Evaluation of near total lower lip reconstruction using mcgregor musculomucocutaneous cheek rotational flap

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Introduction
The goals of lower lip reconstruction are maintenance of adequate oral stoma, restoration of oral competence, to maintain speech, to preserve sensation, to provide both skin cover and oral lining and to produce an aesthetically satisfying result. A number of local flaps are available for reconstruction of lip defects, although free flaps may also be used for more extensive defects. Local flaps achieve better aesthetic and functional results compared with free flaps. In this study, we evaluate the near total lower lip reconstruction using single-stage McGregor musculomucocutaneous cheek rotational flap.

Aim
The aim of this study was to evaluate the near total lower lip reconstruction using McGregor musculomucocutaneous cheek rotational flap.

Patients and methods
This prospective study was performed at the Plastic Surgery Unit, Fayoum University Hospital, in the period from October 2015 to April 2017. Eight patients with squamous cell carcinoma at the lower lip excised with safety margin ranging from 0.5 to 1 cm in each side, leaving defects more than 2/3 of the length of the lower lip, were included in this study. Reconstruction was done in all patients using McGregor musculomucocutaneous flap.

Results
The mean age of the patients was 61.4 years (range: 55–70 years). Five patients were male and three patients were female. In all patients the angles of the mouth were symmetrical with preservation of the anatomic proportions of the lip, except in two patients there were some mucosal folds at the rotation point at the commissure. In all patients, the philtrum had a normal shape and position. The oral mobility was good in all patients, which was evaluated by facial expressions and sound formations.

Conclusion
Although more number of cases are required to build up our conclusion, according to our results on this low number of patients McGregor musculomucocutaneous cheek rotational flap is considered a good option for near total lower lip reconstruction with good functional and aesthetic outcomes.

Keywords:
lower lip, McGregor musculomucocutaneous, near total, rotational flap

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Introduction

The insufficiency of the remained lip tissue causes great difficulty in reconstruction of extensive lower lip defects resulting from the excision of malignant lesions, especially squamous cell carcinoma.

The goals of lower lip reconstruction are maintenance of adequate oral stoma, restoration of oral competence, to maintain speech, to preserve sensation, to provide both skin cover and oral lining and to produce an aesthetically satisfying result [1].

A number of techniques have been described, and the choice depends on the extent of the defect in addition to the surgeon's experience.

A number of local flaps are available for reconstruction of lip defects, although free flaps may also be used for more extensive defects.

Local flaps achieve better aesthetic and functional results compared with free flaps [2].

In this study, we evaluate the near total lower lip reconstruction using single-stage McGregor musculomucocutaneous cheek rotational flap.

Patients and methods

This prospective study was performed at the Plastic Surgery Unit, Fayoum University Hospital, in the period from October 2015 to April 2017. Ethical approval and patients consents: Were obtained.

Eight patients with squamous cell carcinoma at the lower lip excised with safety margin ranging from 0.5 to 1 cm in each side, leaving defects more than 2/3 of the length of the lower lip, were included in this study.

Reconstruction was done in all patients using McGregor musculomucocutaneous cheek rotational flap, which was based on the superior labial artery running just deep into the mucosa.

Supraomohyoid block neck dissection was performed in five patients.

In all patients, preoperative incisional biopsy was performed to prove the diagnosis. Computed tomography scan neck, chest and abdomen were performed to exclude metastasis.

Surgical technique

The skin is marked in a rectangular fan shape that extends laterally from the defect and around the nasolabial fold where the arc of the fan is completed and back cut is designed.

The width of the rectangular flap is equal to the vertical height of the lip defect and the vertical length of the flap is equal to the width of the defect plus the width of the flap itself.

The flap is based on the superior labial artery running just deep into the mucosa.

From the bottom of the lip defect the incision extended laterally along the full thickness of the flap, upward vertically, medially and then the back cut downward vertically up to few millimetres of the vermilion border of the remaining upper lip. The flap was rotated into place and mucosa, muscle and skin were sutured separately.

The donor site was closed directly and the skin and mucosa of the flap were sutured together to create the new vermilion.

Follow-up periods ranged from 9 months up to 1 year postoperative.

Results

The mean age of the patients was 61.4 years (range: 55–70 years). Five patients were male and three patients were female.

All eight patients had a squamous cell carcinoma at the lower lip excised with safety margin ranging from 0.5 to 1 cm on each side, leaving defects more than 2/3 of the length of the lower lip.

Reconstruction was done in all patients using McGregor musculomucocutaneous cheek rotational flap.

In all patients the flaps survived completely.

No recurrence of the tumour was noticed in the follow-up period in all patients.

The vermilion and vermilion–cutaneous white border were reconstructed and established in all patients with good satisfactory shape.

In all patients the angles of the mouth were symmetrical with preservation of the anatomic proportions of the lip, except in two patients there were some mucosal folds at the rotation point at the commissure.

In all patients the philtrum had a normal shape and position.

The oral mobility was good in all patients, which was evaluated by facial expressions and sound formations.

In all patients there was no microstomia with an adequate oral access.

