

Maintenance considerations in elderly dependent patients with implants

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Abstract

Background

Self-care and professional care of implants may prove difficult for elderly people who require nursing care. However, the actual state of care and problems remains unknown. In this study, we investigated the actual state of implant problems in elderly people living in their own home or in a nursing home who received visiting dental treatment due to their inability to visit a dental clinic.

Methods

We mailed questionnaire survey forms to 2339 representatives or specialists who were members of the Japanese Society of Oral Implantology, the Japanese Society of Gerodontology or the Japan Prosthodontic Society. We narrowed down the respondents to those who provided visiting dental treatment, and analyzed the actual state of implants observed during visiting dental treatment (type, care, problems, countermeasures, etc.).

Results

Of the 924 dentists who responded to the questionnaire survey, 291 (22%) provided visiting dental treatment. While the majority of implant types encountered in the previous 12 months were root-form implants, there were still a certain number of blade and subperiosteal implants. Daily implant care involved mostly cleaning with a toothbrush + auxiliary tools (such as interdental brushes). The most frequent implant problems encountered in the past were difficulty in cleaning and peri-implantitis. Medication and antiphlogistic treatment were most frequently adopted as countermeasures to implant problems, followed by observation. When we classified the results into those for the dentists who provided implant treatment and those for the dentists who did not, we found that many of the dentists who did not provide implant treatment opted for observation or medication, while those who provided implant treatment also implemented removal of the upper structure, retightening of screws, repair and so forth.

Conclusions

Since this survey was a questionnaire survey, future field surveys are necessary, it may be necessary for dentists who provide visiting dental treatment to acquire knowledge and skills for implant treatment or coordinate closely with experts.

Background

Aging has advanced in Japan, with the rate reaching 27.3% (34.61 million people) as of September 2016 according to the Statistics Bureau, Ministry of Internal Affairs and Communications [1]. Among these people, more than six million, or approximately 20%, require nursing care [2]. Visiting a dental clinic is difficult for elderly people who require nursing care, and thus they are at high risk of experiencing

deteriorated conditions inside the oral cavity. Meanwhile, oral implants have become popular, with 3.0% of elderly people having implants, according to the Survey of Dental Diseases Fiscal Year 2011 [3]. However, the number of subjects in this survey was quite small at 4253, and included only 1510 elderly people, none of whom were living in a nursing home. Consequently, the data is considered insufficient for grasping the actual state of oral implants in elderly people who require nursing care.

We therefore conducted a survey on the following: provision of implant treatment, provision of visiting dental treatment, trends in implants and patients after treatment, actual state of implants in visiting dental treatment, and actual state of utilization and awareness of implant cards. We distributed the questionnaire survey forms to 2339 representatives or specialists who were members of the Japanese Society of Oral Implantology, the Japanese Society of Gerodontology or the Japan Prosthodontic Society, and received 924 responses [4]. We found that at least 30% of the dentists had patients who had received implant treatment and who were later admitted to a hospital or required home care. We also found that 22% of the dentists had been asked about implants by their patients. The rate of dentists who continued providing care through visits was approximately 80%. However, 40% of the dentists did not grasp the trends of the patients after implant treatment. Approximately 3% of the patients receiving visiting dental treatment had implants (mainly confirmed by visual examination). More than 50% of the dentists who provided implant treatment did not use implant cards, and even when the cards were used, they lacked consistency. It is necessary to expand the provision of continuous care after implant treatment, and we consider that the popularization of cards under a unified standard is essential for achieving this.

In this study, we narrowed down the survey respondents to dentists who provided visiting dental treatment and we analyzed the data on the implant care and problems encountered as well as the countermeasures in order to elucidate the actual state of implants in elderly people requiring nursing care.

Methods

The survey was conducted as a questionnaire for a period of three months from August to October 2015, with the survey respondents' names entered. The questionnaire forms were distributed and collected in mail [4].

Questionnaire forms were distributed to 2339 representatives or specialists who were members of the Japanese Society of Oral Implantology, the Japanese Society of Gerodontology or the Japan Prosthodontic Society, and we received 924 completed (40% collection rate). We then narrowed down the respondents to those who provided visiting dental treatment and analyzed the data for the following three matters.

1. Actual state of implants and daily implant care in patients receiving visiting treatment

□Types of implants encountered in the previous 12 months

□Types of daily implant care implemented in the previous 12 months

2. Actual state of implant problems

□Types and number of cases of implant problems encountered in the past

3. Actual state of countermeasures for implant problems

□Types and number of cases of countermeasures for implant problems

We used the χ^2 test to analyze the relationship between the required items.

