

Micro secure digital card: A novel method for denture identification

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Abstract

Aim: Denture labeling is of vital significance in social and forensic scenario. Numerous published work have attempted to present best method for denture marking, however not all satisfy crucial requirement either in terms of cost or storage of large amount of information. Hence, this paper describes a simple, cheap, and feasible denture marking system using portable Micro Secure Digital (MicroSD) card. These cards are created to store, modify, and view large amount of information with mobile phones, which forms an important part in majority of household in India. **Materials and Methods:** After try-in make a depression slightly wider than the size of the MicroSD card on the external lingual flange of the trial mandibular denture. Process the denture together with acrylic wax flap according to manufacturer's instructions. The acrylic flap is planned in such a way that it is well-flushed with surrounding areas and can be lifted on one side to access the card. MicroSD card is placed in the denture and flap is closed. **Conclusion:** The proposed method is simple, cheap, and can store large amount of information.

Key words: Denture marking, forensic dentistry, MicroSD card

Introduction

Dentists and forensic odontologists have long acknowledged the importance of denture marking.^[1-4] Through denture marking; one can identify the denture wearer in cases of amnesia or senility, loss of consciousness, postmortem in case of natural disasters, and forensic crime scene investigations. The ability to make a quick dental identification can lessen the emotional stress of loved ones and reduce the financial cost of the search.

Researchers have described a variety of surface marking and surface inclusion techniques in published literature.^[5-23] Surface marking includes engraving or scribing on the cast

or the denture itself. Surface markers (spirits, fiber-tip pens) are inexpensive, but can be easily removed by denture cleansers, abrasives, or antiseptic mouthwash.^[5]

Surface inclusion techniques include metallic^[13] or nonmetallic materials, microchips,^[14,15] Radiofrequency identification (RFID) tags,^[16-18] barcodes,^[19-22] and lenticular card.^[23] Although microchips, RFID tags, and barcodes allow fast and reliable denture identification, they are costly and require special equipment to view the information.^[16-22] Microchips^[14,15] do not have large amount of data space and data cannot be modified by the dentist. The barcode^[19-22] also has disadvantage in terms of difficulty in scanning opaque pigmented acrylic resin. In addition, curvature of denture may cause distortion of barcode, making it unreadable. In lenticular card, the information can never be changed once it is printed.^[23]

Hence, an attempt is made to present a simple cheap and feasible denture marking system using Micro Secure Digital (MicroSD) card. MicroSD cards are new and portable. A MicroSD card typically measures 11 × 15 × 1 mm and weighs approximately 0.5 g. The storage capacity for MicroSD cards can range from 128 MB to 4 GB. These cards

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are created to store, modify, and view large amounts of data with mobile phones [Figure 1].

Procedure for denture marking

Stage 1: Using a MicroSD card (Samsung Electronics Co; Japan), patient's information is stored in the denture. Information is to be stored in the form of a photograph, video, and text. Laminate the MicroSD card before incorporating in the denture

Stage 2: Using a lecron wax carver, cut a depression slightly wider than the size of the MicroSD card on the external lingual flange of the trial mandibular denture. Check if the memory card fits in the depression

Stage 3: Process the denture together with a wax sheet measuring $11 \times 16 \times 0.5$ mm in accordance to the manufacturer's instructions

Stage 4: Disinfect, clean, and dry the prosthesis before attaching the acrylic flap to the depression. Place the attachment so that it is well-flushed with the surrounding areas and can be lifted on one side to access the card. Make two grooves on the acrylic flap and attach elastics with autopolymerizing acrylic resin (Rapid Repair; Dentsply Intl, York, PA). Attach the acrylic flap to the denture with

autopolymerizing acrylic resin (Rapid Repair; Dentsply Intl, York, PA) by creating corresponding grooves. The other end of the flap (which can be lifted) carries a 1 mm acrylic extension that fits in the corresponding groove. This extension can be opened whenever it is necessary to remove the card [Figures 2 and 3]

Stage 5: Process the denture in a pressurized container with warm water (100 F, 20 psi) for 15-20 min. Finish and polish the denture

Stage 6: Place the MicroSD card in the denture and close the flap [Figure 4].

Discussion

The MicroSD card is a useful tool for denture marking. With the MicroSD card, data can be stored in the form of treatment photographs, treatment videos, family photos, and videos. The MicroSD holds large amounts of information that can be easily modified. In addition, the stored data does not need sophisticated equipment for viewing, and can even



Figure 1: Micro Secure Digital (MicroSD) card with patient's information

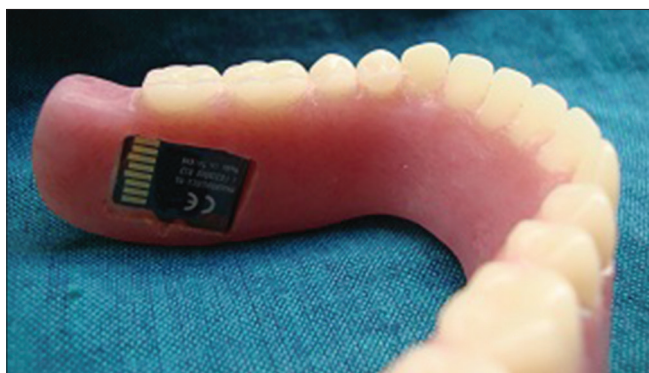


Figure 3: MicroSD card incorporated in the denture



Figure 2: Acrylic flap and depression prepared for identifier in mandibular complete denture



Figure 4: MicroSD card covered with acrylic flap

be viewed using mobile phones. With an adapter, data can be moved from mobile phone to computer or files from your computer to other devices, regardless of the type of memory card. The data is very easily accessible to people across the world with the increasing mobile penetration in developed as well as developing markets. At this time, the cost of MicroSD card is 150 rupees. The cost of this MicroSD card is significantly less than the costs of using a microchip or barcode system for denture identification.

In the present technique, the identifier can be inserted on the lingual flange of the mandibular and buccal flange of maxillary denture. These sites are better resistant to fire, esthetically acceptable, and not removed during adjustments or routine relining procedures.^[8] The manufacturer claims that MicroSD cards were designed to withstand a 24-h test in sea water and to withstand the weight of a 1.6 ton truck, thus protecting data from daily minor mishaps to major impacts.

This method of denture marking can be used both for new and existing denture prosthesis that have not been labeled. A dentist could easily perform this procedure without special training or the use of a dental technician. The disadvantage of this technique is that the marker cannot be permanently sealed in the denture because the MicroSD card needs to be removed and inserted into an electronic device to view the data. In addition it would be restricted to use in dentures with a long enough or large enough flange.

To check durability, the MicroSD card was kept in the denture for 2 months to see if there is any reaction with acrylic. There was no deterioration of data and it was stable with time. The process of using a MicroSD card in denture marking is new. Future research will be required to better understand the MicroSD card's ability to withstand postmortem assaults.

Conclusion

In this paper, we described a simple, easy-to-use and cost-effective design for denture identification. The MicroSD card can store abundant information. The stored data can be easily viewed through a mobile device. This technique can be used for both complete and removable partial dentures.

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