

Barcodes in Naming Basic Denture for Forensic Identification Needs

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Abstract

Background: discipline within Forensic odontology is a part of the science of forensic medicine which recently demonstrated its role in the identification of victims, often confronted with various obstacles, to slow down the investigation of the identity of the victim. There are obstacles in the identification process, partly due to the incomplete identification data that can be collected, so that the identification of the remains becomes difficult and requires a long time to be confirmed despite obtaining good professional management in the identification process. The American Board of Forensic Odontology shows that most identification uses teeth based on restorations, caries, missing teeth and / or prosthetic devices such as removable dentures of the victim. The necessity of naming the removable denture as the data themselves are attached to the patient can facilitate the identification of **Purpose:** Knowing how to manufacture and benefits of identity with a barcode on the denture in the easy identification of individual **Methods:** this research was pre-experiment with only posttest design. By using 10 Full Denture samples, the sample collection was obtained from the Lemeshow Formula. The ten research samples were taken by simple random sampling. **Conclusion** barcode contain identity data embedded in the denture base can be used as labeling on denture users because of their role in knowing the identity of individuals , and hacyl of reading barcodes are not influenced by the length of the base submerged .

Keywords: Barcode, Denture Base, Forensic identification

Introduction

The number of disasters occurring in Indonesia is increasing. Condition is reviewed of the mass media which often times contains news about the occurrence of disasters, such as acts of terror bombing, accident transportation, earthquakes, tsunamis, floods, soil erosion, eruption mountain volcanic, putting pickaxe, and others^[1].

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The National Disaster Management Agency has data on disaster events in Indonesia and the number of disasters has tended to increase in the last ten years. Law Number 36 the Year 2009 regarding health has given a mandate to the government and the community to make efforts to identify victims of accidents. The identification of the dead was carried out to fulfill the victim's right to be returned to the family and to be buried properly by his beliefs during his lifetime. In this case, forensic identification in terms of identity that supports the identification of a victim can be a non-biological identity, in the form of a resident card , driver's license, clothing, and biological identity can be known through bones, teeth, blood, fingerprints, hair, profile, and DNA^[2].

The field of Forensic Odontology is a part of medical

forensic science which has recently shown its role in the effort to identify victims, not infrequently faced with various obstacles, to slow down the investigation of the identity of the victim. There are obstacles in the identification process, partly due to the incomplete identification data that can be collected, so that the identification of the remains becomes difficult and requires a long time to be confirmed despite obtaining good professional management in the identification process^[3]. The American Board of Forensic Odontology shows that most identification using teeth is based on restorations, caries, missing teeth and / or prosthetic devices such as removable dentures of the victim^[4-6].

In Indonesia, the labeling of denture prostheses is rarely done, the labeling itself is only done by the lab and dentists limited to labeling the Denture so as not to be confused during the delivery or use of Denture by the dentist to the patient. Agency Odontology Forensic and International Dental Association recommend two Denture Marking System to simplify and facilitate the identification of a person's identity, namely method surface and inclination method^[7].

Surface methods include engraving methods^[8,9], which are letters and numbers engraved on the base of the denture, and the method of embossing which produces letters that arise on the base of the denture^[10,11]. Whereas the second method is the inclusion method. The inclusion method consists of the ID Band method and the Barcode method, the ID Band method using stainless steel which is planted on the base of the denture. In addition to the ID Band method there is the Barcode method, the data will be stored in a barcode format and planted on a denture base^[12]. From these methods there are advantages and disadvantages of each, and in this study the Barcode method is used because it is easier to apply.

The method of marking identity or code on dentures is very important. Identification of unknown or lost by tagging denture identification method is very good in the forensic investigation. This is also useful for patients who live in hospitals and community homes because dentures may be misplaced, for example when cleaning by an operator there will be a chance of losing false teeth or mixing with other people's property^[13].

Materials and Methods

The research pre-experiment with posttest only design. By using 10 Full Denture samples, the sample collection was obtained from the Lemeshow Formula. The ten research samples were taken by simple random sampling, the research samples were taken from Full Denture Skillab Prosto Students in the old school year that have been collected and assessed

All study samples were reduced at the base by using bur fissures on the palatal for maxillary dentures and lingual for mandibular dentures. Depth of reduction of \pm 1.5mm with a width of 6-7mm.

Then the barcode has been prepared. Contains identity card data, medical record number along with where individuals have been treated, and website link information planted on a base facing the surface, then some that have been reduced and given a barcode closed with self-cured acrylic, and done finishing and polishing.

