

# Functional and aesthetic reconstruction of a large upper lip defect using combined three local flaps

## A case report

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### Abstract

**Rationale:** A significant clinical issue for treating patients with large upper lip defects is how to reconstruct the lip functionally and aesthetically. Traditional methods usually lead to asymmetry of the nasal base, philtrum and the lips.

**Patient concerns:** A 22-year-old lady presented with a large congenital nevus on her upper lip which involved the cutaneous, vermilion, and the philtrum. Secondary deformity caused by previous partial excisions was also identified.

**Diagnoses:** Patient was diagnosed as upper lip nevus with secondary deformity after partial excisions.

**Interventions:** We repaired the large upper lip defect by using combined nasolabial rotation flap and orbicularis oris myocutaneous flap. An additional small piece of mucosal flap was used to lengthen the vermilion.

**Outcomes:** After the surgery, patient with large upper lip defects achieved satisfactory cosmetic and functional repair.

**Lessons:** Reconstruction of the upper lip has been successfully accomplished through the use of combined nasolabial rotation flap, orbicularis oris myocutaneous flap, and a small piece of mucosal flap.

**Keywords:** defect, local flap, nasolabial rotation flap, orbicularis oris myocutaneous flap, reconstruction, upper lip

## 1. Introduction

The main reconstructive intervention of lip defects is using local flaps. The complexity of reconstruction and the selection of flaps mainly depend on the region and size of defects, tissues involved, as well as anatomical landmarks affected. It has always been reconstructive conundrum for plastic surgeons to achieve cosmetic and functional satisfaction when dealing with large defects of the upper central lip, especially which involves composite tissues, the philtrum, and the vermilion border. Various modalities of local flaps have been described for repairing defects in this area.<sup>[1–9]</sup> However, these conventional methods may still leave an asymmetric appearance or local dysfunction. In an attempt to solve this problem, we report our own technique using combined 3 local flaps for the repair of a large upper lip defect. We also discuss the advantages of our design, and how it could prevent some cosmetic problems based on the existing methods.

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## 2. Case presentation

A 22-year-old lady presented with a congenital nevus on her left upper lip. She had received partial excisions of the nevus twice before. Physical examination showed a two-by-one cm<sup>2</sup> irregular remnant nevus, which crossed the cutaneous and vermilion, and extended from the nasal sills to the commissure with its medial margin in-between the philtral columns. Due to the previous excisions and the tension produced by the scar contracture, the left philtral column and the left elevation of the vermilion border had been obliterated of their normal contours. The tubercle had been malposed, and the vermilion was shortened to the left (Fig. 1). Written informed consent was obtained from the patient for publishing this case report and accompanying images.

After the nevus had been resected during operation, there was a large defect left on the upper lip (Fig. 2). To repair the large defect, we designed our own technique using combined 3 local flaps as described in the following sections.

## 3. Methods

### 3.1. Surgical technique

Before the procedure, we designed a nasolabial flap and an orbicularis oris myocutaneous flap of the left angulus oris, and marked them (Fig. 3).

The flaps were meticulously dissected in the subcutaneous plane (Fig. 4). The orbicularis oris myocutaneous flap was then transferred to the lateral of the left nasal alar, while the nasolabial flap was rotated to cover the majority of the defect of the cutaneous upper lip (Fig. 5). After these 2 flaps were in place, we noticed that a piece of subcutaneous tissue near the philtrum was seemed to be a bit thick. We dissected the piece of tissue subcutaneously, and rather than discarding it, we transferred it subcutaneously to the vermilion and rebuilt the vermilion tubercle. This corrected the malposition of the tubercle.



Figure 1. Upper lip nevus.



Figure 4. The flaps were dissected. (A) nasolabial flap; (B) orbicularis oris flap.



Figure 2. The upper lip defect after excision.



Figure 5. The nasolabial flap and the orbicularis oris flap were in place (a' and b'). d: A piece of subcutaneous tissue was used to create the tubercle.

Lengthening of the left vermillion was then accomplished by a small piece of rectangular-shaped mucosal flap (Fig. 6).



Figure 3. Design of the flaps.



Figure 6. Lengthen the vermillion by using a small piece of rectangle-shaped mucosal flap (c). a': The nasolabial flap was in place. b': The orbicularis oris flap was in place.





**Figure 7.** Immediate postoperative photograph. a': The nasolabial flap was in place. b': The orbicularis oris flap was in place. c': The mucosal flap was in place.

**4. Results**

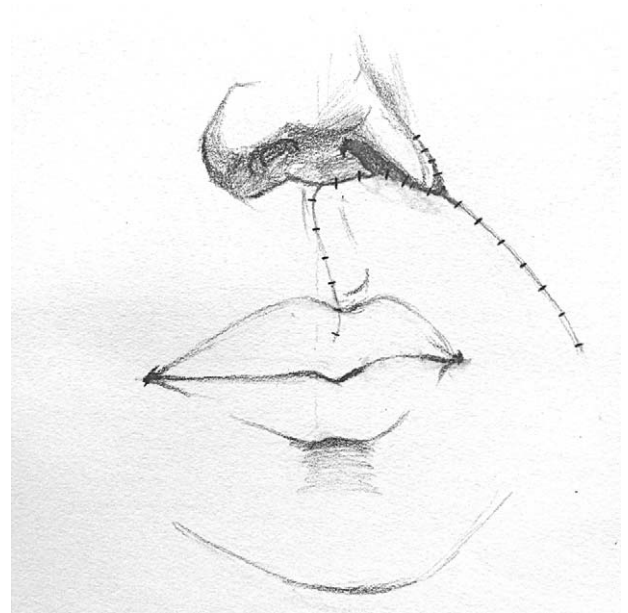
The cosmic result was excellent at the conclusion of the procedure (Fig. 7), and also in 4-month follow-up (Fig. 8). Physical examination showed that the position of the philtrum and tubercle has been restored. The left vermilion border has been raised to its normal level. The length of bilateral vermilion became symmetrical. We did not see any secondary distortion at the nasal base, alar, or nasolabial fold. Microstomia, significant scar, facial asymmetry, or other serious complications were also not identified.

