

Original Article

Dental impression compound as an effective splint for maintenance of ear elevation in microtia reconstruction

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ABSTRACT

Ear projection is an important goal to be achieved after stage two (ear elevation) in cases of microtia. This is a retrospective study conducted on patients with microtia who underwent staged reconstruction for the same. This study has been carried out over a period of 10 years with 211 patients. Dental impression compound was used as a splint after ear elevation and split skin grafting to maintain the projection of the ear. Projection of the ear was measured both pre- and post-procedure and at every follow-up using goniometer and photographic documentation was simultaneously done. Statistical analysis was performed using *t*-test. Patients were reviewed every month and splint was continued until 6 months post-surgery. The splint was very effective in maintaining the ear projection of more than 20° even after prolonged follow-up of upto 2 years. There were no complications associated with the splint application or prolonged use.

KEY WORDS

Ear elevation; splint; microtia

INTRODUCTION

Ear projection after ear elevation in microtia cases is often lost despite the use of various splints, dressings, etc. We used dental impression compound as a splint which is hard at room temperature, but becomes soft in minutes at a temperature over 60°C. We conducted a retrospective analysis of 211 patients with microtia over 10 years who underwent staged reconstruction for the same. Patient's age ranged from 11 to 22 years.

PROCEDURE

Dental mould is kept in hot water for few minutes. Once it becomes soft, it is taken out of hot water and is allowed to cool for few seconds. Softened material is now placed on the posterior aspect of reconstructed ear (auriculocephalic sulcus) after applying an antibiotic cream over the grafted skin [Figure 1]. It is moulded in to the desired shape (wedge shape) with reconstructed ear in desired position of projection [Figure 2]. An extension of mould goes on to the antero-superior aspect of reconstructed ear. This extension of splint helps in retention of mould in its place without any need of tape or bandage. Within few minutes, impression compound again becomes hard and maintains its shape. This splint is applied in the second stage 2 weeks after the elevation of reconstructed ear. He/she is asked to use the splint continuously and is removed only during

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bathing. Patients are reviewed every month and the splint is continued until 6 months post-surgery. Projection of the ear is measured both pre- and post-procedure and at every follow-up using goniometer and photographic documentation is simultaneously done. Statistical analysis was performed using the *t*-test and $P < 0.05$ was considered to be statistically significant

RESULTS

The splint has been used in 211 patients so far with no inadvertent complications. Out of 211 patients 21 patients were either non-compliant or lost to follow-up. The only minor problem, which we have encountered, is breakage of the splint due to fall. The compliance of the patients in wearing this splint has been excellent even in patients as young as 11 years of age. There have been no complaints of dermatitis, loss of the graft or necrosis of the post-auricular skin in our series. The average ear projection measured was more than 20° even after 2 years of follow-up [Figures 3 and 4].

DISCUSSION

Various types of splints have described for post-operative management of reconstructed ear in microtia. Majority of these splints have been used as a protective guard for reconstructed ear,^[1-3] to control the oedema or for the maintenance of contours.^[4-7] There are limited reports of splints for maintenance of desired position of elevation of reconstructed ear.^[8,9] We feel dental impression compound as a splint is very effective and should be used in all patients due to various reasons: Easy fabrication, inexpensive, light weight, easy to apply/remove, self-retaining, no loss of graft or necrosis of post-auricular skin, no dermatitis, no scarring, significant oedema reduction, excellent patient compliance and finally, maintenance of ear projection and post-auricular sulcus even after many years post-surgery. Elevation is very important post microtia treatment otherwise the ear shall stick in post auricular sulcus and loose its normal angulation from the scalp. Well there is not enough literature for reviewing the things, but yet we like to say



Figure 1: Splint in place on the posterior aspect of reconstructed ear



Figure 2: Splint



Figure 3: Microtia posterior view-pre-operative



Figure 4: Microtia posterior view-post-operative note the ear projection

that there are various ways of maintaining the elevated ear. Most of the work has been done by Dr. Nagata of Japan who in second stage uses cartilage block for ear elevation and covers it with temporo-parietal fascial flap.^[10] Other methods have included the use of expanded retroauricular skin (by tissue expander) and fascial flap;^[11] use of retroauricular fascial flap and wrapping of wedge of autogenous costal cartilage;^[12] some authors have modified Dr. Nagata's technique, instead of using temporoparietal flap, people have used simple rotation flap from mastoid and neck to close the defect.^[13] We also use a crescent shaped block of cartilage at the posterior aspect of reconstructed cartilage in the first stage to keep it elevated after its release from the scalp, but in spite of this block of cartilage, the elevated ear tends to lose its elevation due to secondary contraction of the graft. The splint described here tends to resist the forces of contraction and prevents loss of angulation of ear. We did not have any cases of ulceration of the graft since they just splint the area rather than causing any compression. We do not use any supportive tapes to hold the splint since it can be clearly appreciated in the photographs that a small portion of the splint goes well beyond anteriorly in the form of a curve and supports the splint automatically. Since it's small in size and placed in the posterior aspect of the ear, it can be easily concealed under the hair.

CONCLUSION

We would say that this splint be used in all patients since it has an excellent compliance and other advantages as stated above.

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