

Research Article

Improving the Efficiency of Complete Denture Treatment

Daisuke Kawata*, Yuji Sato, Noboru Kitagawa, Toshiharu Shichita, Yukari Isshiki, and Mariko Ishikawa

Department of Geriatric Dentistry, Showa University School of Dentistry, Japan

***Corresponding author**

Daisuke Kawata, Department of Geriatric Dentistry, Showa University School of Dentistry, Japan, Tel: 03-3717-1151; Fax: 03-3787-3971; Email: blackstone@dent.showa-u.ac.jp

Submitted: 07 July 2016

Accepted: 04 August 2016

Published: 06 August 2016

ISSN: 2333-7133

Copyright

© 2016 Kawata et al.

OPEN ACCESS**Keywords**

- Complete denture
- Chair time
- Blank time
- Analysis

Abstract

In Japan, the number of elderly people with missing teeth has been decreasing. However, the number of patients wearing complete denture has not decreased. Therefore, suitable complete denture adjustment for the elderly people is important. The chair time and treatment contents (medical interview, medical examination, fitting, occlusion, adjustment, denture cleaning, patient's instruction, polishing, postoperative instruction, denture score, blank time) involved in complete denture adjustment were investigated and it is confirmed that there was a lot of patient's and blank time. The blank time is defined as "time not engaged in treatment" for the dentist, "observation time" for the assistant, and "time sitting in the chair doing nothing" for the patient. This research aimed to clarify a treatment procedure that allows for effective use of the blank time to provide appropriate treatment to each patient. The participants included 31 patients with complete dentures, 14 dentists, and 12 less experienced dentists. Treatment timetables were created using video data. Analyses were carried out to develop a more effective treatment protocol by changing treatment procedures and contents. Issues associated with treatment were also investigated. Treatment activities and chair time during denture adjustment (57 participants) were investigated to do treatment smoothly. As a result there were 22 out of 31 patients (deficiency of the denture cleaning etc.) whose treatment activities should be improved. The results suggested that treatment procedures that allow for effective use of patient's and less experienced dentist's blank time to provide appreciate treatment to each patient can be clarified.

INTRODUCTION

In Japan, the average number of teeth lost per person, has been decreasing owing to the 1989 implementation of the 8020 campaign [1]. However, 5.2% of the randomly sampled 3718 participants in the 2011 Survey of Dental Diseases [2] were wearing complete dentures. This suggests that 6.6 million people in Japan are wearing complete dentures [3]. So denture education and researches are considered to be very important.

There are several clinical researches related to complete denture treatment such as "the influence of the dentist's skill level on the patient's satisfaction level" [4] and "the patient's chair time differences based on the dentist's skill level" [5,6]. In addition, Sato et al., and Shichita et al., reported dentist's awareness survey about the time required for complete denture treatment [7,8]. Further, other researchers reported the chewing ability of patients who had undergone complete denture treatment [9,10]. Thus, a lot of clinical research regarding complete denture treatment has been conducted to provide patients with high-quality treatment. However, few researches have been conducted to evaluate treatment (whether necessary treatment is lacking or not, whether chair time is appropriate or not).

Isshiki et al., conducted a survey of the time required for and the content (treatment procedure, satisfaction of the patient for the treatment) of complete denture adjustment [11]. Their research revealed that dentist's blank time is only 2.3 min (8.2% of the chair time) during the chair time (28.8 min). However, patient's blank time was 13.2 min (47.2%) and assistant's blank time was 12.6 min (45%). The blank time is defined as "time not engaged in treatment" for the dentist, "observation time" for the assistant, and "time sitting in the chair doing nothing" for the patient. More effective use of patient's and assistant's blank time can prevent the omission of required treatment procedures. Further, such improvements are able to allow dentists to provide more efficient and appropriate dental treatment for patients. The necessary treatment might be lacked owing to the unclearness of treatment procedure during denture adjustment. So the number of emergency cases which go to the hospital was not few. Therefore it is necessary to clarify the treatment procedure during denture adjustment to prevent this. This research's purpose is to clarify a treatment procedure that enhances the effective use of patient's and assistant's blank time by applying questionnaires and by doing Analyses based on complete denture treatment data. Therefore the provision of appropriate treatment for patients will become possible.

