Use of Preexpanded Forehead and Neck Skin in Case of Giant Facial Hairy Naevus: Planning and Technique

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Abstract

A congenital nevi is a pigmented patch which requires complete surgical excision for cosmetic reasons. Here, we report a case of a patient with facial hairy pigmented lesion, occupying the right half of her face since birth, who underwent complete surgical excision and staged reconstruction utilizing, preexpanded forehead and neck skin. We used two rectangular tissue expanders with 150 and 300 cubic cm of volumes inserted in the forehead and the neck, respectively. The length of the expanders selected were equal to 1.2 to 1.5 times the length of their respective lesions, whereas the width of the base of the expanders were approximately similar to the width of their defects. It is concluded with this case report that tissue expansion provides a good cosmetic and anatomical correction to cover large defects, with adjacent skin having similar properties.

Keywords

- congenital
- nevi
- expander

Introduction

The giant congenital melanocytic nevi is defined as a lesion affecting 2% of total body surface area (TBSA) in newborns and toddlers, or having a diameter larger than 20 cm in older children and teenagers.¹ The incidence varies from 1 in 100 births for small nevi to 6 in 1000 births for medium nevi to 1/ 500,000 newborns for giant nevi.² A variety of surgical and nonsurgical options exist for the management of such cases. Complete surgical excision of congenital nevi is done for cosmetic reasons.³ The risk of developing a cancer during the lifetime of the patient remains low even in the residual nevus. Therefore, during treatment decision, factors such as satisfactory cosmetic outcome and psychological effect should be taken into consideration.⁴

We report here a case of a patient with hairy lesion who underwent complete surgical excision and staged reconstruction.

Methods

Case Presentation

An 18-year-old unmarried girl presented with pigmented patch occupying the right half of her face since birth (► Fig. 1), which was associated with pruritus, skin fragility, erosion, and decreased sweating. On examination, she had a hairy gray black pigmented lesion involving the right side of the face, extending superiorly from right frontotemporal hairline to the lower border of the mandible inferiorly, medially reaching up to lateral nasal wall and nasolabial crease, and laterally up to preauricular crease involving right eyebrow and whole of cheek.

The total dimension of the nevus was around 16 × 7 cm and the lesion was divided into two parts, that is, one above the zygomatic arch with surface area 35 sq cm (7 × 5 cm) and second below the arch with surface area 63 sq cm (9 × 7 cm). Thereafter, we selected the two rectangular tissue expanders: one with base

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area of 44 sq cm (11×4 cm) for forehead region to resurface the lesion above the zygomatic arch, and the second one with the base area of 66 sq cm (11×6 cm) for the second part. The length of the expanders selected were equal to 1.2 to 1.5 times the length of their respective lesions, whereas the width of the base of the expanders were approximately similar to the width of their defects. Now to calculate the volume and height of the expanders selected, we used the Microsoft Excel spreadsheet method⁵ that gave us the results as approximately 100 cubic cm as volume and nearly 2.5 cm as height for the expander in forehead and 225 cubic cm and 3.5 cm as volume and height, respectively, for the expander in the neck. Therefore, we selected the final expanders having volume and height as 150 cubic cm and 4 cm, respectively, for the first expander and as 300 cubic cm and 6 cm, respectively, for the second one.

During the first surgery, a rectangular tissue expander of size $110 \times 40 \times 40$ mm was inserted in the forehead through the frontotemporal hairline with port in the temporal region, whereas second tissue expander of size $110 \times 60 \times 60$ mm was inserted in the neck area with port in the mastoid region (►Fig. 2). The expanders were inflated with once a weekly regime. The expander in the forehead region was expanded to approximately 220 mL and the second one in the neck was expanded to approximately 400 mL. Thus, the expanders were expanded to approximately 40% of their initial volumes. For rotation advancement, the flap roughly corresponded to

the defect length below zygomatic arch plus expander base width (approximately 15 cm), which is approximately equal to the length of the dome of the inflated expander, that is, height gained + length of expander which is 17 cm. For propeller flap, defect width = propeller flap width, defect length = or < propeller flap length.

