Problems with Complete Dentures and Related Factors in Patients in Rajavithi Hospital from 2007 to 2012

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Background: *Complete dentures are used to restore masticatory function, improve esthetics, enhance phonetic functionality, and facilitate social communication for edentulous patients. After long-term use, problems can arise because of changes in the patients' condition and because of denture attrition.*

Objective: *To survey problems encountered while using complete dentures, and to evaluate related factors after 3-8 years of use.*

Material and Method: *One hundred and fourteen participants aged between 56 and 97 years who wore complete dentures supplied by Rajavithi Hospital between 2007 and 2012 were included in the survey. Data were collected via telephone interviews. Details were recorded for baseline characteristics of patients, how and when they used their dentures, how they maintained them, their perception of the condition of their dentures, and the problems that they encountered while using them. Descriptive statistics were used to evaluate patient characteristics and Chi-square/Fisher's exact/Student t-tests were used to evaluate correlations between condition of dentures and patient factors. A p-value of less than 0.05 was considered statistically significant.*

Results: *Half of all participants had problems in using complete dentures, and the most frequent difficulty was denture looseness, which affected about one-third of all patients. Marital status, whether or not participants had children, and time of wearing dentures were significantly related to having problems (p = 0.007, 0.039, and 0.003, respectively).*

Conclusion: *Many complete denture patients had problems with denture looseness and dentists should recall these patients in a timely manner to help them achieve a better quality of life.*

Keywords: *Complete dentures, Problems of complete dentures, Denture looseness, Complete denture recall*

When people lose all their teeth and become fully edentulous, complete dentures have, for many years, been the prosthesis used to restore functional mastication, and improve esthetics, phonetics, and social interaction[1-3]. The process of making complete dentures requires several visits to the dentist before the prosthesis can be used comfortably[4-6]. Conventional methods of making complete dentures entail taking preliminary impressions for the study casts, making custom trays for border molding, taking final impressions for the master casts, and making facebow transfer and maxillomandibular relationship records. One or two visits are necessary in order to try out the teeth and verify jaw relationship records and esthetics, perform denture insertion, and monitor the postinsertion adjustment phase. Several studies[4-6] have been conducted to compare the results of shortened or simplified processes with those of conventional methods in terms of patients' satisfaction and reductions in time and cost. After insertion of complete dentures, the patients need to attend to follow-up appointments to have their dentures adjusted until they can be used comfortably; this may take about two or three visits over a time span varying from a few weeks to several months. The typical problems encountered with complete dentures after insertion[7] are pain, lack of retention and stability, gagging, speaking difficulties, salivation, mastication problems, and patient dissatisfaction with esthetics. Many studies have aimed to achieve better results by examining impression techniques[8,9], types of occlusion[10], and dental implants[11-13]. After long-term use, changes in patients' systemic and oral conditions together with denture attrition may trigger the need for some denture-problem management to improve comfort and ease of use.

The present study aimed to survey the conditions of complete dentures in patients who had

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worn dentures obtained from Rajavithi Hospital for three to eight years, and to evaluate correlations between patient factors and the problems encountered.

Material and Method

The protocol of the present research was reviewed and approved by the ethics committee of Rajavithi Hospital (EC No. 45/2558). A cross-sectional study was conducted in Rajavithi Hospital, Bangkok, Thailand, from May to June 2015. One hundred and fourteen participants (36 men and 78 women) who wore complete dentures obtained from Rajavithi Hospital between 2007 and 2012 were interviewed by telephone in order to examine their denture use. Names, addresses, and telephone numbers were collected from the records of individuals who acquired complete dentures between 2007 and 2012, and the patients were contacted by telephone and invited to participate in this study. If they could not be contacted by telephone, letters were sent to their home addresses inviting them to take part in the research, and a specific telephone number was supplied for them to call if they wished to participate. Data obtained from the participants were demographic baseline characteristics (sex, age, educational level, marital status, having children or not, income, type of payment, and systemic condition), details of denture-wearing habits, and in cases of difficulties, information about the problems. Details were recorded of how they used and maintained their dentures. Data were presented as mean $\pm$ standard deviation (SD) (minimum-maximum) for continuous variables and number (%) for categorical variables. Differences in the frequencies of events between the two groups (good condition vs. problems) were analyzed using Chi-square test or Fisher exact test. Student t-test was used to compare continuous variables in the two groups, and a *p*-value of less than 0.05 was considered statistically significant.

