

Ide, Y. Anatomical examination of the fibula: Digital imaging study for osseointegrated implant installation (Poster presentation)

Authors: Yoshiaki Ide, Satoru Matsunaga, Jeffrey Harris, Daniel O'Connell, Hadi Seikaly, Johan Wolfaardt

Presenter: Yoshiaki Ide, DDS, PhD – Institute for Reconstructive Sciences in Medicine; Assistant Professor, The Nippon Dental University

ideaki@tky.ndu.ac.jp

Free vascularized fibular flaps have been used for jaw reconstruction and have shown, from cadaver studies, to have adequate bone volume for osseointegrated implant installation. In order to fully describe the anatomy of the fibula a digital imaging study of the fibula was undertaken. The purpose of the present study was to examine the anatomical structure of the fibula using patient CT images. The CT scan images of fibulae of twenty patients were used for the study. Three transverse sections of the fibula within the free flap harvesting region were analyzed using the following measures: (1) width from margins (anterior border, lateral border and medial crest) of the fibula to their opposing surfaces (posterior surface, medial surface and lateral surface); (2) shape type (triangular, quadrilateral and irregular type); (3) height and width related to implant long axis of installation; (4) length of available bone volume for the osseointegrated implants (with the diameter of 4.3 mm) installation. The results were as follows: (1) The results of the analysis showed that of the widths from the margins of the fibulae to their opposite surfaces, the anterior border of the fibula to the posterior surface was the largest dimension ($P < 0.01$). (2) The shape type analysis showed that the triangular type was most prominent in the section near the fibula head and the irregular type was most prominent in the section near the lateral malleolus. (3) The results of height and width related to implant long axis of installation showed that width of the central section was the largest in all sections ($P < 0.01$). (4) The length of available bone volume measure showed that the length in the section near the lateral malleolus was larger than in the section near the fibula head ($P < 0.05$). The results showed that there were significant differences in size between male and female fibulae ($P < 0.01$). The present study provides important information for the optimal site of installation of osseointegrated implants in fibular free flap reconstructions.