

“Fortune cookie” modification in free radial fasciocutaneous flap inset in oral commissure

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summary

Tumors in cheek and oral commissure are not uncommon and free flaps are more acceptable solutions for large defects after tumor excision. Flap inset as the last stage of surgery and reconstruction has its importance. Aesthetically, free flap inset usually is not what patient expects, due to large or bizarre shapes. Every deformity in this area is significant and unpleasant. There are numerous solutions to refinement in flap inset. Authors tried to present their modification named “ Fortune Cookie” in this flaps as folding transferred flap and de-epithelialization of folded part and approximating raw surfaces together. By this way, the final flap has more smooth surface and the pedicle is preserved.

Level of Evidence: Therapeutic level V

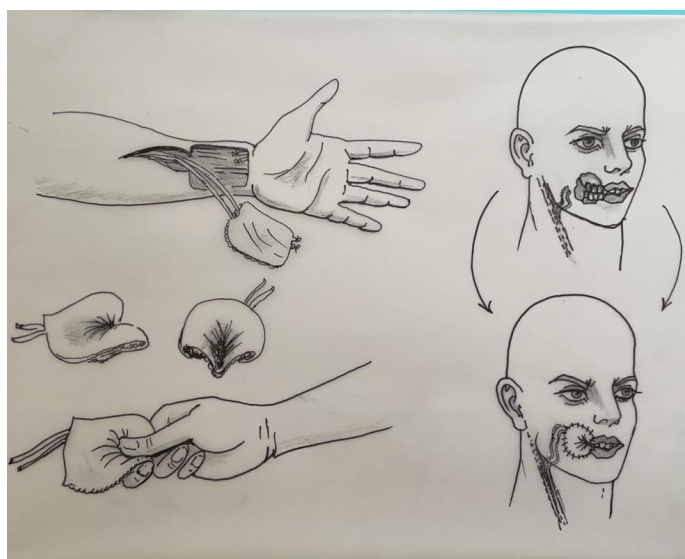
Dear Sir,

Facial cancers are not uncommon and every surgeon may encounter tumors to deal in his/her challenges. Oral commissure is among difficult areas to reconstruct according to functional and aesthetic aspects. Free flap option provides sufficient opportunity for surgeon to provide free margins during tumor excision to improve long-term outcome. However, there are problems for inseting free flaps in sites with limited spaces to manage. Facial units and subunits have their aesthetic significances and final shape depends on every manipulations of surgery. When free flaps like radial or ulnar fasciocutaneous flaps are harvested to reconstruct facial units, reshaping these flaps to form beautiful curves or folds become vital or even magic stages (2). Surgeons try to do the manipulations with elegance. Although primary design is important, but ultimate shape changes according to defects of skin and/or mucosa. Moreover, in contrast to local flaps, surgeon should consider to preserve viable pedicle during inseting and not to compromise nourishing vessels.

We, mostly encounter conditions in which full thickness defect of oral cavity requires folding flap to reconstruct both layers. In this way, pedicle is in danger of traction and eventual congestion and ischemia. Folding, usually is associated with a hollowness in outside or inside of flap, which resulted in unpleasant appearance or intraoral pouch, respectively. Both should be considered during reconstruction. We think de-epithelialization of folded area and re-approximating both edges can solve mentioned problems. Besides, pedicle is far from danger and to some extent, from traction and by this way can save transferred flap.

Our patients had tumors involving all layers near oral commissure, and we had to excise in full thickness with free margin. When the free flap- in our cases free radial fasciocutaneous flap- transferred and vascular anastomosis was completed, this thin flap was folded to adjust the remained defect with proper depth without hollowness (fig1).

Figure 1: Schematic presentation of free radial fasciocutaneous flap transfer to oral commissure by folding flap to adjust the defect



By this way, flap filled the defect in its size. The folded area was defined, and de-epithelialization was done and raw surfaces sutured together in a simple fashion (fig 2).

