

Denture labeling in forensic dentistry

A new denture labeling system as an ante-mortem record for forensic identification

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Personal identification by means of deoxyribonucleic acid profiling and comparison of various dental structure are not always possible due to various reasons such as fire, putrefaction, edentulous patients. Denture labeling is very much helpful in identification of cadavers during mass disasters. According to Stenberg and Borrmann *et al.*, labels should consist of gender, phone numbers, address, job, national identity number, which also has a great impact on forensic dentistry.

In this study, it involves the lead foil paper from intra-oral periapical measuring of about 1 mm in thickness. Write the patient personal identification on the appropriate size foil paper. During flasking and packing, with the help of resin it has to place appropriately on the posterior lateral surface of the maxillary denture and posterior buccal and lingual flange in the mandibular denture. After this usual steps like trimming and polishing has to be done.

According to author, personal identification has an important role in forensic dentistry. But in edentulous patients and others scenarios where other techniques are not of much value denture labeling has a vital role. In addition, also other denture marking are mostly expensive, need skilled technicians, well-equipped labs, also jeopardize the strength and durability of dentures. The lead paper labeling techniques are best suited for all the recommended requirements for denture labeling.

Lenticular card: A new method for denture identification

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Denture marking has its significant application in personal identification in case of accidents, disasters and mass destruction of human beings, wars, also in identifying lost or misplaced dentures in health care centers, in coma or unconscious person. Lenticular technique is an advanced technology in which when the printed image is viewed from a different angle, image has the ability to move or change. Lenticular printing is a technique in which with the help of the lenticular lens, two or more images are combined. Images are sliced, interlaced and printed on the synthetic paper and laminated. Lenticular card made of polyethylene terephthalate, measuring of about 13 mm × 10 mm × 0.5 mm in size was processed with patient's details.

Under sterile condition, 0.7 mm depression made on the posterior buccal surface of maxillary denture with the help of the carbide bur. Followed by with the help of the self-cure acrylic resin, identifier has to incorporate make sure acrylic has to place around and not on the identifier. Lenticular card identification has an advantage over other methods in various ways such as, has no ill-effects on identifier, also store large and detailed information regarding patient's personal information. Lenticular images laminated so its waterproof, durable doesn't reacts with monomer.

It has its disadvantages in its own ways like printed information never be changed again, technique sensitive such as its surface should be free of resin if present, information are not able to see clearly, doesn't withstand the fire, rough handling can damage the image surfaces. Due to its cost-effective, easy handling, advantage of storing large data, makes it superior and effective denture marking system.

Incorporation of radio frequency identification tag in dentures to facilitate recognition and forensic human identification

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Radio frequency identification (RFID) a wireless electronic communication technology was first introduced in 1940,

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during World War II. An RFID technique, which consists of a reader device that converts the radio waves reflected back from the passive RFID-tag into digital information that are then passed to a computer with applications to interpret it is recommended for incorporation into a denture. A RFID-tag comprises of a serial number that identifies a person stored in a microchip with an attached antenna.

The tags used in the study were Italian manufactured passive, 12 mm length × 2.1 mm width, torpedo shaped, read-only low frequency tags and they were positioned so that their long axes were placed parallel to occlusal plane, with the antenna orientated mesially in an 12 mm × 13 mm deep depression made in a denture using carbide bur and later were autopolymerised with pink resin covering over it. The transponder contains no batteries and was sealed in a protective tube. The reader energizes the transponder by means of an electromagnetic field emitted through the reader's antenna. Signal received will be interpreted over a computer and patient information will be obtained with a maximum scanning range of 1 cm for the tag. Three such dentures were experimented. The study reveals that even though a general dentist without any special training or assistance from a laboratory technician can easily perform the incorporation of a microchip transponder in a denture, further investigations over RFID-tags technical performance are required.

Denture labeling: A new approach

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Forensic dentistry serves as an important tool to neglect mistaken identity in any medicolegal investigation. Labeling dentures can be important in identifying an individual, but no standard method has been developed yet. An easy, quick and esthetically acceptable method of denture labeling is illustrated in this article. Complete denture trial is done in a routine manner until the dewaxing stage, then write the required patient detail with a ball tipped pen in a 2-5-0.6 cm size cut a piece of lead foil from a used intra-oral periapical (IOPA) and place the lead foil along with a small amount of heat-cure acrylic resin in the posterolateral region of the palate (in the maxilla), in the lingual flange (in mandible). Sandwich the foil with acrylic and chip blow the acrylic 2-3 times with a blow torch followed by regular packing, trail closure, polymerization, deflasking, trimming and polishing procedures. An IOPA radiograph is exposed in the area where the lead foil was placed, which revealed patient information on it.

