



Ideas and Innovations

Compressive plastic splint for postoperative management of the ear

T. Yotsuyanagi

Department of Plastic and Reconstructive Surgery, Hirosaki University School of Medicine, Hirosaki, Japan

SUMMARY. A new splint for use after ear reconstruction is described. This splint adjusts suitably to the complicated contours of the ear without requiring any impressions before fabrication. The splint controls expansion and contractile forces and consequently prevents some of the complications following ear surgery.

For preventing haematoma, oedema and scarring, which may cause some of the deformities occurring after ear reconstruction, a proper dressing or a splint is useful.¹⁻³ We describe a new splint that can be easily and quickly fabricated, and that can be continuously applied to the complicated contours of the ear by controlling expansion and compression forces. We have used the splint in 38 cases after ear reconstruction.

Technique

Our splint is made from thermoplastic material (Free Plastics®, Daicel Craft, Tokyo), which is elastic and hard at room temperature, but becomes soft in seconds at a temperature over 60°C. As the softened material soon becomes cold, it is easy to handle and readily remodelled by kneading in the hand.⁴ When ear deformities are considerable, or in uncooperative

children, our splint therapy is started soon after surgery. After applying antibiotic ointment or a few layers of gauze to the wound, an adequate volume of thermoplastic material, which has been warmed and softened, is applied with light pressure to the reconstructed ear from the anterior and posterior sides. The material takes the form of the reconstructed ear and hardens in minutes.

The splint gives support to the cranial aspect of the concha or the auriculocephalic sulcus, and a compression force from both sides of the ear. These forces can be controlled by remodelling the splint in hot water according to the degree to which contraction forces and deformities are progressing. The splint is applied continuously during sleep and physical activity, though it can be removed while bathing.

Illustrative cases are shown in Figures 1-3.



Fig. 1

Figure 1. For legend see p. 623.



Fig. 2



Fig. 3

Figure 1—Case 1 (A) An 8-year-old girl with a right cryptotia. Soon after surgical correction by incision of the cartilage and a skin flap from the temporal area, our splint was applied for 3 months. (B) Our splint replicates the complicated form of the reconstructed ear. No complication was experienced although the patient was active and uncooperative. **Figure 2—Case 2.** A 44-year-old male who had a skin tumour on the right helix and antihelix, which was adherent to the underlying cartilage. After skin grafting following removal of the tumour and the cartilage our splint was applied for 3 months. **Figure 3—Case 3.** A 7-year-old boy who had a congenital cleft ear lobe in the left ear. The ear lobe, reconstructed by two skin flaps, was bulky. In this case, the splint was fabricated with an earring and the compression force could be adjusted by the earring screw.

Discussion

It is known that when a proper dressing or a splint that achieves immobilisation, obliteration of dead space, compression, and protection from trauma, is used continuously, severe complications following ear reconstruction can be reduced. However, it is difficult to apply and maintain dressings and splints because the ear has complicated contours and protrudes from the head.¹⁻³

Though various kinds of dressings and splints for ear management have been reported, they have some disadvantages. For example, the popular traditional dressing, which consists of proflavine-soaked wool and a bandage, may be dislodged when bandaged loosely or may cause pressure necrosis when bandaged tightly. Furthermore, such a dressing may cause excess moisture and discomfort because the whole head is bandaged.^{3,5,6} Other splints are difficult to fabricate, apply, or remove and are sometimes bulky, heavy or uncomfortable.^{1-3,6-9}

Our splint of thermoplastic material is easily applied to the complicated contours and can control expansion and contractile forces even if these, and the growth of keloids, are progressing. The splint can be easily and quickly fabricated without requiring any prior impression. In addition, the splint is light, inexpensive, and easy to apply and remove.

Acknowledgement

The author wishes to thank Professor Mitsuo Sugawara, Department of Plastic and Reconstructive Surgery, Hirosaki University

School of Medicine, for his advice on the preparation of the manuscript.

References

1. Tempest MN. A safe and simple postoperative dressing for bat ears. *Br J Plast Surg* 1962; 15: 398-401.
2. Tanzer RC, Chaisson R. A protective guard for use during reconstruction of the auricle. *Plast Reconstr Surg* 1974; 53: 236-8.
3. McIntire MR, Morgan RF, Kenny JG, Edgerton MT. Postoperative protection for external ear. *Ann Plast Surg* 1983; 11: 261-2.
4. Yotsuyanagi T, Sawada Y. Expanding oral plastic splint for burn patients. *Burns* 1993; 19: 131-3.
5. Powell BWEM. The value of head dressings in the postoperative management of the prominent ear. *Br J Plast Surg* 1989; 42: 692-4.
6. Chongchet V. A method of antihelix reconstruction. *Br J Plast Surg* 1963; 16: 268-72.
7. Tegtmeier RE. A silicone form ear dressing. *Plast Reconstr Surg* 1977; 60: 131-2.
8. Mercer DM, Studd DMM. "Oyster splints": a new compression device for the treatment of keloid scars of the ear. *Br J Plast Surg* 1983; 36: 75-8.
9. Ross JK, Matti B, Davies DM. A silastic form dressing for the protection of the post-operative ear. *Br J Plast Surg* 1987; 40: 213-4.

The Author

Takatoshi Yotsuyanagi, MD, Instructor, Department of Plastic and Reconstructive Surgery, Hirosaki University School of Medicine, 53 Hon-cho, Hirosaki City, Aomori Prefecture 036, Japan.

Requests for reprints to the author.

Paper received 5 March 1993.

Accepted 20 May 1993, after revision.