

Karapandzic Flap for Functional & Cosmetic Reconstruction of Lower Lip Cancer with Review of Literature

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Abstract

The incidence and prevalence of lip and oral cavity cancer has increased over the last decade, worldwide and in India. It ranks at 1st position in males in India, all ages, in 2020. Lips are essential organ of the body which carries dynamic role in facial expression, speech, sensuality, deglutition. Resection of central, large, lower lip cancer creates a more than 2/3rd large defect. Covering of this defect with maintenance of oral competency is a difficult task for a treating surgeon. Number of techniques are described for covering of large lower lip defects. Out of these techniques, karapandzic flap is a successful, accepted, simple, easy to learn reconstructive procedure with good cosmetic results. It is a modification of Gillie's fan flap and it involves unilateral or bilateral full-thickness circumoral advancement-rotation flaps. The feature which distinguishes it from other techniques is preservation of neuro-vascular integrity, symmetry and oral competency. We are reporting a case of an elderly gentleman with large, central, lower lip cancer who underwent oncological resection with reconstruction by karapandzic flap technique.

Keywords: lip cancer; karapandzic flap; cosmesis; reconstructive surgery; squamous cell carcinoma

Introduction

Human lips are considered as the dynamic organ of the body as they are responsible for multiple functions like facial expression, articulation of speech, deglutition, and containment of salivary secretions. Lips are responsible for one's quality of life, self-esteem and facial appeal [1]. Squamous cell carcinoma of lip is considered as most common and aggressive malignancy. In 95% of cases lower lips are involved compared to only 5 % involvement of upper lip [2]. Worldwide, number of new cases in 2020, both sexes, all ages and number of death in 2020, both sexes, all ages were 3,77,713 and 1,77,757 respectively [3]. In India, lip and oral cavity cancer ranks at 1st position in males, all ages with incidence 16.2 % and 13.5% incidence in both sexes, all ages in 2020 [4]. Depending on the extent and depth of the tumor, the resection procedure works and depending on the defect of the lower lip, the reconstruction procedure will be planned. Full thickness loss of more than 1/2 to 1/3rd of lower lip poses a challenge to the treating surgeon as it's a difficult task to cover the defect with maintenance of commissure competence, cosmesis, symmetry and preservation of sensation.

Number of techniques are described and available for reconstruction of lower lip. Karapandzic flap is a technique for reconstruction of full thickness, large, centrally located defects of the lower lip and, to a lesser extent, the upper lip [5]. The technique involves unilateral or bilateral full-thickness circumoral advancement-rotation flaps [6]. The outstanding feature of this flap reconstruction technique is preservation of the neural and vascular structures which helps in maintaining oral competency and sensory function. We are reporting a case of an elderly gentleman with large, central, lower lip cancer who underwent oncological resection with reconstruction by karapandzic flap.

Case Report

A 51 year old gentleman with no co-morbidity with Eastern Cooperative Oncology Group Performance Status 1 (ECOG –PS 1) presented to our clinic with ulero-proliferative lesion over the lower lip for the last 4 months. He had an addiction of tobacco chewing and he used to consume it, 8-9 times per day for the last 30 years. Family history, past history, medical history and surgical history were not relevant. On clinical examination, an ulcero-proliferative growth of size 3x3cm was present over the lower lip at central region located at 2cm left from right

commissure and 1.5cm right from left commissure [Fig 2] . No other positive findings were noted in the oral cavity. Bilateral submandibular lymph nodes were palpable. He underwent CECT (Contrast Enhanced Computed Tomography) of oral cavity, neck and chest which was already advised by primary general practitioner. CECT was also suggestive of same findings with absent disease in the chest [Fig. 1]. We did wedge biopsy from the lesion which was indicative of squamous cell carcinoma.

Case was discussed in our institutional multidisciplinary tumor board and plan of upfront surgery was decided for him. As per board decision, we had planned surgery after getting fitness from physician and anesthetist. He underwent surgery with wide local excision of the lower lip lesion with bilateral selective neck dissection (Level I to IV) with reconstruction by karapandzic flap.