MATERIALS AND METHODS

Participants

The participants included 31 patients with complete dentures, 14 dentists, and 12 less experienced dentists. The participants of this research were 31 patients (12 men, 19 women, average age: 81.7) who underwent complete denture adjustment for missing teeth at the Department of Geriatric Dentistry, Showa University Dental Hospital and were provided with a sufficient explanation of this research and whose consents were obtained.

The participants were the patients whose dentures were fitted more than one month before and stable based on their dentist's judgment. The number of dentists are 14 (years of clinical experience: 2-28, average years of clinical experience: 9.0), less experienced dentists are 12 dentists (years of clinical experience: 1-2, average years of clinical experience: 1.3). The less experienced dentists do only treatment assistance. The dentists performed treatment procedures such as denture adjustment.

Survey duration

The survey duration was the time required only for denture adjustment. However, patients who were undergoing tissue conditioning or who required denture repairs or new dentures were excluded.

Ascertaining of denture adjustment procedure

Scenes of the complete denture adjustment for edentulous patients undergoing adjustment were recorded using a video camera. This research was conducted with the approval of the Showa School of Dentistry ethics committee (Approval No. 2011-004). Treatment activities were broadly divided into 16 categories (medical interview, medical examination, denture examination (fitting, occlusion), adjustment, denture cleaning, oral care, patient's instructions, polishing, postoperative instructions, preparation of instruments and clean up, medical records entry, denture score, observation, blank time, others) based on the treatment data obtained from the recordings (Table 1). The blank time is defined as "time not engaged in treatment" for the dentist, "observation time" for the less experienced dentist, and "time sitting in the chair doing nothing" for the patient. Using these categorized activities, timetables (30 seconds interval) were created for the dentists, patients, and less experienced dentists (Figure 1).

Analysis to change the timetable

Analyses of changing timetable were conducted and their impact on treatment activities and chair time was evaluated. The Analysis is to clarify the ideal treatment procedure by changing the treatment contents of the timetable.

Analysis to shorten the chair time (Step 1): A concrete example of Analysis (Step 1) designed to shorten the treatment time is shown in Figure (2). Chair time was reduced by allotting the "treatment tasks that could also be done by the less experienced dentist" (denture cleaning, oral care, patients' instructions, polishing, postoperative instructions, preparation of instruments and clean up, medical records entry, denture score) to the less experienced dentist.

Table 1: Categorization of the complete denture treatment steps.

Small Category	Large category
1. Medical interview (hearing of the chief complaint) 2. Medical examination (State confirmation of the mucosa) 3. Fitting (Inspection using the fitness test material) 4. Occlusion (inspection using an occlusion paper)	Treatment tasks that could only be performed by a dentist
5. Adjustment (To make adjustments based on the results of fitness test and occlusal test)	
6. Dentures cleaning (Wash the dentures using a denture brush) 7. Oral care (Removal of food remaining in the mouth) 8. Patients instructions (Guidance of the storage method of denture) 9. Polishing 10. Postoperative instructions 11. Preparation of instruments and Cleanup 12. Medical records entry 13. Denture Score (Implementation of the questionnaire using the denture score)	Treatment tasks that could also be done by an assistant
14. Observation 15. Blank time 16. Others (Talking which is unrelated to treatment emergency etc.)	Blank time
Treatment activities were broadly divided into 16 categories based on the treatment data.	

Analysis to utilize the chair time effectively (Step2): The main purpose of this research is to utilize the blank time effectively and to improve the quality of treatment for patients. A concrete example of the Analysis (Step 2) designed to improve the effective use of the time is shown in Figure (3). Questionnaires (denture satisfaction questionnaire, chewing function questionnaire, denture usage questionnaire, daily life questionnaire) were planned to do for the effective use of the blank time. According to the previous research, the necessary time of the questionnaire is denture satisfaction questionnaire 1.8 minutes, chewing function questionnaire 2.0 minutes, denture usage questionnaire 1.8 minutes, daily life questionnaire 4.0 minutes [12]. This questionnaire was done in case that patients and less experienced dentists have at least 1.8 minutes blank time at the same timing during treatment.

