

Denture Marking with the Use of a Memory Card

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ABSTRACT

Background: Marking dental prosthesis has always been considered an important part of forensic dentistry. Denture marking is useful for identification of a person during massive calamities, a natural disaster such as earthquake, tsunami etc. Various denture identification systems have been reported in the literature. This case report describes a case of incorporation of memory card for denture identification. The memory card contains all patient-related information. This is a simple and affordable method of denture identification.

Keywords: Forensic odontology, Memory card, Denture identification, Surface methods, Inclusion methods.

INTRODUCTION

Forensic odontology is the branch of dentistry, which deals with the proper handling and examination of dental evidence and the proper evaluation and presentation of dental findings in the interest of justice. Most dental identifications are based on restorations, caries, missing teeth and/or prosthetic devices, such as partial and full removal prostheses, which may be readily documented in the record.¹

The importance of denture identification was brought into focus by Dr Robert H. Griffiths during his tenure as a president of American Dental Association.² Labeling of all dentures is recommended by most international dental associations and forensic odontologists.³

There are many advantages to denture identification marking. Firstly, it enables the identification and return of lost or misplaced dentures, which is essential in institutions such as hospitals and residential care homes. Secondly, it is beneficial in post-mortem identification of the

denture wearer.⁴⁻⁶ The denture marking should be biologically inert when incorporated into the denture, inexpensive, easy and quick to apply, readable, durable without jeopardizing the strength of the prosthesis.⁷

A number of labelling systems are available and can be broadly separated into either surface marking methods or inclusion systems. Posterior regions of the lingual flange of mandible and palate in maxilla are common sites for denture identification.³

This case report describes a case of denture marking with an inclusion method using a memory card. Memory card is an electronic storage device used to store a wide range of data files such as audio and video clips, images and text documents. It is small in size, re-recordable, and it can retain data without power. It stores all the relevant information regarding the patient's identification and photograph. The data can be read by any personal computer using windows operating systems with the help of memory card reader.⁸

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CASE REPORT

A 56-year-old male patient reported to the Department of Prosthodontics and Crown & Bridge with a chief complaint of difficulty in chewing food. Medical history was not contributory. Intraoral examination revealed a completely edentulous maxillary and mandibular arch. The treatment plan was to fabricate a conventional complete denture with denture identification. The patient was explained in details about the benefits of denture identification, and he agreed for the procedure. Informed consent of the patient was taken. The incorporation of memory card for denture marking was planned. In case of any mishap, the memory card would help in the forensic study. A wide range of memory cards is available in the market. They differ in sizes and storage capacities. They have different brand names like SanDisk, Sony and Samsung etc.

SanDisk SD (secure digital) memory card (Fig.1) was chosen in this case for denture marking because of its easy availability, economical price and universal acceptance. A device, memory card reader (Fig.2) was used to connect the memory card to computer, for accessing the data on the card. Memory card and memory card reader, together (Fig.3) function as a pen drive.

PROCEDURE-

1. All the relevant information regarding the patient identification as name, age, sex, occupation, address, contact number, identification mark on the body and the photograph of the patient were stored in the memory card (Fig.4).
2. The complete dentures were fabricated following the routine standard clinical and laboratory procedures (Fig.5).
3. The routine denture insertion was completed (Fig.6).
4. It was planned to incorporate memory card in the posterior region of the mandibular lingual flange. The mandibular denture was cleaned, disinfected and dried before beginning the incorporation process.
5. An (18 × 15 × 2) mm recess was made in the mandibular denture's external surface on the posterior region of the lingual flange with a carbide bur. This dimension is required to incorporate the card (15 × 11 × 0.7) mm without structurally weakening the denture.
6. The previously programmed card containing patient details was wrapped (Fig.7) in a thin cellophane sheet to protect it from polymer powder and liquid. Care was taken not to increase the thickness of the memory card.
7. The card wrapped (Fig.8) in cellophane was placed in the recess. Minor adjustments in recess size were made to accommodate wrapped card. Then wrapped card was covered with clear auto polymerizing acrylic resin (DPI-RR cold cure, Dental products of India Ltd. Mumbai) eliminating any trapped air bubbles.
8. The denture was then processed in a pressurized container with warm water (40°, 25 psi), was finished and polished (Fig.9).
9. The card was visible through the clear acrylic resin and was esthetically acceptable to the patient. Denture insertion was done, and the patient was given all post denture insertion instructions.
10. The patient was recalled and checked at regular interval. The memory card did not pose any problem to the patient. Speech and function of denture were well accepted by the patient (Fig.10).

