Commissural localization of squamocellular carcinoma of the lip

Our experience

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AIM: *Lip cancer is the most common malignant tumour of the oral cavity and the oral commissure is the origin of the tumour in 6% to 8.5% of cases. Reconstruction of oral commissure defects aims at securing oral competence and providing an acceptable appearance. Satisfactory reconstruction of defects affecting the lip commissure is always challenging.*
MATERIAL OF STUDY: *The authors present a selected group of 22 patients, who, between November 2005 and 31st October 2012, underwent reconstruction for primary or secondary defects involving the oral commissure.*
RESULTS: *The results were generally satisfactory, both functionally and cosmetically. The patients had been followed up for 5 years.*
CONCLUSIONS: *All patients had excellent oral competence during rest, speaking and eating. Good sphinteric function was obtained in early postoperative days. No drooling or air leakage. The aesthetic results were good in all patients.*

KEY WORDS: Lip cancer, Oral commissure cancer, Oral commissure reconstruction

Introduction

The lips are paired mobile folds covered externally by skin and internally by mucous membrane encompassing a highly muscular inner layer. Burget et al. [1] have organized the lip into topographical subunits including two lateral subunits and two medial subunits. The oral commissure demarcates the upper lip aesthetic subunits from the lower lip subunits.

Although burn contractures and congenital defects may be the common causes, malignancy involving the commissure, as well as varying portions of the lower and/or upper lip, is the most frequently encountered clinical situation. Carcinoma of the lower lip, in fact, accounts for approximately 12% of all head and neck tumors, as well as for 25% of cancers of the oral cavity. Squamous cell carcinoma is the most frequently occurring tumor of the lips, with a commissural localization rate of about 6-8.5 % [2,3]; the recommended safety excision margins are at least 1 cm from the visible borders of the lesion, so reconstruction becomes mandatory even for small tumors.
As a date of fact, technical difficulty is greater for lesion involving the commissure that for the same-sized defects of the proper lip and that's the reason why the lip commissure reconstruction still remains a big challenge for plastic surgeons.

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Basic goals in lip reconstruction are the prevention of drooling and re-establishment of the continuity of the lip. A variety of local and regional flaps are capable of meeting these goals; however, with the recent advent of several innervated local flaps and modified versions of the previous non-dynamic and non-sensitive flap, function and cosmesis are now of primary importance [4, 5].
Although not yet within reach, the ideal lip repair results in a completely functional lip demonstrating normal sphinteric and complex motor actions with identical texture and colour to the missing lip segment.
The purpose of this study is to describe and to evaluate both functional and aesthetic outcomes derived from different techniques use for lip commissure reconstruction.

Material and Methods

Between November 2005 and the 31st October 2012, at Plastic & Reconstructive Surgery Department of Perugia University, 37 patients were managed for lip commissure reconstruction; 20 (54%) were males and 17 (46%) were women with a median age of 63 years.
Every patient underwent ecographic study of the lymphatic stations of the neck in order to assess any potential lymphatic metastasis and to a 5-years follow-up (Table I).
The 7 patients with positive submandibular nodes underwent lymphatic neck dissection and a subsequent local radiotherapy. All patients had been followed up for 5 years with local tumors recideve just in 4 cases.
We managed to treat all this patients using three principal techniques: wide excision with primary closure in case of small/localized lesions not involving adjacent healthy tissue; Eastlande flap for lesions up to 2 cm and with no distortion of the oral symmetry, since it has been a "gold standard" for commissural reconstruction for long time and, finally with composite radial forearm free flap for larger defects [5] (Table II).
Small defects involving the oral commissure have been managed following basic principles of cutaneous surgery; optimal results are often achieved when the defect can be convert to a wedge or pentagonal defect oriented within relaxed skin tension lines [6].
Eastlander flap transfers full-thickness tissue between opposing lips pedicle on the labial artery. Donor site is rotated around the oral commissure to the opposing lip and therefore this single-stage procedure has been considered for long time the "gold standard" for commissural reconstruction.
We had to perform commissuroplasty in 5 patients in order to treat the commissure blunting resulting from this technique.

