Ancestry Estimation in a Web-based, Searchable Database of Orthodontic Case Files for Patient Care, Education, and Research

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Abstract and Objective

In 2005, the Maxwell Museum of Anthropology accepted a donation of orthodontic patient records from an orthodontist who has been practicing in the Albuquerque area since the early 1970's. This collection represents a diversity of patients not often encountered in orthodontic training in the United States. A virtual, de-identified, web-based version of a subset of the collection is now being developed. Users can search for cases with particular characteristics of interest (e.g., patient ancestry, extraction patterns, diagnoses, and cephalometric parameters), then review sequential intra-oral and X-ray images to observe treatment outcomes. An innovative feature of the database is that it records multiple ancestry estimations, made at multiple points in time by multiple raters, along with a list of ancestry indicators on which the estimations are made (e.g., skin color, hair form and color, facial shape, name, and locality). This poster describes how the database can be used to overcome the limited diversity in the patient populations available to most orthodontics trainees. When this project concludes, the database will contain approximately 400,000 digitized images from 5650 individual cases.

Keywords:

Dentistry, Orthodontics, Medical Informatics Applications, Internet, Anthropology.

Introduction

The U.S. has the most diverse population of any nation. However, orthodontic education often fails to reflect this diversity in the patient populations available to students during their training.

Methods

In 2005, the University of New Mexico's (UNM) Maxwell Museum of Anthropology (MMOA) acquired a collection of dental casts, cephalometric radiographs, photos, and treatment records for approximately 5,650 orthodontic patients including records of approximately 600 sibling pairs and several multi-generational families. Approximately 400,000 photos/images and 20,000 x-ray films are included in the collection. The diversity and quality of this collection are its unique strengths, representing African, Asian, European, Hispanic, and Native American populations. This project's goal is to make a virtual, de-identified version of this collection freely available on the World Wide Web to maximize its use for patient care and research in a wide variety of domains (e.g., orthodontics, anthropology, and biomedical informatics).[1]

Conclusions

This database allows orthodontics students the world over access to a range of ethnic variation that the majority of students are currently unlikely to encounter during training. The development of this database will help the specialty of orthodontics to train practitioners in working with a wider variety of face shapes, as well as ethnic and racial distinctions. Rather than comparing every patient to potentially inappropriate population norms that do not take into consideration racial and ethnic variation, orthodontists can incorporate into their treatment plans normal population variation, as well as patients' positive perceptions of facial features common in their own self-identified group.

Acknowledgments

This project was supported by Award Number 5G08 LM009381 from the National Library of Medicine. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Library of Medicine or the National Institutes of Health.

[1] http://hsc.unm.edu/programs/ocfs/