Treatment satisfaction and oral health behavior of the before and after dental implanting treatment

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ABSTRACT

Objectives : In this study, for before/after dental implant surgery, our aim is to provide the basic data based on the decision of the treatment by measuring satisfaction of the treatment and finding out the intention to revisit a hospital and also by recommendation.

Methods : We conducted the frequency analysis, a cross-tabulations, paired t-test and a correlation analysis of 146 data who had visited at 6 dental clinics and hospitals located in Daegu for dental implant surgery, with SPSS (PASW 18.0 for Windows, SPSS Inc, USA) to find out the satisfaction of the treatment before/after dental implant surgery.

Results : The satisfaction related to before/after dental implant surgery of oral health was all statistically significant on a masticatory, social and psychological function, the satisfaction towards the treatment, the intention to revisit a hospital and also by recommendation. Independent variables explained the satisfaction of the treatment before/after dental implant surgery as 19.1% and indicated a significantly high value in general.

Conclusions : The satisfaction was higher on satisfactory of the postoperative treatment than on satisfactory of the preoperative treatment in spite of these limitations. Therefore, the dental medical team should take into account dental implanting as a way which improves the satisfaction of the treatment related with oral health and have continuous managements and careful concerns.

Key Words : dental implant, intention of recommendation, revisit to dental clinics, treatment satisfaction

색인 : 재내원, 치과 임플란트, 만족도, 추천의도

Introduction

Stomatosis is a chronic illness once it occurred. There are two types of diseases including dental caries and periodontal disease[1].

Main causes of tooth loss, dental caries, periodontal disease, tooth injuries and congenital deficiency[2], are not prevented completely and closely related to the aging process[3,4].

If tooth is lost by stomatosis, it can only be replaced by artificial materials[1]. For the restoration of masticatory function and aesthetic caused by tooth loss, there are crown-bridge, removable partial denture, full denture and dental implant[5].

In the past, traditional methods like removable or fixed partial denture were commonly performed[6], but these meth-

ods after removing the healthy teeth, increased the danger of dental caries and root-canal treatment of neighboring teeth and caused periodontal diseases[7].

As dental prosthetic procedures of the past have much more obstacles than advantage, interest and demand on dental implanting[8] and functional improvements are very important.

Furthermore, without damaging the surrounding tissues, dental implant surgery on the basis of the osseointegration principle, restoring the function as well as the aesthetic and preventing further absorption of the bone by giving an appropriate stimulus to the remaining bones[9,10].

In earlier years, the treatment done by implant was applied only to fully edentulous patients, gradually it has also been successfully done to partial edentulous patients as a widely used method and has been chosen fairly at a single tooth restoration. Moreover, on one-day dental implanting is being done[11-13].

Also, by the use of various bone supplements, surgical methods such as maxillary sinus floor elevation with dental implanting results in a high success rate[14].

For successful maintenance of dental implanting, we need more practical and systematic oral health education in the clinics to emphasize related periimplantitis and oral health behaviour change[15].

Most studies on dental implanting reported the results based on the success or failure and the studies which evaluated causes of satisfaction or dissatisfaction about treatment from the viewpoint of patients, are insufficient. At this time, when patients' demands and concerns about medical services gradually increase and the medical target switches from a doctor to a supplier, a supplier to a patient, a patient to a demander, then the satisfactory evaluation about prosthetic treatment from the viewpoint of patient, is very important.

The purpose of this study is to provide the basic data for the decision of the treatment by measuring the satisfaction of dental implant surgeries and finding out the intention to revisit and recommend the dental surgery clinic.

Materials and Methods

1. Objective of the study

Subjects were the patients receiving dental implant surgery from January 1, 2011, to June 30, 2011 in 6 dental clinics in Daegu. A total of 150 patients signed up with informed consent. Questionnaire included a demographic characteristics and the satisfaction of the treatment before dental implant surgery. After 6 months, when the treatment was over, we let the participants visit a hospital and a dental hygienist directly explained the questions about the satisfaction of the treatment after dental implant surgery to subjects and examined them with a medical record by the use of structured questionnaires. Except 5 incomplete questionnaires, 145 data were analyzed.