Table II - *Reconstructive techniques.*

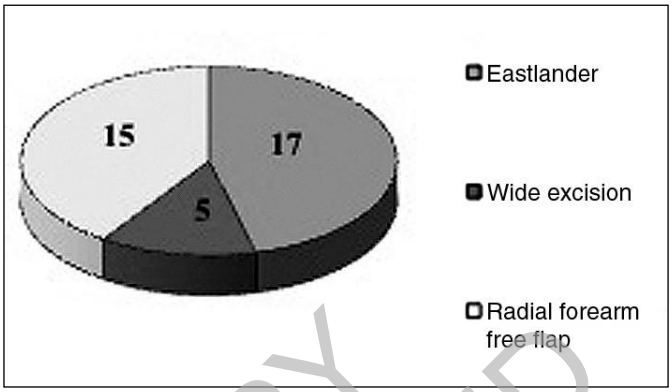

Table I - *Patient's history.*

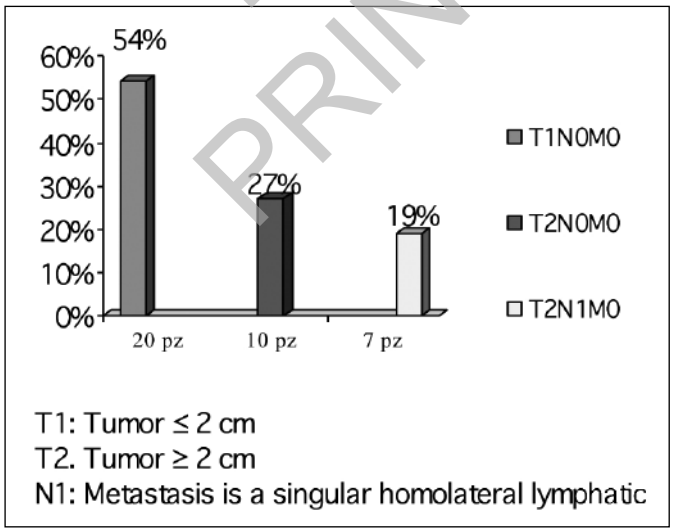

Fig. 1: Basocellular cancer of the chin infiltrating the right oral commissure

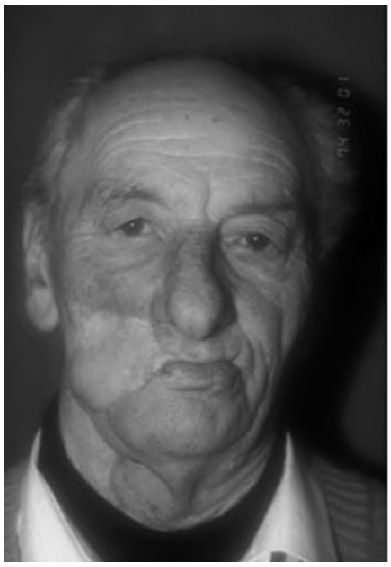

Fig. 2 and 3: Reconstruction of the chin and the right commissure by a free radial forearm flap: follow-up after 6 month from the operation.

Defects involving up to 2/3 of the lip and adjacent soft tissue of the cheek or chin were reconstructed with radial forearm free flap (Figs. 1-3). The skin paddle was folded over the palmaris longus tendon to provide internal and external lip lining and the vessels were anastomised with facial ones. An Allen test was done before flap elevating to predict potential post-operative ischemia [7,8].
All patients were evaluated in the first post-operative period emphasizing the vitality of the flap and wound healing; the late post-operative follow-up was focused on the presence of alterations of functionality, on present of microstomia and on aesthetic appearance. We evaluated lips' functionality in consideration of three aspects: static sphinteric competence, dynamic competence during a meal and phonation.

Results

All patients had excellent oral competence during rest and during speaking and eating. Good sphinteric function was obtained in early post-operative days. No drooling or air leakage was seen up to 1 year after operation. The patients' articulation was near to normal. The aesthetic results were accepted in all patients: good results were obtained with primary closure, mostly because of the small dimension of the lesions and with Eastlander and free flaps the results were satisfactory. All patients were able to resume regular diet. No complications were observed such as dehiscence, fistula formation or abscess formation.
Five of the 17 patients treated with Eastlander technique needed a secondary commissuroplasty for commissure blunting and for a variable grade of microstomia.
In the 15 patients treated with radial forearm flap the vermillion was reconstructed by de-epithelialization of a radial forearm segment using a facial artery myomucosal flap or with mucosal flap from the tongue, upper lip or cheek; in 6 cases a medical tattooing, performed after 6 months from the flap harvesting has also been used with acceptable results.

