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Case Report

Old Age Lower Lip Cancer Defects Reconstruction by Abbe-Estlander Flap

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S U M M A R Y

Reconstruction of lower lip defect is a challenge for oral and maxillofacial surgeons. Microvascular free flap is the main choice for lip cancer reconstruction recently but still have several morbidities presented, especially for elderly, like long surgical time and difficulty in denture fabrication. The purpose of this report is to discuss the indication and select the appropriate reconstruction technique for old age lower lip cancer patients with defects. We present 2 cases of old age (65 and 73 year-old age) lower lip cancer males who received wide excision with lower lip defects more than one half. The defect was reconstructed by Abbe-Estlander flap and secondary revision surgery was performed after 3 weeks. Oral competencies were well preserved and dentures were well adapted. After 6 months, there was no saliva leakage and esthetic results were ideal. Based on our experience, Abbe-Estlander flap is an easy and reliable reconstruction technique for elderly lip cancer patients with defects less than one half.
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1. Introduction

Lips are complicated structures with multiple functions such as eating, speech, facial expression, and the symbol of beauty.[1] For elders, lips also play an important role for chewing and denture fitting. There are different causes of lips defects with dysfunction including neoplasm, trauma, and congenital deformity. Lip squamous cell carcinoma (SCC) is one of the major causes of defect which needs to be reconstructed. It accounts for 12–30% of oral cavity cancer and raises the proportion of incidence in old age population.[2–4] Most lip cancers are located on lower lips which associates with high level exposure of ultraviolet radiation.[4] It is a slowly growing tumor and the frequency of lymph node metastasis is 8%.[5] The 5 years survival rate of lip cancer is about 62–67%.[6,7] Reconstruction of lip defect became a complicated surgery which challenged the surgeons because of complex anatomy and esthetic consideration. There are many surgical techniques that could be used in lip defect reconstruction depending on its size, such as Abbe-Estlander flap, nasolabial flap, Karapandzic flap, and microvascular free flap. Abbe-Estlander flap was first performed on cleft deformity to switch a lower lip flap into upper lip defect in 1898.[8] It is usually used for reconstruction of defect in lip cancer because of its safety, efficiency, functionality, and good cosmetic results. Although this technique was described more than one century ago, many surgeons still use it or combine other flaps to reconstruct the lip defect recently.[4,9,10] The aim of this paper is to present two old age lip cancer patients with defects reconstructed by using Abbe-Estlander flap. The good functional results allow patients for denture rehabilitation and cosmetic satisfaction.

2. Cases report

2.1. Case 1

A 65 year-old male suffered from right lower lip unhealed ulceration for more than one month. He was a heavy smoker (20 cigarettes per day) and had moderated betel quit chewing habit. The lower lip ulcerated mass was indurate with occasional tenderness. His past medical history revealed type II diabetes and

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bilateral buccal leukoplakia after CO_2 laser excision 2 years ago. Physical examination revealed a crater mass involving more than one-thirds of the right lower lip about 1.5 cm in diameter (Fig. 1A).The commissure part was not involved. No locoregional lymph node was observed. After incision biopsy that showed SCC, he was diagnosed as lower lip SCC (T1N0Mb, stage I). Supra-omohyoid neck dissection and tumor wide excision with 1.0 cm safe margin were performed (Fig. 1B). The defect was measured 3.5 cm without commissure involvement and reconstructed by Abbe-Estlander flap (Fig. 1C). The motor and sensory lips functions are preserved. There is no major complication developed after following 6 months with satisfactory esthetic and good function for denture fabrication (Fig. 1D).

