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Research Article

A Single-Stage Silicone Implant With Temporal Fascia Flap For Adult Microtia Reconstruction: A Case Series

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ABSTRACT

Introduction: Microtia reconstruction in adults presents unique challenges distinct from paediatric populations. While autologous costochondral grafting is the gold standard, it is a multi-stage procedure with significant morbidity. Alloplastic frameworks offer a single-stage alternative but carry risks of extrusion, particularly without robust coverage. This case series evaluates the outcomes of a single-stage technique using a silicone implant covered by a temporal fascia flap (TFF) for adult microtia reconstruction.

Methods: A retrospective review was conducted on 12 consecutive adult patients (age range: 19-42 years) with unilateral congenital microtia (Grades III-IV) who underwent reconstruction with a custom-carved silicone implant and a pedicled TFF between august 2023 and June 2025 in SVIMS. A thin skin graft was applied over the flap. Primary outcomes included aesthetic result (evaluated by a blinded surgeon panel using a 10-point scale) and complication rates. Secondary outcomes included patient satisfaction.

Results: The mean follow-up period was 18 months (range: 12-30). The mean aesthetic score was 8.2/10. No cases of major implant extrusion occurred. Minor complications included partial graft loss in one patient (8.3%) and temporary temporal hollowing in two patients (16.7%), which resolved with conservative management. All patients reported high satisfaction with the aesthetic outcome and the single-stage nature of the procedure.

Conclusion: Single-stage auricular reconstruction with a silicone implant and TFF is a viable and effective option for adult patients with microtia. It provides satisfactory aesthetic results with an acceptable complication profile, avoiding the donor-site morbidity and multiple surgeries associated with autologous techniques. This approach is particularly suited for adults seeking a definitive correction in a single intervention.

Keywords: *Microtia, Auricular Reconstruction, Silicone Implant, Temporal Fascia Flap, Adult, Single-Stage Surgery, Alloplastic.*

INTRODUCTION

Congenital microtia, with an estimated incidence of 1 in 5,000-10,000 live births, presents a significant challenge in craniofacial surgery[1].The goal of reconstruction is to create a symmetrical, aesthetically pleasing auricle that withstands the test of time. For decades, the autologous costochondral graft, popularized by Brent[2] and Nagata,[3] has been considered the gold standard. This technique utilizes the patient's own tissue, offering excellent biocompatibility and durability. However, it is a complex, multi-stage procedure requiring significant surgical expertise, associated with donor-site morbidity (chest wall deformity, pain), and a prolonged overall treatment time[4]

These challenges are amplified in the adult population. Adults often have less pliable skin, calcified costal cartilage that is difficult to carve, and a strong desire to minimize time away from professional and personal commitments. The prospect of multiple surgeries can be a significant deterrent[5] .Consequently, alloplastic frameworks have been explored as an alternative. Materials such as Medpor® (porous polyethylene) have shown success but still carry a persistent risk of

exposure and infection, especially in the long term[6] Silicone, while historically plagued by high extrusion rates when placed subcutaneously, has seen a resurgence when combined with robust vascularized soft tissue coverage [7].

The temporoparietal fascia flap (TFF) provides an ideal, well-vascularized covering for alloplastic implants. Its proximity to the auricle, reliable anatomy, and pliability make it an excellent option for enveloping a framework [8]. This case series describes and evaluates the outcomes of a single-stage reconstruction technique using a custom-carved silicone implant covered by a TFF in 12 adult patients with congenital microtia.

MATERIALS AND METHODS

A single-surgeon, retrospective case series was performed. Ethical approval was obtained from the institutional review board.

Patient Selection

Twelve consecutive adult patients (8 males, 4 females) with unilateral congenital microtia (Grades III and IV according to the Marx classification) who underwent primary reconstruction between January 2020 and December 2022 were included. The mean age was 28.5 years (range: 19-42). All patients were thoroughly counselled on the risks and benefits of both autologous and alloplastic techniques, and they specifically opted for the single-stage alloplastic approach. Exclusion criteria included a history of previous ear reconstruction, radiation therapy to the head and neck region, and uncontrolled systemic diseases.

Surgical Technique

Preoperative Planning: A template of the contralateral, normal ear was created using a radiographic film. A solid, medical-grade silicone block was custom-carved intraoperatively to match the template's size and projection.

Implant Fabrication: The silicone framework was carved to replicate the helix, antihelix, and scapha. It was then thoroughly cleansed and soaked in an antibiotic solution.

Pocket Creation and Flap Elevation: A pre-auricular incision was made. A subcutaneous pocket was dissected precisely to accommodate the implant. A pedicled TFF, based on the superficial temporal artery, was elevated through a separate temporal incision.