Results

One hundred and fourteen participants, 36 men and 78 women, with a mean age of 75.69$\pm$8.37 years, were included in the present study. Baseline characteristics of the patients are shown in Table 1. Details of participants' problems with their dentures and their satisfaction with them are shown in Table 2. Half of the patients (57) thought their dentures were still in good condition, while an equal number had problems, the most common of which was denture looseness, followed by pain. Table 3 demonstrates the relationships between patient factors and problems in using dentures. Characteristic factors that were

Table 1. Baseline characteristics of complete denture participants (n = 114)

Factors	Number	Percent
Gender		
Male	36	31.6
Female	78	68.4
Age (years)		
Mean $\pm$ SD (min-max)	75.69$\pm$8.37 (56-97)	
<80 years	83	72.8
$\geq$80 years	31	27.2
Education		
Unschooled	11	9.7
Primary school	73	64.0
Secondary school/vocational	26	22.8
Undergraduate or higher	4	3.5
Marital status		
Single	12	10.5
Married	98	86.0
Widowed/divorce	4	3.5
Income		
Earner	20	17.5
Dependent on other	94	82.5
Payment for the dentures		
Universal coverage	77	67.5
Self payment	8	7.0
Civil rights/social security	29	25.5
Systemic disease	78	68.4

Table 2. Number and percent of problems from complete denture using

Factors	Number	Percent
No problem, good condition	57	50.0
Having any problems	57	50.0
Loose	35	61.4
Painful	10	17.5
Damaged	5	8.8
Blunt	2	3.5
Irritating	2	3.5
Loose and painful	2	3.5
Loose and blunt	1	1.8

significantly associated with denture problems were marital status and whether participants had children. Gender, age, education, income, payment, systemic disease, and living alone or not were not related to denture problems. Factors of denture maintenance related to problems in wearing complete dentures are

Table 3. Patient baseline characteristics related to problems from complete denture use

Factors	Good condition (n = 57)	Problems (n = 57)	p-value
Gender			0.420
Male	20 (55.6)	16 (44.4)	
Female	37 (47.4)	41 (52.6)	
Age (years)			0.833
Mean ± SD (min-max)	76.35±8.47 (58-97)	75.04±8.33 (56-95)	
<80 years	41 (49.4)	42 (50.6)	
≥80 years	16 (51.6)	15 (48.4)	
Education			0.153
Unschooled	4 (36.4)	7 (63.6)	
Primary school	38 (52.1)	35 (47.9)	
Secondary school/vocational	11 (42.3)	15 (57.7)	
Undergraduate or more	4 (100)	0 (0)	
Marital status			0.007*
Married	44 (44.9)	54 (55.1)	
Single/widowed/divorce	13 (81.2)	3 (19.8)	
Having children or not			0.039*
No	10 (76.9)	3 (23.1)	
Yes	47 (46.5)	54 (53.5)	
Income/occupational			0.622
Earner	9 (45.0)	11 (55.0)	
Dependent on other	48 (51.1)	46 (48.9)	
Payment for dentures			0.375
Universal coverage	39 (50.6)	38 (49.4)	
Self payment	2 (25.0)	6 (75.0)	
Civil rights/social security	16 (55.2)	13 (44.8)	
Systemic disease			0.227
No	21 (58.3)	15 (41.7)	
Yes	36 (46.2)	42 (53.8)	
Dwelling			0.509
Alone	9 (45.0)	11 (55.0)	
With relatives	45 (49.5)	46 (50.5)	
With offspring	2 (100.0)	0 (0.0)	

Values were represented as n (%), * = significance at $p<0.05$

shown in Table 4. Time of denture use was the only factor related to problems.