2. Method of study

In this study, we searched for gender, age, average monthly income, job, smoking frequency a day, the number of tooth-brushing per day, regular dental checkups and the reason why they chose the dental clinics and hospitals to understand the general idea. For measuring satisfaction of the before/after dental implant surgery, we did a survey on each function of implant ; a masticatory, social and psychological function, overall satisfaction with the model from OHIP-14[16].

Questionnaires were divided into 16 sections, each having variables, and 4 questions per section, each question was measured by a 5-point Likert scale ; never (1), no (2), normal (3), yes (4), best (5), and higher the mark, greater the satisfaction.

3. The analysis method

The demographic attribution of subjects and the score of characteristics related to the treatment were calculated. In statistical analysis, we conducted frequency analysis general characteristics of the subjects, the oral health behaviors before dental implant surgery, the number and region of dental implants, paired t-test analysis the satisfaction on each detailed factor before and after dental implant surgery, x^2-test the overall satisfaction and the intention to revisit a hospital after dental implant surgery and multiple regression analysis to investigate general factors affecting the treatment satisfaction of partially missing tooth were used by SPSS(PASW 18.0 for Windows, SPSS Inc, USA) and a significance level was set at 0.05.

Results

1. The general characteristics of the subjects

Among the distributions, a demographic characteristics of subjects and the characteristics related to the treatment, about gender, male was 53.1% and female was 46.9%. For age, 40-49 was 29.7%, 50-59 was 22.1% and under 30-39 was 16.6%.

On monthly income, more than 5,000,000 Korean won was 26.2%, under 4,000,000-4,990,000 Korean won was 24.1% and under 3,000,000-4,000,000 Korean won was 20.7%. About academic ability, high school graduates were 50.3%, below middle school was 34.5% and above university/college graduates were 15.2%.

The number of office jobs were 27.6%, service industries and sales positions were 24.8% and housewives were 15.2%.

Table 1. The general characteristics of subjects

Variables	Characteristics	N	%
Gender	male	77	53.1
	female	68	46.9
Age (years)	20–29	21	14.5
	30–39	24	16.6
	40–49	43	29.7
	50–59	32	22.1
	60–69	22	15.2
	≧70	3	2.1
Marital status	married	112	77.2
	single	33	22.8
Monthly income (10,000 Korea Won)	<200	20	13.8
	200–299	22	15.2
	300–399	30	20.7
	400–499	35	24.1
	≧500	38	26.2
Education	≦middle school	50	34.5
	high school	73	50.3
	university or higher	22	15.2
Job description	manager/professions	5	3.4
	technician/subprofessionals	18	12.4
	office job	40	27.6
	service industry/sales position	36	24.8
	agriculture/fishing business	7	4.8
	craftsman	8	5.5
	simple labor	1	0.7
	housewives	22	15.2
	unemployed	8	5.5
Dental checkup	yes	52	35.9
	no	93	64.1
Gum bleeding	yes	70	48.3
	no	75	51.7
Main reason for dental clinic visit	reputation of dental institution	45	31.0
	cost	8	5.0
	expertise	53	36.3
	convenience of geographical location	23	15.9
	latest facilities and equipment	4	2.8
	quality of service	12	8.3
	medical treatment services	1	0.7
Total		145	100.0

Table 2. The oral health behaviours of the subjects before dental implant surgery

Variables	Characteristics	N	%
Smoking quantity a day	1-10	13	9.0
	11-20	40	27.6
	21-30	10	6.9
	no smoking	82	56.6
Tooth brushing frequency a day	1	14	9.7
	2	68	46.9
	≧3	63	43.4
Hard food intake	yes	61	42.1
	no	84	57.9
Prosthetic devices installation	yes	78	53.8
	no	67	46.2
Periodontal disease of the past	yes	63	43.4
	no	82	56.6
Oral pain/discomfort	yes	96	66.2
	no	49	33.8
Total		145	100.0

On regular dental check ups, 64.1% do and 35.9% don't. About gum bleeding, 51.7% said no while 48.3% said yes.

The main purpose of hospital visit was medical expert 36.2%, reputation 31.0% and convenience of geographical location 15.9%〈Table 1〉.

2. The oral health behaviors of the subjects

Smokers accounted for 56.6% including smoking of 11 to 20 sticks per day 27.6% and 1 to 10 sticks per day 9%. On tooth brushing frequency a day, twice a day was 46.9%, more than three times a day was 43.4% and once a day was 9.7%.