2.2. Case 2

A 73 year-old patient was a right buccal SCC with right commissure and lower lip involvement. His past medical history revealed type II diabetes and hypertension under medical controlled. The patient received tumor wide excision and modified radical neck dissection with anterior lateral thigh free flap reconstruction. The postoperative radiotherapy was performed to control the neck lymph node metastasis. The following morbidity showed lip incompetency with saliva leakage and unsatisfactory esthetic results after 1 year 3months. The commissure and lower lip defects were measured about 1.5 cm and lip incompetency triangular space was noted about 0.7 cm $\times$ 2 cm in size (Fig. 2A). After discussion different surgical options, Abbe-Estlander flap reconstruction was performed to deal with the defect (Fig. 2B). Following 6 months later, the result showed good lip function and satisfactory esthetic. Compared with preoperative mouth opening, there is no difference in maximum interdental distance of 28 mm, but have mild and acceptable oral commissure limitation (Fig. 2C and D). It is adequate for individual tray to pass into mouth for arch impression and denture fabrication.

3. Discussion

For old age lip SCC patients, the goals of lip reconstruction include remain lip function, satisfactory esthetic result and support prosthesis fabrication.[1] Lip defects always result in orbicuaris oris muscle discontinuity and loss of function with lip incompetency. Microvascular free flap reconstruction is good for space maintenance but cannot replace lip function of intact continuity of orbicularis oris muscle. In order to support prosthesis fabrication, adequate vestibule depth is required. Abbe-Estlander flap can support and maintain adequate vestibular tissue for denture fabrication. It also prevents disturbance of lip sensation and has satisfactory esthetic outcome. Abbe-Estlander flap is a rotational flap which pedicle was originated from superior or inferior labial artery. It is used for full thickness lip defects with intermediate size.[4,11] The advantages of lower lip reconstruction with Abbe-Estlander flap were good esthetic results, restoration of the motor and sensory innervations, and equal shortage of the lips. The disadvantages of Abbe-Estlander flap were the necessity of the secondary stage surgery with 3 weeks interval time and limited mouth opening when the defect was large.

Lip reconstruction poses a particular challenge for surgeons because the lips are the dynamic center of the lower third of the face.[12] The structures of lips are complex including muscles, modiolus, philtrum ridge, vermillion, and oral commissures which drive the function of facial expression, speech, deglutination, and the symbol of esthetic. For lip cancer patients, the postoperative defects are more difficult to reconstruct because of radiation therapy which may cause tissue fibrosis and loss of vestibule. The troublesome

