NO-FEE OPEN ACCESS JOURNAL indexed in Scopus

Bulletin of the International Association for Paleodontology

Volume 19, Issue 1, 2025

Established: 2007

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We thank all the reviewers for their effort and time invested to improve the papers published in this journal.

Forensic odontology for edentulous cases – a diagnostic bereft*

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Bull Int Assoc Paleodont. 2025;19(1):83-85.

As stated by Federation Dentaire Internationale, “forensic odontology is that branch of dentistry which in the interest of justice deals with proper handling and examination of dental evidence and presentation of dental findings (1).” Forensic odontologists have now become an integral part of the entire medico-legal team. They study and interpret the maxillofacial complex to arrive at the final diagnosis involved in the crime scene. Thus, it is necessary for a forensic odontologist to have sound knowledge of dental, maxillofacial and forensic sciences to provide justice to each and every case (2).

Various methods have been used in the field of forensic odontology for various purposes such as age and/or gender estimation, estimation of individuals in mass casualties, etc [Figure 1] (3).

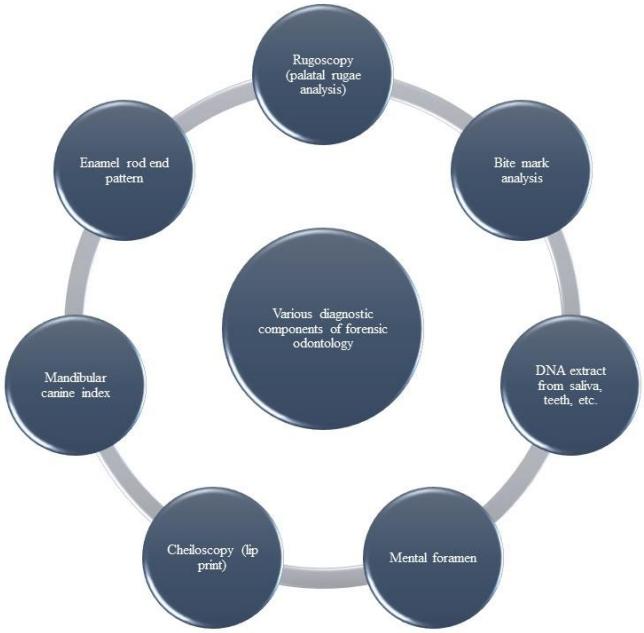

Figure 1. Different components of forensic odontology.

Commonly used source for these procedures includes tooth and its associated components such as enamel, dentin and/or pulp, etc. However, it is imperative to acknowledge the fact that teeth have an influence over the overall maxillofacial structure. Presence or absence of tooth will affect the alveolar bone, lip positioning, etc which can overall have a direct or indirect influence on the identification techniques such as position of mental foramen for identification of age and gender or lip prints in cheiloscopy.

Thus, it is crucial that research is conducted to find out methods which can be exclusively practiced to identify cases of edentulism. Rugoscopy where palatal rugae patterns are used for forensic identification is one such example, although studies done till date on edentulous cases using palatal rugae are limiting (4-6). Additionally, in absence of antemortem data, matching during postmortem is extremely difficult or impossible. Another major drawback of rugoscopy is wherein complex patterns are involved making it difficult to identify (7). All these conditions can potentially become more hinderous if the patient is edentulous with alveolar ridge resorption, etc. In certain cases, where no antemortem records are available for an edentulous person; labelled or marked dentures can serve to be useful. It consists of name of the individual alone or with other details like social security number, driver’s license number as well as city code (8). This demonstrates that there is a dire need to have more such methods which relay completely edentulous dental arch characteristics for forensic identification. Studies including the assessment of alveolar ridge height, shape in age and sex determination in both healthy and

patients affected with systemic diseases can be proposed and performed. Use of trabecular patterns, mental foramen position, incisive papilla position with midline for face reconstruction, etc can also be undertaken. These studies are feasible and yet impactful and the advent of cone beam computed tomography (CBCT), the overall conductance of these studies is very optimal.

In parallel, there also a need to study all the currently practice identification methods in edentulous dental arches to figure the specificity and sensitivity of these methods and whether these methods have accurate diagnostic value in practice. Forensic odontologists along with prosthodontists, oral radiologists and periodontists can work together to address such diagnostic bereft.

Statement on the use of artificial intelligence in manuscript preparation

Artificial intelligence was not used in the preparation of this text.

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