On the amount of hard food intake, none was 57.9% and yes was 42.1%. On the installation of the prosthetic devices , no was 46.2% and yes was 53.8%. On the periodontal disease of the past - none was 56.6%, yes was 43.4%. On the oral pain and discomfort, yes was 66.2%, no was 33.8%〈Table 2〉.

3. The number and region of dental implants

On the number and region of dental implants, from minimum 1 to 11, 2 teeth were 30.3%, 1 tooth and 3 teeth was 20.7% respectively. On implant region, just the posterior teeth

Table 3. The number and region of dental implants

Variables	Characteristics	N	%
No. of implant	1	30	20.7
	2	44	30.3
	3	30	20.7
	4	19	13.1
	5	10	6.9
	6	3	2.1
	7	3	2.1
	8	1	0.7
	9	2	1.4
	10	2	1.4
	11	1	0.7
Site	anterior teeth	14	9.7
	posterior teeth	99	68.3
	2nd molar	32	22.0
Total		145	100.0

Table 4. The satisfaction before and after dental implant surgery (N=145)

Variables	Before−treatment	After−treatment	t	p−value
	Mean±SD	Mean±SD		
Masticatory function	2.68±0.63	3.63±0.32	−18.395	0.000
Social function	2.67±0.38	3.34±0.35	−14.432	0.000
Psychological function	2.47±0.59	3.76±0.38	−19.991	0.000

Table 5. The overall satisfaction after dental implant surgery

Variables	N(%) 145(100.0)	Never	Normal	Best	X^2(p)
Anterior teeth	14(9.7)	3(21.4)	1(7.2)	10(71.4)	29.285 (0.000)
Posterior teeth	99(68.3)	0(0)	14(14.1)	85(85.9)	
2nd molar	32(22.0)	0(0)	3(9.4)	29(96.6)	

was 68.3%, the 2nd molar was 22.0% and just the anterior teeth was 9.7%〈Table 3〉.

4. The satisfaction before and after dental implant surgery

Preoperative satisfaction of mastication was 2.68 points and postoperative satisfaction was 3.63 points. Before and after of social functions were 2.67 points and 3.34 points, respectively. The satisfactions of the psychological function were 2.47 points and 3.76 points, respectively. There was a statistically significant difference(p〈0.001〉〈Table 4〉.

5. The overall satisfaction after dental implant surgery

With regard to the satisfaction after dental implant surgery, the ratio of the patient was 68.3% in the posterior region, 22% in the foremost rear region and 9.72% in the anterior region. The overall satisfaction after dental implant surgery

was 96.6% in the foremost rear region, 85.9% in the posterior region and 71.4% in the anterior region(p〈0.001〉〈Table 5〉.

6. Intention to revisit a hospital after dental implant surgery

The intention to revisit a hospital after dental implant surgery was 100% in the 2nd molar region, 98% in the posterior region and 78.6% in the anterior region. In this study, a significantly high outcome was shown(p〈0.001〉〈Table 6〉.

7. Intention to recommend the dental clinic after dental implant surgery

The intention of recommending the dental clinic after dental implant surgery, was 96.9% in the 2nd molar region, 93.9% in the posterior region and 71.4% in the anterior region. it showed a significantly high value(p〈0.001〉〈Table 7〉.

Table 6. Intention to revisit a hospital after dental implant surgery

Variables	N(%) 145(100.0)	Never	Normal	Best	X^2(p)
Anterior teeth	14(9.7)	3(21.4)	0(0)	11(78.6)	29.530 (0.000)
Posterior teeth	99(68.3)	0(0)	2(2.0)	97(98.0)	
2nd molar	32(22.0)	0(0)	0(0)	32(100)	

Table 7. Intention of recommending the dental clinic after dental implant surgery

Variables	N(%) 145(100.0)	Never	Normal	Best	X^2(p)
Anterior teeth	14(9.7)	3(21.4)	1(7.1)	10(71.4)	29.284 (0.000)
Posterior teeth	99(68.3)	0(0)	6(6.1)	93(93.9)	
2nd molar	32(22.0)	0(0)	1(3.1)	31(96.9)	