Samples that have been planted by the barcode are soaked for 4 weeks, and every week they are checked to see if there are any leaks or damage in the barcode planting. And then the barcode reading process is carried out by means perform scanning in barcodes and data matching.

Results

In Table 1 it can be seen that the most readable barcodes are in the first week, 9 samples with a percentage of 90%, and in the second week to the fourth week are 8 samples with a percentage of 80%.

After obtaining the results from the base that contains the barcode and soaked in water, the data were analyzed using the Kruskal Wallis test^[14]. The Kruskal Wallis test is carried out to see whether there are significant differences in the barcode readings that are done every week. The results of the Kruskal Wallis test are shown in Table 2. Can be seen the statistical value of 0.0917, which is greater than 0.05. This means that in this study there was no significant difference from the barcode that was immersed from the first week to the fourth week.

Tabel 1. The results of the barcode scan are implanted on an acrylic denture base after immersion in water for 4 weeks

Long Immersion		Week 1		Week 2		Week 3		Week 4	
The resulting value is scan		0	1	0	1	0	1	0	1
The sample	1		√	√		√		√	
	2		√		√		√		√
	3		√		√		√		√
	4		√		√		√		√
	5		√		√		√		√
	6		√		√		√		√
	7		√		√		√		√
	8		√		√		√		√
	9	√		√		√		ü	
	10		√		√		√		√
Total (%)		10	90	20	80	20	80	20	80

Information: 0 = scan unreadable

1 = unreadable scan

TABEL 2 Kruskal Wallis Test Results from barcode reading after soaking in water for 4 weeks

Statistic	0.506
df	3
Sig.	0.917

Information:

df = degree of frequency (n-1)

Sig. = $P > 0.05 = H_0$ accepted (no significant difference)

Discussion

The research on giving a barcode containing the identity of an individual planted on an acrylic removable denture base and continued with immersion in water for 4 weeks, aims to see whether the barcode can still be read after being submerged in water for a long time.

Based on the results of the study found that in

the first week there is 1 barcode that is not readable and in the second week to the fourth week each has 2 barcodes that cannot be read. This is caused by several things that affect the barcode so that the scanning results cannot be read. The cause of the writing on the barcode cannot be read due to the presence of liquid on the barcode, which is in the form of a clear self-cured acrylic liquid (monomer) or water from soaking. Fluid liquid (monomer) self-cured acrylic can damage plastic laminate coatings barcode, because the nature of the monomers may damage the plastic. This will happen if when you put the self-cured dough in a soft condition, which means there are still many monomers left. So that the rest of the monomer will damage the laminated plastic, and the liquid will damage the barcode, so the barcode scanner cannot be read.

In addition to the influence of liquid-liquid, the entry of immersion water used can also affect the damage of the barcode. This happens because the attachment between the denture base and the self-cured acrylic barcode cover is less than perfect. So that water can enter and affect barcode writing. Of course, the barcode will be affected because there is a leak from the plastic laminate. Leakage or imperfect adhesion between the acrylic base

of the denture and the self-cured clear acrylic barcode cover can be caused because there is dirt that disturbs the attachment between the two acrylics^{[15],[15,16]}. Thus the barcode will be damaged so it cannot be read.

The two liquids above can hit the barcode if a leak occurs in laminated plastic. This can occur due to poor attachment. In addition to the leakage that occurs in plastics, damaged plastic laminates can also affect. Damaged plastic laminates can occur because plastic laminates are damaged before installation. The laminated plastic surface of the barcode which has been damaged before being installed on the denture and then comes into contact with the self-cured clear dough, so that the barcode cannot be read.

It is better if the leak on the barcode naming needs to be aware so that the denture used can still be identified for law enforcement^[17]. Where an unknown body must be made an identification effort^[18]. Often corpses that need to be identified are old, because of that the naming of dentures by the barcode method should not occur leaks or damage in a long time.

Dental denture material is a means for identification that can be trusted to be able to survive in high altitude, especially if the records and photos of teeth when they were still alive are still well preserved^[19]. This dental examination becomes very important if the body is already in a state of decay and damage, such as fire^[20].

From the table data above, it can be seen with the barcode system on the denture plate that during the mass identification process, in the fourth phase of reconciliation^[1], it can be searched quickly using this barcode method. Dental data, fingerprints and even DNA data can be found quickly. When the barcode data is done the scanning process.

Conclusions

In conclusion, the results of the barcode reading are not influenced by the length of the base submerged, but are influenced by other factors, namely an error occurred in the barcode planting process. And barcode contains identity data embedded in the denture base can be used as labeling on denture users because of their role in knowing the identity of individuals when needed in an emergency / certain.

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