Discussion

Complete dentures are widely used prostheses for edentulous patients. They are supported by the remaining alveolar ridge, and their retention and stability depend on close adaptation of the denture base to supporting tissue, optimal contour of borders to surrounding tissue and muscle attachment, position of denture teeth, type of occlusion, and patients' adaptability. The results of the present study showed that half of all participants who had used complete

dentures for more than three years had problems when using them, and the most frequent problem encountered was looseness of the dentures. Bilhan et al[14] evaluated patients who requested new complete dentures and found that the most common complication was loss of retention, followed by ulceration. In new complete denture cases, studies[15-17] have shown that patients' complaints were related to denture faults or tissue problems. Post-insertion recheck and adjustment should solve these problems, which may persist for a few weeks or even months. Govasi et al[18] surveyed patients who had had dentures for at least one year and found that mastication discomfort and looseness

Table 4. Factors of denture maintenance related to problems of complete denture use

Factors	Good condition (n = 57)	Problems (n = 57)	p-value
Time when worn			0.003*
Sometimes	2 (12.5)	14 (87.5)	
Daytime	52 (55.9)	41 (44.1)	
Daytime and nighttime	3 (60.0)	2 (40.0)	
Cleaning dentures/day			0.542
Less than 3 times/day	41 (51.9)	38 (48.1)	
3 times or more/day	16 (45.7)	19 (54.3)	
Cleaning method			1.000
Brushing by toothpaste	54 (50.5)	53 (49.5)	
Brushing by other detergent/tap water	3 (42.9)	4 (57.1)	
Keeping dentures			0.618
Kept dry	1 (25.0)	3 (75.0)	
Soaked in water	56 (50.9)	54 (49.1)	
Container for soaking			0.350
Closed	37 (54.4)	31 (45.6)	
Open	19 (45.2)	23 (54.8)	
Commercial denture cleanser			0.227
Not used	49 (52.7)	44 (47.3)	
Used	8 (38.1)	13 (61.9)	

Value were represented as n (%), * = significance at $p<0.05$

were the most common complaints and their study also revealed a significant relationship between age and patient complaints. The present study suggests that clinicians should recall complete denture patients in a timely fashion to improve retention and stability. During recall visits, dentists should review medical status and perform oral examination to find any benign or malignant lesions that might or might not be related to denture use. It is also important to review proper oral hygiene and denture maintenance[18] during this recall visit. Dentists can improve the quality of complete dentures by adjusting denture bases, relining, rebasing, making occlusal adjustment, or making a new set of dentures depending on the specific requirements of the individual patient. Apart from quality of dentures, other factors may also affect patients' perception of the dentures. A study by Yoshida et al[19] showed that edentulous elderly people who were well-satisfied with their daily lives also expressed satisfaction with their complete dentures. In the present study, single patients and patients who had no children experienced significantly fewer problems, and most of them were still satisfied with their dentures. With regard to the systemic disease factor, the present study's findings were in agreement with those of former studies[16,17]

which showed that it was not significantly related to problems in using complete dentures.

Using dentures only on certain occasions such as during meals and going out in public was significantly related to having problems; conversely, it was because of experiencing problems that some participants used their dentures only for some periods of the day, and if their dentures were corrected to improve retention and stability, they may use them all day.

Recall and correction of complete dentures can also be useful for patients whose dentures are still functioning well. Dentists should check for and correct any abnormal signs or lesions, review oral hygiene, assist with denture maintenance and give nutritional advice because, as one study showed[20], the masticatory efficiency of complete dentures is only 30% of that of dentate persons.

Conclusion

The results of the present study demonstrated that after more than three years of using complete dentures, the number of patients who thought that their dentures were still functioning well was identical to the number of patients who were experiencing problems,

the most frequent of which was denture looseness. Patient characteristics that were significantly associated with problems in using complete dentures were marital status, having children or not, and the times when dentures were worn.

What is already known on this topic ?

Most patients use the same complete dentures for more than 5 years.

