

Personal experience in the repair of microtic ear

Esperienza personale nella ricostruzione auricolare totale

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Key words

External ear malformations • Microtia • Surgical treatment • Rib Cartilage Graft

Parole chiave

Malformazioni dell'orecchio esterno • Microtia • Trattamento chirurgico • Lembo di cartilagine costale

Summary

Aim of this report is to share with colleagues, the senior author's experience in total auricular reconstruction with autogenous rib cartilage, based on Burt Brent's technique. The method has been personalized in the sequence of the surgical procedures. There are three stages: first, the cartilage carved framework graft is performed; secondly, the retro-auricular sulcus is reconstructed and thirdly, the earlobe is transposed onto a three-dimensional frame.

Riassunto

Lo scopo di questo articolo è condividere l'esperienza acquisita dal primo autore nella ricostruzione auricolare totale, con cartilagine costale autologa, basata sui principi di tecnica chirurgica descritti da Brent. Tali tecniche hanno subito alcune personalizzazioni. Gli interventi sono tre e vengono effettuati nella seguente successione cronologica: 1° tempo – innesto di cartilagine costale autologa scolpita; 2° tempo – elevazione del neopadiglione e ricostruzione del solco auricolo-cefalico; 3° tempo – trasposizione del lobo.

Introduction

Total auricular reconstruction, on account of the complex morphology and small size of the auricle, remains, still to-day, a serious problem, even for the most able reconstructive surgeon.

In the last 45 years, an incredible evolution has been witnessed, with improvement leading to standardization of the various surgical approaches¹⁻⁵.

In the past, numerous materials, such as homogenous and heterogeneous cartilage, bone, and a variety of implants were used. Today, the autogenous cartilage is widely accepted as the most successful long-term material and is much less susceptible to trauma^{3,6}.

Materials and methods

The first Author's experience is based on observations, since 1993, of 90 patients with microtia, as described by Tanzer⁷. At present, 35 patients have completed reconstruction with autogenous rib cartilage. Five patients had previously undergone functional surgery.

Since 1998, keeping in mind Brent's technique^{3,8} (Case 1, Figs. 1, 2), the first Author^{9,10}, has personalized the sequence into 3 stages (Figs. 3-5). He argues that the auricle is a laminar three-dimensional frame, joined to the head in its anterior third, and free in the

posterior two thirds. Consequently, in the first stage of surgery, the rib cartilage is harvested from the contra-lateral chest side, carved into the pattern of the unaffected ear, and finally grafted inside a cutaneous pocket⁴, (Case 2, Figs. 6-8). In the second procedure, the reconstructed auricle, still bidimensional, is separated from the mastoid area. The raw retro-auricular sulcus is repaired with a full-thickness skin graft, taken from homolateral groin area, plus scalp advancement. The auricle under reconstruction is now a three-dimensional structure, free in the posterior two thirds.

The lobe joins the *cauda helix* in the free part of the pinna. Up to now, all methods have described lobule transposition when the auricle is still bidimensional and attached to the head. The first author considers it is much more difficult to judge the physiological position of the earlobe and define the position of the precise meeting point between the lobule and the helix when the auricle is still bidimensional and attached to the head. For this reason, since 1998, the author has carried out transposition of the earlobe on a three-dimensional auricle as the third and last stage of reconstruction (Case 3, Figs. 9, 10; Case 4, Figs. 11, 12).

This surgical sequence presents two advantages: the first is anatomical, since only on a three-dimensional frame is it possible to understand where exactly the helix terminates and where the earlobe starts, and



Fig. 1. A 20-year-old female with unilateral microtia: pre-operative appearance.



Fig. 2. Post-operative appearance, according to Brent's technique.



Fig. 3. Design after first reconstructive stage: cartilage framework has been grafted in cutaneous pocket.

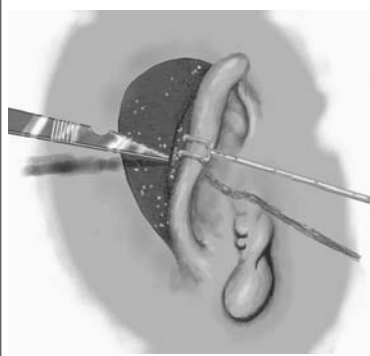


Fig. 4. Design of second surgical stage: reconstruction of retroauricular sulcus.

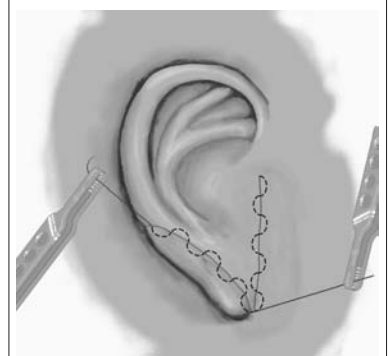


Fig. 5. Design of new pinna after earlobe transposition.



Fig. 6. Adult male with unilateral microtia: pre-operative lateral view.



Fig. 7. Carved framework.

how deep the concha really is. The second advantage is surgical, since when earlobe transposition is the last procedure, it is possible to have three anatomical subunits, Concha, Lobule and Tragus “surgically open”. This makes it easy to improve the conchal depth and the Tragus, or to reconstruct the Tragus with other techniques^{3 11}.