The questionnaire using the denture score

a. Denture satisfaction questionnaire: This questionnaire Figure (4) allowed the patient's denture satisfaction level to be converted to numerical values, and revealed the change of satisfaction between before and after treatment [13].

b. Chewing function questionnaire: This questionnaire Figure (5) revealed the change in the patient's food intake status between before and after treatment [14].

Chair time (minutes)	Dentist	Patient	Assistant
1	Medical interview	Medical interview	Observation
2	Medical examination	Medical examination	Observation
3	Postoperative instructions	Postoperative instructions	Denture cleaning
4	Preparation of instruments	Blank time	Denture cleaning
5	Denture examination(fitting)	Denture examination(fitting)	Preparation of instruments
6	Blank time (fitting)	Blank time (fitting)	Observation
7	Adjustment	Blank time	Observation
8	(fitting)	(fitting)	Preparation of instruments
9	(occlusion)	(occlusion)	Observation
10	Adjustment	Blank time	Preparation of instruments
11	(occlusion)	(occlusion)	Observation
12	Adjustment	Blank time	Preparation of instruments
13	(occlusion)	(occlusion)	Observation
14	Adjustment	Blank time	Preparation of instruments
15	(occlusion)	(occlusion)	Observation
16	Adjustment	Blank time	Preparation of instruments
17	(occlusion)	(occlusion)	Observation
18	Adjustment	Blank time	Observation
19	(occlusion)	(occlusion)	Observation
20	Adjustment	Blank time	Observation
21	(occlusion)	(occlusion)	Observation
22	Polishing	Others	Preparation of instruments
23	Polishing	Others	Others
24	Polishing	Others	Others
25	Polishing	Others	Others
26	Polishing	Others	Others
27	Postoperative instructions	Postoperative instructions	Observation
28	Postoperative instructions	Postoperative instructions	Preparation of instruments

- : Treatment tasks that could only be performed by a dentist
- : Treatment tasks that could also be done by an assistant
- : Blank time (dentist, patient, assistant)

Figure 1 Sample of the timetable of dentist, patient, and assistant.

Chair time (minutes)	Dentist	Patient	Assistant
1	Medical interview	Medical interview	Observation
2	Medical examination	Medical examination	Observation
3	Postoperative instructions	Postoperative instructions	Denture cleaning
4	Preparation of instruments	Blank time	Denture cleaning
5	Denture examination(fitting)	Denture examination(fitting)	Preparation of instruments
6	Blank time (fitting)	Blank time (fitting)	Observation
7	Adjustment	Blank time	Observation
8	(fitting)	(fitting)	Preparation of instruments
9	(occlusion)	(occlusion)	Observation
10	Adjustment	Blank time	Preparation of instruments
11	(occlusion)	(occlusion)	Observation
12	Adjustment	Blank time	Preparation of instruments
13	(occlusion)	(occlusion)	Observation
14	Adjustment	Blank time	Preparation of instruments
15	(occlusion)	(occlusion)	Observation
16	Adjustment	Blank time	Preparation of instruments
17	(occlusion)	(occlusion)	Observation
18	Adjustment	Blank time	Observation
19	(occlusion)	(occlusion)	Observation
20	Adjustment	Blank time	Observation
21	(occlusion)	(occlusion)	Observation
22	Polishing	Others	Preparation of instruments
23	Polishing	Others	Others
24	Polishing	Others	Others
25	Polishing	Others	Others
26	Polishing	Others	Others
27	Postoperative instructions	Postoperative instructions	Observation
28	Postoperative instructions	Postoperative instructions	Preparation of instruments

→,↑; Shift

Figure 2a Original of the timetable of dentist, patient, and assistant.

