Journal of Cranio-Maxillo-Facial Surgery 44 (2016) 934–939

Contents lists available at ScienceDirect

Journal of Cranio-Maxillo-Facial Surgery

journal homepage: www.jcmfs.com

Facial animation with gracilis muscle transplant reinnervated via cross-face graft: Does it change patients' quality of life?

Bernardo Bianchi [a], Andrea Ferri [a, *], Valentina Poddi [a], Andrea Varazzani [a], Silvano Ferrari [a], Giuseppe Pedrazzi [b], Enrico Sesenna [a]

[a] Maxillo-Facial Surgery Division, Head and Neck Department, University Hospital of Parma, Parma, Italy
[b] Department of Neuroscience, University of Parma, Parma, Italy

ARTICLE INFO

Article history:
Paper received 2 April 2016
Accepted 9 May 2016
Available online 17 May 2016

Keywords:
Cross-graft
Facial animation
Facial palsy
Quality of life

ABSTRACT

Purpose: Gracilis muscle reinnervated by the contralateral facial nerve via cross-graft technique is nowadays considered to be a first-line procedure for facial animation in unilateral palsies. Despite the wide number of papers published analyzing technical aspects, refinements, functional results, and cosmetic outcomes, only a few authors have focused their publications on the patient's perspective and impact on QOL of these procedures.

Material and methods: Changes in quality of life in 42 patients treated with gracilis muscle transplant reinnervated via cross-face graft were analyzed through a comparison of preoperative and postoperative items on the Facial Disability Index questionnaire. Statistical evaluation with a paired *t*-test was performed concerning overall results and specific items modifications.

Results: Overall improvement of QOL was found to be highly significant ($p = 0.001$). Mouth and eye functions were the most improved ($p = 0.001$), whereas isolation ($p = 0.004$) and feeling calm and peaceful ($p = 0.001$) were the most improved among the social functions.

Conclusions: Facial animation with gracilis neuromuscular transplantation reinnervated with contralateral healthy facial nerve via a cross-graft procedure has been demonstrated to be a safe and reliable procedure in the treatment of congenital or established facial palsies. Our results on quality of life impact support that these operations are not only reliable and safe but also of primary relevance to patients' everyday lives.

1. Introduction

Facial palsy is a severe disabling condition that leads to functional and psychological impairments that deeply affect patients' quality of life (QOL). Functionally, incomplete mouth closure and commissural asymmetry cause oral incompetence and difficulties in speaking, while incomplete eye closure results in paralytic lagophthalmos, eye discomfort, and sometimes ocular complications. Psychologically, facial disfigurement causes difficulties in social interactions, reduction of self-esteem, and depression.

In the last 20 years, several efforts have been made by surgeons to treat this condition, and many surgical procedures have been proposed in the international literature for both recent and established or congenital palsies, having as goals the restoration of a spontaneous smile and of facial symmetry and the improvement of functional and psychological impairments (Bianchi et al., 2012).

When established (conventionally defined as lasting for more than 18 months) and congenital palsies are approached, neuromuscular transplantations are nowadays considered as the gold-standard procedures, and gracilis muscle transplant is the most commonly used technique worldwide (Bhama and Hadlock, 2014). The key point, and most debated topic of the procedure, is the selection of the donor nerve for re-innervation of the transplant:

* Corresponding author. via Gramsci 14, 43100 Parma, Italy. Tel.: +390521703107, +390521703109; fax: +390521703761.
E-mail address: a.ferri@libero.it (A. Ferri).

http://dx.doi.org/10.1016/j.jcms.2016.05.009
1010-5182/

contralateral facial nerve via cross-graft technique, masseteric nerve, and combined techniques are the procedures usually performed by the largest majority of authors (Faria et al., 2007). When unilateral forms are treated, in order to achieve a spontaneous activation of the transplanted muscle, the use of contralateral healthy facial nerve via a cross-graft procedure is worldwide considered as the best option in the majority of patients, whereas the masseteric nerve use is usually reserved for selected cases including elderly patients, salvage surgeries after previous cross-graft failures, incomplete bilateral palsies when contralateral facial nerve is not completely healthy, or in combination with a cross-graft to provide a dual innervation to the transplant (Bianchi et al., 2014a).

