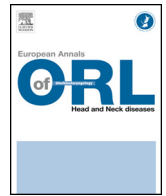




Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en



Original article

Virtual planning and guided surgery in fibular free-flap mandibular reconstruction: A 29-case series



D. Culié*, O. Dassonville, G. Poissonnet, J.-C. Riss, J. Fernandez, A. Bozec

Institut universitaire de la face et du cou, centre Antoine-Lacassagne, 31, avenue de Valombrese, 06103 Nice, France

ARTICLE INFO

Keywords:

Mandibular reconstruction
 Free flap
 Fibula
 Virtual planning and guided surgery

ABSTRACT

Introduction: Virtual planning and guided surgery (VPGS) has been recently developed for mandibular reconstruction, but benefit remains to be assessed. The aim of this study was to analyze the impact of VPGS on operative time and postoperative course.

Material and methods: All patients who underwent fibula free-flap mandibular reconstruction between 2013 and 2014 in our institution were included in a retrospective study. Operative times and postoperative course were compared between patients who underwent conventional surgery in 2013 and those who underwent VPGS in 2014.

Results: A total of 29 patients were included: 11 in 2013 and 18 in 2014. Taking all types of mandibular defect together, ischemia time was significantly decreased by VPGS (75 min, vs 150 min for conventional surgery; $P < 0.001$), whereas overall operative time was not significantly reduced (481 and 516 min, respectively; $P = 0.4$). VPGS had no impact on postoperative course: local or general complications, time to decannulation and nasogastric tube removal, or length of stay.

Conclusion: VPGS significantly reduced fibula free-flap ischemia time. Long-term functional and esthetic benefit remains to be evaluated.

© 2016 Elsevier Masson SAS. All rights reserved.

1. Introduction

Free vascularized bone transplant is the gold standard for mandibular reconstruction. Fibular flaps are by far the most widely used, being easy to harvest with good dimensions and quality of bone and pedicle length [1]. Conforming flap to defect, however, is a long and complex task that is critical for functional and esthetic outcome but needs to be accomplished quickly enough not to jeopardize flap survival. In recent years, computerized tools have been developed to help surgeons plan and perform the intervention. More recently again, preoperative 3D modeling (virtual planning) has provided cut guides and preformed osteosynthesis plates to optimize conformation [2].

The present study sought to assess the impact of virtual planning and guided surgery (VPGS) with cut guides and preformed osteosynthesis plates on operative time and postoperative course in fibular free-flap mandibular reconstruction.

2. Material and methods

All patients undergoing fibular free-flap mandibular reconstruction in our institution between January 1st, 2013 and December 31st, 2014 were included in a retrospective study. In 2013, the procedure was conventional, whereas in 2014, VPGS was implemented, with preoperative 3D modeling and cut guides with preformed osteosynthesis plates as described by Schouman et al. [2].

Virtual planning was based on millimetric-slice CT acquisitions of the facial bone and fibulas. The surgeon defined the exact sites of the intended mandibular osteotomies. The OBL laboratory produced the various cut guides for mandibular resection and flap conformation and the preformed plates for flap conformation and fixation onto the remaining mandible (Figs. 1 and 2).

Resection and reconstruction were in all cases performed in a single step by two surgical teams, one in charge of cervicofacial resection and the other harvesting the flap. All procedures were performed by 3 senior surgeons with more than 10 years' experience in microsurgery at the outset of inclusion. In procedures performed in 2013, without preoperative modeling, flap conformation began in the harvesting site and was completed in the tumor resection site after fibular pedicle section and before vascular anastomosis (during ischemia time). In 2014, using VPGS, flap

* Corresponding author.

E-mail address: culiedorian@gmail.com (D. Culié).

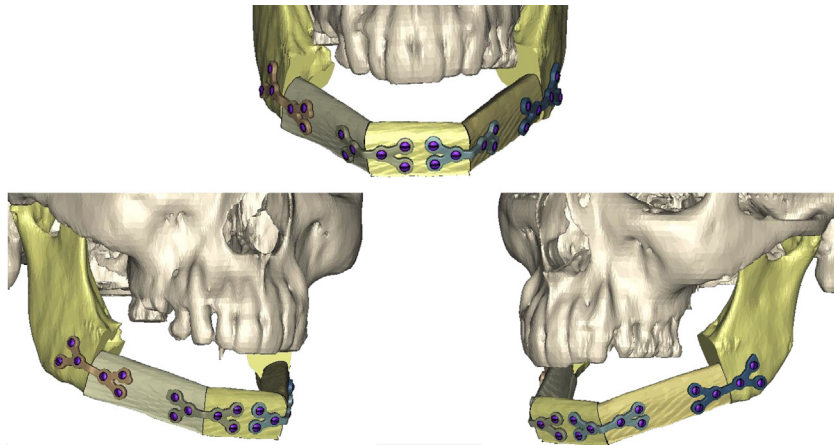


Fig. 1. Preoperative 3D modeling of mandibular reconstruction: defect in mandibular symphysis and 2 horizontal branches (3 fragments and 2 intermediate osteotomies).