Chair time (minutes)	Dentist	Patient	Assistant
1	Medical interview	Medical interview	Observation
2	Medical examination	Medical examination	Observation
3	Postoperative instructions	Postoperative instructions	Denture cleaning
4	Denture examination(fitting)	Denture examination(fitting)	Preparation of instruments
5	Adjustment	Blank time	Observation
6	(fitting)	(fitting)	Preparation of instruments
7	(occlusion)	(occlusion)	Observation
8	Adjustment	Blank time	Preparation of instruments
9	(occlusion)	(occlusion)	Observation
10	Adjustment	Blank time	Preparation of instruments
11	(occlusion)	(occlusion)	Observation
12	Adjustment	Blank time	Preparation of instruments
13	(occlusion)	(occlusion)	Observation
14	Adjustment	Blank time	Preparation of instruments
15	(occlusion)	(occlusion)	Observation
16	Adjustment	Blank time	Preparation of instruments
17	(occlusion)	(occlusion)	Observation
18	Adjustment	Blank time	Preparation of instruments
19	(occlusion)	(occlusion)	Observation
20	Adjustment	Blank time	Preparation of instruments
21	Polishing	Others	Others
22	Polishing	Others	Others
23	Polishing	Others	Others
24	Polishing	Others	Others
25	Postoperative instructions	Postoperative instructions	Observation
26	Postoperative instructions	Postoperative instructions	Observation
27	Postoperative instructions	Postoperative instructions	Observation
28	Postoperative instructions	Postoperative instructions	Preparation of instruments

↑ 2.0 minutes shortening

Figure 2b The timetable of dentist, patient, and assistant after simulation (Step 1)

Chair time was reduced by allotting the “treatment tasks that could also be done by an assistant” to the assistant.

Chair time (minutes)	Dentist	Patient	Assistant
1	Medical interview	Medical interview	Observation
2	Medical examination	Medical examination	Observation
3	Postoperative instructions	Postoperative instructions	Denture cleaning
4	Denture examination(fitting)	Denture examination(fitting)	Preparation of instruments
5	Adjustment	Blank time	Observation
6	(fitting)	(fitting)	Preparation of instruments
7	(occlusion)	(occlusion)	Observation
8	Adjustment	Blank time	Preparation of instruments
9	(occlusion)	(occlusion)	Observation
10	Adjustment	Blank time	Preparation of instruments
11	(occlusion)	(occlusion)	Observation
12	Adjustment	Blank time	Preparation of instruments
13	(occlusion)	(occlusion)	Observation
14	Adjustment	Blank time	Preparation of instruments
15	(occlusion)	(occlusion)	Observation
16	Adjustment	Blank time	Preparation of instruments
17	(occlusion)	(occlusion)	Observation
18	Adjustment	Blank time	Preparation of instruments
19	(occlusion)	(occlusion)	Observation
20	Adjustment	Blank time	Preparation of instruments
21	Polishing	Others	Others
22	Polishing	Others	Others
23	Polishing	Others	Others
24	Polishing	Others	Others
25	Postoperative instructions	Postoperative instructions	Observation
26	Postoperative instructions	Postoperative instructions	Observation
27	Postoperative instructions	Postoperative instructions	Observation
28	Postoperative instructions	Postoperative instructions	Preparation of instruments

▨ : Denture score

Figure 3 The timetable of dentist, patient, and assistant after analysis (Step 2)

The questionnaire using the denture score was conducted during patient’s and less experienced dentist’s blank time.

Factors	Satisfaction grades			Score		
	Well satisfied	Satisfied	Dissatisfied			
Chewing	1	2	3	14	6	0
Tasting	1	2	3			
Speech	1	2	3	9	6	0
Pain (upper)	1	2	3	12	11	0
Pain (lower)	1	2	3			
Esthetics	1	2	3	13	11	0
Fit (upper)	1	2	3	18	13	0
Fit (lower)	1	2	3			
Retention (upper)	1	2	3			
Retention (lower)	1	2	3	15	11	0
Comfort (upper)	1	2	3	19	16	0
Comfort (lower)	1	2	3			

Satisfaction score : Total () points

Figure 4 Denture satisfaction questionnaire. This questionnaire allows the patient's denture satisfaction level to be converted to numerical values.