When gracilis muscle re-innervated by the contralateral facial nerve via cross-graft technique is chosen, results are usually satisfactory, and in our experience this is the first-line procedure for facial animation in unilateral palsies.

Despite the wide number of papers published analyzing technical aspects, refinements, functional results, and cosmetic outcomes, only a few authors have focused their publications on the patient's perspective and impact on QOL of these procedures.

The aim of the present study is to evaluate the impact on QOL of facial animation with gracilis muscle transplant re-innervated by contralateral healthy facial nerve via cross-graft procedure in patients affected by unilateral established or congenital facial palsy, through the administration of QOL Facial Disability Index (FDI) questionnaires (Appendix 1).

Fig. 2. Postoperative results after gracilis transplant reinnervated via cross-graft in patient at rest (a) and smiling (b).

2. Material and methods

Patients treated for established or congenital unilateral facial palsy with gracilis muscle transplant re-innervated with a cross-graft by the contralateral facial nerve between January 1, 2004, and January 1, 2016 at the Facial Nerve Center (Maxillo-Facial Surgery Division) of the University Hospital of Parma were retrospectively considered. Patients with transplant contraction lasting less than 6 months were considered not yet significant for assessing QOL changes and were therefore excluded from the study. Two patients did not complete the postoperative questionnaire and were also excluded. One case of failure in re-innervation of the transplant, later salvaged with a masseter co-optation of the same gracilis, was excluded as well.

Due to the retrospective nature of the study, institutional review board approval was not required by our institution. The study was conducted written in accordance with the principles of the Declaration of Helsinki.

The study population consisted of 42 patients, 20 males and 22 females, aging from 6 to 61 years in age (mean age, 33.5 years). Children were assisted by their parents in filling out the questionnaire according to methods previously described in the literature for such evaluation in these patients (Lindsay et al., 2014). Of the 42 patients, 23 were affected by congenital unilateral facial palsy (Figs. 1 and 2), whereas the remaining 19 had acquired established palsies (Figs. 3 and 4). Among the latter, 6 palsies developed after acoustic neuroma resection, 6 from Bell's palsy, 4 from skull base tumor removal, and the remaining 3 consequent to parotid malignancy resections. At the first visit, clinical examination included a specific facial palsy evaluation and FDI QOL questionnaire administration.

Fig. 1. Preoperative picture of a 7-year-old patient with congenital unilateral right facial palsy at rest (a) and smiling (b).

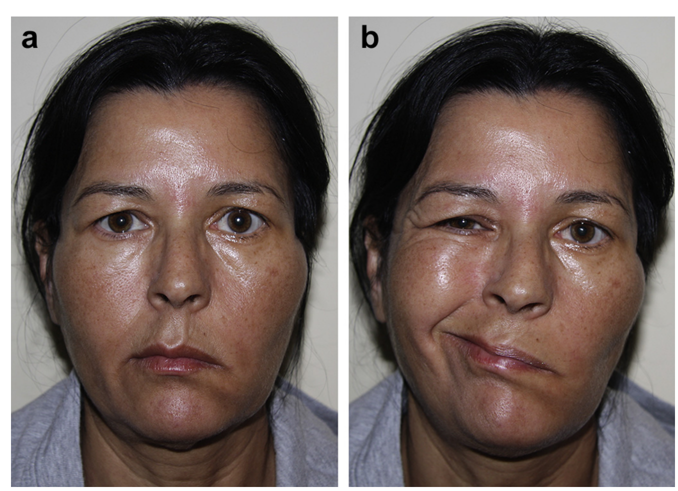

Fig. 3. Preoperative picture of a 38-year-old patient with unilateral left facial palsy acquired after acoustic neuroma resection at rest (a) and smiling (b).