

Denture Barcoding - The Clever Way

Chhavi Grover^{1*}, Purnima Radesh², Pulkit Thakur³, Gaurav Issar⁴, Siddharth Bansal⁵

¹Post Graduate Student in Orthodontics at I.T.S Dental College, Muradnagar, Ghaziabad and Former B.D.S Student at I.T.S Dental College, Muradnagar, Ghaziabad, India.

²Senior Research Fellow, Faculty of Dental Sciences, King George Medical College, Lucknow, India.

³Prosthodontist, Former Post Graduate Student at I.T.S Dental College, Muradnagar, Ghaziabad, India.

⁴Prosthodontist and Professor at ITS Dental College, Muradnagar, Ghaziabad, India.

⁵Prosthodontist at Bansal's Dental Clinic and Implant Center and Former Reader at I.T.S Dental College, Muradnagar, Ghaziabad, India.

***Corresponding Author:** Chhavi Grover, Post Graduate Student in Orthodontics at I.T.S Dental College, Muradnagar, Ghaziabad, India (Former B.D.S Student at I.T.S Dental College, Muradnagar, Ghaziabad), Tel: +91-9717662277, E-mail: chhavi_0414@hotmail.com.

Citation: Chhavi Grover, Purnima Radesh, Pulkit Thakur, Gaurav Issar, Siddharth Bansal (2023) Denture Barcoding - The Clever Way. J Forensic Crime Stu 11(1): 101

Abstract

Forensic Odontology is the means to identify a person from their dental remains. Various methods are there for identifying an individual. In this study, the main aim is to identify an edentulous person making a positive identification by means of Barcode. A Barcode is a machine-readable code in the form of numbers and a pattern of parallel lines of varying widths, printed on a commodity. The study focuses on creating dentures with identification marks/labels using patient's identity proofs such as Aadhar Card, PAN card, Voter ID card. And these will be incorporated in the denture after acrylization using cost effective and minimally altering method. This is an attempt to incorporate identity marks in dentures that can be provided by a General Dental Practitioner on day-to-day basis.

Keywords: Denture; Barcoding; Human Identification; Aadhar Card; Pan Card; Voter Id Card; Forensic; Barcodes; Economical

List of Abbreviations

EPIC- Electoral Photo Identity Card; PAN - Permanent Account Number; SC- Schedule Caste; ST- Schedule Tribe; OBC- Other Backward Cast; RTA/RTO- Regional Transport Authorities/Offices

Background

The word forensic comes from the Latin word *forensis*, meaning “in open court” or “public.” When you describe something as forensic you usually mean that it has to do with finding evidence to solve a crime. It could also mean that it has to do with the courts or legal system. [1] The word Forensic is defined as relating to or denoting the application of scientific methods and techniques to the investigation of crime and Odontology means study of teeth. Thus, Forensic Odontology is the application of dental science onto legal investigations, which is primarily involving the identification of the offender by comparing dental records to a bite mark left on the victim or an object left at the scene of crime, identification of unidentified human remains based on by comparative identification of using ante mortem dental records.

Historically, the earliest case of dental identification is recorded in ancient Rome with the Agrippina who identified decapitated head of Lollia Paulina with her “distinguished teeth” [2]. In year 1775, Dr Paul Revere became first dentist who performed forensic dental identification in United States[3] using his dental records for identifying the body of the remains of Gen. Dr. Joseph Warren by finding the ivory dentures he crafted and wired to his Warren’s jaw, after his body was exhumed after nine months.[4] Since then identification using dental tissues has offered a new perspective in various aspects of identification of unclaimed human remains in mass disasters both man-made and natural scenarios.