Bean curd (tofu)	
Boiled eggplant	
Boiled potato	
Boiled carrot	
Artificially-grown soybean	
Boiled fish-paste (kamaboko)	
Potato chips	
Burdock	
Rice-cake cubes	
Beef steak	
Peanuts	
Pickled raddish	
Hard biscuit	
Hard cracker	
Hard pickled raddish	
Fresh ear shell	
Dried cuttlefish	
Chewing gum	
Whole apple	

check as follows:
 ○ : Easy to chew
 △ : Difficult to chew
 × : Impossible to chew

Patient No. _____
 Name _____
 Age _____
 Sex F·M
 Date _____
 Stage of prosthesis _____
 Chewing function score
 (Number of ○/20 × 100)

 Name of dentist _____

Figure 5 Chewing function questionnaire. This questionnaire reveals the change in the patient's food intake status between before and after treatment.

- (1) When do you wear your dentures?
 1: I wear them all day
 2: I put them on when eating
 3: I put them on when going out
 4: Other ()
- (2) What do you do with your dentures when sleeping at night?
 1: I take them out before bed every night
 2: I sometimes take them out before bed
 3: I always sleep with them in
 4: Other ()
- (3) What do you do with your dentures after removing them?
 1: I put them in water
 2: I put them in water with denture cleaner
 3: I just take them out and leave them as is
 4: Other ()
- (4) How do you clean your dentures?
 Toothpaste Brush
 1: Regular toothpaste 1: Toothbrush
 2: Denture toothpaste 2: Denture toothbrush
 3: None 3: None
 4: Other 4: Other
- (5) Denture cleaner use
 1: I use it every day (Product name:)
 2: I sometimes use it (Product name:)
 (once every _____ day (s))
- (6) Denture adhesive use
 1: I always use it (Product name:)
 2: I sometimes use it (Product name:)
 3: I never use it
 4: Other ()
- (7) Do your family members know that you wear dentures?
 1: Yes
 2: Probably
 3: No

Figure 6 Denture usage questionnaire.

c. Denture usage questionnaire: This survey Figure (6) allowed the dentists to easily check each patient's current denture handling and could be used as a guide when providing instructions to the patient.

d. Daily life questionnaire: By doing this Table (2) it becomes possible to guide the patients the relation of each patient's denture status and their mood, sense of fulfillment, fatigue, personal relations, dietary habits, etc [15].

The survey method of the questionnaire using the denture score

Not all patients were able to complete the 4 kinds of questionnaires using the denture score during the patient's and less experienced dentist's blank time. Therefore the questionnaire order in this research was as follows,

1. Denture satisfaction
2. Chewing function
3. Denture usage
4. Daily life

Treatment Issues

Treatment issues such as omitting required treatments occur, because the procedures involved in denture adjustment are not clearly defined. Therefore, the issues were assessed using a series of questions ("Did you wash the dentures?" "Did you conduct the medical interview?" "Did you conduct the intraoral inspection?" "Did you perform the fitting test?" "Did you perform the occlusion test?" "Did you follow the treatment order?" "Did you explain the treatment?") throughout the treatment.

Statistical Analysis

The change of the average chair time between before and

after of the timetable change was analyzed using a t-test. The change of the blank time for the dentists, patients, and less experienced dentists was analyzed using one-way ANOVA and Bonferroni test. All statistical analyses were performed using statistical processing software (SPAW Statistics Base®, ver. 18, IBM, and Tokyo, Japan).

RESULTS

Average chair time

The average chair time was reduced 2.4 minutes (8.3%) by introducing the changes suggested by the Analysis (Step 1); the change of the chair time was little (Figure 7).

Changes in dentists, patient's, and less experienced dentist's blank time

The dentist's blank time during denture adjustment was reduced by the Analysis (Step 2) (Figure 8). Patient's blank time was 13.2 min (47.2%) and less experienced dentist's blank time was 12.6 min (45%). Patient's and less experienced dentist's blank time was reduced by the Analysis (Step 2) (p < 0.05).

Treatment Issues

Treatment activities and chair time during denture adjustment (31 patients) were investigated to do treatment smoothly. As a result there were 22 out of 31 patients (deficiency of the denture cleaning etc.) whose treatment activities should be improved (Table 3).