This study was conducted with the approval of the Ethics Committee of the Japanese Society of Oral Implantology (No.: 2015-1).

Results

Of the 924 dentists who responded to the survey, 291 dentists (22%) provided visiting dental treatment. Among them, 206 dentists (71%) provided implant treatment. The total number of implant patients encountered was 360, which was 3% of 12,356, the total number of patients [4].

1. Actual state of implants and daily implant care in patients receiving visiting treatment

Figure 1 shows the types of implants encountered in the previous 12 months. While the majority (86%) were root-form implants, there were still a certain number of blade and subperiosteal implants. Figure 2 shows the types of daily implant care implemented in the previous 12 months. The majority was cleaning with a toothbrush + auxiliary tools (such as interdental brushes) (89%).

2. Actual state of implant problems

Figure 3 shows the types of implant problems encountered in the past and the number of cases. Frequent problems were difficulty in cleaning (45%) and peri-implantitis (37%).

3. Actual state of countermeasures for implant problems

Figure 4 shows the countermeasures for implant problems implemented in the past. Medication and antiphlogistic treatment (32%) were most frequently adopted, followed by observation (22%). When we classified the data into that for the dentists who provided implant treatment and that for the dentists who did not, we found that many of the dentists who did not provide implant treatment opted for observation ($p < 0.01$) or medication, while those who provided implant treatment also implemented removal, retightening, repair and so forth (Fig. 5).

Discussion

Since this study is a questionnaire survey, the quality of the data is inferior to that of a field survey, and it is not possible to grasp the situation of individual peri-implantitis or the kinds of responses to the

situation. However, conducting a survey of this number of patients in a field survey would be very time consuming and expensive. To extract 10 implant patients, a field survey of 300 patients is required, which is not realistic. Therefore, we will conduct a practical field survey based on these survey results, and will further clarify the actual conditions of implant patients in visiting clinics by combining the results. Although this study is considered to be important for future field surveys, care is required when interpreting the obtained data.

Our previous report [4] revealed the state of implant treatment provision, state of visiting dental treatment, trends in patients after implant treatment, actual state of implants in visiting dental treatment, and actual state of implant card utilization as well as awareness of it, and indicated that it was essential to expand the provision of continuous care after implant treatment and that popularization of the implant cards under a unified standard was necessary to achieve this. In this report, we narrowed down the survey respondents to dentists who provided visiting dental treatment, and analyzed the actual state of implant care and problems encountered as well as the countermeasures in order to elucidate the actual state of implants in elderly people requiring nursing care.

According to the results, there were still a certain number of blade and subperiosteal implants in use, even though the majority of implant types encountered (86%) were root-form implants (Fig. 1). Adoption of blade implants started decreasing around 1985 [5], and the use of subperiosteal implants is assumed to have also declined [6]. However, they are still present in some patients, and thus it is considered that education on these systems is still necessary.

We consider it favorable that toothbrush + auxiliary tools (such as interdental brushes) accounted for a majority of daily implant care. However, this study was not able to clarify who provides this care and how, or whether such care is properly implemented. Implant treatment itself has achieved sufficient success rates even in elderly people [7] (Dudly, 2015) and people with disabilities [8] (Romero-Pérez et al, 2014), as long as the implants are properly managed. It may be difficult for elderly people who require nursing care and who cannot visit a dental clinic to continue self-care or professional care [9] (Sweeney, et al., 2007). In their report on three case examples, Visser, et al. (2011) [10] stated that it was important to ask, "Is the patient supported by a well-functioning oral (self) care assisting network? Is it possible for the patient to regularly see an oral health care professional and is oral health care easily accessible in case of an emergency?" Due to the fact that the rate of people who were incapable of self-care was quite high at 56% [4], it seems that professional care and management are more important, even though there is also an issue of manpower [11–13]. We await the results of more detailed fact-finding studies on oral care in the future.

The fact that many of the dentists who did not provide implant treatment opted for observation or medication while those who provided implant treatment also implemented removal of the upper structure, retightening of screws, repair and so forth suggests that those who did not provide implant treatment found it difficult to take appropriate measures due to insufficient knowledge or skills related to implants. Even though student education on implants has become more substantial in recent years [14], further

coverage is desired, including oral care for patients living in a nursing home including elderly people and patients receiving home treatment, comprehension and management of systemic conditions, coordination with other occupations and so forth. In addition, since it is not practical to presume that all dentists providing visiting dental treatment would be capable of sufficient measures regarding implants, coordination with implant specialists should also be examined.