This meant that identification using dental structures has gained more importance as these dental tissues are often preserved even if the deceased person is skeletonized, mummified [19], adipocered, burnt or dismembered. Dental tissues are often used to determine age, sex, and ethnicity of the person using comparative, reconstructive or profiling methods. The Comparative identification means to establish the remains of decedent and a person represented by ante mortem records are of the same individual while reconstructive identification is the Dental Profiling or Post Mortem Dental Profile which elicit race, gender, age and occupation of the dead individual. They are undertaken when ante mortem records are not available [5]. The methods can be expensive like Deoxyribo Nucleic Acid (DNA) printing to economical.

Weissenstein first proposed that denture should have some form of identifiable marking in 1931[6] and ideal characteristics of denture markers were described by Vestermark in 1975[7]. Denture Barcoding is a newer and an innovative technique to identify a patient with Complete Denture/RPD using a QR code just like the ones that come with Implants. A Barcode is a machine-readable code in the form of numbers and a pattern of parallel lines of varying widths, printed on a commodity. Barcodes are not limited to those white and black vertical printed lines these can also be made using some special numbers or codes.

In this article the study focuses on the economical method of denture barcoding using the patient’s own identity proof numbers (Aadhar Card, Voter Id card, PAN card).

Following are the Criteria Which Need to be Fullfilled for Barcoding a Denture [8,9]

The strength of the prosthesis must not be jeopardized.

Easy and inexpensive to apply

The identification system must be efficient.

The marking must be visible and durable.

The identification must withstand humidity and fire.

The identification mark should be aesthetics acceptable.

The identification mark should be biologically inert.

The marking should be permanent and resistant to everyday cleansing and disinfecting agents.

The advantages and disadvantages of Denture Barcoding is given in Table 1

ADVANTAGES [8]	DISADVANTAGES [8]
1. For identification of a person in case of accidents, state of unconsciousness, health issues like dementia or Alzheimer's, Natural calamities.	1. Patients need to carry their dentures wherever they go.
2. Allows entering of data, its tracking and verification.	2. Denture incorporated with a QR code if not in use should be thoroughly discarded on medicolegal grounds.
3. Less expensive	3. Residual ridge resorption pattern results in refabrication of denture over the years which may result in different identification marks.
4. Useful in forensic odontology and in medico-legal aspects.	

Table 1: Advantages & Disadvantages of Denture Barcoding

This study focuses on an economical method of denture barcoding using patient's identity proof. Following are the various identification proofs issued by the government of India:

- Aadhar card
- Passport
- Electoral Photo Identity Card (EPIC)
- Permanent Account Number (PAN)
- Driving license

Other Identity Proofs Issued:

- Ration card
- A Birth certificate
- SC/ST/OBC Certificates
- Transfer/School leaving/Matriculation Certificate

Aadhar Card

Aadhaar is a verifiable 12-digit identification number issued by UIDAI to the resident of India for free of cost. The UIDAI was established on 28 January 2009 after the Planning Commission issued a notification [10], and on 23 June Nandan Nilekani headed this project by the Government of India. The Aadhar Card comprises of the following [9].

12 Digit Number,

Face Photo,

Fingerprint,

Iris Scanner,

Body Identification Mark,

Demographic such as name, age, gender, address,

QR code,

2D QR code

The rationale and aim behind Government of India to introduce Aadhar Card was to provide an individual identity which would allow each person to avail social security benefits. Thus, allowing every individual to be will be financially inclusive and would also enable direct services delivery along with direct benefit transference. The government is able to communicate and govern its people using e-governance, preventing its people from identity fraud, ghost employee/voters and will in return reduce corruption [9]. It is thus rightly known as “Aam Aadmi ka Adhikar.” (Figure 1)



Figure 1: Aadhar Card [14]

Voter Id Card

The Indian voter ID card is an identity document issued by the Election Commission of India to adult domiciles of India who have reached the age of 18, which primarily serves as an identity proof for Indian citizens while casting their ballot in the country's municipal, state, and national elections. It was first introduced in 1993 during the tenure of the Chief Election Commissioner T. N. Seshan [11]. (Figure 2)



