

# Stair climbing performance in assessing donor-site morbidity following osteocutaneous free fibula transfer: a preliminary study

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Autologous free fibula flap (FFF) is among the most used techniques to reconstruct facial bone defects [1]. Donor site morbidity has been quantified mostly with over ground gait analysis, and no longitudinal investigations of stairs climbing have been performed. Only a pilot cross-sectional investigation reported minimal disturbances [2]. We longitudinally assessed the gait kinematic parameters during stairs ascent and descent after a vascularized FFF removal for facial reconstruction in 15 patients (7 men, 8 women; mean age  $49 \pm 16$  y; height  $167.5 \pm 8.8$  cm; body mass  $69.7 \pm 19.2$  kg): a first evaluation was made before surgery and a second 6-months after surgery. In both assessments the patients ascended and descended a three-steps wooden staircase (rise height 16 cm, tread length 30 cm) at self-selected, comfortable speed. Kinematic variables were measured through optical gait analysis. The patients approached the stair from farther away, and stair negotiation was done with both the healthy and the operated side. Spatiotemporal parameters and the Range of Motion (ROM) of lower limb joints were obtained. In particular, step duration, cadence, stance, swing and double support duration; step width, velocity; ankle (dorsi-plantar flexion; inversion-eversion), knee (flexion-extension), hip (flexion-extension, abd-adduction) and pelvis ROM (inclination, rotation, tilt) were computed separately for the ascent and descent phases, for the operated and healthy limb, and for the pre- and post-surgical assessments. Data were compared by a 2-way ANOVA (sidetime) with repeated measures on the time factor. No significant effects of side or of time were found (all p values  $> 0.05$ ) for both the ascent and descent phases. In sum, no functional limitations during gait performance were detected: in our patients, FFF harvest was generally associated to successful functional outcomes of the donor site. While previous studies found some differences in the lower limb function [3,4], this is the first longitudinal investigation focused on stairs climbing. Further studies with an increased sample size and a longer follow up are necessary to draw general conclusions.

## References

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## Key words

Free fibular flap, morbidity, gait analysis, longitudinal, stairs.