is now favored by most. Tanzer was undoubtedly the principle promoter of its use and he popularized it with his many articles, so did Converse. Barinka introduced the mono bloc model in Eastern Europe. Its comeback to the Western hemisphere was made after Tanzer and Edgerton's symposium on reconstruction of the auricle in 1974. Thereafter, Brent's advancement in sophistication of the framework dominated the field. Others such as Nagata and Firmin have greatly contributed and improved the technique to near perfection.

Indians pioneered ear reconstruction as described in the famous *Sushruta Samhita*, using a pedicled flap from the cheek. Some of the oldest illustrations are by Tagliacozzi, a professor of anatomy and medicine in Venice in the late 16th century. He described partial reconstruction of the upper ear and the lower auricle. Larger defects were reconstructed with a flap from the arm. Total ear reconstruction was still not recommended by many.

Reconstruction with auricular reduction was done by a few in the 19th century. The first performed advancement of the helix was done by Gersuny in 1903. It has subsequently been modified in many different ways.

In the early 20th century, reconstruction without reduction heralded the use of regional flaps of posteriorly or superiorly based skin as described by Smith and Omredanne. Free composite grafts for partial ear reconstruction were used by Korte in 1905 and reported by Lexer in 1910. In 1914, Streit was first to use a bipedicled mastoid flap to reconstruct the helix and anthelix. Gillies described an inferiorly based postauricular flap in 1920 for reconstruction of the lower third of the ear. In 1925, Pierce used tubed pedicled flaps from

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the neck and later from the supraclavicular area. They did not have a good color match and fell out of favor. Pedicled composite grafts were used by Lang in 1972 and later by Gillies and Millard. The use of a temporo-parietal fascial flap was first described by Fox and Edgerton in 1976, for cases where there was a lack of adequate skin coverage over a framework.

The first use of a tissue expander dates back to Neumann, using air to fill the balloon via an external valve several times over 2 months in 1956. This method remained relatively unknown until rediscovered for breast reconstruction in 1976.

Before 1950, only ~165 total ear reconstructions were reported, although it had first been suggested by Szymanowski in 1870. Schmieden in 1908 was the first to insert an autologous costal cartilage framework to support ear reconstruction, but the result was not very satisfying. In 1920, Gillies implanted carved autologous cartilage and placed it into the mastoid region through a hairline incision. The following year, Esser used the 6th and the 7th rib cartilage to make the framework and a tubed neck flap for the helix.

Xenografts and alloplastic supports such as ivory, silicone, metal, rubber, acrylate, Teflon, and porous polyethylene were also tried. Most authors were not satisfied with their results. The complexity of ear recon-

struction and suboptimal materials made the results rather disappointing.

Since 1950, with his four-stage ear reconstruction, Tanzer is undeniably the one who promoted and popularized ear reconstruction in microtia. Stage one was rotation of the lobule; stage two about 2 months later, was the insertion of a costal cartilage carved framework. Three to 4 months later, in stage three, he created the sulcus by lifting the framework and placing a split-thickness skin graft. The fourth and final stage consisted of deepening the concha or creating a tragus. In 1987, his assistant, Brent refined the technique and modified it into three stages. In 1994, Nagata's technique modified the incision and framework and made the process into two stages. Firmin in France has continued to perfect the technique used by Brent and Nagata and obtains spectacular results.

The audiologic aspect of ear reconstruction is of great importance, especially in cases of bilateral ear reconstruction. Techniques and timing of the reconstructive sequence need to be well planned to restore optimum function and form. Partial and total ear reconstruction continues to be a fascinating and evolving art for plastic surgeons.

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Guest Editor