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# Functional and aesthetic results obtained by modified Bernard reconstruction technique after tumour excision in lower lip cancers

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## KEYWORDS

Lower lip;  
Lip cancer;  
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**Summary** *Background:* In this study, we investigated the functional and aesthetic results in new lip formation using modified Bernard reconstruction technique after tumour excision in lower lip cancers.

*Material and methods:* The study included 47 patients. All were operated due to lower labial squamous cell carcinoma and underwent defect reconstruction using modified Bernard technique. The patients were separated into two groups as: 50–70% and 70% total defect occurring after surgical excision. The functional and aesthetic assessments were done after at least 1 year had passed, and the results were compared statistically with a control group.

*Results:* Of the 18 patients with 50–70% defect, sensibility was normal in 16 (89%) and complete competence was determined in all (100%). In 17 patients (94%), complete and symmetric pouting and mouth-opening movements were ensured. Normal mouth opening was noted in all patients. Nasolabial asymmetry was detected in one patient (6%) and apparent mentolabial scar tissue was detected in two patients (11%). The new vermilion was of equal width to the upper lip vermilion in 15 patients (83%). Of the 29 patients with 70% total defect, sensibility was normal in 21 (72%) and complete competence was detected in 27 patients (93%). Sialorrhoea on fluid intake was detected in one patient (3.5%) and sialorrhoea at rest in one patient (3.5%). In 22 patients (76%), complete and symmetric pouting and mouth-opening movements were ensured. Normal mouth opening was noted in 27 (93%) of the 29 patients. Asymmetry in nasolabial fold was detected in one patient (3.5%), apparent scar tissue in nasolabial fold in one patient (3.5%) and commissure asymmetry in one patient (3.5%). In 25 patients (86%), the new vermilion was of equal width to the upper lip vermilion. No statistically significant difference was found ( $p > 0.05$ ) among the two patient groups and the control group in terms of functional and aesthetic results.

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**Conclusion:** Modified Bernard technique provides a good degree of lip mobility and sensation after excision of lower lip malignant tumour and produces acceptable results.

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Lip cancers constitute 12–15% of oral cavity cancers and 95% of them are seen in the lower lip.<sup>1</sup> The sun's rays (ultraviolet rays of the sun) and chronic irritation created by smoking are the factors increasing the development of neoplasia of the lower lip. Since the 5-year survival of patients with lip cancer varies between 80% and 90%, a successful reconstruction in terms of functionality and aesthetics is necessary after the surgical excision is done within oncological limits. The lip has complex functions, including expression of feelings and smiling, oral sphincter function, articulation and serving as the symbol of aesthetic beauty. Complete competence, maximum oral opening, mobility, sensation and maximum aesthetic results should be the goals of the reconstruction undertaken.<sup>2</sup>

More than 200 different lower lip reconstruction techniques, varying from primary closing to free-flap transfer, have been described since the mid-19th century.<sup>3</sup> The dimensions and the localisation of the defect play important roles in the selection of the type of reconstruction. The cheek advancement flap for defects covering one-third to one-half of the lower lip, described by Camille Bernard in 1853, has become useable for subtotal and total defects, and after modifications by various authors, its results are considered acceptable in terms of functionality and aesthetics.<sup>4</sup> Currently, modified Bernard technique is recommended as the first preference in major lower lip defects.<sup>5</sup> In this study, patients who underwent reconstruction using the modified Bernard technique are presented and discussed.

## Material and methods

Lower lip functions and aesthetic appearance were assessed after at least 1 year in patients operated in the Ear, Nose and Throat Clinic of Ankara Numune Training and Research Hospital between 1998 and 2007 due to lower lip squamous cell carcinoma. In all patients, reconstruction was performed using the modified Bernard technique. In the functional assessment, the subjective loss of sensation was investigated, with sensibility assessed using a two-point discrimination test (scar tissue and within the intact tissue at a distance of 2 cm to the scar tissue). Oral competence was assessed as incompetence, sialorrhoea at rest, sialorrhoea formed with fluid intake and complete competence. Labial mobility was assessed as symmetric/asymmetric by observing pouting and the mouth-opening movements. Aesthetic assessment included comparison of the status of the oral stoma (severe microstomia, moderate microstomia and normal stoma), comparison of the asymmetry and/or scar tissue in nasolabial and mentolabial folds and in the commissure, and comparison of the width of the new vermilion with the upper labial vermilion. For this functional and aesthetic assessment,

a special form was prepared and was completed for each patient (Table 1).

Patients were divided into groups according to defect width of 50–70% and 70% total, and the mean scores obtained according to Table 1 were compared with a control group (10 healthy individuals with normal labial functions and with normal aesthetic appearance). Statistical analysis was performed using SPSS for Windows 11.5 software package. Mann–Whitney U test was used in the statistical assessment and the level of significance was set as 0.05.

## Surgical technique

In the 1-cm security margin to the tumour, after performing a rectangular full-thickness incision, horizontal lines were drawn beginning from the commissure extending laterally and curling slightly downwards. Burow's triangles were constructed with a base length that was one-third to one-half of the defect, where its base was on the line drawn from the oral commissure lateral to the nasolabial fold. The cutaneous and subcutaneous tissues at these triangles were excised. Varying from Bernard–Webster technique,

**Table 1** The form used for functional and aesthetic assessment in patient and control groups

Functional Assessment	SCORES
Sensibility	
- Hypoesthesia	1
- Normal	2
Competence	
- Incompetence	1
- Sialorrhoea at rest	2
- Sialorrhoea with fluid intake	3
- Complete competence	4
Pouting/mouth-opening movement	
- Asymmetric	1
- Symmetric	2
Aesthetic Assessment	
Stoma	
- Severe microstomia	1
- Moderate microstomia	2
- Normal	3
Asymmetry/scar tissue in nasolabial, mentolabial folds, and in commissure	
- Scar tissue in nasolabial, mentolabial folds and in commissure	1
- Asymmetry in nasolabial, mentolabial folds and in commissure	2
- Normal	3
Vermilion	
- Upper vermilion > lower vermilion	1
- Upper vermilion = lower vermilion	2

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