Figure 2: Voter Id Card Old(left) & New (Right), Issued by Election Commission of India [15]

Pan Card

A permanent account number (PAN) is a ten-character alphanumeric identifier, issued in the form of a laminated "PAN card", by the Indian Income Tax Department, to any "person" who applies for it or to whom the department allots the number without an application [12]. In the year 1972, the concept of PAN was rolled out by the Indian government and was made statutory under section 139A of the Income Tax Act, 1961. Initially a voluntary process, PAN was made mandatory for all taxpaying individuals in 1976 [13]. (Figure 3)



Figure 3: Permanent Account Number (PAN CARD) [14]

Passport

A passport is a travel document, usually issued by a country's government to its citizens, that certifies the identity and nationality of its holder primarily for the purpose of international travel. Standard passports may contain information such as the holder's name, place and date of birth, photograph, signature, and other relevant identifying information [16].

Driving Licence

In India, a driving licence is an official document that authorizes its holder to operate various types of motor vehicles on highways and some other roads. It is administered by the Regional Transport Authorities/Offices (RTA/RTO) [17].

Aim and Objective

Positive identification through labeled Complete Denture using Personal Identity Proof without compromising the structural and functional integrity of the denture based on both post insertion assessments of dentist and patient.

Materials and Method

According to literature review, numerous methods have been previously used for denture identification namely Surface Methods which includes Scribing or Engraving, Embossing or writing using fibre tip. On the other hand, there are some Inclusion methods. In surface methods marks are laid on the denture surface area.[20] In this technique, letters, or numbers are engraved with a small round dental bur on the fitting surface of the complete denture [21] whereas, Embossing comprises initials of the name and the surname of the patient that are scratched with a dental bur on the master cast. On the other hand, Inclusion methods are more permanent as opposed to the relatively simple surface marking methods; however, these techniques require certain skills and are time consuming.[20] Other methods may include ID-Band, Paper strips, T-Bar, Laser etching, Electron microchips, Radio-frequency identification (RFID)-tags.[20]

Focus of our study was positive identification of a denture using identity proofs it also focuses on the idea for it to be feasible to a General Dental Practitioner as well as be economical to the patient.

The intent of this study was to establish an economical and feasible protocol which would enable a general dental practitioner can use on complete denture prosthesis on everyday basis. Thus, enabling a general dentist in creating a positive identification mark on the denture without distorting the prosthesis.

Here we are linking the denture marking system with Patient's Identity card, i.e citizen's unique identification card in India. This was done after patient's informed consent was obtained. The study was conducted at I.T.S Dental College, Muradnagar in the Department of Prosthodontics, on completely edentulous patients. For the purpose of sample collection, the completely edentulous patients reported to the department were taken into inclusion criteria (Table 2) to bring their identity proofs and along with this the informed consent of the patient was taken. The clinical sequence for the conventional method was performed in accordance with a standardized protocol consisting of the following steps:

First was making preliminary impressions using aluminum stock trays and impression compound (Y-Dents Impression Compound) and for Diabetic cases alginate impressions were made. Then, custom acrylic resin trays were prepared by followed by Border moulding using green stick (DPI Pinnacle Tracing Sticks) on their borders and then shaped by tongue movements and manipulation of labial and buccal soft tissues after which Definitive Impression (final Impression) using irreversible hydrocolloid material Algitek (Alginate Dental Impression Material) and Zinc Oxide Eugenol (DPI Impression Paste) was made using Selective Pressure technique. Third was occlusal plane orientation and maxillomandibular relationships using record bases. The position of maxillary rims was transferred to a mean value articulator. Dentures received anatomic teeth with cuspal inclination of 0 degrees (Premadent Teeth Set) were set. The fourth step was denture try-in. A methacrylate-based resin (Heat Cure Acrylic-DPI Heat Cure) was used, mixed, and packed according to the manufacturer's instructions and polymerized. On the day of insertion of the denture base during insertion of the denture a small area was removed using micromotor and then a printed slip of identity proof no. covered with scotch tape was placed in that area using clear acrylic (DPI-RR Cold Cure Acrylic Rapid Repair). (Figure 4). The barcodes were inserted using the process of Randomization and are shown in figure 5, 6, 7 and 8. Further appointments were

scheduled within 15 days as necessary to check for any post denture insertion problems.