DISCUSSION

In order to clarify the treatment procedure that is this research's purpose, participant and assessment period were standardized.

Patients with remaining teeth are susceptible to periodontal

Table 2: Daily life questionnaire.

Question	Category		
	Grade 1	Grade 2	Grade 3
1. Are you satisfied with your diet?	Well satisfied	Satisfied	Dissatisfied
2. Are you confident about your health?	Very much	Almost	Little
3. Do you exercise daily?	Every day	Some days	Few days
4. Do you feel tired most days?	Few days	Some days	Most days
5. Is your sleep often disturbed?	Never	Sometimes	Often
6. Are you satisfied with your communication?	Well satisfied	Satisfied	Dissatisfied
7. Do you usually feel well?	Very well	Well	Not well
8. Do you feel anxious about aging?	Never	Sometimes	Often
9. Do you feel loneliness often?	Never	Sometimes	Otten
10. Are you satisfied with your job and hobbies?	Well satisfied	Satisfied	Dissatisfied
11. Do you feel your life is meaningful?	Very much	Almost	Little
12. Are you contributing to your community?	Very much	Almost	Little
13. Are you satisfied with your economic status?	Well satisfied	Satisfied	Dissatisfied
14. Are you satisfied with your overall daily life?	Well satisfied	Satisfied	Dissatisfied

By doing this it becomes possible to guide the patients the relation of each patient's denture status and their mood etc.

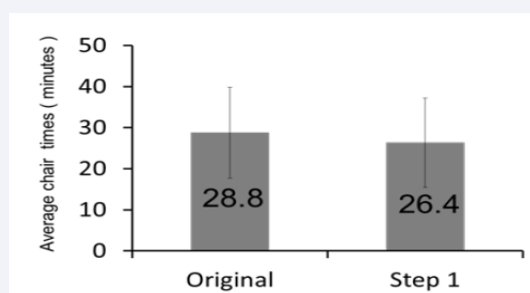


Figure 7 Denture usage questionnaire.

Table 3: Treatment issues.

		n=31
	Treatment issues	Number of case
1	Deficiency of the denture cleaning	9(29%)
2	Deficiency of the treatment procedure	8(26%)
3	Deficiency of the postoperative instruction	7(23%)
4	Deficiency of the medical examination	3(10%)
5	Deficiency of the denture examination (fitting)	3(10%)
6	Deficiency of the medical interview	2(7%)
7	Deficiency of the denture examination (occlusion)	1(3%)

The survey in 90% of cases was carried out.

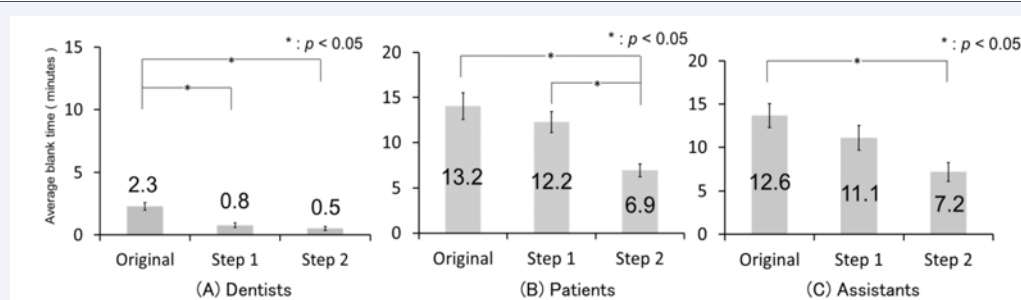


Figure 8 (A) Comparison of the blank time between before and after of dentist's timetable changes (Step.1, Step.2)

(B) Comparison of the blank time between before and after of patient's timetable changes (Step.1, Step.2)

(C) Comparison of the blank time between before and after of less experienced dentist's timetable changes (Step.1, Step.2)

disease. Therefore the standardization of the treatment conditions will be difficult. The status of patients who wear complete denture is various. The participants were the patients whose dentures were fitted more than one month before and stable based on their dentist's judgment.

