

Review of Auricular Reconstruction

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Ear reconstruction surgery is considered one of the most challenging procedures in plastic surgery. The delicate cartilaginous framework, convoluted three-dimensional structure, and the thin, adherent overlying skin of the auricle are very difficult to be recreated. The first report of otoplasty appeared in ancient India. As early as 1957, the Italian surgeon Tagliacozzi described partial reconstruction of upper and lower ear defects. The early work focused mainly on traumatic deformities.

The origin of microtia reconstruction has its significant beginning in 1920, when Gillies implanted carved autologous cartilage under the hairless skin in the mastoid area. Later, xenografts and alloplastic supports were also tried, but the results were unsatisfactory. A major breakthrough came in 1959, when Tanzer described the principles of multistage surgery for total auricular reconstruction using costal cartilage and showed his long-lasting results. The procedure of microtia reconstruction was later popularized and modified by Brent, who improved the reliability of the autologous approach. In 1987, Nagata reduced the number of stages of surgery and further elucidated the intricate convolution of the ear by creating a four-level three-dimensional cartilaginous framework to mimic the normal ear contour. In the pursuit of early surgery and the absence of donor site morbidity, Reinisch has pioneered alloplastic auricular reconstruction with high-density porous polyethylene as a reasonable and appealing alternative. By the incorporation of temporoparietal fascia coverage and full-thickness skin graft, consistent and favorable results could be achieved in single-stage operation.

Moreover, the advent of three-dimensional imaging and printing technology has revolutionized the ability to provide personalized surgical care. Combining computer-assisted design and computer-assisted manufacturing (CAD/CAM), surgeons can customize the auricular framework with higher accuracy and achieve ideal aesthetic outcomes.