INCLUSION CRITERIA	Completely edentulous patient Patient with valid identity proof i.e Aadhar card, PAN card, Voter Id card.
EXCLUSION CRITERIA	Any physical or mental illness affects the patient’s ability to cooperate during or after treatment. Patient who is hypersensitive to denture materials. Pathology eg. Pemphigus, cysts etc. Patient with bone necrosis or root stumps. Patients without a valid Id proof.
TOTAL NO. OF SAMPLES	Total number of 40 cases of Complete Denture were selected among which 20 were females and 20 males.
DISTRIBUTION OF SAMPLES	These samples were then distributed into 4 groups each with 10 samples with Aadhar card no., 10 with QR code on Aadhar Card. 10 with Voter Id card no., and 10 with PAN card no.

Table 2: Inclusion & Exclusion Criteria



Figure 4: MATERIALS USED- DPI-RR Cold Cure Acrylic Rapid Repair, Scotch tape, Scissors, Denture Base, Identity proof.



Figure 5: Barcoding of the denture with Aadhar Card number

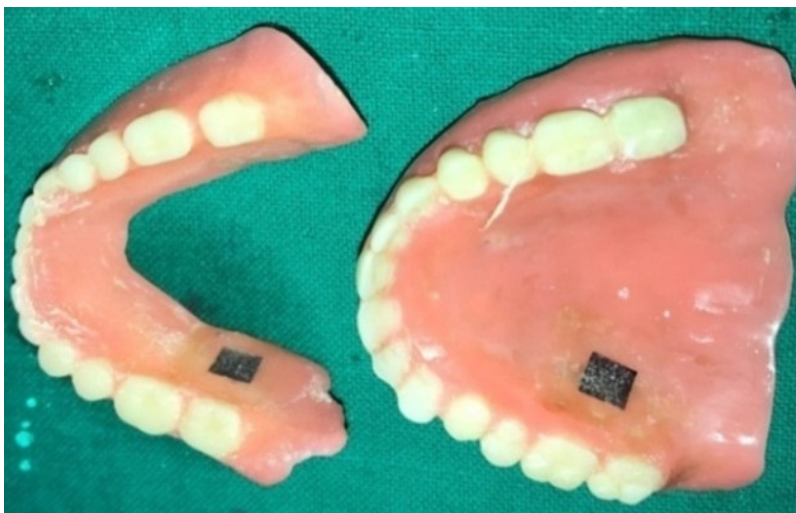


Figure 6: Barcoding of the denture with QR code on the Aadhar Card



Figure 7: Barcoding of the denture with Voter Id Card number



Figure 8: Barcoding of the denture with PAN Card number

Statistical Analysis

SPSS version 23 software was used for analysis of the data. The test applied was chi-square test to check the difference in responses among four categorical variables.

Results

Denture Barcoding was done using various identity proofs (Aadhar Card, PAN card, Voter ID card) of Complete Denture patients at I.T.S CDSR, Muradnagar. After processing of the denture a printed slip laminated with Scotch tape was inserted with clear self-cure resin. Barcoding of dentures during heat curing was not done to eliminate the error of misplacing of the slips and also to make the procedure feasible in day-to-day practice along with the corrections in post processing/insertion errors in the denture if any.