In university hospitals, it is difficult for dental hygienists to act as assistants for one dentist. When the assistants are students, there are many procedures (postoperative instruction etc.) that they cannot perform and there is a high risk that they will interfere with a treatment. Therefore, in this research all the assistants were unified to trained dentists. In addition, the dentists who were acting as assistants were limited to providing only treatment assistance, and were not allowed to perform treatments instead of the attending dentist. Therefore, similar results would be expected if dental hygienists were acting as the assistants.

Since the difficulty associated with fitting dentures, taking impressions, and maxillary and mandibular registrations differs greatly between patients (due to alveolar ridge instability or jaw position), the denture adjustment period easy to unify the conditions was defined as assessment period.

When the Analyses (Step.1, Step.2) on the timetable were done, it was thought that the average chair time will decrease. However, the results of this research demonstrated that even after implementing timetable changes, the average chair time didn't decrease. According to the study [16] conducted by the Japan Association for Dental Science, the average chair time for denture adjustment in university hospitals is 25.6 minutes. In this research, the average chair time for complete denture adjustment was 28.8 minutes. It is thought that this was derived from two factors. Two factors are that this research's average chair time for complete denture adjustment is appropriate and

there are little blank time during the procedure performed by the dentist. It became clear that the blank time of the patients and less experienced dentists after the Analyses decreased. This was made possible by conducting “denture score” during the time of the less experienced dentist’s “observation”. It is thought that this improved the treatment of the patients and less experienced dentists.

In this research, 22 of the 31 patients should be improved during their complete denture adjustment. It is thought that it is caused by the fact that the treatment procedure of denture adjustment is not clear. There were not few emergency patients who go to the hospital due to lacking necessary treatments, because the treatment procedure of complete denture adjustment was not clear. The comprehensive survey of living conditions [17] in Japan shows the rate of dental diseases outpatients is the 3rd place for man and the 5th place for woman. The rate of dental diseases outpatients is very high in Japan. Therefore it is necessary to clarify the treatment procedures in order to reduce the rate of outpatients. Based on the result of this research, treatment procedure for the effective use of the patient’s and

assistant’s blank time is shown in Figure (9). According to this treatment procedure, several dentists did treatment.

CONCLUSION

Analyses (Step 1 and Step 2) were implemented. As a result the chair time was shortened a little (8.3%). And implementing Step 2 could reduce patients and less experienced dentist’s blank time. Based on these results, new treatment procedures that enabled patient’s and assistant’s blank time to use effectively was clarified. And treatment activities during denture adjustment have many issues to be improved. By doing the treatment according to the treatment procedure which can use the blank time efficiently based on the questionnaires, it is suggested that the provision of appropriate treatment to each patient becomes possible.

ACKNOWLEDGEMENTS

We thank the patients, dentists, and less experienced dentists for their participation in this study and the Professors of Geriatric Dentistry at Showa University for their kind assistance. This

Total chair time (25~30minute)		→ Acts to be performed always	-----> Act to be performed during the blank time	
Average chair time (minute)	Dentist	Assistant	Patient	
1	Medical interview 1. Physical status 2. Physical condition 3. Chief complain	Medical records entry	Medical interview	
4	Denture examination (Take off a denture) 1. Denture status 2. Attrition 3. Fracture 4. Location of sequence	Denture cleaning	Inspection out of the oral	
	Inspection out of the oral 1. Examination of temporomandibular joint 1) Clicking 2) Pressure pain 3) Maximal mandibular opening 4) Deviation			
	Intraoral inspection 1. Mucosal surface of denture base 1) Impression, Cloudiness 2) Redness 3) Ulcer, Fibroma 2. Soft tissue			Intraoral inspection
	Denture examination (Denture wearing) 1. Pain 2. Retention 3. Stability, Bracing 4. Tongue space			
20	Adjustment 1. Fitting	Treatment assistance Medical records entry Denture score	Adjustment Denture score	
	2. Occlusion			
5	Medical records entry 1. SOAP 2. Disease name 3. Medical treatment contents	Polishing Assistants' instructions Oral care	Assistants' instructions Oral care Postoperative instructions	
	Postoperative instructions			
	Appointment			Appointment

Figure 9 Sample of the treatment procedure designed for effective use of edentulous patient’ and assistant’ blank time. Treatment procedure for the effective use of the patient’s and assistant’s blank time is shown in Figure 10.

study was partly supported by a 2011 Grant-in-Aid for Scientific Research C from the Ministry of Education, Culture, Sports, Science and Technology (No. 22592160).

