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Case Report

International telephone code used for citizenship identification in a denture

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Abstract: This case report describes a simple method for identifying the citizenship of a denture wearer by marking the telephone country code number inside the denture base. A wax pattern for the denture framework was prepared on the refractory cast. A piece of embossing tape, containing the country code (81, Japan), Japanese prefectural code, and abbreviation of the dental clinic where the denture was fabricated, was placed on the metal framework. A titanium-aluminum-niobium (Ti-6Al-7Nb) alloy was cast in the mold, and the denture was then fabricated by the conventional method. The casting satisfactorily reproduced the embossed letters, and the plate was identifiable through the gingiva-colored acrylic denture base resin. Since an embossed metal plate integrated with the skeleton is embedded in the denture base resin material, the current denture marking technique serves as a simple procedure for insertion of an undegradable denture identification mark which makes it possible to identify the nationality of the denture wearer. (J. Oral Sci. 49, 337-340, 2007)

Keywords: casting; denture identification; telephone code.

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Introduction

Denture marking systems are being used for the identification of dentures and/or denture-wearers in various situations, and a number of direct and indirect methods have been reported. Incorporation of a piece of typewritten paper or marked plastic sheet is one of the simplest techniques (1-6). Although these methods are useful to prevent the misplacement of dentures at hospitals, long-term care units, and nursing homes, the marked materials are vulnerable to chemical and physical attacks and thus leave room for improvement. Incorporation of a marked metal structure into the denture base resin is an alternative method that addresses extreme situations such as fires and traffic accidents (7-9). The plate, however, may be lost if it is too small or if the denture base material is burned out. In addition, care must be taken in selecting the metallic component of the plate and in installing the plate into the proper position on the denture base resin. Previously, we described a simple technique for insertion of a marked metal plate into the denture using an embossed plastic pattern prepared with a label marker (10). This article describes inclusion of the international telephone country code for identifying the citizenship of the denture wearer. The concept of this case was partly presented in the official publication of the Nippon Academy of Dental Technology in Japanese (11).

Case Report

A 63-year-old woman presented with the chief complaint of masticatory disturbance derived from missing maxillary canines, premolars, and molars. Among the various prosthodontic treatment options, the patient preferred fabrication of a removable partial denture with a titanium alloy framework. The patient also requested placement of an identification plate inside the denture base. A cast metal framework with denture marking was fabricated according to a method previously described (10,11). The method employed was as follows:

1. Prepare a working cast for a partial denture framework with die stone (Fig. 1). Relieve and block-out the working cast with wax materials, and prepare a refractory cast with a mold material.
2. Type letters on an embossing tape with a manual label marker (Dymo M-1535 or Dymo Mini, Esselte N.V., Sint-Niklaas, Belgium) and cut a piece of tape for the plastic pattern (Fig. 2).
3. Prepare a wax model pattern of the denture skeleton on the refractory cast. Fix the trimmed tape in the appropriate position on the wax model with wax instruments, model adhesive, and sheet wax (Fig. 3).
4. Invest the wax model pattern into a mold material, and replace the pattern with a casting alloy. When the casting alloy is titanium-aluminum-niobium (Ti-6Al-7Nb) alloy (12,13) (T-Alloy Tough, GC Corp., Tokyo, Japan) (Fig. 4), the use of a magnesia-based ethyl silicate- and calcium aluminate-bonded mold material (Slevest D or DM, Selec, Osaka, Japan) as well as a spin-cast centrifugal apparatus (Ticast Super R, Selec) is recommended. Other combinations of mold material and casting alloys (Co-Cr, Ni-Cr, or gold alloys) are applicable depending upon the denture skeleton structures.
5. Arrange the composite artificial teeth (Endura, Shofu Inc., Kyoto, Japan) on the bite rim (Fig. 5) after checking the maxillo-mandibular relations.
6. Process the denture with a heat- and redox-cured acrylic denture base material (Quick Acron, GC Corp.) (Figs. 6 and 7).

Figure 7 shows the marked plate embedded in the gingiva-colored denture base material. The number '81' represents the international telephone country code of Japan (Table 1), the letters 'NU' are abbreviations of the dental clinic where the denture was seated (Nagasaki University), and the number '42' is the prefectural code (Nagasaki) recommended by the Tokyo Metropolitan Police Agency, Japan for use in forensic applications (Table 2). Fig. 8 demonstrates the intraoral view of the removable partial denture one year after insertion. Since the identification plate is made of the same material as the denture framework and is completely embedded in the denture base resin, the patient did not complain of any discomfort while wearing the denture.

Table 1 International single and two-digit country codes used in telephone service

Africa											
Canary Islands	34	Egypt	20	South Africa	27	Spanish North Africa	34				
Oceania											
Australia	61	Christmas Island	61	Cocos-Keeling	61	New Zealand	64				
Asia											
India	91	Indonesia	62	Iran	98	Malaysia	60	Myanmar	95	Pakistan	92
Philippines	63	P. R. China	86	Republic of Korea	82	Singapore	65	Sri Lanka	94	Thailand	66
Vietnam	84										
America											
American Virgin	1	Anguilla	1	Argentina	54	Bahamas	1	Barbados	1	Bermuda	1
Brail	55	British Virgin	1	Canada	1	Cayman	1	Chile	56	Colombia	57
Cuba	53	Dominica	1	Grenada	1	Hawaii	1	Jamaica	1	Mexico	52
Montserrat	1	Peru	51	Puerto Rico	1	Trinidad & Tobago	1	USA	1	Venezuela	58
Europe											
Austria	43	Belgium	32	Denmark	45	France	33	Germany	49	Greece	30
Hungary	36	Italy	39	Kazakhstan	7	Netherlands	31	Norway	47	Poland	48
Romania	40	Russian Federation	7	Spain	34	Sweden	46	Switzerland	41	Turkey	90
United Kingdom	44	Vatican	39								

Three-digit area codes are available from www.worldtravelgate.net/telcodes.htm, www.lincmad.com/countrycodes.html, www.studyabroad.com/telcodes.html, www.bspage.com/inttel.html etc.