Group	Male	Female	Total
Aadhar card number	4 (40%)	6 (60%)	10 (100%)
Election card number	5 (50%)	5 (50%)	10 (100%)
Pan card number	6 (60%)	4 (40%)	10 (100%)
Aadhar barcode	6 (60%)	4 (40%)	10 (100%)

Table 3: Gender Details of Study Participants

Among the groups, after insertion of the dentures Post Insertion Evaluation of the denture along with the area on which Identity details were placed was done which comprised of asking the patients for any discomfort associated with the denture, checking for retention, stability, support or any other issues related to the denture. This Post Insertion Evaluation of the denture was subjected to naked eye visibility test. In group 1 (10 samples with Aadhar card no.), group 2 (10 samples with PAN card no) and group 3 (10 samples with Voter Id card no.) the font used was size 7 and the information printed was clearly visible and recognizable. Within group 4 (10 samples with QR code of Aadhar Card) QR Code was visible and recognizable yet no information was deciphered at this stage. By using the QR code which are “Quick Responses”, are square-shaped black and white symbols that are used to take a piece of information from a transitory media and put it in to your cell phone [25] which were scanned using the application “Aadhar QR Scanner” (for Android) and “Aadhar Card QR Scanner” (for IOS) [22]. It was noted that when Dentures with QR code on Aadhaar card is placed it resulted in jeopardizing its stability as it occupies more area and the once scanned the information retained in the QR code was scanned in 2 out of 10 successfully. This was followed by re-evaluation of the patient after 30 days and noting their feedback. For easier understanding we have included a flowchart to explain the process which we followed to get the results:

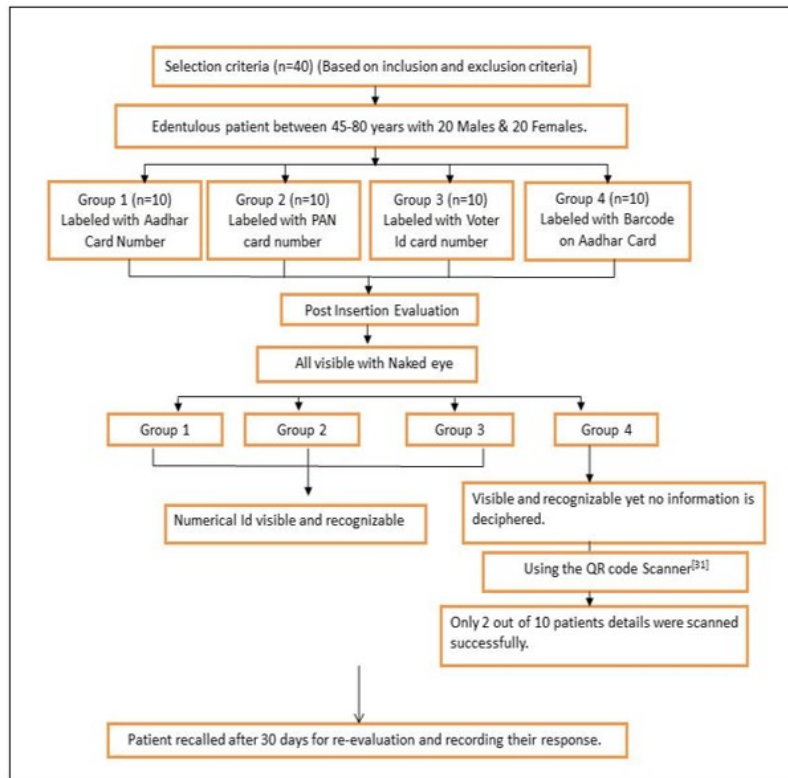


Figure 9: Result process flowchart

Criteria	Response	Aadhar card number	Election card number	Pan card number	Aadhar barcode	p value
Denture stability	Yes	10 (100%)	10 (100%)	10 (100%)	10 (100%)	--
	No	0	0	0	0	
Denture retention	Yes	10 (100%)	10 (100%)	10 (100%)	5 (50%)	0.001*
	No	0	0	0	5 (50%)	
Visibility of barcode	Yes	10 (100%)	10 (100%)	10 (100%)	2 (20%)	<0.001*
	No	0	0	0	8 (80%)	
Placement of barcode	Easy	10 (100%)	10 (100%)	10 (100%)	10 (100%)	--
	Tough	0	0	0	0	

Chi-square test; * indicates significant difference at p≤0.05

Table 4: Comparison of dentist opinion criteria among four groups

Denture stability was reported in all the dentures having aadhar card number printed on denture, election card number printed on denture, pan card number printed on denture, and aadhar barcode printed on denture.

