

Accordion Flap

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Abstract. The accordion flap is proposed as a means of covering a rhombic defect. A prominent feature of the method presented is in the preparation of a flap on one side of the skin defect, resulting in little dog ear.

Key words: Local flap — Rhombic flap — Flap

The Limberg flap [7], the Dufourmentel flap [5], and other flaps [2] are well known for coverage of a rhombic defect of the skin. However, dog ear is one of the shortcomings of these methods. To avoid dog ear formation, rhomboid-to-W plasty [1] and double-Z plasty [3, 6] have been performed on both sides of a skin defect. Our accordion flap is presented on only one side of the skin defect, and results in little dog ear.

Design of the Flap

As shown in Figure 1A, a fan-like arc is drawn through point A representing one tip of the defect (ABCD). Then points, E, F, and G, are marked on the arc so that $\widehat{AE} > \widehat{EF} > \widehat{FG}$. The results are $\alpha_1 > \alpha_2 > \alpha_3$ and $\beta_1 > \beta_2 > \beta_3$. The sides of the triangular flaps are equal in length. Flap A1 is transferred to the defect. Flap A2 is transferred to cover the secondary defect. In the same way, each flap is transferred to cover each defect in order. Figure 1B shows the completed accordion flap transfer.

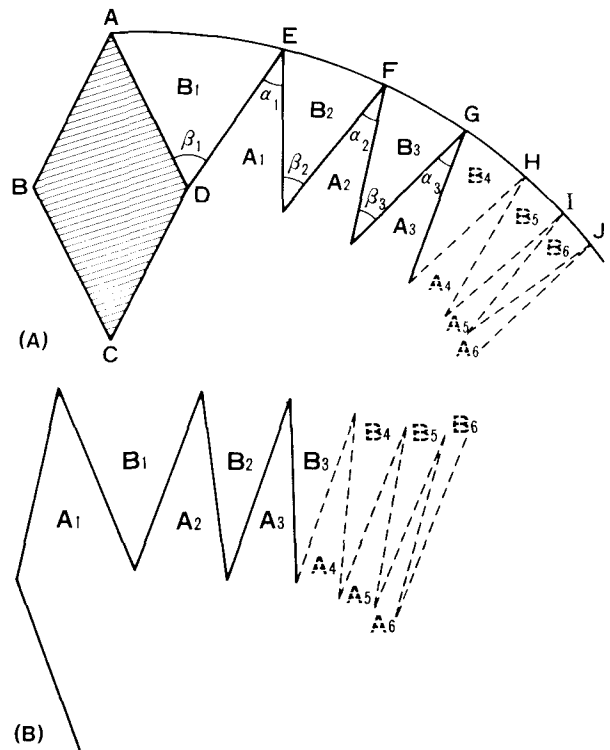


Fig. 1. (A) Design of the accordion flap, $\widehat{AE} > \widehat{EF} > \widehat{FG}$. (B) Accordion flap transfer completed.

Case 1

A 41-year-old man had a benign tumor at the upper edge of the left eyebrow. After excision of the tumor, plasty was performed with an accordion flap (three triangular flaps). After the flap was elevated, the surrounding subcutaneous tissue was undermined for transposition of the flaps (Fig. 2).

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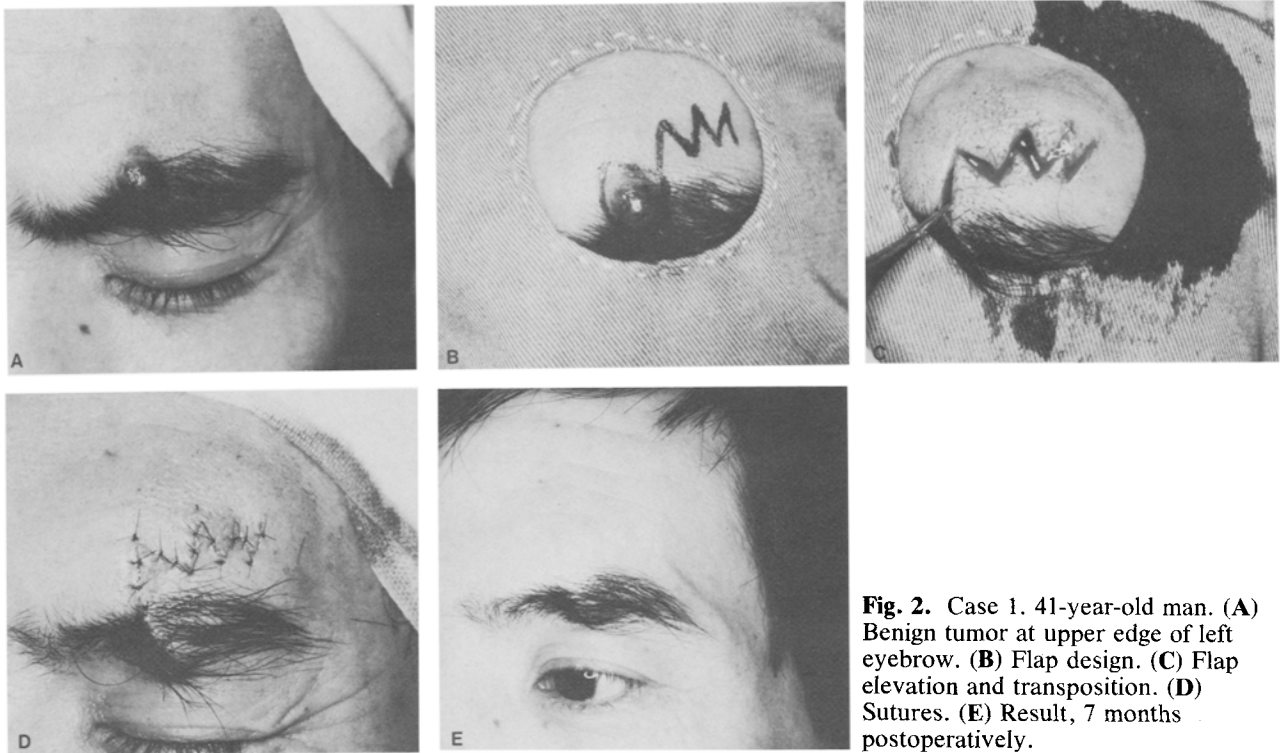


