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Original Article

The use of medpor as a projection block for the elevation of the constructed auricle in total auricular reconstruction

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ABSTRACT

The 2-stage methods of the total auricular reconstruction developed by Dr. Nagata have been widely used. In the second stage of ear reconstruction, the implanted auricle is separated from the underlying bed, and its posterior surface is covered with a skin graft or a flap. Many surgeons have used various projection blocks, such as banked cartilage or alloplastic materials, to provide the constructed auricle with adequate projection. Banked costal cartilage is most commonly used as a projection block, but it may not be possible to obtain banked cartilage in sufficient volume to ensure an acceptable projection. Previously, in this procedure, the author used a new fabricated cartilage block harvested from the fourth and fifth costal cartilages. Although this material is stable and yields acceptable results, an invasive and time-consuming procedure is necessary to obtain it. Therefore, the author considered the use of a Medpor (a high-density porous polyethylene, Stryker, USA) projection block as an alternative to the cartilage. Between January 2012 and May 2015, the author performed the second-stage operation by using a Medpor block in 51 patients. The follow-up period ranged from 1 year to 4 years. The use of a Medpor block for projection in the second stage is time-saving and less invasive. Delayed healing of the wound was noted in 2 cases, in which a deep temporal fascial flap, instead of a temporoparietal fascial flap, had been used for the coverage of the exposed framework. A hypertrophic scar was noted on the posteroinferior surface of the reconstructed ear in 1 case. However, no major

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complications such as infection or exposure occurred. The constructed ears showed a firm and stable projection.

Total auricular reconstruction for microtia remains one of the great challenges in reconstructive plastic surgery. Numerous reports describing reconstructive methods have been presented in the literature. The 2-stage technique developed by Dr. Nagata has been widely used because of its rapid recovery time and stable results. Many surgeons prefer to use banked cartilage from the first stage of the operation for the elevation of the constructed auricle. However, it may not be possible to obtain banked costal cartilage in sufficient volume to ensure an acceptable projection. Although some surgeons have obtained a new cartilage from the fourth and/or fifth costal cartilages to obtain a sufficient volume to create a projection block, and doing so is invasive and time-consuming. Therefore, the author considered the use of Medpor (Stryker, Kalamazoo, MI, USA), an alloplastic material, as an alternative to cartilage.

Herein, elevation of the constructed auricle in the second stage of the operation by using temporoparietal fascial flap and Medpor block is described.

Methods

Design of the medpor block

The author used the ear base, which is one of the two pieces in the Medpor framework for total ear reconstruction (Figure 1a). The height of the ear base is 20 mm, while the length of the thick portion of the ear base is 53 mm (Figure 1b). The block was carved into a concave shape, according to the size of the reconstructed auricle (Figure 2a) and the contour of the posterior surface of the elevated framework (Figure 2b). The mean height and length of the fabricated block were 12 mm (range, 10–14 mm) and 42 mm (range, 41–43 mm), respectively.

Operative techniques

The 3-dimensional cartilage framework was fabricated and implanted into the subcutaneous pocket during the first stage of total auricular reconstruction, following the method developed by Nagata.[1–4] The operation for the elevation of the constructed auricle was performed more than 6 months after the first operation. Skin incisions were made 5 mm apart from the reconstructed auricle, and the implanted framework was separated from the underlying bed. The Medpor block was carved into a concave and rectangular shape at the bedside table and adjusted according to the projection of the normal ear, if present. The fabricated Medpor block was transplanted to the posterior surface of the elevated framework. Anteriorly, fixation between the block and the elevated framework was performed with wires, through the 3 slit incisions in the conchal wall. Posteriorly, a block was fixed into the bed with white nylon #4-0 sutures (Figure 3). After harvesting of thin split-thickness skin from the scalp for a skin graft, the temporoparietal fascia was harvested through a zig-zag incision in the scalp. A meticulous subcutaneous dissection was performed upwardly to approximately 12 cm above the imaginary upper margin of the new ear to ensure tensionless covering of the posterior surface of the elevated ear. Taking care to avoid damage of the frontal branch of the facial nerve, the margin of the temporoparietal fascial flap was incised and the inferior-based fascial flap was elevated from the underlying deep temporal fascia. The dimension of the fascial flap was 8–9 cm × 11–12 cm (mean, 8 cm × 12 cm). The temporoparietal fascial flap was then passed through the subcutaneous tunnel to the posterior surface of the