Denture retention was reported in all the dentures having aadhar card number printed on denture, election card number printed on denture, and pan card number printed on denture; however, denture retention was reported in only 5 subjects who were given denture with aadhar barcode printed on it. There was a significant difference in denture retention reported among study groups.

Identity number was visible on all the dentures having aadhar card number printed on denture, election card number printed on denture, and pan card number printed on denture; however, aadhar barcode was visible only on 2 dentures and the difference was significant.

Placement of barcode was easy in all the methods reported and there was no difference.

Criteria	Aadhar barcode vs Aadhar card number	Aadhar barcode vs Election card number	Aadhar barcode vs Pan card number
Denture retention	0.033*	0.033*	0.033*
Visibility of barcode	0.001*	0.001*	0.001*

Chi-square test; * indicates significant difference at $p \leq 0.05$

Table 5: Pairwise Comparison

Pairwise comparison showed that dentures with aadhar barcode printed showed poor retention as compared to dentures with aadhar number printed, denture with election card number printed and dentures with pan card number printed. Also, visibility of barcode was significantly less on dentures with aadhar barcode printed as compared other methods.

Criteria	Response	Aadhar card number	Election card number	Pan card number	Aadhar barcode	p value
Denture satisfaction	Yes	9 (90%)	10 (100%)	10 (100%)	9 (90%)	0.551
	No	1 (10%)	0	0	1 (10%)	
Aesthetics	Yes	10 (100%)	10 (100%)	10 (100%)	7 (70%)	0.021*
	No	0	0	0	3 (30%)	
Retention	Yes	10 (100%)	8 (80%)	9 (90%)	9 (90%)	0.528
	No	0	2 (20%)	1 (10%)	1 (10%)	
Discomfort	Yes	4 (40%)	4 (40%)	2 (20%)	5 (50%)	0.567
	No	6 (60%)	6 (60%)	8 (80%)	5 (50%)	
Speech	Yes	7 (70%)	5 (50%)	8 (80%)	4 (40%)	0.244
	No	3 (30%)	5 (50%)	2 (20%)	6 (60%)	
Maintenance	Easy	10 (100%)	10 (100%)	10 (100%)	10 (100%)	--
	Tough	0	0	0	0	

Chi-square test; * indicates significant difference at $p \leq 0.05$

Table 6: Comparison of patient opinion criteria among four groups

There was no difference in denture satisfaction as reported by the patients in all the four methods. Compromised aesthetics was reported by the patients wearing dentures with aadhar barcode printed. Pairwise comparison of aesthetics criteria between Aadhar barcode and other types did not show any significant difference. There was no difference in the discomfort caused due to denture, speech and maintenance of denture reported by the patients in all the four methods.

Discussion

The result of this study shows that in both instances that are patient and dentist preferred other three methods of denture barcoding namely incorporation of Aadhar Card number, Pan Card number and Election card number over the method which involves incorporation of Aadhar Barcode. In the results, it is seen that with incorporation of Aadhar barcode compromises aesthetics as per patients and denture retention in dentist opinion as it occupies too much surface area. Further reduction in size of Aadhar barcode is not possible, as the current size of Aadhar Barcode itself has reduced the visibility, thus compromised the scanning and reduced the chance for information retrieval required for identification purposes.