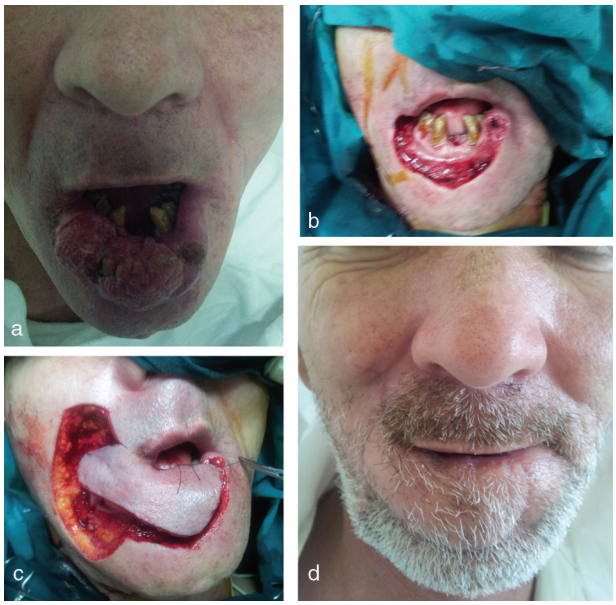
The oral continence to food, fluids and air was good in all patients.

The patients' satisfaction ranged from 60 to 100%: in three patients it was from 60 to 80%, and in five patients it was from 80 to 100% (Figs. 1 and 2).

Discussion

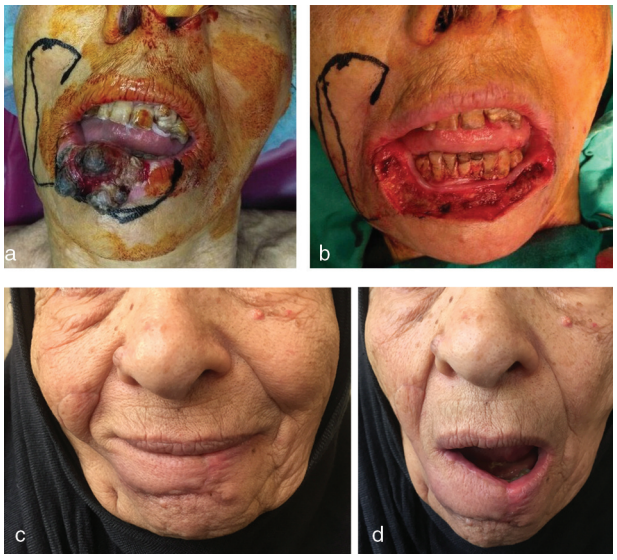
Many surgical techniques for reconstruction of the extensive lower lip defects have been described, each of them having its own advantages and disadvantages. Most of these techniques restore lip continuity, but compromise mouth opening (cause microstomia) or sphincter function, or cause significant perioral scarring and poor aesthetic outcome [3].

Figure 1



(a) Preoperative picture of squamous cell carcinoma at the lower lip; (b) intraoperative picture of the defect; (c) flap inset to the defect; (d) 6 months postoperative picture.

Figure 2



(a) Preoperative picture of squamous cell carcinoma at the lower lip; (b) intraoperative picture of the defect; (c) 6 months postoperative picture; (d) 6 months postoperative picture.

The local flaps that are used for extensive lower lip defects (>two-thirds) are mainly Karapandzic flap, the Gillies fan flap, McGregor and Nakajima flap and the Webster–Bernard flap.

The Karapandzic flap can achieve a functional lip with preserved competence and sensation, but results in narrowing of the mouth especially when reconstructing large defects and necessitating another setting of commissuroplasty [4].

The Gillies fan flap is another option to reconstruct massive lower lip defect, but the angle of the mouth is distorted and the lower lip is shortened [5].

The Webster–Bernard procedure can produce good lip reconstruction but involves a large amount of perioral tissue loss, resulting in a tight lower lip and significant perioral scarring with contour deformity [6].

The Fujimori nasolabial 'gate flaps' can achieve lip reconstruction with good functional and cosmetic results, but retouch operations are often necessary [7].Free flaps are suitable for reconstruction of the total lower lip owing to more soft tissue availability; however, there is risk of donor site morbidity, and the operative time is longer and the aesthetic appearance is less satisfactory because the flaps lack the harmony of the face. Furthermore, it is difficult to create a functional oral sphincter leading to oral incompetence [8].

In this study, we evaluated the functional and the aesthetic outcome of the McGregor musculomucocutaneous cheek rotational flap, which is a rectangular modification of the Gillis fan flap.

In all patients the flaps survived completely. The vermilion and vermilion–cutaneous white border were reconstructed and established in all patients with good satisfactory shape.

In all patients the angles of the mouth were symmetrical with preservation of the anatomic proportions of the lip, except in two patients there were some mucosal folds at the rotation point at the commissure.

In all patients the philtrum had a normal shape and position. The oral mobility was good in all patients, which was evaluated by facial expressions and sound formations.

In all patients there was no microstomia with an adequate oral access.

The oral continence to food, fluids and air was good in all patients.

The patient satisfaction ranged from 60 to 100%: for three patients it was from 60 to 80% and for five patients it was from 80 to 100%.

Conclusion

Although more number of cases are required to build up our conclusion, according to our results on this low

number of patients McGregor musculomucocutaneous cheek rotational flap is considered a good option for near total lower lip reconstruction with good functional and aesthetic outcome.

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Conflicts of interest
There are no conflicts of interest.

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