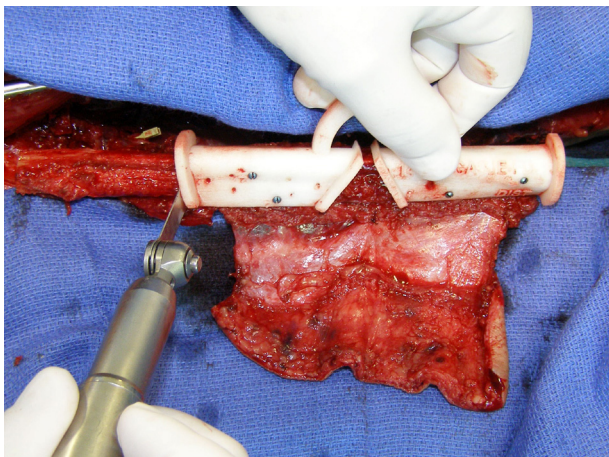


Fig. 2. Intraoperative view of a cut guide positioned at the fibula: oscillating saw osteotomies after cut guide fixation.

conformation was entirely performed at the harvesting site before the pedicle was clamped (flap still vascularized).

Total operative time was recorded by a theater management software package; theater nurses entered the starting and finishing times. Flap ischemia time was recorded from the anesthesiology forms on which the anesthesiology nurses entered the time of vascular pedicle clamping and of completion of vascular anastomosis.

Mandibular defects were classified following Jewer [3]: H for hemimandibulectomy (condyle and ascending and horizontal branches); L for lateral defect (horizontal branch ± perpendicular portion without condyle); and C for central defect (mandibular symphysis). Two subgroups were distinguished according to type of defect: type H, and defects involving the mandibular symphysis (types C, HC, LC or LCL).

Comorbidities were assessed by Kaplan-Feinstein index (KFI) [4] American Society of Anesthesiologists (ASA) score.

For postoperative course, the following data were taken from the patients' computerized medical files: fibular flap necrosis, local and general complications, enteral feeding time, time to tracheal decannulation, and hospital stay.

The two groups (with and without VPGS) were compared on clinical characteristics, mean operative time and postoperative

Table 1
Clinical characteristics in the two groups.

Clinical characteristics	Without VPGS ^a ; n = 11	With VPGS ^a ; n = 18	<i>p</i> ^b
Gender: male/female (%)	8 (73)/3 (27)	13 (72)/5 (28)	1
Mean age	60.6 ± 10.9	64.8 ± 8.9	0.28
History			
Airway cancer	5 (55)	4 (22)	0.24
Cervical surgery	4 (36)	4 (22)	0.43
Radiotherapy	3 (27)	1 (6)	0.14
ASA: 1/2/3	0 (0)/8 (73)/3 (27)	3 (17)/13 (72)/2 (11)	0.32
KFI: <2/≥2	10 (91)/1 (9)	17 (94)/1 (6)	0.21
Alcohol abuse: no/yes	5 (45)/6 (55)	8 (44)/10 (56)	1
Smoking: no/ex/active	3 (27)/3 (27)/5 (45)	4 (22)/10 (56)/4 (22)	1
Indication			0.38
Squamous cell carcinoma	7 (64)	16 (89)	
Osteoradionecrosis	2 (18)	0 (0)	
Other	2 (18)	2 (11)	
Type of defect ^c			0.91
Type H	5 (45)	11 (61)	
Type C, HC, LC or LCL	4 (36)	6 (33)	
Type L	2 (18)	1 (6)	
Associated neck dissection	8 (72)	14 (78)	0.28

n: number of patients per group.

^a VPGS: virtual planning and guided surgery.

^b *P*-values for comparison between with- and without-VPGS groups.

^c Type of mandibular defect according to the Jewer classification.

Download English Version:

<https://daneshyari.com/en/article/4109867>

Download Persian Version:

<https://daneshyari.com/article/4109867>

[Daneshyari.com](https://daneshyari.com)