REFERENCES

1. White Papers & Reports Annual Health, Labour and Welfare Report, Dental Health Promotion. 2010-2011.
2. Analysis Committee for the Report on the Survey of Dental Diseases Table III-5-3 Edentulous patients, patients currently with 20 or more teeth, patients currently with 24 or more teeth, patients who have lost teeth (no. and percentage), region, sex, 10-year 10 segment age levels (15 and over, adult teeth). Report on the Survey of Dental Diseases (2011) Oral Health Association of Japan, 96-102, 2011.
3. Statistics Bureau, Ministry of Internal Affairs and Communications, Population Census Survey. 2014.
4. Kimoto S, Kimoto K, Kitamura A, Saita M, Iijima M, Kawai Y. Effect of dentist's clinical experience on treatment satisfaction of a complete denture. *J Oral Rehabil.* 2013; 40: 940-947.
5. Kimoto S, Kimoto K, Tanaka K, Takeo A, Sugimura K, Imamichi Y, et al. Effect of clinicians' experience on chair time and the number of denture adjustment visits required for complete denture treatment. *Prosthodont Res Pract.* 2007; 6: 166-172.
6. Sileversin JB, Shafer SM, Smalesz FC, Sheiham A. Time and methods used for complete denture construction by dental students and general dental practitioners in Great Britain in 1972. *J Dent.* 1978; 6: 196-200.
7. Sato Y, Kitagawa N, Hattori Y, Yamashita S, Tamaki K, Nakamura T. Effect of Clinician's Experience and Degree of Difficulty on Chair Time for Complete Denture Treatment. *J Prosth Soc.* 2008; 52: 457-464.
8. Shichita T, Sato Y, Kitagawa N. Actual and Estimated Chair Time by Dentists for Complete Denture Treatment. *J Prosth Dent.* 2011; 3: 360-368.
9. Kapur KK, Soman SD. Masticatory performance and efficiency in denture wearers. 1964. *J Prosthet Dent.* 2004; 92: 107-111.
10. Haraldson T, Karlsson U, Carlsson GE. Bite force and oral function in complete denture wearers. *J Oral Rehabil.* 1979; 6: 41-48.
11. Isshiki Y, Sato Y, Kitagawa N, Shichita T, Kawata D, Ishikawa M. Evaluation of chair time and treatment steps during complete denture adjustment. *J Gerodont.* 2015; 30: 12-24.
12. Kawata D, Sato Y, Kitagawa N, Shichita T, Isshiki Y, Ishikawa M. A study on the time required to questionnaire of complete denture evaluation lists. *JPN J Dent Pract Admin.* 2015; 50: 45-51.
13. Sato Y, Hamada S, Akagawa Y, Tsuga K. A method for quantifying overall satisfaction of complete denture patients. *J Oral Rehabil.* 2000; 27: 952-957.
14. Sato Y, Minagi S, Akagawa Y, Nagasawa T. An evaluation of chewing function of complete denture wearers. *J Prosthet Dent.* 1989; 62: 50-53.
15. Yoshida M, Sato Y, Akagawa Y, Hiasa K. Correlation between quality of life and denture satisfaction in elderly complete denture wearers. *Int J Prosthodont.* 2001; 14: 77-80.
16. Japanese Association for Dental Science Press. 2011.
17. Ministry of Health, Labour and Welfare Comprehensive Survey of Living Conditions.

Cite this article

Kawata D, Sato Y, Kitagawa N, Shichita T, Isshiki Y, et al. (2016) Improving the Efficiency of Complete Denture Treatment. *JSM Dent* 4(3): 1069.