Table 8. Multiple regression analysis of satisfaction towards the treatment

Variables	B	SE	β	t	p	VIF
(Constant)	3.634	0.040		90.652	0.000	
Hard food intake	−0.121	0.040	−0.245	−3.049	0.003	1.114
Monthly income	0.178	0.046	0.321	3.845	0.000	1.203
Tooth brushing	−0.136	0.041	−0.276	−3.334	0.001	1.189
Marital status	0.101	0.047	0.174	2.147	0.034	1.136

R^2=0.191, F=8.263, p=0.000

hard food intake dummy (0=yes, 1=no)
monthly income dummy(0=<200, 1=≧500)
toothbrushing dummy(0=1, 1=≧3)
marital status dummy(0=married, 1=single)

8. General factors affecting the treatment satisfaction

The independent variables for the affecting variables fully explained the satisfactory rate of the treatment, 19.1% and indicated a significantly high value because The VIF is 8.263.

Since the VIF value is distributed from 1-10, there is no multi-colinearity which has a close relationship, between an independent variable and other independent variables〈Table 8〉.

Discussion

Global advancement in the medical industry is competitively growing, at the same time the awareness of the medical customer increases[17]. New technology and materials constantly have developed for many reasons[18,19]. When a number of adults lose their teeth, they considered the partial or full denture as a treatment by priority[14]. However, stationary implant and sustaining full denture by dental implanting have been recommended.

In Korea, dental implanting is widely performed, not as a special treatment but as a part of general prosthetic restoration treatment; therefore, this study focused on the satisfaction towards the dental implant from the viewpoint of the patients.

Satisfaction of the treatment before/after dental implant surgery was all statistically significant in the masticatory, social and psychological function. The previous study revealed the satisfaction of the dental implant treatment and showed a positive recommendation of treatment[20-23]. A positive response to each question was similar to those of Pjetursson et al.[22] and Jeong et al.[23].

In the multiple regression analysis, the independent varia-bles for the affecting variables showed a significant satisfaction on the report of after dental implant surgery which is more significant than before dental implant surgery study of Han and Kim[24].

There are some limitations in this study. This study did not show the generalization of satisfaction. First, we could not obtain the representatives of samples because we adopted patients who had visited 6 dental clinics and hospitals located in Daegu for dental implant surgery by the convenient sampling method. Therefore, this should be supplemented by a methodological study with representative method of sampling in prospective studies.

Secondly, because we measured satisfaction of the treatment of 6 months after dental implant surgery, the routing period was too short. On successful criteria of dental implanting, success rate for 5 years should be 85%, for 10 years, 80%[25]. Therefore, we need to reexamine the satisfactory rate of the treatment on dental implanting by a tracing survey over 10 years through a further follow-up survey.

To ensure the great satisfaction of patients, we need to conduct a broad patient education as well as dental implanting[26].

In spite of such limitations, this study has a significantly continuing assessment data on an effect of dental implant surgery by measuring and analysing satisfactory rate of the treatment before/after dental implant surgery.

Conclusions

To grasp an influence which has on satisfaction of the treatment before/after dental implant surgery, we came up with

a conclusion by the analysis of the 145 patients data.

1. For before/after dental implant surgery of subjects, the masticatory function increased from 2.68 point to 3.63 point, the social function, from 2.67 point to 3.34 point and the psychological function from 2.47 point to 3.76 point. So, we confirmed a statistical significance from the masticatory, social and psychological function, caused by stomatopathy after dental implant surgery.

2. The overall satisfaction after dental implant surgery of partially missing tooth was 96.6% in the 2nd molar region, 85.9% in the posterior region and 71.4% in the anterior region.

3. Since the intention to revisit a hospital after dental implant surgery of partially missing tooth was 100% in the 2nd molar region, 98% in the posterior region and 78.6% in the anterior region. The satisfaction towards the treatment on dental implanting was very high.

4. Since the intention to recommend after dental implanting on partially missing tooth was 96.9% in the 2nd molar region, 93.9% in the posterior region and 71.4% in the anterior region. The satisfaction towards the treatment on dental implanting was very high.

5. In multiple regression analysis, these independent variables explained satisfaction towards of the treatment as 19.1% and indicated a significantly high value because F value had a 8.263 in general.

In conclusion, satisfaction towards the treatment was higher in postoperative and implant improved the quality of life in the adults.

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