Flap Transposition and Inset: The TFF was tunneled inferiorly to completely envelope the silicone framework. The flap was sutured to the surrounding soft tissues to ensure stable, tension-free coverage.

Skin Grafting: A thin split-thickness skin graft, harvested from the ipsilateral scalp, was used to resurface the neoauricle.

Closure and Dressing: A suction drain was placed under the flap. A compressive, non-adherent dressing was applied to define the auricular contours.

Outcome Measures

Patients were followed up at 1 week, 1 month, 3 months, 6 months, and annually thereafter. Primary outcomes were:

Aesthetic Outcome: Evaluated at 6 months postoperatively by a panel of three independent plastic surgeons blinded to the study using a 10-point Likert scale (1=very poor, 10=excellent). Criteria included symmetry, definition of contours, and color match.

Complication Rate: Recorded as early (≤30 days) or late (>30 days). Major complications were defined as implant extrusion, infection requiring removal, or flap failure. Minor complications included hematoma, seroma, partial skin graft loss, and temporary alopecia.

Secondary outcome was patient satisfaction, assessed via a simple questionnaire at the final follow-up, rating satisfaction as "Very Satisfied," "Satisfied," or "Not Satisfied."

RESULTS

All 12 procedures were completed successfully in a single stage. The mean operative time was 3.5 hours (range: 3-4.5 hours). The mean follow-up period was 18 months (range: 12-30 months).

Aesthetic Outcomes

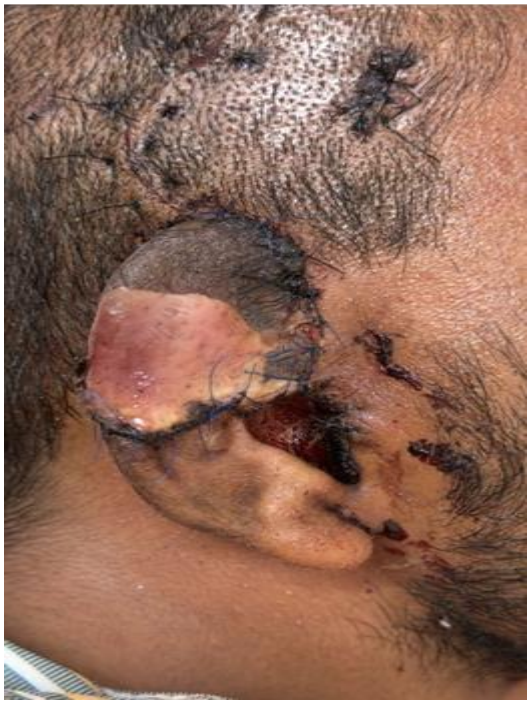
The mean aesthetic score given by the independent panel was 8.2 out of 10 (range: 7-9). The panel consistently noted good symmetry and well-defined helical contours. The color match of the skin graft was deemed satisfactory in all cases.

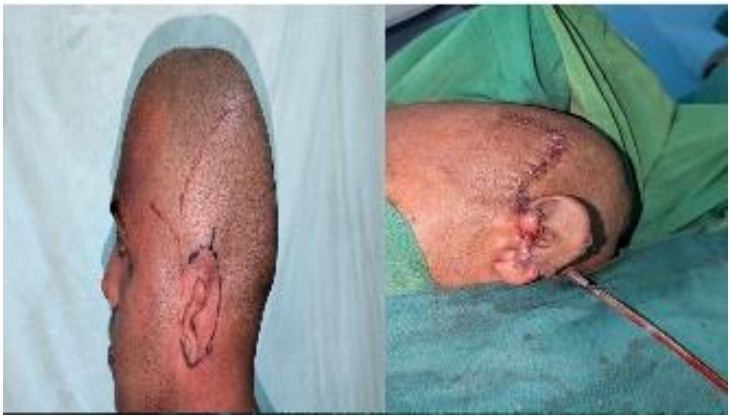
Complications

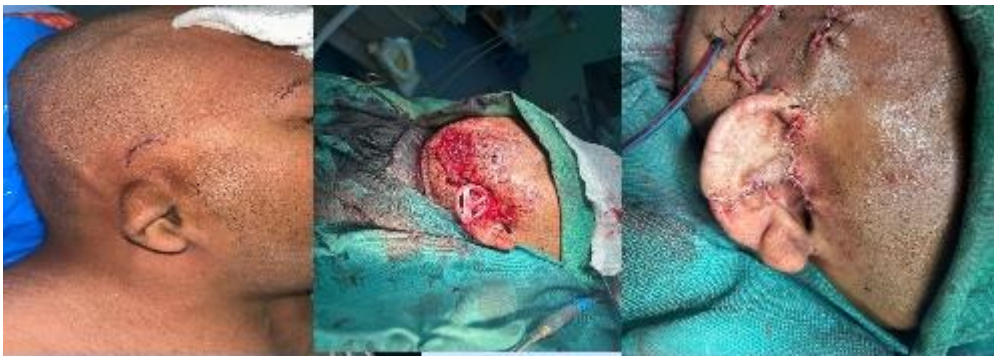
There were no major complications. No implants were lost to extrusion or infection. One patient (8.3%) experienced a partial loss of the skin graft over the superior pole, which healed completely with conservative wound care, resulting in a minor contour irregularity. Two patients (16.7%) had noticeable temporal hollowing at the donor site at the 3-month follow-up; both cases improved significantly without intervention by the 12-month mark.