Furthermore, there seems to be little evidence regarding countermeasures for implant problems in visiting dental treatment. Many of the troubles concerning implants were cleaning difficulties and peri-implant inflammation, and it was speculated that the treatment selected for the troubles also differed depending on whether or not the dentist had experience in implant treatment. While position papers by experts [15, 16] are beginning to be published, the accumulation of evidence as well as the establishment of guidelines will also be necessary. Another issue that needs to be examined is one unique to Japan, which is that the measures against implant problems are not covered by health insurance. It is important to strive to obtain a consensus of the people of Japan, while also taking the growing medical expenses into consideration.

Conclusion

Since this survey was a questionnaire survey, future field surveys are necessary, but the following are inferred:

1. Implant problems encountered by dentists who visited dental clinics were difficulty in cleaning and peri-implantitis.
2. Many of the dentists who did not provide implant treatment opted for observation or medication, while those who provided implant treatment also implemented removal, retightening, repair and so forth.
3. Dentists who perform visiting dental care may need to acquire knowledge and skills for implant treatment, or coordination with implant specialists should also be examined.

Abbreviations

Not applicable

Declarations

Ethics approval and consent to participate

The study design and consent forms for all procedures performed on the study subjects were approved by the ethics committee for human subjects at Japanese Society of Oral Implantology in accordance with the Helsinki Declaration of 1975 as revised in 2008.

Consent for publication

Not applicable

Availability of data and materials

The data that support the findings of this study are included in this published article and its supplementary information files (https://www.shikaimplant.org/publication/dl/2016_investigation.pdf) (in Japanese).

Competing interests

Yuji Sato, Shigeto Koyama, Chikahiro Ohkubo, Shin Ogura, Ryutaro Kamijo, Satoru Sato, Yuuichi Izumi, Mihoko Atsumi, Shunsuke Baba, Noriharu Ikumi and Fumihiko Watanabe declare that they have no competing interests. Jun Aida, is an Associate Editor of BMC Oral Health.

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Authors' contributions

YS, SK, CO, SS, JA, YI, MA, SB, NI and FW conceived and designed the study, performed the experiments, and wrote the manuscript. YS performed the experiments and YS and JA performed data analysis. SO and RK participated in the manuscript preparation. All authors read and approved the final version of the manuscript.

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Figures

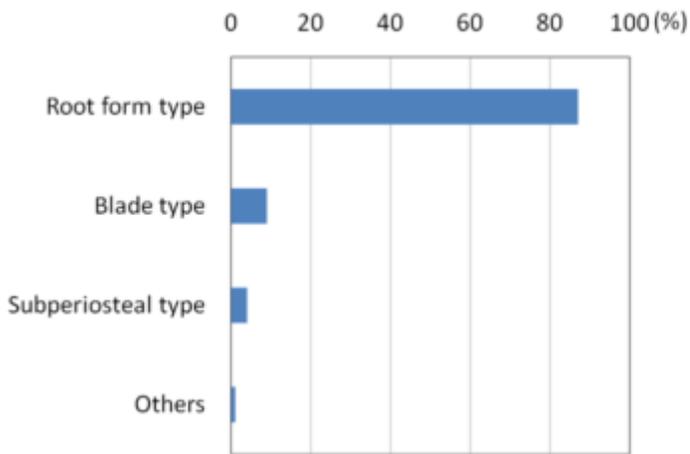


Figure 1

Types of implants encountered in the previous 12 months While the majority of implant types encountered in the previous 12 months were root-form implants, there were still a certain number of blade and subperiosteal implants.

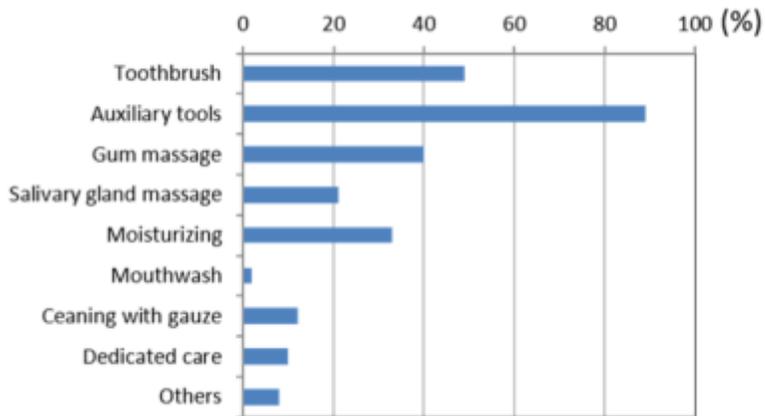


Figure 2

Daily implant care implemented in the previous 12 months Toothbrush + auxiliary tools (such as interdental brushes) accounted for the majority of cases.