Identification of individuals has always been a major issue due to lack of proper record management in various parts of the world. Thus, it becomes difficult to maintain records for a person [23]. Due to these various methods have come up in the field of Forensics that deals with identification of a person ranging from expensive to pocket friendly ones. Most of the methods available are widely used for dentulous patients. Very few methods are available for identification of a completely edentulous patient due to lack of teeth; residual ridge resorption etc, there is less of body remain needed for a positive identification. Residual Ridge Resorption is defined as the diminishing quantity & quality of residual ridge after teeth are removed. (G.P.T -8).[18] The resorption of the ridge starts as soon as the teeth are removed and continues rapidly. Since no tooth structure is remaining it becomes even more difficult to identify the concerned individual. This makes it further more important to label the dentures that can be done using micro-chips, QR codes or by own identity proof numbers that have a centralized system for record that takes into consideration starting from the person's name to their biometrics.

In United Kingdom, an incentive is offered by the National Health Service to the dentists who label the dentures of the patients, who are elderly and in nursing care facility. In United States, the social security number of the individual is marked on the denture, but such mandate is only present in its 21 states [26], whereas in Sweden the patient's unique personal ID is marked on a metal band and incorporated in the denture before processing. [27, 28, 29, 30]

Here, in India even though we have multiple identity proofs, yet we have failed to incorporate denture marking in our daily dental teaching and practices. In India, we need a method that is cost-effective and could be easily identified by all the people of the society, across the length and breadth of the country equally.

Aadhar card comprising both card number and bar code, Pan card and Election card details serves just the above-mentioned purpose.

Currently, there are two methods of denture barcoding in practice that are the surface marking methods and the inclusion methods. The earlier used methods are usually done by inclusion method where in the Micro-chip is inserted in the denture that can be removed and opened in the laptop for viewing of the data which makes it a bit expensive and cumbersome. Here in this study we have used surface method to link dentures with Identity proof number which is different as it is more economical and can be done on a day-to-day basis even by a General dentist with no prior training.

The reason for not using cold cure as a material for fabrication of denture is due to its low strength [24]. The QR codes are inserted after the fabrication of denture with heat cure with self-cure so that it can be easily incorporated in the denture in day-to-day practice by a General Dentist and also to correct any post insertion problems if any.

The major reasons for not marking dentures are cost and lack of awareness. Hence, an appropriate framework within dental education is required. There is a need to offer patients an esthetically suitable denture marking system that is also inexpensive and permanent. Considering the social and practical value of denture marking, there is a need for marking dentures by members of the dental team involved in the provision of dentures to the public. The following recommendations to achieve this are offered:

Education at undergraduate level is urgently needed regarding the social and forensic value of marking dentures. The practice of denture marking in all teaching institutions should be initiated immediately. Further research should be carried out into improving and simplifying methods of labeling dentures. Dental associations should find more effective ways of promoting the practice of denture labeling within the dental profession and the community.

Conclusions

The patients were recalled after a month to enquire if they were facing any problems in respect to the denture or the QR codes inserted. The patients faced no such problems in respect to the denture. This study describes an easy and cost-effective technique with readily available armamentarium in any dental office or institution for denture identification. The label demonstrates no sign of deterioration withstands and is esthetic. It is biologically acceptable and fulfills all the forensic requirements of a suitable prosthesis. Denture ID linked to unique Aadhaar card system of labeling dentures. Government of India make mandatory of linking Aadhaar card in various schemes which include e.g. linking of Aadhaar card to liquid petroleum gas cylinder distribution system. Similarly, there is a need to implement this strategy by government also in the field of dental sciences in labeling prosthesis. Dental Council of India can suggest Government of India to make necessary legislations regarding compulsory denture labeling system in India.

