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Title	Study of facial monphology of Maya people with cleft lip adn/or palate based on subjects obtained from surbical missions in Mexico
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論 文 内 容 の 要 旨

Introduction：

A recently devised procedure developed at Osaka University makes it possible to show the three-dimensional relationship between the facial surface and dentition by using a non-contact three dimensional (3D) laser scanner and 3D dental cast models.　The Mayas, native people of Mexico, live in remote and undeveloped areas and have lack of attention of its cleft lip and palate-affected population.　They depend on volunteer surgical missions for their cleft treatment.　The First Department of Oral and Maxillofacial Surgery at Osaka University performs one of them.　Also, their three-dimensional facial morphology is unknown.

Purpose：

The objective of this study was to test the accuracy of the measuring system by comparing it to a 3D CT scan. To perform data collection using the 3D measuring system at surgical missions in Mexico under severe and undeveloped conditions.　Based on the collected data, to show the character of facial morphology of Maya people with/without cleft lip and palate.

Material and Methods：

Study 1.　Construction of a three-dimensional model by integration of 3-D shapes of facial morphology and dentition (Com), using a non-contact 3D laser scanner and 3D dental casts by Computed Tomography (Ct). Subject is a 22-year-old Japanese female with prior history of orthognatic surgery.

Study 2.　Evaluation of facial and nasal morphology of normal Maya subjects.　Subjects：20 normal Maya subjects.　(10 males age 20 to 45 and 10 females age 32 to 45).　All subjects were healthy with no obvious craniofacial dysmorphology.　A non-contact 3D laser scanner scanned the faces of the subjects in Mexico and analysis was done in Japan.

Study 3.　3D analysis of facial and upper dental arch morphology of Maya subjects with operated cleft lip and

palate.　Subjects : 6 Maya subjects, 3 subjects with unilateral cleft lip and palate (UCLP) (2 female and 1 male, age 14 to 15) and 3 subjects with bilateral cleft lip and palate (BCLP) (1 female and 2 males, age 14 to 18).

Study 4.　Analysis of dental condition of Maya patients with operated cleft lip and palate using dental plaster casts.　Subjects : Same subjects as on Study 3.

Study 5.　Analysis of a 40 year old unoperated cleft palate subject using 3D images of face and dentition (Com).

Results

Study 1.　There is no significant difference between the measurements from the Com image and the Ct image. Comparing the linear measurements of the Com with the Ct, we found the discrepancy between both images to be less than 1 mm on each measurement.

Study 2.　We could identify the normal facial characteristics of Maya people and compare them with other ethnic groups.　The Mayas share similar features to that people of Asian origin.

Study 3.　The procedure of two-dimensional analysis based on 3D coordinates of the face and dentition is quite useful for assessing the appearance of the face and dentition in cleft lip and palate subjects on surgical missions. Effects of previous palatoplasty could be observed.

Study 4.　Using dental cast analysis we could evaluate the overall dental condition and observe that primary palatoplasty showed a negative effect on the growth of the maxillary arch in transverse and anteroposterior dimensions on the subjects.

Study 5.　Unoperated cleft palate subject had an almost normal profile when compared to the Maya control group.　He showed normal maxillary growth and a slightly shorter mandibular length.　Lip surgery without palatal surgery did not seem to interfere with anteroposterior and transverse maxillary growth.

Conclusion : The construction of three-dimensional models of the face and dentition were accomplished using a commercially available non-contact 3D laser scanner and CT scans of dental casts.　The accuracy of the method was comparable to that of a CT scan.　The combined facial and dental images were useful and reliable as a data collection tool during surgical missions.　The normal facial characteristics of Maya people were identified on normal subjects.　On the cleft lip and palate subjects, the effects of the repair on the cleft lip and palate could be observed.

<div align="center">論 文 審 査 の 結 果 の 要 旨</div>

　本研究は発展途上地域における唇裂・口蓋裂患者の三次元的形態分析法について研究したものである。唇裂・口蓋裂を有するマヤ人の顔面および上顎歯列形態を非接触型レーザースキャナーを用いて三次元的に分析を行った。その結果、非接触型レーザースキャナーによる三次元データは CT データと遜色なく、唇裂・口蓋裂を有するマヤ人の顔面および上顎歯列形態の分析に有用であることが明らかとなった。本研究は発展途上地域における研究に有用な示唆を与えるものと考えられ、博士（歯学）を与えるに値するものと認める。