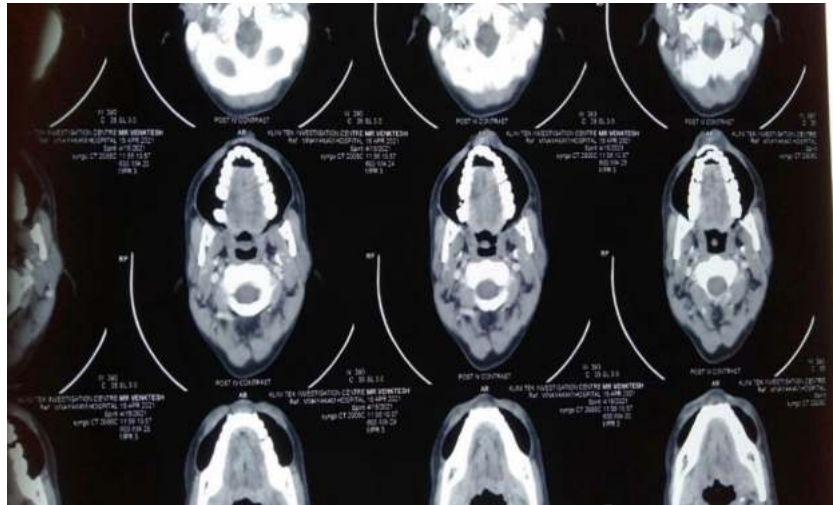


Figure 1: CECT of oral cavity



Figure 2: Central lower lip ulero-proliferative growth

After excision of the lesion [Fig. 3, 4], bilateral nasolabial folds are mobilised maintaining neurovascular structures. These mobilised full thickness circumoral advancement flaps are rotated and a new lower lip was reconstructed [Fig. 5, 6]. Every care was taken to maintain the oral competency [Fig. 7]. Patient was started on oral feeding from postoperative day two. Postoperative course was uneventful and he was discharged on 5th postoperative day. Final histopathology report was indicative of moderately differentiated squamous cell carcinoma with tumor size 3 x 2.5 x 1.5 cm and all margins were free from tumor except inner mucosal margin which was 0.3cm away from the tumor (close

margin) with no lymph node metastasis (0/47 lymph nodes) . AJCC 8th edition staging was p T2 pN0 pM0. Case was re-discussed in our board meeting for adjuvant treatment planning. Patient had been advised adjuvant radiation in view of close inner mucosal margin. However, patient didn't turn up for radiation. Hence, he had been advised close follow up as per our institutional follow up protocol. His swallowing function, speech was unaffected with no microstomia and no functional impairment. After completion of follow up period of one year post treatment [Fig. 8], he is still disease free.



Figure 3: Incision marked before excision



Figure 6: Bilateral flap harvesting



Figure 4: Post excision defect of the lower lip



Figure 7: Approximation with new lower lip reconstruction



Figure 5: Marking at Naso-labial folds



Figure 8: Follow up picture after 1 year

Discussion

Lips are considered as an organ of expression, feeling and sensuality. Facial cosmesis will be affected if lips lost their functional integrity. Hence, it is very important for the reconstructive surgeon to maintain its normal form and shape. In 1768, Louis is the first person who described the method of v-shaped excision of the lesion followed by primary closure [7]. Large size, full thickness defects of the lower lip requires a larger amount of tissue to cover up the defect which can provide desired functional outcome. Fujimori [8] and Nakajima et al [9] recommended some of the basic measures before selecting a reconstructive procedure -

1. Local flaps should be preferred with innervated muscle.
2. There should not be any microstomia in a newly reconstructed lip
3. All suture lines should be in natural facial creases.
4. The flaps should be large enough to contain whole elements of lip tissue.

The available techniques described for reconstruction of the lower lip with primary closure are ‘‘Y’’, ‘‘W’’, ‘‘M’’, or Z plasties for defects affecting less than one-third of the lip. For more extensive defects, the techniques available are the Abbe, Estlander, Gillies, Bernard-Burrow flaps or combinations of these [10, 11]. Webster-Bernard technique gives good results which creates new lower lip with medial advancement of the cheek tissue, however, significant scarring will be there in postoperative period [12].

Bakamjian [13] described the use of the tongue flap as a source of tissue in major lip reconstructions.

Mchug described reconstruction of large lip defects including the whole of the lower lip by using neurovascular island flap. The sensory function, muscular function and sphincter functions are maintained in this technique [14]. Rayner [15] described the technique of musculo-mucosal flaps from the cheeks. Johanson et al. [16] described the step ladder technique for lower lip reconstruction by mobilising lip tissue opposite to site of defect. Abbe or Estlander cross-lip transposition flaps are described for the reconstruction of defects of the lateral parts of the lower lip, however, their extent is limited to upper lip only [17].

Gillies and Millard [18] described a fan flap for reconstruction of the lower lip which is based on upper labial artery and it involves rotation of the naso-labial folds with advancement toward midline. However, this flap did not work in preserving neuro-vascular structures and it may result in formation of microstomia. Karapandzic [19] described a technique which is a modification of the Gillies fan flap and it was named as karapandzic flap. The main arterial supply of karapandzic flap is from the inferior labial artery, which is a branch of the facial artery. It provides numerous perforators through the orbicularis oris muscle to the overlying skin. Sensory nerve supply to the lower lip is from the mental nerve which is a terminal branch of inferior alveolar nerve which is in turn a branch of mandibular division of the trigeminal nerve. The principle feature of this flap is preservation of neuro-vascular structures, thus the competency of oral commissure and sensory and motor innervation are preserved with avoidance of additional transaction of orbicularis oris muscle [19]. Though the flap maintains the competency of oral commissure, in case of large lower lip defects, microstomia is unavoidable. However, it can be corrected with commissuroplasty [20]. In the index case, all dissection was carried out carefully with preserving neuro-vascular bundle and avoiding injury to orbicularis oris muscle with rotation-advancement of naso-labial folds. Oral competency was maintained with maintenance of sensory and motor functions.

Conclusion

Karapandzic flap is a successful, simple, easy to learn technique for the reconstruction of central 2/3rd of the lower lip with preservation of motor

and sensory supply with maintaining oral competency and produces good cosmetic results.

Disclosures

Human subject: Informed consent was obtained from the patient for being included in the study.

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Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Availability of data and materials: Not applicable.

Consent for publication: An informed consent to publish this case was obtained from the patient.

Ethics approval and consent to participate: Not applicable.

Clinical trial transparency: Not applicable

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