

A simple and inexpensive bar-coding technique for denture identification

Sonali N Nalawade,
Sanjay B Lagdive,
Gangadhar SA,
Aruna J Bhandari
*Department of Prosthodontics,
Rural Dental College,
Pravara Institute of Medical
Sciences, Rahata, Ahmednagar,
Loni, India*

Address for correspondence:
*Dr. Sonali N. Nalawade,
Department of Prosthodontics,
Rural Dental College,
Pravara Institute of Medical
Sciences Rahata, Ahmednagar,
Loni 413 736, India.
E-mail: dr.sonalinawade@
yahoo.com*

Abstract

A number of commercial methods for identifying dentures are available. They can be either invasive or noninvasive techniques. The less sophisticated procedures include simple engraving with bur, and more sophisticated procedures use labels or chips. Bar coding system is a way of transferring data to the computer and huge data can be stored as a record. Bar coding can be easily incorporated during acrylization of the denture and thus could be used in individual identification.

Key words: Bar code, heat-cured clear acrylic resin, scanning device

Introduction

Bar coding is a way of transferring data to the computer. The bar-code symbol represents general data such as name, age, sex, address, occupation, phone number, and nationality of the patient, which can be scanned with a specific scanning device to transfer information to the computer.

After scanning the bar code, the information can be accessed, added, or subtracted. In today's world we cannot find a single product without bar code associated with it.

Advantages of bar coding


Labeling of dentures can be important in early identification of the dead and injured people in the event of major

disasters such as earthquakes, floods, plane crashes, and accidents; for patients suffering from dementia; or the denture itself being inadvertently misplaced on admission of the patient in the hospital.^[1-6]

Denture identification is important for hospitalized patients or patients in geriatric institutions. Loss of dentures or confusion in identification of denture is not uncommon, particularly during cleaning by the nursing staff. The loss is of greater consequence to the elderly patient who may have difficulty in learning to control new dentures.^[6]

As a bar-code system can incorporate large amount of data, data pertaining to the treatment procedure can be stored as a record. The same bar code can be accessed, modified, or updated with the scanning device. Bar codes are more efficient and provide a method to track and store information about individuals. They serve an important role and provide advantages as compared to manual entry of the information. Manual tracking leads to many human errors, whereas bar codes are nearly 10,000 times more accurate than are the manual entries.

The system speed allows tracking to be done quickly. They are least expensive and a reliable method of entering

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data. Bar-code verification is the best way to ensure 100% scanning.

Bar coding is also helpful in medicolegal aspects and in forensic odontology.

Some of the basic requirements of bar coding are as follows:^[1,2,6,7]

1. Must be easy to incorporate
2. Must give definite information in every situation
3. Must not alter the structure or properties of the material of the dentures
4. Must not affect adaptation of the dentures to the supporting tissues
5. Must not affect aesthetics
6. Must resist high temperatures
7. Must be inexpensive.

The various sites where bar codes can be incorporated are palatal portion of the maxillary denture, external posterior buccal surface of the denture, and lingual flange of the mandibular denture.^[1,4,8]

Labeling can be made up of metallic or nonmetallic materials, such as microlabels, chips, acrylic resin strips, disks, or printed papers, that are incorporated into the denture base during the flasking and/or the packing process.^[8-16] At times, the nonmetallic labels cannot withstand high temperatures, and for this reason a newer technique of ceramic marking system can be used that can endure high temperatures and are aesthetically pleasing as well.^[1]

Bar coding can be done in complete dentures, removable partial dentures, fixed partial dentures, and maxillofacial prosthesis.^[1]

Bar coding is done on a printed paper of 15 × 25 mm, which is further laminated and then incorporated in a maxillary complete denture. The major advantage of the bar-coding technique is that it can incorporate large amount of data.

Technique

Various types of software are available that can facilitate encoding of patient's information and generate a corresponding bar code. With the help of appropriate software, the encoded information can be retrieved by scanning the bar code with the precise laser staff [Figure 1].

The procedure involves a compression molding technique of denture fabrication. First, a heat-cured clear acrylic resin Dental Products of India (DPI) is applied on the palatal surface (near the first or second molar region) of the maxillary mold, followed by placing the laminated bar code in the inverted fashion [Figure 2]. Over the bar code, a heat-cured pink acrylic resin DPI is applied and packed in the usual manner. The processing and acrylization is done

after the standard curing cycle. Then, the retrieved denture is finished and polished [Figure 3]. The palatal surface of the maxillary denture was chosen for incorporating the bar code because of its larger surface area and to avoid distortion [Figure 4].