After 3 months of expansion, full-thickness skin excision of the nevus was done. The expanders were removed and the first part of the nevus was replaced by a propeller flap, based on the anterior branch of the right superficial temporal artery, and lower part by a flap which was rotated and advanced from the preexpanded skin over the neck, with pivot point around the angle of right mandible (►Fig. 3). Postoperatively, venous congestion was seen over both the flaps, which had resolved spontaneously over the period of the following 3 to 4 days (►Fig. 4). The postoperative period was uneventful, and the suction drains were removed on the 7th day.

After 3 months of second surgery, the excision of residual nevus around eyebrow and nasolabial crease was done under local anesthesia. Cheek flap and forehead flap advancement and readjustment were done (►Fig. 5). Minor refinements like medial scar Z plasty to correct the deformity of the

Fig. 1 Image of the same patient at 10 years of age.

Fig. 2 Image of large right side facial hairy nevus of the patient, with tissue expanders inserted inside for head and neck (front view).

Fig. 3 Incision marking for the flaps.

Fig. 4 Postoperative image following second surgery.

Fig. 5 Postoperative image following third surgery.

right side angle of mouth and either scar revision or laser therapy for the patch of hair over the right forehead were planned (► Fig. 6a, b, c).

Discussion

Giant congenital melanocytic nevus has traditionally been called birthmark in India and often bears a social stigma. Congenital pigmented nevi are associated with risk of developing malignant melanoma.⁶ The nevus in our report belongs to Group 3 class of giant facial nevi, that is, more than 12 cm maximum, involving more than two aesthetic units, and requiring more than two reconstructive stages.⁷ Giant nevi are variously defined as those requiring serial excision or tissue expansion or more commonly > 20 cm in the greatest dimension⁸. Chen⁹ defined giant congenital nevi as covering 1% of body surface area in the face and neck and 2% elsewhere on the body. Therefore, in accordance with both the above-mentioned definitions, the lesion in our case report is a giant nevus involving the most of half of the face, which is defined by Lesham et al as being hemifacial (forehead, periocular area, nose, and cheek).¹⁰

The goal of treatment is complete excision with satisfactory cosmetic reconstruction.⁴ Several therapeutic procedures have been considered. Nonsurgical options include dermabrasion,

Fig. 6 (a) Follow-up image after 1 year following further refinement (lateral view). (b) Follow-up image after 1 year following further refinement (frontal view). (c) Follow-up image after 1 year following further refinement (oblique view).

laser ablation, curettage, and chemical peel.¹¹ Surgical options include staged excision with primary closure, skin graft, local flaps, skin substitute like Integra,¹² or tissue expansion and flap cover,¹³ or single-stage complete excision and microvascular free flap coverage.

Tissue expansion has become one of the most effective forms of treatment of large and giant nevi, which allows the complete excision of the nevus while maintaining acceptable aesthetic and functional outcomes. The available flap length is estimated by subtracting the base width from the length of the dome of the inflated tissue expander.¹⁴ However, infection, hematoma, expander exposure, and implant failure are the most common complications of tissue expansion.¹⁵ Microvascular free flap cover has various disadvantages: requires microsurgical expertise, less tissue match in terms of color and texture, sometimes become bulkier, and flap failure. Tissue expansion has best tissue match, with delayed flap having less chance of congestion and failure. The surface area gain provided by the rectangular expander is usually more as compared with any other expander, which is approximately 38%.¹⁶ Therefore, we decided to use rectangular/cuboid-shaped tissue expander. The use of propeller flap and planning of the final suture line were unique in our case, with suture lines falling in the natural creases.

Conclusion

Management of giant melanocytic nevi requires complete surgical excision with acceptable aesthetic reconstruction. Tissue expansion provides a good cosmetic and anatomical correction to cover such large defects.

Conflicts of Interest

None declared.

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