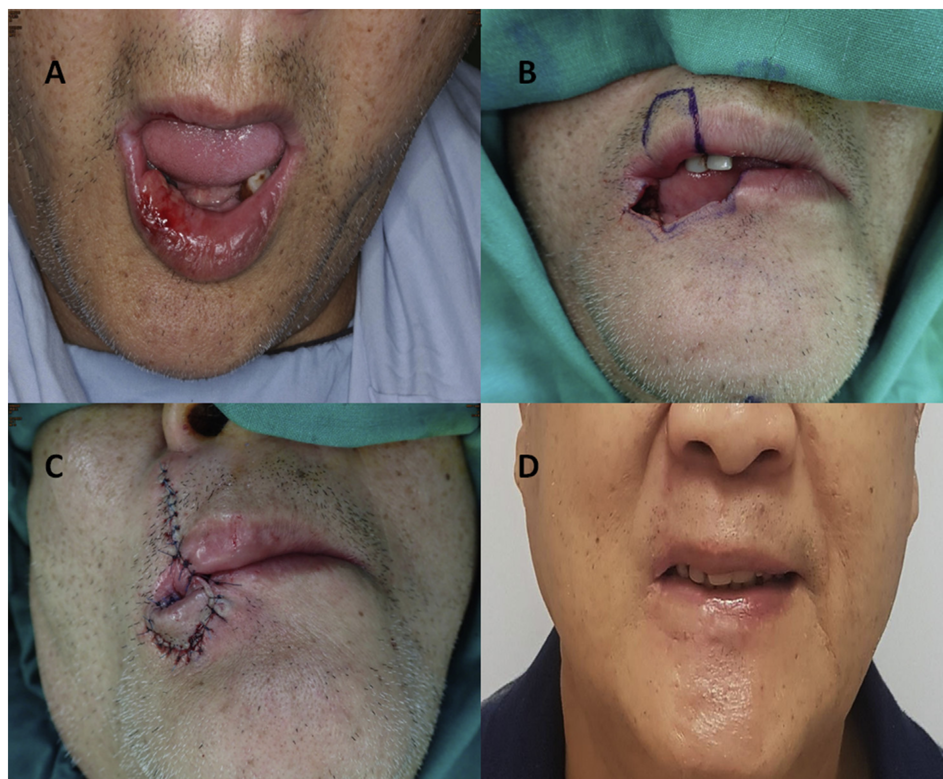

Fig. 1. A 65 year-old male with right lower lip cancer received tumor wide excision surgery and Abbe-Estlander flap reconstruction, the postoperative profile are symmetry and lower denture can easily fit in. (A) Right lower lip cancer before surgery (B) Right lower lip cancer post ablation (C) After Abbe-Estlander flap reconstruction (D) After 6 months follow up.

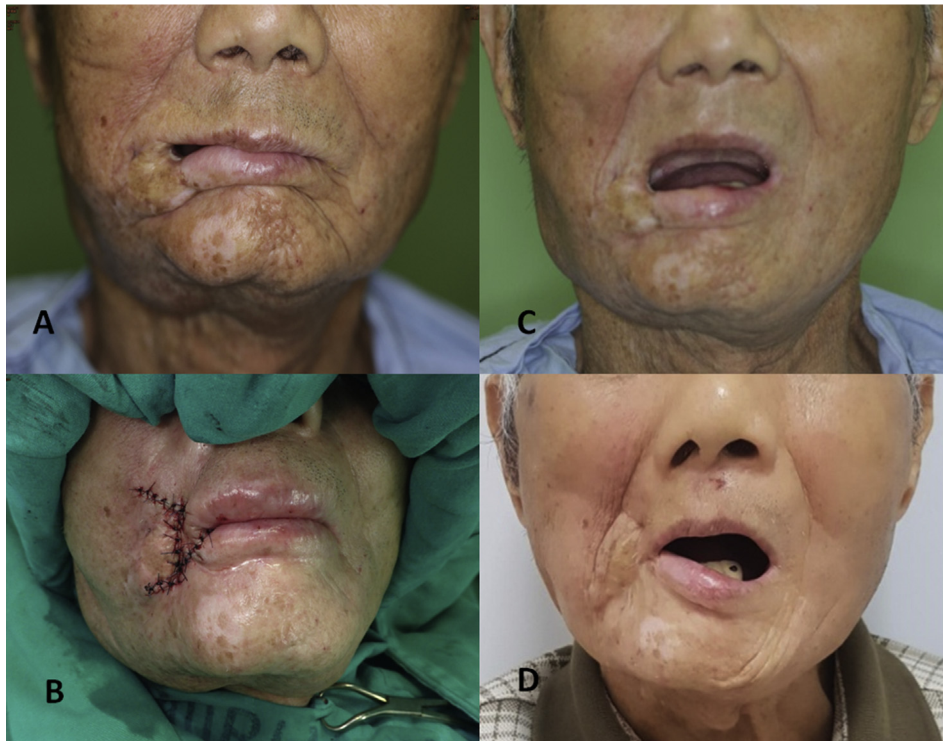

Fig. 2. (A) A 73 year-old male with right buccal cancer received anterior lateral thigh microsurgery with lip incompetency. (B) After Abbe-Estlander flap reconstruction (C, D) There is no difference on mouth open limitation between preop and postop.

result will bother the denture fabrication and influence the facial expression. Facing these defects, there are many surgical techniques to reconstruct, like Gillies fan flap, Karapandzic flap, Webster-Bernard flap, and microvascular free flap. The choice of surgical techniques depends on its indication and size of defect. Mohammed et al though Karapandzic flap and Abbe flap are indicated in lip defect less than one half. For large defects, free flap is recommended if patient could tolerate long operation time.