**5. Discussion**

Facing this situation, we reviewed the literature and discussed all the potential reconstruction methods, including using local flaps, a skin graft, or implanting a tissue expander. Using a skin graft could be the last choice due to differences in thickness, color, and texture with the surrounding tissue. There was also only a slight chance of recreating the philtral columns and the gentle slope of the vermilion line. Another possibility is that if we implant the expander in her left cheek and make an advancement flap to the

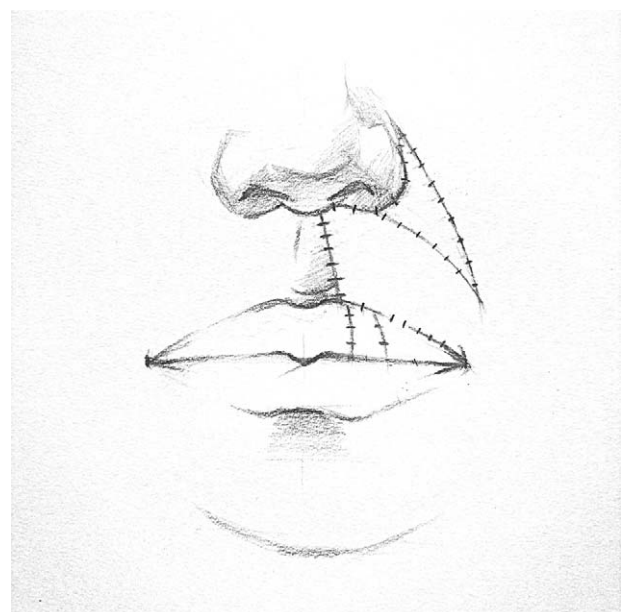


**Figure 8.** Four-month follow-up photograph.



**Figure 9.** If a labial rotation advancement flap was solely used, then an equalizing Burow triangle of skin in alar-facial sulcus wound probably to be removed. When in place, the nasal alar might be pulled to the lateral, the angulus oris might be pulled upward, and shorten of the upper lip would left.

upper lip, then considerable flattening or deviation of the left alar-facial sulcus and distortion of the angulus oris may occur. Thus, we decided to use local flaps. The majority of the upper lip defects that cannot be closed in a side-to-side fashion can be resurfaced with some local flaps. Various modalities of local flaps can be considered. Different styles of advancement flaps, rotation flaps,<sup>[1,2]</sup> lip switch flaps,<sup>[3,4]</sup> subcutaneous pedicle flaps, and island pedicle flaps<sup>[5-7]</sup> have been well described for repairing defects in this area. Recently many new methods have been



**Figure 10.** The illustration of our design. Our design gained excellent and symmetric result.

reported.<sup>[8,9]</sup> Some of these methods did not apply to this case; for instance, Kaufman AJ described that surgical wounds most amenable to island pedicle flap closure are less than 50% the height of the philtrum.<sup>[6]</sup> Yet, almost 100% of the height of the philtrum was occupied by her lesion, which further extended inferiorly to the commissure. Another example, reported by Baker, showed that the location and size of the defect of his patient seemed similar to those of our patient.<sup>[1]</sup> In that case, a labial rotation advancement flap was created to repair the defect; meanwhile, an equalizing Burow triangle of skin in alar-facial sulcus was removed. We considered this a good choice because it only distorts the philtrum and nasal base with a minor shortening of the upper lip (Fig. 9). Furthermore, dissatisfactory cosmetic problems might emerge with adopting some other methods, which showed the high need of subsequent revision operations.

Finally, we designed and adopted our own technique (Fig. 10) and gained excellent results.

The advantages of our design are as follows:

1. Our design facilitated more effective skin use. Symmetry of the vermilion and nasal base was achieved by utilizing the myocutaneous flap, which filled the defect beside the alar without discarding a Burow triangle of skin.
2. For the triangular-shaped myocutaneous flap, the 2 sides of the triangle aligned with the alar-facial sulcus and the nasolabial fold postoperatively, preserving these 2 natural curves to the maximum extent.
3. For the rotation skin flap, the terminal side coincided with the left philtral column, therefore laying the foundation for reconstructing the philtral column.
4. When in place, the myocutaneous flap provided a slight tension upward, which adjusted the descended peak of the left Cupid's bow perfectly, avoiding revision operations or lip line tattooing.
5. Through this method, we were able to keep most of the scars hidden in the natural pucker lines, and successfully restored the vermilion tubercle using a "redundant" piece of subcutaneous tissue.

## 6. Conclusion

The lip plays a vital role both cosmetically and functionally to individuals, the least bit of difference may cause the patient to

carry on a great psychologic burden for a very long time. Especially for the young people, who have more distinct philtrums and vermilion borders compared with older people. We should try our best to preserve, adjust, or recreate these structures for them to permit a more natural appearance. We advocate personalized treatment for each patient who suffers from lip defect, meanwhile, we highly recommend our design. We hope that it can be used to treat more selected patients with similar situations, and we believe they will achieve satisfactory cosmetic and functional repair.

## Author contributions

**Conceptualization:** X. Wang.

**Methodology:** H. Zhang, X. Wang.

**Resources:** T. Meng, H. Zhang.

**Supervision:** X. Long, X. Wang.

**Validation:** X. Long.

**Writing – original draft:** T. Meng.

**Writing – review & editing:** X. Long, X. Wang.

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