Fig. 2. Case 1. 41-year-old man. (A) Benign tumor at upper edge of left eyebrow. (B) Flap design. (C) Flap elevation and transposition. (D) Sutures. (E) Result, 7 months postoperatively.

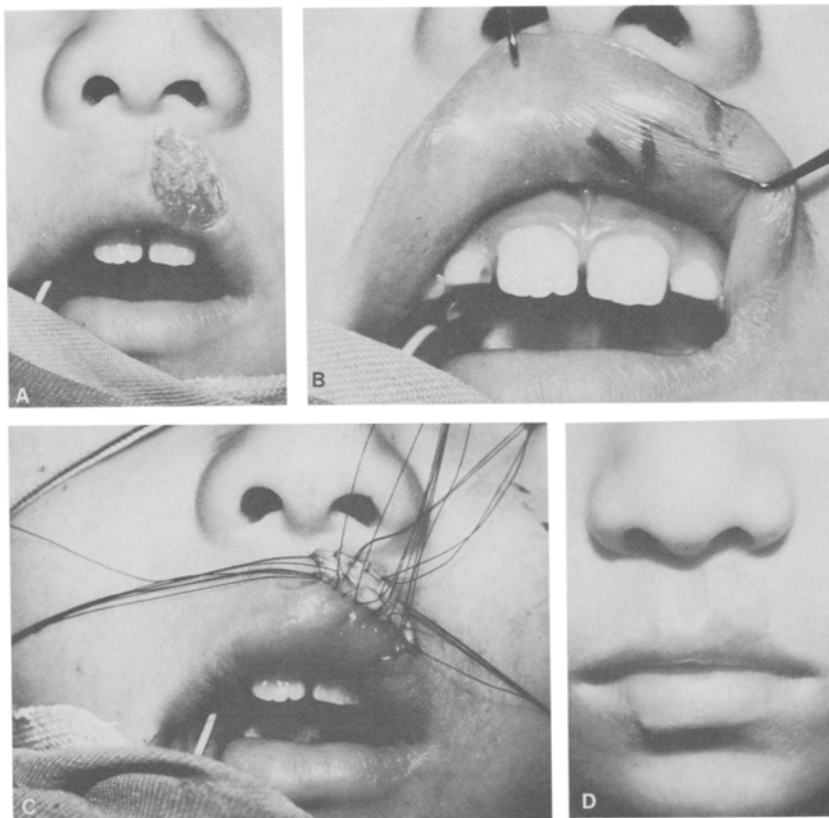


Fig. 3. Case 2. 10-year-old boy. (A) Full thickness defect of left upper lip. (B) Accordion flap with two triangular flaps designed for repair of red lip. (C) Positioning of flap and suturing. (D) Result, 4 months postoperatively.

Case 2

A 10-year-old boy had a full thickness defect of the left upper lip after a dog bite. An accordion flap (two triangular flaps) was applied to repair the red lip, while a full thickness skin graft from the preauricular region was used to cover the white lip (Fig. 3).

Discussion

When a single flap, such as the Limberg flap, is used in a case where the skin defect to be covered is large, the formation of a dog ear is a notable feature. Rhomboid-to-W plasty or double-Z plasty should be applied for such a defect, the flaps being prepared on both sides of the defect. However, this is not possible in some cases.

Dreyer reported the stair-step flap for nasal alar reconstruction [4]. In his method, a full thickness (skin, cartilage, and mucosa) rotation advancement flap is prepared in a stair-step fashion. The resulting triangular flaps are of equal size. In our method, the flap is a pure skin flap and there is a slight deescalation in size of the triangular flaps to minimize the possibility of dog ear after transposition of the flaps.

To determine the number of triangular flaps, we use the premise that: the larger the number of triangular flaps, the less possibility of developing dog

ear. As in Case 1, however, the maximum number of triangular flaps should be three or four, even if the scar is not marked. A greater number of flaps would result in narrow pedicled triangular flaps and reduced blood circulation. In Case 2, two flaps were sufficient as the dog ear was transferred into the oral cavity and the purpose of the transposition was achieved successfully.

References

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