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(예시)

The study on the dimensional stability of digitized dental stone replicas according to difference color of gypsum materials

치과용 모형재 색상에 따른 디지털 모형의 체적 안정성 연구

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1. Introduction

The sophisticated processing of advanced ceramics for dental restorations lead to the further development of CAD/CAM technologies (computer-aided design, computer-aided manufacturing). These techniques necessitate digitizing of the prepared teeth or the planned restoration itself and surfacing of the acquired digital data before milling paths can be generated. Optical systems may use either a triangulation laser sensor which detects the deflection of a laser spot on a CCD camera or they may use a white light or laser sensor to record the surface topography using the confocal principle. Laser profilometers emit light at a specific wavelength that could be absorbed or reflected by the sample in dissimilar ways depending upon the color and transparency of the material. The aim of study was to compare the dimensional stability of digitized dental stone replica using different color of gypsum materials using a white light scanner with three-dimensional software.

2. Methods

A master model(500B-1, Nissin dental product, Japan) with the prepared lower full arch tooth was used. Several type Ⅳ stones(white, yellow, green) were used for 30 stone casts(10 casts each) duplicated a master model of mandible. The master model and the replicas were digitized with the

non-contacting white light scanner to create 3-dimensional digital models. The linear distance between the reference points were measured and analyzed on the Delcam Copycad®(Delcam plc, UK) 3D graphic software. One-way analysis of variance(ANOVA) combined with a Tukey multiple-range test were used to analysis the data(α=0.05).

3. Results

There were considerable differences in mean values between gypsum materials within each color(white, yellow, green), and this difference was statistically significant, p=0.001.

4. Conclusions

Digitization of dental materials on optical scanner was affected by color. Three different color of gypsum materials showed clinically acceptable accuracies of full arch digital model produced by them. Besides, these results will have to be confirmed in further clinical studies.

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