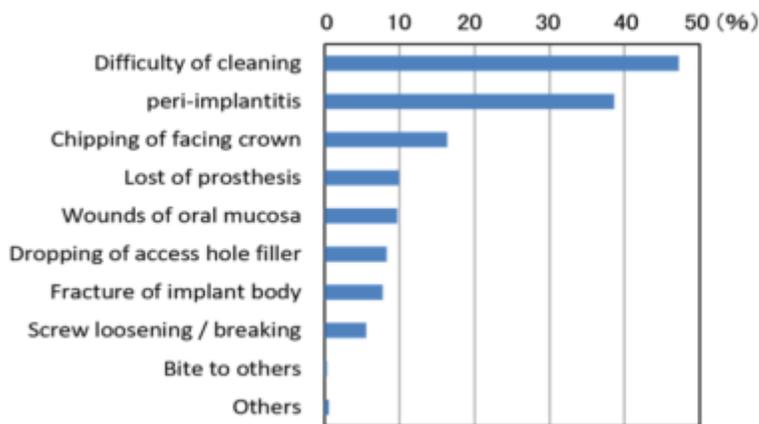


Figure 3

Implant problems encountered in the past Most frequent problems were difficulty in cleaning and peri-implantitis.

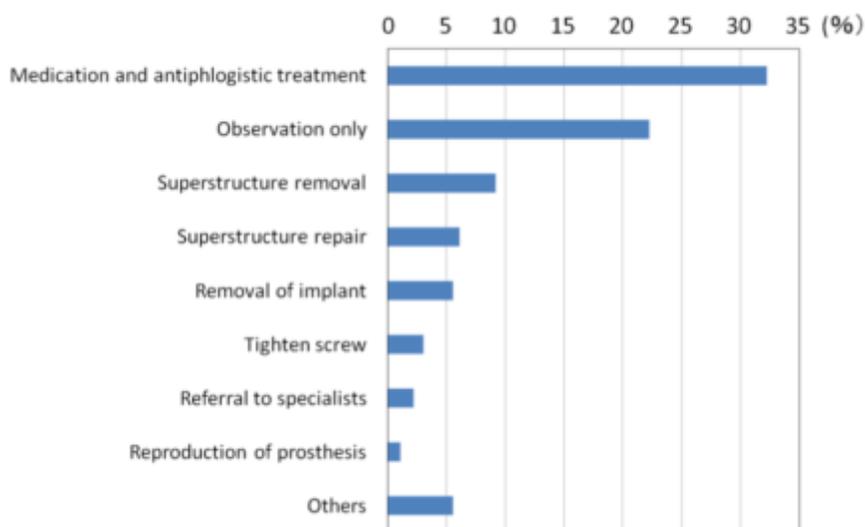


Figure 4

Countermeasures for implant problems taken in the past Medication and antiphlogistic treatment were most frequently adopted, followed by observation.

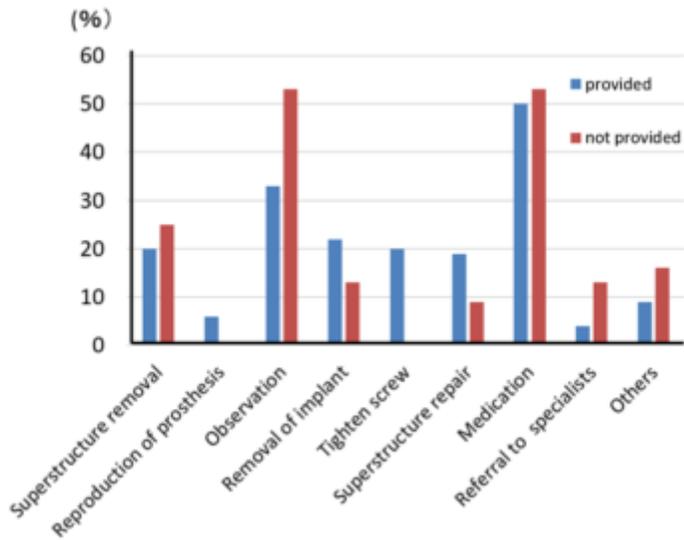


Figure 5

Provision of implant treatment and countermeasures for problems Many of the dentists who did not provide implant treatment opted for observation or medication while those who provided implant treatment also implemented removal, retightening, repair and so forth.