Use of Acrylic Splint for the Stabilization of Bony Components After Rhinoplasty: A New Technique

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Abstract

Introduction Adequate stabilization of the osteotomised bony components and/or nasal grafts requires proper post operative care in order to maintain its position till the initial healing phase. An ideal splint should be light, adaptable, easy to remove and inexpensive.

Technique This paper presents the author's experiences with use of self cure acrylic resin (DPI-RR) in fabrication of nasal splint following rhinoplasty. Special care should be taken during the final setting stage to irrigate the splint, especially on its undersurface, to counter the effects of the exothermic reaction.

Conclusion The Acrylic nasal splint is easy to fabricate, less time consuming, hygienic and cost effective. Our experience with the acrylic splint in over 250 cleft and aesthetic rhinoplasties shows that the acrylic splint fulfils all the criteria of an ideal splint.

Keywords Rhinoplasty · Acrylic splint · Post rhinoplasty care

Introduction

Adequate stabilization of the osteotomised bony components and/or nasal grafts requires proper post operative care in order to maintain its position till the initial healing phase. An ideal splint should be light, adaptable, inextensible, easy to remove and inexpensive [1]. Three main categories of splints are commercially available: metallic, thermoplastic, and plaster. Metallic splints are difficult to conform owing to their rigid structure. They are moderately expensive and easy to remove. On the other hand, thermoplastic splints are light, adaptable and easy to use, but can be easily deformed by swelling and are very expensive [2]. We describe a technique of fabrication of nasal splint using self cure acrylic resin (DPI-RR).

Technique

After completion of the rhinoplasty a small piece of vaseline gauze is adapted over the dorsum. The monomer liquid and polymer powder of the self cure acrylic are mixed and, as it reaches 'dough stage' (Fig. 1), is adapted over the nasal dorsum and contoured in close contact with the skin without excessive pressure; extending 2 mm onto the cartilaginous portion inferiorly and beyond the osteotomised edge of the nasal bone onto the stable bone laterally and superiorly. The working time of the mixture is around 3–5 min, during which, any excess material may be cut with a sharp pair of scissors (Fig. 2) prior to the onset of the exothermic reaction, which denotes the final setting stage of the splint. Once the exothermic reaction starts, the splint is irrigated with cold water on all surfaces taking care to forcefully irrigate the undersurface using an intravenous catheter (Fig. 3). During this stage, care should be taken

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Fig. 1 Soft moldable mass of self cure acrylic before adaptation over the nasal dorsum

not to disturb the splint as it may change its dimensions. However minimal movement of the splint to facilitate adequate irrigation has not shown to affect the adaptability. This process is important as direct contact of the splint with the skin during the final stage of curing without cooling will cause mild burns on the skin surface. The acrylic splint, which hardens within 10 min, is removed and checked for its approximation. The splint can now be trimmed with a portable drill using a 'cherry stone' so that the thickness is around 2–3 mm and the well rounded edges do not impinge on the medial canthus of the eye and

Fig. 2 Excess material is trimmed with a sharp pair of scissors after adaptation over nasal dorsum

other soft tissue structures. The final smoothing is achieved with a sand paper. The splint is fixed with micro-adhesive strips (Fig. 4). In our centre the splint is maintained till the tenth post-operative day.

Discussion

The purpose of the splint is to stabilize the osteotomised nasal skeleton, to stabilise the nasal dorsal graft that may

Fig. 3 Splint is irrigated with cold water using an intravenous catheter

Fig. 4 Acrylic splint is fixed using microadhesive strips

have been placed, to approximate the skin flap to the underlying bone and to prevent haematoma formation. More than physically preventing movement of the underlying nasal bones or graft when subject to external pressure, the splint serves as a reminder, to the patient and to others that care should be taken in the early healing period. Hence the splint, while being rigid, should be light, comfortable and unobtrusive.

The nasal skin, mainly over the dorsum of the nose, is characterized by its delicacy. Excessive pressure in the post-operative period may cause skin damage over sharp osteotomised bony edges and grafts, and in some cases, even pressure necrosis. Also sharp edges can cause severe indentation and laceration of the skin. Metallic and some thermoplastic materials may cause severe pressure in some areas as they may not adequately mold to the nasal contours. Self curing acrylic splints are passively molded onto the nose in the soft dough stage and it thereby takes the form achieved during surgery. It is not possible to apply excessive pressure without deforming the material due to

its elastomeric properties in this stage. By the time the material hardens it also becomes non-pliable and further pressure cannot be applied without breaking it. The edges automatically confirm to the contours of the skin and underlying tissues and no sharp edges are formed. Furthermore any unacceptable edges formed in the splint or areas of excessive pressure may be trimmed easily at the bedside and the splint may be polished with a portable micro-motor unit. It is inexpensive (costing approximately USD 0.50) and easily reproducible.

We have used the splint in over 250 aesthetic and cleft rhinoplasties in our centre. We have had three cases of discoloration of the surface skin over the dorsum of the nose due to contact with the heated splint during the exothermic phase of setting. This has been attributed to inadequate cooling of the undersurface of the splint. This is easily prevented with copious irrigation using intravenous catheter to flush the undersurface of the splint with cold water. We have not encountered a single case of such skin changes in cases where copious irrigation has been carried out.

Conclusion

In our experience the splint is aesthetically acceptable, comfortable, and hygienic and can be easily fabricated at the bedside and hence can be used to stabilize nasal components after rhinoplasty.

References

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