The label used in the study can withstand high temperature also it requires no additional instrumentation apart from the one that are readily available in a dental laboratory. An additional benefit is the incorporation of a radiographic substance to help locate an aspirated temporary partial

denture. A routine marking of all dentures with this cosmetically appealing labeling technique, which satisfies forensic requirements is recommended.

A simple and inexpensive bar-coding technique for denture identification

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Bar-coding is the most advanced and upcoming methods for identifying dentures. After scanning the bar-code with specific scanning devices, it shows the patient's personal information, which can be easily accessed and edited according to the need and which can be transfer to the computer.

Apart from incorporating a large amount of patient's date, it also helps to store data regarding treatment procedure. It also helps to compare and minimize the human errors, more accurate than the manual entries. Basic requirement of bar coding are as follows, must be easy to handle, access, edit in every possible situation, doesn't alter the durability, property of denture material, must be cost-effective, temperature resistance and esthetically pleasing, must adapt well to the supporting tissue. Ceramic marking system is employed to overcome drawbacks of non-metallic labels and esthetically pleasing as well. Printed laminated paper measuring of about 15 mm × 25 mm is incorporated in maxillary dentures.

Techniques involve the application of heat cure resin on the palatal surface followed by placing the laminated bar code in an upside down fashion. After curing, finishing and polishing are done. Using various software, bar-code are generated and again scanned with specific laser devices to access the patient's information when needed. Due to its clinical significant and ease of use, cost-effectiveness future research should be encouraged in the field of bar code.

Perceptions and preferences on denture marking in an Indian sample

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Both institutional settings and post-mortem forensic scenarios are beneficial from obtaining the identity of denture wearers through various denture marking techniques. Since its introduction two decades ago various techniques have been assessed and followed, but patients perception toward denture marking and preference for different markers are of great value. Perceptions and preferences on denture marking in an Indian sample were assessed in this study done by Ashith *et al.*

The sample comprised of 101 adult edentulous subjects who were handed a questionnaire, which included a provision for the collection of basic demographic information and gave a brief background to denture marking, its use in identifying dentures, followed by thirteen questions. The various denture markers presented as models for patients were photographic model, stainless steel matrix band with name inscribed on it, a white paper strip with name written on it and laminated bar-code on which patient information could be stored using an optical writer/reader. The results showed that only 12 patients were aware of the denture marking system and 65 of them did not want to get their dentures marked with eight in 65 said that they would prefer denture marking in future.

It was found that awareness of denture marking in the Indian sample surveyed was low, almost to two-thirds of the patients surveyed were not interested in getting their dentures marked in spite of them knowing the advantages to marking and that the education level and other socio-demographic factors along with population specificity influences denture acceptance in a given population.

Subscriber identity module: A new method for denture identification

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Surface marking and engraving denture marking techniques plays an important role in forensic odontology, but they create rough surfaces that can be annoying for the patient in terms of comfort and maintenance of hygiene. Instead a new simple denture marking system using subscriber identity modules (SIMs), which can provide personal information, such as a phone book entries and text messages, as well as operational information, such as that involving location can be considered.

Wrap cello tape over micro SIM card of cut dimensions 12 mm × 15 mm size was obtained from a normal 15 mm × 25 mm SIM card, which was prestored with patients information. SIM card was placed in the slot that was prepared in the processed acrylic denture with wider dimensions than the micro SIM card during wax trial on the posterior lingual flange. After applying separating medium over the slot and the SIM card, mix a small amount of auto-polymerizing acrylic resin and apply to the empty space remaining between the SIM card and the upper horizontal and left vertical borders of depression and process the acrylic flap.

A SIM card contains 16-256 KB of memory and can store sufficient amount of patient's information in the form of messages or contacts also the information stored can be viewed and modified using a cell phone. In addition, the SIM card can be inserted in the surfaces of the posterior lingual flange of the mandibular denture or buccal flange of maxillary denture. These areas are not removed during the post insertion adjustments or routine relining procedures and are better resistant to fire since denture, which remains in the mouth during incineration is well-protected by the tongue and surrounding soft-tissues. Author recommends that further investigations are required to evaluate this simple, cheap, easy to use and cosmetically appealing technique for denture identification technique.

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