Table 2 Prefectural codes used for forensic applications in Japan

Hokkaido	01	Aomori	02	Iwate	03	Miyagi	04	Akita	05	Yamagata	06
Fukushima	07	Ibaraki	08	Tochigi	09	Gunma	10	Saitama	11	Chiba	12
Tokyo	13	Kanagawa	14	Niigata	15	Toyama	16	Ishikawa	17	Fukui	18
Yamanashi	19	Nagano	20	Gifu	21	Shizuoka	22	Aichi	23	Mie	24
Shiga	25	Kyoto	26	Osaka	27	Hyogo	28	Nara	29	Wakayama	30
Tottori	31	Shimane	32	Okayama	33	Hiroshima	34	Yamaguchi	35	Tokushima	36
Kagawa	37	Ehime	38	Kochi	39	Fukuoka	40	Saga	41	Nagasaki	42
Kumamoto	43	Oita	44	Miyazaki	45	Kagoshima	46	Okinawa	47		

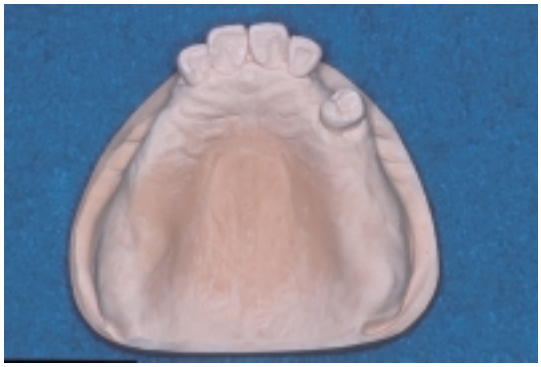

Fig. 1 The working cast for removable partial denture.

Fig. 2 A manual label marker (Dymo Mini) used for preparation of the plastic pattern.

Fig. 3 A piece of embossed plastic tape was fixed to the wax model pattern of the partial denture framework.

Fig. 4 The cast framework of the partial denture made from Ti-6Al-7Nb alloy. The embossed letters were clearly reproduced.

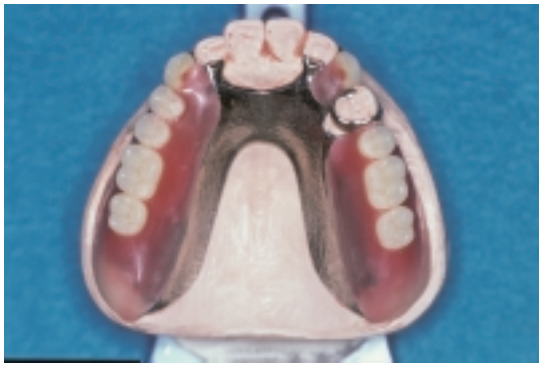

Fig. 5 Wax model denture arranged with composite artificial teeth.

Fig. 6 Metal framework was placed in a flask for polymerization of denture base resin.

Fig. 7 Lingual view of the completed denture. The marked plate is visible through the gingiva-colored acrylic denture base resin.

Fig. 8 Intraoral view of the partial denture one year after seating.

Discussion

The marked plate reported here is identifiable at any time if the plate is properly positioned during the laboratory waxing process. Also, the plate incorporated inside the denture base material does not interfere with oral functions. Preparation of a marked plate integrated in the denture framework is one of the advantages of the current technique. The laboratory technician does not require any additional metallic material or procedure to process the denture base resin. Also, the use of a cast alloy plate in conjunction with the skeleton is biologically desirable in view of the long-term functioning of the denture in the oral environment.

In the laboratory, a label marker and embossing tape are required to prepare the plastic pattern to be used for the marking plate. This machine and tape are not expensive. Although the most commonly used types are somewhat large for marking multiple letters, the use of the smallest available type and shortest pitch makes it possible to include more than six letters in one lingual flange. If there is need for inclusion of smaller letters or for characters other than the alphabet and Arabic numerals, the engraving of letters manually into the wax pattern within the major connector is recommended. Although alternative materials and methods may be available for denture identification, the technique described here offers a stable and fireproof marking that is integrated in the denture framework.

A variety of information can be included on the identification plate. Among the letters and numerals, the authors selected a combination of the international telephone country code, Japanese prefectural code, and abbreviation of the dental clinic where the denture was fabricated. Although the tax file number in Australia, the social security number in the USA, the personal identity number in Sweden, and other numbers can be used for denture marking, combination of three different numbers or letters would make it possible to strictly limit the area in the world, where the denture wearer is located. In marking the denture, however, the use of either a visible or an invisible source should be selected, according to the purpose of the denture marking.

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