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A trial of tooth arrangement on CT images using simulation software.

K. Kawaguchi*, T. Watanabe, D. Yamauchi, S. Suzuki, Y. Fukuoka *Numazu, Shizuoka, Japan*.

Purpose: When trying a denture tooth arrangement based on CT implant simulation software, one needs a set of measured values on a natural dental arch in reference to bone anatomy of the jaw. Reference points adopted in this study are as follows: intersection between zygomatico–alveolar crest and the anterior margin of infratemporal fossa, designated as point Z, incisive foramen, and hamular notch. Using these references, natural dental arches of the subjects in the study were morpho-anatomically measured on their CT images and DICOM data. Values obtained this way were fed into a commercially available version of CT implant simulation software in an attempt to devise an optimal tooth arrangement for the subject. Materials and Methods: CT image DICOM data come from those patients who visited us for dental treatment, and agreed that their cases be made public for academic purposes. A total of 50 subjects participated in the study: 15 male and 35 female, with an average age of 56 years, ranging from 31 to 71 in years. Their bilateral maxillary sinuses were the object of this investigation. Images so obtained were then adjusted in relation to incisive foramen and hamular notch; and morpho-anatomical measurements were taken of each dental arch in reference to point Z defined

as above. Results: Average distance from point Z to occlusal plane was 29.4mm; average distance from line connecting bilateral Z's to maxillary inciser 33.0mm; average distance from inter-Z line to intercuspid line 23.8mm; and average distance from inter-Z line to mesial palatal cusp of first molar was 3.3mm. Additionally, average intercuspid distance was 56.6mm, while average distance from between mesial palatal cusps of bilateral first molars was 38.4mm. Discussion and Conclusion: In a trial study for artificial tooth arrangement using commercially available implant simulation software, we managed to turn a dental arch based on morpho-anatomical measurements described as above into an image on display. Although there was an imbalance between male and female sample sizes in this study, it is probably reasonable to say that a denture tooth arrangement for a Japanese patient is possible on CT implant simulation software images based on certain anatomical information.