Results

A total of 35 patients (22 male, 13 female, aged range 8-40 years) with microtia, were treated. Unilateral microtia was present in 31 patients and bilateral in 4. In 25 patients, the right side was affected, and in 6 the left.

In this group, the first 15 patients were treated according to Brent's classic technique. The other 20 have been treated with the author's sequence, since 1998. Complete ear reconstruction takes one year. A period of 6 to 8 months will elapse between the first and second procedure and a mean of 3 months before

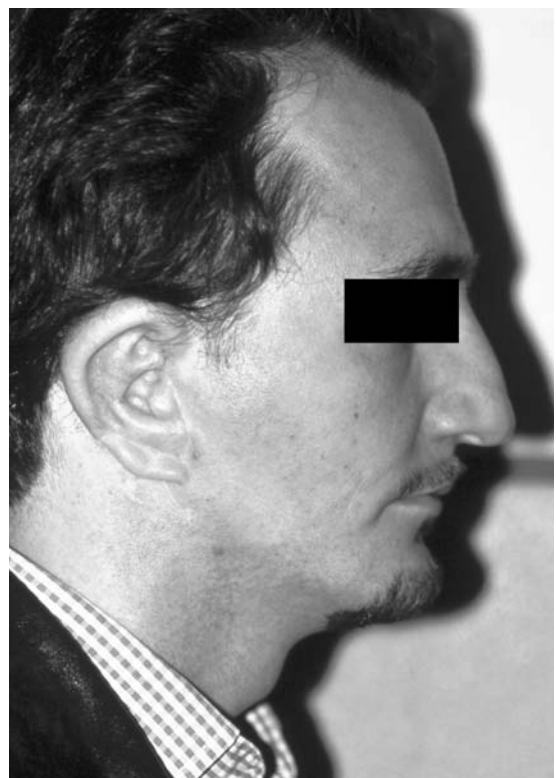


Fig. 8. Appearance 3 years post-operatively: satisfactory result has been achieved.

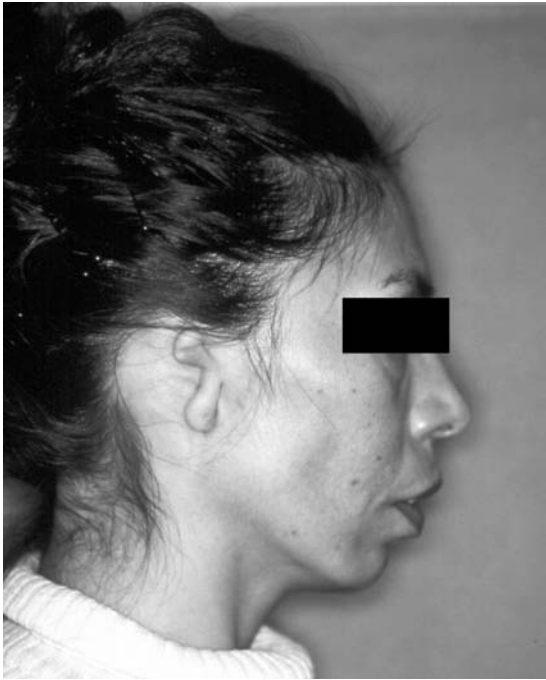


Fig. 9. Adult female with right microtia: pre-operative lateral view.



Fig. 10. Result 2 years post-operatively.



Fig. 11. An 11-year-old female with left microtia.



Fig. 12. Result 2 years after end of reconstruction.

earlobe transposition. Complications, in the present series, were rare, but present: one infection not responding to antibiotic treatment and one cartilage graft loss; 2 drained haematomas; one framework exposure repaired with partial earlobe transposition; one hypertrophic scar treated with 2 triamcinolone infiltrations, and, finally, two stitch exposures, promptly removed.

Discussion

Total auricle reconstruction is considered crucial for the psychological development of patients, thus, clearly, a poor result can be devastating.

Over these years, the first Author has developed a personal sequence to reduce the time interval between the 3 stages by joining the stages together, attempting to be very conservative, from the anatomical point of view, and to avoid, if possible, the use of fascial flaps or implants. For the last 5 years, the first surgical procedure has always been a fine sculpted

rib cartilage graft, the second, the construction of the retro-auricular sulcus with a full-thickness skin graft, and the last, lobule transposition. At this point, two considerations are necessary. First of all, in our opinion, the current tendency for retro-auricular sulcus reconstruction is too aggressive and too expensive in elevating the construct by placing a further piece of cartilage beneath the framework in a fascial pocket, closing the defect with skin graft. This approach gives a much more rigid ear and also destroys the fascial layer that could be useful at some time in the future^{12,13}. The second consideration is the advantage gained from earlobe transposition, as the last operation, on a three-dimensional auricle. It becomes much easier to join the cauda helices exactly with the lobule. Moreover, having 3 opened subunits makes it possible to plan the surgery of adjustment earlier. In conclusion, thanks to Tanzer¹, Brent¹⁴, Nagata⁴ and Firmin⁵ we have gained so much knowledge that, nowadays, it is possible to achieve very good results while keeping the technique as simple as possible.

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