Figure 2: 76 years old man with SCC of right oral commissure and cheek, treated by full thickness tumor excision and free radial flap reconstruction with fortune cookie modification.



After suture removal and wound care, the reconstructed part was in continuity of lips and cheek.

Patients with large cancers in oral commissure and cheek,

seek operations to save their natural appearance following tumor resection, especially ones with less comorbidity. Free flaps have the least alterations in contrast to large local flaps, which may deviate natural curves and resulted in tractions in normal facial volumes. Technical improvements in microsurgery settings, enhanced the level of success. Flap inset is one of the basic stages in these operations, and patients like to have normal appearance and not operated face. Thus, every tries to preserve previous shape is appreciated (3). Thin flap in old or malnourished patients is a shortcoming in free fasciocutaneous radial flaps. Though, long-term edema in this flap compensates, but it may need more jobs to have a smooth uniform surface. Previously, modifications of key stone flap named "fortune cookie" presented to improve aesthetic results of reconstructive flaps. Authors compacted flaps to pre-established space following tumor resection in a fortune cookie fashion to reshape. Huang et al (2019) introduced their modifications in key stone flap to make smaller flap following tumor resection (4) and Park et al (2018) presented case series on thoracic keloids treated by wide excision and reconstruction by keystone flaps which had been adjusted by fortune cookie modification (5). Both of them did reconstructions by keystone local flaps to cover the skin defects, and then added fortune cookie fashion modification to have better result. These cookies have folded fashion which seem compact.

Our two patients had squamous cell carcinoma (SCC) of oral commissure invading all layers and we excised tumors in full thickness with sufficient margins. Then, we planned to reconstruct the resulted defect with free radial fasciocutaneous flap in two-layer style to replace both layers of skin and mucosa. The pedicle lied between these layers and guided via subcutaneous tunnel to neck to do vascular anastomosis. As the flap was thin, there was a hollowness and depression in the flap, so according to fortune cookie design- as illustrated in schematic figure 1- we folded the flap inset to complete empty site of puzzle in a smooth style. After that, extra skin- considering not to injure vascular pedicle- de-epithelialized and fresh edges sutured together and operation completed. At last, pedicle was not in traction and depressed surface was smooth in continuity with neighbor tissues.

In our opinion, though this adaptation of primary procedure, has fundamental differences, but generally every attempt in the last stage of free tissue transfer, reflexes the future attitude of patient to final outcome of surgery. So, refinements in oral commissure reconstruction by fortune cookie modification may result in better outcome.

Disclosure

None of the authors has a financial interest in any of the

products, devices or drugs mentioned in this manuscript.

Conflict of interest

The authors declare that they have no conflicts of interest to disclose.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the

ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

The patient gave written informed consent for using his images.

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References

1. Sasidaran R, Zain MM, Basiron NH. Lip and oral commissure reconstruction with the radial forearm flap. *Natl J Maxillofac Surg* 2012;3:21-4.
2. HsiaoYC, Huang JJ, Zelken JA, Wu CW, Chang CS, Abdelrahman M, Kolios G. The folded Ulnar Forearm Flap for Nasal Reconstruction. *Plast Reconstr Surg*. 2016 Feb;137 (2): 630-635.
3. Kim, S.T., Jung, J.H., Ha, R. et al. Oral Commissure Lift: A Retrospective Analysis of Complication Rates and Overall Outcomes. *Aesth Plast Surg* 45, 2772–2780 (2021).
4. Huang J, Kim CW, Wang X, Zhao Y, Yu N, Zhao R, Bai M, Long X, Park TH. Successful application of modified keystone flaps following skin tumor ablation. *Medicine* 2019;98: 40(e17469).
5. Park TH, Lee JW, Kim CW. The fortune cookie flap for aesthetic reconstruction after chest keloid resection: a small case series. *J Cardiothorac Surg* 13, 31 (2018).