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Case Report

DENTURE LABELING: A BOON OR BANE

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Abstract

Identification of a person through forensic science is an art of giving the corpse a name. Denture markers play an important role in forensic odontology and also in identifying a deceased person. A number of methods are used. Out of the differently available denture markers, the bar-coding system is a way of collecting data from the mobile. It can be easily incorporated during the fabrication process of the denture and thus could be helpful in identification. This article reviews the importance of bar-coding and how easily it can be used in the routine procedure.

Keywords: Barcode, prosthodontist, denture markers, forensic dentistry, mobile camera

Introduction

Forensic dentistry is one of the most innovative branches of dentistry, which helps to identify victims in mass disasters and many medico-legal investigations.[1] Identification of dentures provides vital clues in recognizing the denture-wearer and takes vital significance especially in the field of forensic dentistry, thus bringing closure to the case.[2] Prosthodontists play an important role in forensic dentistry as they are concerned with the fabrication of various prosthesis which serves as an important tool for identification.[3]

Denture marking is recommended by forensic odontologists and most international dental associations. In few countries, the labeling of dentures is regulated by legislation.[4] The American Board of Forensic Odontology guidelines indicates that the most dental identifications are based on missing teeth, caries, prosthetic devices, and restorations. The purpose of denture marking not only assists in the return of a lost denture, but it will also add the identification of edentulous persons who are either living or deceased.[5] Denture marking is regulated by law only in Iceland and Sweden. In 1986, the "National Board of Health and Welfare" of Sweden, which is the supervising authority of the health sector in Sweden, legislated and made it necessary for all dentist practitioners to comply with the following requirements: "The patient shall always be offered the opportunity to have her/his dentures marked with a personal number." In addition to the above, the dentist should inform clearly and motivate the patient to the advantages of the denture marking.[6,7] In the USA, denture

marking is mandatory in 21 states, whereas in New York state denture marking is performed only after the request of the patient. Several states impose the duty to mark dentures on long-term care facilities and denture marking is mandatory for the army.

The two main methods in marking dentures are inclusion method and surface method. The surface method includes scribing and embossing technique. In inclusion methodology, the markers are enclosed in the denture. The various denture markers embrace quick response code (QR Code), denture barcoding, lenticular card, ID band, paper strip, T bar, laser etching, electronic microchips, photographic, radiofrequency identification (RFID) tags and subscriber identity module (SIM).[8-10] A barcode is an optical machine-readable representation of data which can be read with the help of a barcode scanner. Barcodes reveal an outsized quantity of information about the patient compared to labels bearing simply names and ID numbers. The barcode image represents general data, such as name, age, sex, address, occupation, phone number, and nationality of the patient. Quick response code(QR) is a two-dimensional (2D) type of barcode.[11,12]

Case Report

A 58-year-old male blind patient reported to the Department of Prosthodontics, Manav Rachna Dental College, Faridabad with the chief complaint of missing upper and lower teeth. Patients had no relevant medical history. Past dental history revealed that he had undergone extractions of teeth 6 months ago due to chronic periodontitis. Intraoral examination revealed that the maxillary and mandibular arches were completely edentulous. All treatment modalities were discussed with the patient and due to low socio-economic status, surgical management and implant prosthetic options were discarded. Keeping all these concerns in mind, the treatment plan decided was to provide him with a conventional bar coded denture.

Technique:

Firstly, the patient was motivated regarding the use and importance of denture marking system. A primary impression of maxillary and mandibular arch was made with impression compound (Y Dents, MDM Corp). The maxillary and mandibular impression were poured in plaster of Paris (Kaldent, India). A special tray was fabricated with auto polymerizing acrylic resin (DPI – RR Cold Cure). Border molding was done with green stick compound (Pinnacle, DPI, India). A secondary impression of maxillary and mandibular impression was made with zinc oxide eugenol (DPI Impression Paste). Impressions were poured in dental stone (Kalstone, India). Master casts were obtained. Occlusal rims on the maxillary and mandibular denture bases were constructed and contoured for adequate lip support in the anterior region to simulate the vertical and horizontal overlap of anterior teeth. The vertical dimension of occlusion was established. The face-bow transfer was made followed by a recording of jaw relation which was secured in a semi-adjustable articulator for teeth arrangement. The artificial teeth were selected and arranged in centric occlusion. The denture trial was carried out and patient's consent was obtained. The conventional procedures of flasking, dewaxing were performed. Then curing of the dentures was carried out. The patient detail obtained from the case history was converted to a QR Code with the help of QR Code generator software. The QR Code was printed on A4 sheet and cut. The size of the QR Code was measured and a groove (1.5 mm depth) in accordance with the QR Code size was created on the lingual/palatal flange of the denture without affecting its structure. A clear 'Acrylic Sheet' of 1 mm thickness was taken and cut to the dimensions of the QR Code. The QR Code was placed on the groove created and the acrylic sheet cut to its size was placed over it. The margins of the clear acrylic sheet were fused to the denture with the help of an auto polymerizing acrylic resin. The

final denture was finished and polished in the usual manner. The denture was inserted into the patient's mouth and was inspected for comfort, retention, esthetics, and function. A smartphone (iPhone 6S) was used to scan the QR Code and the code was deciphered in seconds.