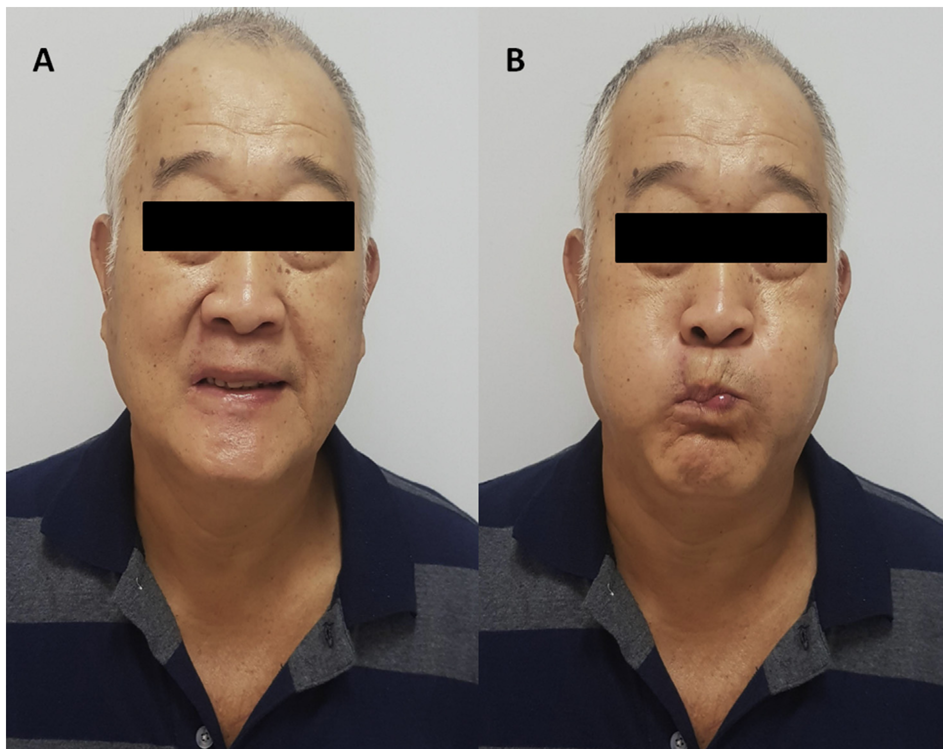

Fig. 3. (A) After Abbe-Estlander surgery, the oral commissure was symmetry with satisfactory esthetic. (B) There is no air leakage when patient performed the blowing action.

Another study presented four cases with defects larger than one half lip treated by modified Abbe-Estlander flap.[13] The results showed acceptable cosmetic outcome without philtrum deformity and well lip function with normal sensory and motor contraction after following in 6 months, however, post operative microstomia should be alerted with this technique. Luce et al concluded that general concepts for lower lip reconstruction are primary closured with V-W or V-Y flap when defect size is less than one third lip.[14] If the defect size is from one third to two third lower lip, Abbe-Estlander flap, Karapandzic flap, Gillies fan flap, Webster-Bernard flap, and tongue flap are the indication.[15,16] When lip defects larger than two third, bilateral Webster-Bernard flap, Fugimori's gate flap or microvascular flap are the choice.[14] Some studies showed Abbe-Estlander flap combined with other flaps have excellent results for reconstruction of lip defects larger than two thirds.[10,13] However, our cases were lower lips defect between one third to two thirds and reconstructed by indication of the Abbe-Estlander flap with good outcomes. Our first case presented the satisfied facial expression and good function of bowing action without air leakage (Fig. 3A and B). The denture was fabricated smoothly because Abbe-Estlander flap surgery could preserve most vestibular tissues. Second case showed satisfied results in obtaining lip competence without obvious mouth open limitation and position of oral commissure.

4. Conclusions

A good and stable denture is important for Gerontology. It is associated with chewing, nutrition and lower facial profile support in old age patient. We share these two old age lip cancer patients with Abbe-Estlander flap reconstruction. The following results showed mouth opening is not limited for denture fabrication and lip function is good without incompetency or sensation loss. Abbe-Estlander flap is suitable for defects involving one third to two thirds of lips or oral commissure involvement. It can also be used for primary lip reconstruction or secondary oral commissure defect repairment.

Conflicts of interest

The authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.ijge.2018.03.015.

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