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Short Communication

Occlusal morphology in identification of individual – A useful forensic tool

Urvashi Shetty and Pushparaja Shetty*

Department of Oral Pathology, AB Shetty Dental College, Nitte University, Deralakatte, Mangalore- 575018

***Corresponding Author**
Dr. Pushparaja Shetty
Professor,
Department of Oral Pathology
AB Shetty Dental College, Nitte University
Deralakatte, Mangalore, India - 575018
E-mail: drpusti@yahoo.com

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Abstract

Dental evidence can now be employed with reasonable reliability & also as an adjunct in the Identification of an unknown body or remains. Dental tissues are the strongest tissues in the human body and therefore their characteristics remain unchanged even after long periods of stay in extreme environments. When combined, occlusal features of the each arch are unique for an individual and easy to compare with antemortem dental record and may of great help in identifying an Individual.

1. Introduction

The world has seen a plenty of mass disasters in recent years like hurricanes, earthquakes, floods, aircraft accidents, fires, terrorist acts etc. All of these have led to the loss of the number of human lives & hence the identification of the dead is very essential.

Dental evidence can now be employed with reasonable reliability & also as an adjunct in the identification of an unknown body or remains. Dental tissues are the strongest tissues in the human body and therefore their characteristics remain unchanged even after long periods of stay in extreme environments. The teeth can often survive long periods of immersion under water, buried under the soil, fire, exposure to biological agents in the natural environment [1,2]. Dental materials used for restoring teeth are also resistant to post mortem destruction[3]. Identification by means of the distinctive features of the dentition is an important stage in the practice of forensic Odontology.

The important and distinctive features applied in forensic Odontology are, Morphology of the tooth is size, shape & occlusal surface, Eruption pattern, analysis of rugae pattern, Bite mark analysis, Lip prints and extraction of DNA from teeth[3].

Therefore, the use of dental evidence, especially the occlusal morphology of the teeth could be one of the methods of choice in establishing the identity of the dead since it is a simple & easy to evaluate. The occlusal morphology of an individual of the entire tooth in combination is almost as unique as fingerprints.

Identification of occlusal and incisal morphology will be useful in Identifying unknown human remains through dental records, Determining the gender of an unidentified individual, Age estimation of both the living and deceased, Analysis of bite marks. Different dental identification procedures using occlusal morphology can be done by Comparative & reconstructive, variation in arch pattern, variance in cusp& groove pattern and variation in shape &size.

The form &shape of dental arches are subject to considerable variation. They are usually Ovoid, U-shaped, and horse shoe shape. The proportion of the palate &associated dental arches are indicated by the palatal index, the ratio of the width to the length of the palate. The usual variations in occlusal surfaces of the mandibular molars are on the basis of number of cusps and groove shape are 5-y, 4-y, 6-y, 5-+, 4-+, and 6-+ [4].

Other features of dental morphology, which are useful in identification are Shovelling, Cusp of carebelli, Interruption groove, Lateral incisor variations, Premolar lingual cusp, Para style Protostylid[5,6].

Shovelling is a presence of mesial &distal marginal ridges on the lingual surface of the maxillary & mandibular anterior teeth. This is at a most important racial clue in dentition usually found in Asiatic Mongoloids &Amerindians.

Cusp of carebelli is a groove or a well developed tubercle on the mesiolingual surface of maxillary molars is most common among Europeans [6]. A *protostylid* is a supernumerary or accessory *cusp* located on the mesial half of the buccal surface of the molars is first reported in Eskimos [7].

The certain occlusal feature of individual teeth may help in the identification of of race, gender and age, even at the time of unavailability of Antemortem dental records. When combined occlusal features of the each arch are unique for an individual and easy to compare with antemortem dental record and may of great help in identifying. The success of forensic Odontology relies on sound knowledge of dental anatomy, histology, radiography, dental materials and developmental anomalies in teeth and jaws. It is the responsibility of every dentist to keep accurate & ordered dental records of all the patients, which may be of immense value in forensic identification.

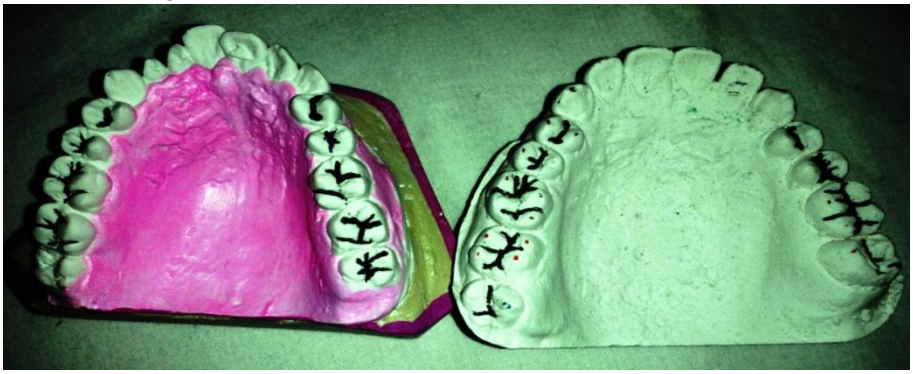

Figure 1: Photograph showing Dental cast exhibiting different occlusal morphology between two individual.

Disclosure

The authors report no conflicts of interest related to this study

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