Conclusion

The prosthesis or any appliances such as spectacles, hearing aids, complete dentures or any prosthesis that offer space for bar-coding them with individual's information would prove of valuable assistance in bio-identification of the individual. The major reason for not marking dentures maybe lack of awareness of the various methodologies and a belief of its little importance. This has been often stressed by the forensic odontologists. Therefore, an appropriate framework within dental education is needed to ensure that both dentists and dental students are exposed to denture marking methodologies. Among the denture labeling, the bar-coding technique provides us the better data's and because of improving technologies one and all have a Smartphone with the assistance of which we can easily view the details present in the denture barcodes. Accordingly, in future, researches ought to shift their focus on developing the barcode technique so as to increase the domain of its usage.[13]

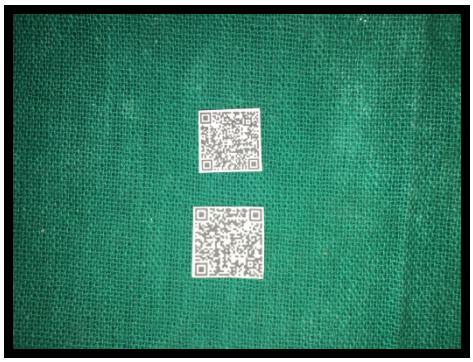
Frontal view

Profile view

Preoperative OPG

Maxillary Ridge

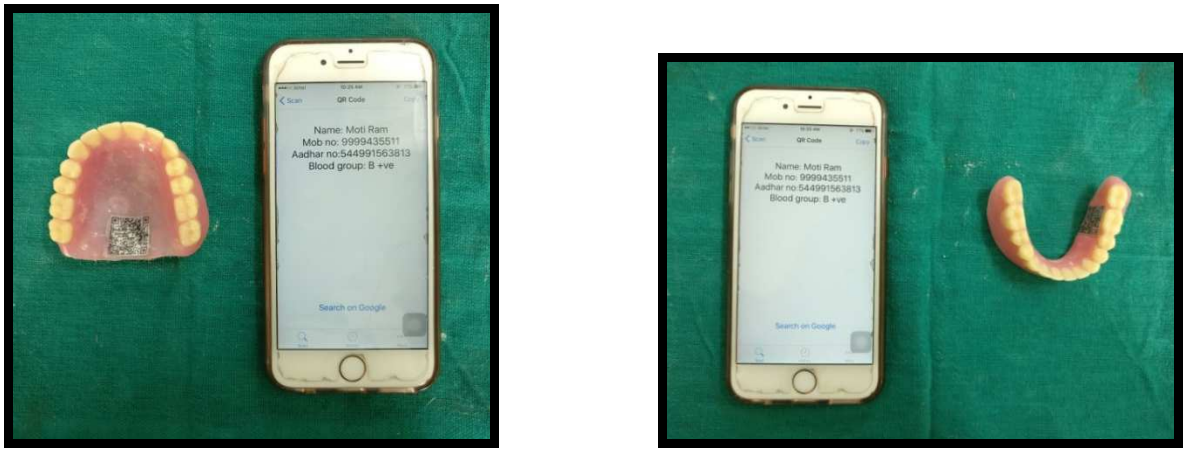
Mandibular Ridge



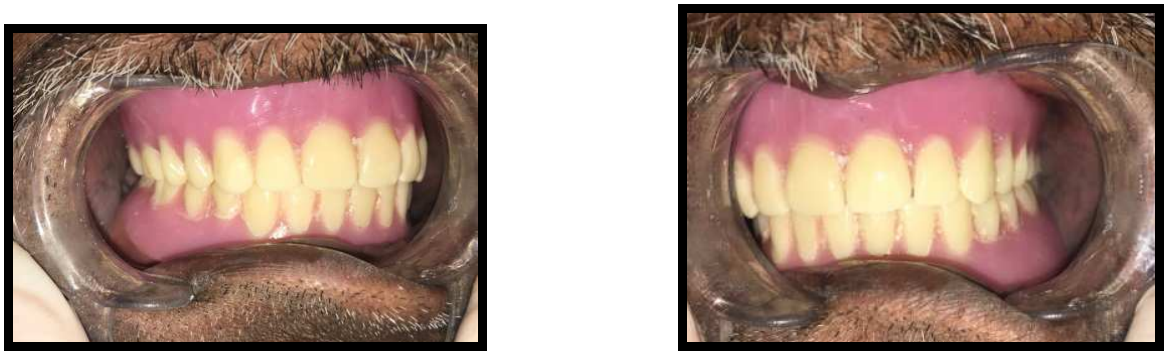
A computer-generated barcode was fabricated containing all the essential details of the patient such as name, phone number, Adhaar no. and blood group

Space was created in the palatal region of the maxillary denture and lingual region of mandibular denture and barcode was embedded in the space and sealed with waterproof clear acrylic sheet

Scanning the QR Code using Smart Phone



Quick response code deciphered



Final denture insertion (Lateral view)

Final denture insertion (Frontal view)

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