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ORIGINAL ARTICLE

Morphologic assessment of mandibular reconstruction by free fibula flap and donor-site functional impairment in a series of 23 patients

E. Bartaire[a,d], F. Mouawad[c], Y. Mallet[a,*], P. Milet[a,b], S. El Bedoui[a], J. Ton Van[a], D. Chevalier[c], J.-L. Lefebvre[a]

[a] *Département d'ORL et de chirurgie cervico-faciale, centre Oscar-Lambret, 3, rue F. Combemale, 59020 Lille cedex, France*
[b] *Head and Neck Surgery Department, National Institute of Cancer Inca, Rua do Rezende 128/322 Rio de Janeiro, Brazil*
[c] *Service d'ORL et de chirurgie cervico-faciale, hôpital Claude-Huriez, 1, Place de Verdun, 59037 Lille cedex, France*
[d] *Service ORL, centre hospitalier de Valenciennes, avenue Désandrouin, 59322 Valenciennes cedex, France*

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Reconstruction;
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Summary
Introduction: Micro-anastomosed free fibula flap is an attitude of choice in mandibular defect repair in oncology, enabling effective functional rehabilitation. The present study assessed donor and recipient site morphology and donor-site sequelae.
Patients and methods: The study consecutively recruited patients undergoing mandibular resection with free fibula flap reconstruction in our centre between December 2003 and September 2008. Assessment on adapted scales was performed by two independent expert physicians and patient self-assessment.
Results: Out of 49 mandibular reconstructions performed in the centre over the 5-year study period, 23 patients free of recurrence were included. Satisfaction rates were 73% for the recipient site and 70% for the donor-site, with patient/expert agreement of 47% and 49.5% respectively. Donor-site impact was mainly in terms of reduced ankle range of motion (43% of cases) and flexion strength (39%) and discomfort in running (35%) and walking (26%). Risk factors for dissatisfaction were more than 5% weight loss at admission for recipient site dissatisfaction (patient, $P = 0.012$; expert, $P = 0.046$), and skin graft for donor-site dissatisfaction (patient, $P = 0.04$; expert, $P = 0.035$).
Conclusion: Free fibula flap was associated with high satisfaction rates, but non-negligible donor-site impact.

* Corresponding author. Tel.: +33 3 20 29 59 18; fax: +33 3 20 29 59 71.
E-mail address: y-mallet@o-lambret.fr (Y. Mallet).

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Introduction

Micro-anastomosed fibula flap was first described by Taylor in 1975 [1] and implemented in lower limb reconstruction. In 1989, Hidalgo applied it in mandibular reconstruction [2], drastically changing morphological and functional prognosis in many mandibulectomies, especially anterolateral, avoiding the classic ''Andy Gump'' facial aspect [3]. The other possible osteomyocutaneous flaps available for such reconstruction are mainly the iliac crest flap described by Forrest in 1992 [4] and the scapular flap first described by Swartz in 1986 [5]. Many authors routinely employ a free fibula flap for mandibular defects, as it provides 25 cm of highly reliable solid bicortical bone, enabling reconstruction of the entire mandible with good oral rehabilitation [6,7].

Most studies have therefore confirmed the benefits of this technique, underlining the simple postoperative course and good long-term results in terms of esthetics and feeding [8—13].

A certain number of studies have assessed morphologic and functional sequelae [3,6,14,15], but very few focused on the donor-site [16].

The prime objective of the present study was to assess satisfaction with donor and recipient site morphology and donor-site functional impairment. The secondary objective was to identify perioperative risk factors for dissatisfaction.

Box 1a: Expert morphologic assessment. Adapted from Bozec.

Recipient site:

0: Dissatisfied/unacceptable/significant deformity/severe depression/disfiguration.

1: Poorly satisfied/moderate deformity/malalignment/poor or inflammatory scar.

2: Satisfied/slight deformity/good cicatrisation.

3: Very satisfied/good quality/no deformity/no facial scar.

Donor-site:

0: Deformity/severe depression.

1: Deformity/depression/poor or inflammatory scar.

2: Deformity/mild depression.

3: Good quality.

Box 1b: Morphologic and functional self-assessment. Adapted from Bozec

How do you find the morphological result of your facial operation?

0: Dissatisfactory/unacceptable/intolerable.

1: Not very satisfactory/poor result.

2: Satisfactory/good result.

3: Very satisfactory/normal/''like before''.

How do you find the leg scar, morphologically?

0: Dissatisfactory/unacceptable/intolerable.

1: Not very satisfactory/poor result.

2: Satisfactory/good result.

3: Very satisfactory/normal/''like before''.

Do you have difficulty walking with the operated leg?

Yes/No.

And running?

Yes/No.

Have you had pain in the operated leg since surgery?

Yes: VAS (visual analog scale).

No.

Do you have anything to add about the treatment?

Free expression.

Patients and methods

Patients

Living patients able to be examined at time of study, free of clinical tumour or lymph node site recurrence and providing consent were included. They were treated consecutively in our cancer centre between December 2003 and September 2008 for squamous cell carcinoma of the oral cavity touching or invading the mandibular bone. Surgery consisted in mandibular resection with micro-anastomosed free fibula flap reconstruction.

Methods

The surgical protocol was identical in all cases. Functional and morphologic data were collected by individual directed interview. The microsurgical and reconstructive stages were performed by the same surgeon.

Assessment was systematically performed by two ENT physicians on scales adapted from Bozec's assessment grill [14,15] and concerned operated limb scar and mandibular reconstruction quality (Box 1a); the same assessment was made by the patient on a self-administered questionnaire (Box 1b). Agreement was estimated by subtracting the expert's from the patient's scores and rated on five levels as: no difference = 0; patient more satisfied by one interval ± 1; patient more satisfied by two intervals ± 2; patient les satisfied by one interval ± 1; or patient less satisfied by two intervals ± 2. Lower limb muscle strength was assessed against the contralateral value on the standard Medical Research Council (MRC) muscle test scale [16]. Ankle range of motion was assessed against the contralateral value, with differences recorded as degree of flexion and of extension. Donor-site sensitivity was assessed in the superficial peroneal nerve territory (inferior third of the lateral side of the leg) in three modes: epicritical, with a graduated compass measuring the shortest distance between two points on the skin identifiable by the patient; tactile, using a 10-gram Semmes-Weinstein calibrated esthesiometer; and pain, using a 19-guage needle prick (Box 1c). Neither of the assessment experts had been involved in the primary treatment.

A standardized form was used to collect data retrieved from systematic examination of each patient's individual file: initial pathology (radiologic TNM status, histology), background (history, comorbidity, previous radiation therapy and dose, alcohol or nicotine intoxication, ASA score, height, usual weight and weight at admission) and early postoperative course (events in the first 30 postoperative days).