For the patient who experienced ongoing difficulties with new complete dentures, dentist must carefully evaluate the dentures for faults in denture bases extension and horizontal and vertical jaw relationships.

Impression technique, occlusion and implant can improve retention and stability of complete denture.

What this study adds ?

About one-third of complete denture patients suffer from denture looseness after use for three years.

Factors about marital status and having children or not had influence perception on patients regarding denture quality.

For regular recall visits of complete dentures, clinicians should focus on improving denture retention and stability.

Potential conflicts of interest

None.

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ปัญหาของการใช้งานฟันเทียมทั้งปากและปัจจัยที่เกี่ยวข้องในผู้ป่วยที่ใส่ฟันเทียมจากโรงพยาบาลราชวิถีระหว่างปี พ.ศ. 2550-2555

ประพิณ เปี่ยมพริ้ง

ภูมิหลัง: ฟันเทียมทั้งปากใช้สำหรับฟื้นฟูผู้ที่สูญเสียฟันธรรมชาติไปจนหมด เพื่อช่วยในด้านการบดเคี้ยว ความสวยงาม การออกเสียง และการออกสู่สังคม พบปะผู้คนหลังจากใส่ไปเป็นเวลานานอาจเกิดปัญหาในการใช้งานขึ้นได้จากการเปลี่ยนแปลงของสภาพในช่องปากของผู้ป่วย และการสึกหรอไป ของฟันเทียม

วัตถุประสงค์: เพื่อสำรวจปัญหาของการใช้งานของฟันเทียมทั้งปาก และหาปัจจัยที่อาจมีผลเกี่ยวข้องในผู้ป่วยที่ใส่ฟันเทียมไปเป็นเวลา 3-8 ปี

วัสดุและวิธีการ: สำรวจในผู้ป่วย 114 ราย อายุระหว่าง 56-97 ปี ที่ได้ใส่ฟันเทียมทั้งปากไปจากโรงพยาบาลราชวิถีระหว่างปี พ.ศ. 2550-2555 โดยการสัมภาษณ์ทางโทรศัพท์ข้อมูลที่สำรวจประกอบด้วย ข้อมูลพื้นฐานของผู้ป่วยสภาพการใช้งานฟันเทียมว่ายังใช้ได้ดีหรือมีปัญหา ถ้ามี มีปัญหาอะไร ช่วงเวลาในการใส่ฟันเทียมและการดูแลรักษาฟันเทียม ใช้สถิติเชิงพรรณนาในการอธิบายปัจจัยต่างๆ ของผู้ป่วย และใช้สถิติเชิงอนุมานคือ Chi-square test/Fisher's exact test/student t-test ในการหาความสัมพันธ์ระหว่างปัจจัยต่างๆ ของผู้ป่วยกับการมีหรือไม่มีปัญหาของฟันเทียม

ผลการศึกษา: ครึ่งหนึ่งของผู้ป่วยที่สำรวจมีปัญหาในการใช้ฟันเทียม ปัญหาที่สำคัญที่สุดคือ ฟันเทียมหลวม พบมากถึงหนึ่งในสามของจำนวนทั้งหมด ที่สำรวจ รองลงมาเป็นอาการเจ็บเวลาใช้งาน สำหรับปัจจัยที่มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับปัญหาการใช้ฟันเทียมทั้งปากมี 3 ปัจจัยคือ สถานภาพสมรส การมีหรือไม่มีบุตร และช่วงเวลาในการใส่ฟันเทียมโดยมีค่า $p = 0.007$, 0.039 และ 0.003 ตามลำดับ

สรุป: ผู้ที่ใส่ฟันเทียมทั้งปากจำนวนมากประสบกับปัญหาฟันเทียมหลวม เจ็บ เมื่อใช้งานไปนานเกินกว่าสามปี ทันตแพทย์ควรนัดผู้ป่วยกลับมาตรวจดู ตามระยะเวลา เพื่อแก้ไขปัญหาโดยเน้นที่ฟันเทียมหลวม เพื่อช่วยให้ผู้ป่วยมีคุณภาพชีวิตที่ดีขึ้น