Discussion

Lip cancer is the most common malignant tumour of the oral cavity, constituting 25% to 30% of cases and is the second most common cancer in the head and neck, following cutaneous malignancy. It is most common in white male smokers with a fair complexion who are in their V to VI decade of life. The oral commissure is the origin of the tumour in 6% to 8,5% of cases [2,3].
A restored commissure should ideally be symmetrical with respect to the opposite side both during rest and mouth opening, with no webbing and with a normal well-defined vermillion. The lateral extend of the commissure should falls in the line with the medial border of the cornea.
Re-establishment of this functional integrity, because of its complexity, brought Bakamjian in 1964 to define this surgical endeavour as an 'almost unreachable objective'.
The literature is replete with a discussion of various methods: Converse suggests using as donor tissues, in descending order of preference, the remaining lip segment, the tongue, the adjacent cheek, or even distant sites.
The most efficacious treatment modality for lip carcinoma is the one that allows adequate treatment of the primary tumor, an appropriate management of cervical

lymph node and successful reconstruction. The treatment should be planning according to the following "key points":
– Excise all tissue involved by cancer;
– Preserve oral competence in term of speech, mastication and saliva retention;
– Maintain satisfactory lip cosmesis;
– Allow early rehabilitation and return to daily activities.
Since its original description by Yang et al. [9], the radial forearm flap proven to be extremely versatile in head and neck reconstruction. The radial forearm flap supplies thin, relatively hairless skin that conforms readily to irregular three-dimension contours. It can provide simultaneous intraoral lining and external skin coverage for full thickness defects of the lip [10-12]. Although pectoralis major myocutaneous pedicle flap has been considered for long time the "gold standard" for extensive single-stage lip reconstruction, currently, we consider, according to literature and to our experience, the radial forearm composite free flap the best flap for extensive lip reconstruction due to its ease of sampling, its lower tendency to bulk and its sensory re-innervation resulting in a much better outcomes.
Primary closure and Eastlander flap are still two valid techniques for lesions which dimension are not excessive; the first one leads to less scarring and the last one is more prone to need a commissuroplasty in a second time to correct the commissural blunting deriving from modiolus displacement.

Conclusion

The reconstruction after lip cancer excision still continues to be a challenge for the surgeons, both for functional and aesthetic results.
The treatment of lip cancer must consider adequate removal of the disease and yet to provide the patient with a lip functionally efficient in speech and chewing and that retains oral competence and adequate cosmesis.
Careful selection of techniques appropriate to the defect, in addition to observing principles of preserving and restoring motor and sensory function, has substantially improved the results of contemporary reconstructions compared to those obtained historically. The development and recognition of the innervated composite flaps also has substantially enhanced outcome as compared with historic procedures, which often cut across valuable neuromuscular structures and impaired the quality of outcome.
Primary closure and Eastlander flap still remain very valid reconstructive methods for this area but they should be used for small lesions and when surrounding tissues are not involved.
With the use of a free microvascular flap we are able to reconstruct wider areas or even entire sub-units, achieving better cosmetic outcome although sacrificing the sensibility of the area.

Riassunto

Il carcinoma squamocellulare rappresenta il tumore più frequente della regione della testa e del collo avendo nel labbro inferiore la sua localizzazione principale. In una percentuale variabile di casi, questo tumore può insorgere a livello della commissura labiale rendendo l'iter terapeutico e ricostruttivo più complesso. In questo lavoro gli autori hanno mostrato come la letteratura descriva svariate tecniche ricostruttive che il chirurgo plastico ha a disposizione e come l'iter ricostruttivo sia comunque strettamente dipendente dalle caratteristiche del tumore, dei tessuti circostanti e delle condizioni cliniche del soggetto. Il lembo di Eastlander, da sempre considerato un caposaldo per le ricostruzioni commissurali, nel corso dell'ultimo ventennio, è stato scalzato dalle nuove tecniche di microchirurgia che permettono di intervenire in un unico tempo operatorio anche su difetti di dimensioni importanti e indipendentemente dalle condizioni dei tessuti circostanti.
Concordando con quanto descritto in letteratura, gli autori ritengono che ad oggi i lembi microchirurgici sono le migliori armi nelle mani dei chirurghi plastici durante le ricostruzioni "complesse" della faccia; nonostante ciò, il lembo di Eastlander rimane il "gold standard" nei casi di carcinomi di piccole dimensioni.

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