Following are the limitations of this technique:

- Patients need to carry their dentures wherever they go.
- Denture incorporated with a bar code if not in use should be thoroughly discarded on medicolegal grounds.

Discussion

Heath and Stevenson proposed different techniques for writing names on removable dentures in 1980s.^[1,16] In the 1990s, researchers such as Ling, Furst, Ibrahim, and Berry wrote personal information on different materials that were then buried in acrylic.^[1,8,17-19]

With people becoming more techno savvy at the dawn of twenty-first century, ID labels became more prevalent by

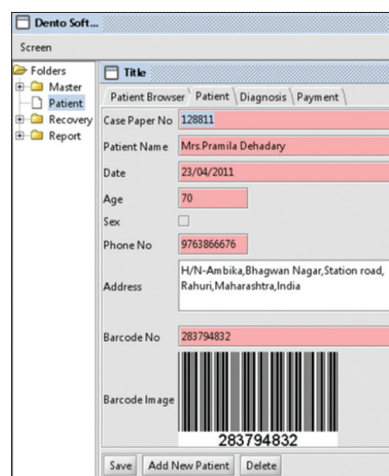


Figure 1: Information retrieved after scanning the bar code

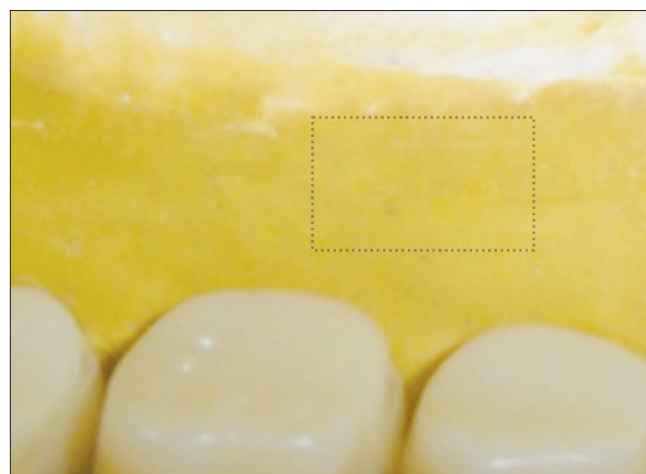


Figure 2: Palatal surface of the maxillary mold showing the site for bar-code incorporation



Figure 3: Finished and polished denture

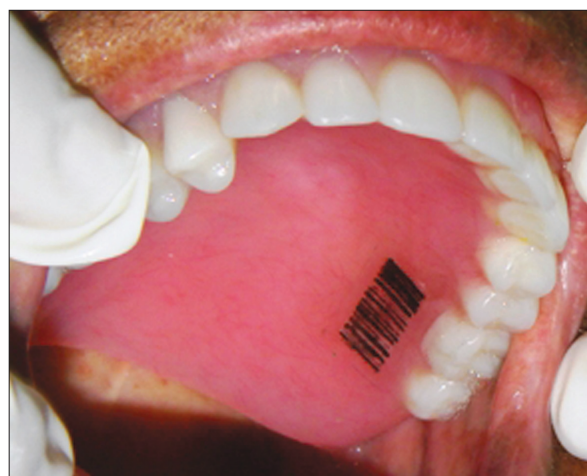


Figure 4: Intra-oral photograph

making use of microchips and radiofrequency devices.^[1,6] In 2002, Rajan and Julian reported a method based on electronic microchip manufacturing technology.^[1,20] To maximize the amount of data that could be written on a metallic ID label, Ling *et al.* used a high-power copper vapor laser in 2003.^[1,21] In 2004, Millet and Jeannin implanted a radiofrequency ID transponder in a complete upper denture.^[1,6]

ID labels incorporated on the prostheses should not be affected by daily routines followed by the patient. In addition, the surfaces of the labels should be smooth and have high polish to prevent plaque formation and facilitate hygiene maintenance.^[1] Hence, in future, researches should focus on developing the bar-code technique so as to increase the domain of its usage.

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