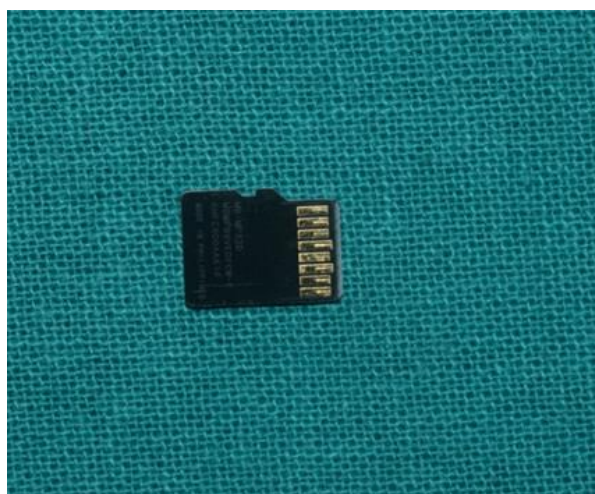


Fig 1: Memory card.



Fig 2: Memory card reader.

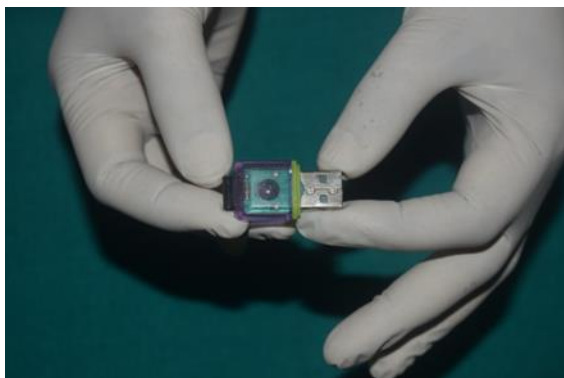


Fig 3: Memory card inserted into card reader.



Fig 4: Patient information being transferred to memory card with help of card reader.



Fig 5: Finished complete denture.



Fig 6: Denture insertion.



Fig 7: Wrapping of card with cellophane.



Fig 8: Wrapped card.



Fig 9: Embedded memory card covered with clear acrylic resin for denture marking.



Fig 10: Satisfied Patient with a denture.

DISCUSSION

The dentist should always inform the patient about the obvious benefits of denture labelling and motivate the patient for the same.⁹ Denture marking methods have been divided broadly into 'surface marking' and 'inclusion methods'.^{10,11}

In the surface marking method, the marks are located on one of the denture's surface and can be done by 'scribing or engraving' the denture itself.^{10,11} surface marking methods are easy to apply and relatively inexpensive. The disadvantage of wearing off can be managed by following the technique appropriately.³

The inclusion methods involve incorporation of the identity mark within the denture base material hence rendering them relatively permanent. Various materials as memory card, onion skin paper, soft metal band, stainless steel tape, lenticular card, bar code, lead foil, photograph, aadhaar card QR code on photographic paper, can be incorporated with patient details into the dentures by either pre or post-fabrication methods.^{12,13} The inclusion methods of denture labelling are definitely more permanent and provide a positive result, but it tends to weaken the denture structure and also create minute porosity.³

Use of memory card has several advantages. It does not interfere with oral function or strength of denture because of its small size. No special training or equipment is required for the fabrication procedure.¹² Cost of a 2 GB memory card is around 250 Indian rupees making the procedure a viable option. The data will remain stable in the card. In

the event of a disaster, the card can be retrieved from the denture and read on any computer using a card reader which is easily available.⁸

There are certain limitations to the use of a memory card. In the event of an excessive impact, which can damage or fracture the denture, the card may also be damaged.⁸ Exposure to fire can cause damage to the card. In a study conducted by Rotzscher et al., it was found that if the acrylic dentures in the skull were heated at 400-600° C for 30 minutes, only the front teeth of acrylic dentures were burned after 10 minutes and after 16 minutes anterior parts of dentures until premolars were burned.¹⁴ In fire accidents or aviation disasters, temperatures of 600° C are usually encountered.¹⁵ In such cases, the memory card will be damaged and will not provide any information. During any mass disaster, if the patient loses marked denture, denture marking will be of no use. If the memory card is damaged by carbide bur during retrieval, it will not provide any valuable information. Benefits are more as compared to a few limitations of using a memory card for denture marking. It is a simple and economical method.

CONCLUSION

The denture identification system is immensely helpful for the branch of forensic odontology. Advantages of the denture marking should be explained to all patients.¹⁶ Use of memory card is a simple inclusion method, which can be performed easily without any special equipment within a limited amount of time. The dentists must be encouraged to routinely mark all dentures using any affordable method.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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