References

1. Forensic (2022) - Dictionary Definition [Internet].
2. Singh K, Anandani C, Kaur Bhullar R (2012). Teeth and their Secrets- Forensic Dentistry. J Forensic Res 03.
3. Divakar KP (2017). Forensic Odontology: The New Dimension in Dental Analysis. Int J Biomed Sci 13: 1-5.
4. Strangerremains (2017). Paul Revere: The first American forensic dentist [Internet]. Strange Remains. Strange Remains.
5. Pramod JB, Marya A, Sharma V (2012). Role of forensic odontologist in post mortem person identification. Dent Res J 9: 522-30.
6. Fletcher AM, Turner CH, Ritichie GM (1977). Denture marking methods and induced stress. Br Dent J 142: 224-6.
7. Murray CA, Boyd PT, Young BC, Dhar S, Dickson M et al. (2007). A survey of denture identification marking within the United Kingdom. Br Dent J 203: E24.
8. Dineshshankar J, Venkateshwaran R, Vidhya J, Anuradha R, Mary G et al. (2015). Denture bar-coding: An innovative technique in forensic dentistry. J Pharmacy and Bioallied Sci 7: 350.
9. Patel D, Datta A, Bhise G, Chethan M, Nandeeshwar D (2019). Identification of the deceased in disaster by barcode: Aadhaar-linked complete denture. International Journal of Forensic Odontology 4: 43.
10. Wikipedia Contributors (2020). Aadhaar [Internet].
11. Voter ID (2020). (India) [Internet].
12. Permanent account number (2020). [Internet].
13. PAN Card (2020). What is PAN, how to Apply New PAN, Know Uses & History [Internet].
14. Vritika (2016). Difference between PAN Card and AADHAR Card [Internet].
15. West Bengal (2019). New voters to get smart ID cards with digitised information. The Times of India [Internet].
16. Wikipedia Contributors (2020). Passport [Internet].
17. Driving licence in India [Internet].
18. Kushal Singh. Residual ridge resorption 44 [Internet].
19. Dental Identification of a Mummified Body using Dental Cast and Prosthesis (2015). Journal of Forensic Investigation 3.
20. Stavrianos CH, Petalotis N, Metska M, Stavrianou I, Papadopoulos CH (2007). The value of identification marking on dentures. Balk J Stom 11: 212-6.
21. Datta P, Sood S (2010). The various methods and benefits of denture labeling. J Forensic Dent Sci 2: 53-8.
22. QR Code Reader (2023) [Internet]. Unique Identification Authority of India | Government of India.

23. Lake AW, James H, Berketa JW (2011). Disaster victim identification: quality management from an odontology perspective. *Forensic Science, Medicine, and Pathology* [Internet] 8: 157-63.
24. Themes UFO (2015). 3.2: Denture base resins [Internet]. Pocket Dentistry.
25. Lyne M (2011). What Is A QR Code and Why Do You Need One? - Search Engine Land [Internet]. Search Engine Land.
26. Richmond R, Pretty IA (2010). Identification of the edentulous individual: An investigation into accuracy of radiographic identifications. *J Forensic Sci* 55: 984-7.
27. Richmond R, Pretty IA (2006). Contemporary methods of labeling dental prostheses – A review of the literature. *J Forensic Sci* 51: 1120-6.
28. Alexander PM, Taylor JA, Szuster FS, Brown KA (1998). An assessment of attitudes to, and extent of, the practice of denture marking in South Australia. *Aust Dent J* 43: 337-41.
29. Ling BC (1998). Computer printer denture microlabeling system. *J Prosthet Dent* 79: 363-4
30. Matsumura H, Shimoe S (2002). Incorporation of a cast, embossed identification plate into a partial denture framework. *J Prosthet Dent* 88: 215-7.

Submit your next manuscript to Annex Publishers and benefit from:

- ▶ Easy online submission process
- ▶ Rapid peer review process
- ▶ Online article availability soon after acceptance for Publication
- ▶ Open access: articles available free online
- ▶ More accessibility of the articles to the readers/researchers within the field
- ▶ Better discount on subsequent article submission

Submit your manuscript at

<http://www.annexpublishers.com/paper-submission.php>