Patient Satisfaction

At the final follow-up, 10 patients (83.3%) reported being "Very Satisfied," and 2 patients (16.7%) reported being "Satisfied." The most frequently cited reason for satisfaction was the avoidance of a chest scar and the completion of reconstruction in a single operation.







DISCUSSION

This case series demonstrates that a single-stage approach using a silicone implant and TFF is a reliable method for microtia reconstruction in carefully selected adults. The results indicate a favourable aesthetic outcome and a low rate of significant complications.

The primary advantage of this technique is its single-stage nature, which aligns with the preferences of many adult patients[5]. By avoiding the harvest of rib cartilage, it eliminates donor-site morbidity, a significant concern for patients engaged in physical labor or athletics. The use of the TFF is the critical factor in mitigating the historical weakness of silicone implants: extrusion. The flap provides a richly vascularized cushion that protects the implant and promotes graft take, a principle well-supported in the literature[8,9].

Our complication profile compares favorably with other alloplastic techniques. The reported extrusion rates for Medpor frameworks can be as high as 5-10%, even with flap coverage[6]. Our series had no extrusions, though the sample size is modest. The minor complications we encountered, such as partial graft loss and temporary temporal hollowing, were manageable and did not affect the final outcome. Temporal hollowing can be minimized by meticulous dissection in the subfollicular plane to preserve temporal fat pad volume.

The aesthetic results, while not aiming to surpass the nuanced, living quality of a well-carved cartilage framework, were deemed highly satisfactory by both surgeons and patients. The silicone framework allows for precise and sharp definition of the auricular landmarks, which can sometimes be challenging to achieve with cartilage in older patients[7].

This study has limitations, including its retrospective design, small sample size, and lack of a direct comparative group (e.g., a cohort of adults who underwent autologous reconstruction). Furthermore, the long-term durability of the reconstruction beyond 3-5 years remains to be fully evaluated, as silicone implants may be prone to late-term complications like capsular contracture or migration[10]. Long-term follow-up is essential.

CONCLUSION

For adult patients with microtia, single-stage reconstruction with a silicone implant covered by a temporoparietal fascia flap presents a compelling alternative to multi-stage autologous rib cartilage reconstruction. It offers the significant benefit of a definitive correction in one operation, with acceptable aesthetic outcomes and a low risk of major complications. This technique is a valuable addition to the armamentarium of the craniofacial surgeon, particularly for adults who are well-informed about the risks and benefits of alloplastic materials.

REFERENCES

1. Luquetti DV, Heike CL, Hing AV, et al. Microtia: epidemiology and genetics. Am J Med Genet A. 2012;158A(1):124-139.
2. Brent B. Technical advances in ear reconstruction with autogenous rib cartilage grafts: personal experience with 1200 cases. Plast Reconstr Surg. 1999;104(2):319-334.
3. Nagata S. A new method of total reconstruction of the auricle for microtia. Plast Reconstr Surg. 1993;92(2):187-201.
4. Baluch N, Nagata S, Park C, et al. Auricular reconstruction for microtia: a review of available methods. Plast Surg (Oakv). 2014;22(1):39-43.
5. Firmin F, Marchac A. A novel algorithm for autologous ear reconstruction in congenital microtia. Plast Reconstr Surg. 2015;136(4):868-871.
6. Reinisch JF, Lewin S. Ear reconstruction using a porous polyethylene framework and temporoparietal fascia flap. Facial Plast Surg. 2009;25(3):181-189.
7. Romo T 3rd, Presti PM, Yalamanchili HR. Medpor alternative for microtia repair. Facial Plast Surg Clin North Am. 2006;14(2):129-136.
8. Park C, Lee TJ, Shin KS. A single-stage two-flap method of total ear reconstruction. Plast Reconstr Surg. 1991;88(3):404-412.
9. Tegtmeier RE, Gooding RA. The use of a temporal fascia flap for the coverage of a silicone framework in total ear reconstruction. J Hand Surg Am. 1977;2(1):23-26.
10. Thorne CH, Brecht LE, Bradley JP. The use of alloplastic materials in rhinoplasty and ear reconstruction. Clin Plast Surg. 2000;27(1):107-119.