

Implant-supported prosthesis treatment planning aspects of Kaunas city dentists and dental specialists

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SUMMARY

Objective. Rehabilitation of mastication using fixed or removable prosthesis on dental implants is a daily procedure in modern dentistry. The huge variety of diagnostic tools and methods, such as cone beam computed tomography or surgical guides help to avoid complications. A vast quantity of diagnostic tools and prosthesis require a tight communication between surgeons and prosthodontists in order to achieve better treatment plan.

Methods. The questionnaire was approved by LUHS Committee of Ethics. A questionnaire of 17 demographic and specialized questions was composed. A randomized survey of dentists and dental specialists was conducted in Kaunas. A statistical analysis was performed using χ^2 test and Student's T-test criteria.

Results. Most of correspondents believe that treatment plan should be created by the current dentist, regardless his/hers specialization. All correspondents performing dental implantation, use elevation of mucoperiosteal flap. The most common diagnostic tool among dentists and oral surgeons is panoramic x-ray. The most common diagnostic tools between prosthodontists are panoramic x-ray and analysis of dental stone castings. The most common complications among dentists and prosthodontists are improper adjustment of soft tissue and errors of dental technicians, among oral surgeons – improper adjustment of soft tissues and implant position.

Conclusions. 1. The creation of treatment plan does not depend on specialization of dentist. 2. The elevation of mucoperiosteal flap is more common than non-flap procedure. 3. The most used diagnostic method is panoramic x-ray. 4. The most prevalent complications are improper adjustment of soft tissues and errors of dental technicians.

Key words: implant, prosthesis, treatment, plan.

Definitions and abbreviations

Implantologist – dentist or dental specialist, who performs dental implantations.

Prosthetic dentist – dentist or dental specialist, who does implant-supported prosthetics.

CT – computed tomography.

CBCT – cone beam computed tomography.

INTRODUCTION

Dental implant supported prosthesis is state-of-the-art method for mastication rehabilitation and are used in partial or full dental arches defects. They are widely used due to their high success rate and affordable price (1-3, 7). While implants are becoming a golden standard for even the smallest dental arches defects such as single missing tooth or tooth avulsion, risk of complications is getting higher. In

order to predict and avoid possible failures a huge variety of diagnostic tools are used during implantation and prosthetics. Contemporary dentistry offers plenty of ordinary and advanced diagnostic methods, ranging from dental stone casts analysis, intraoral x-rays to cone-beam computed tomography and intraoral scanning (4, 11, 16).

As the dental arch defect gets larger, the prosthetics get more complicated – harder to reach a correct position of multiple implants and the adjustment of soft tissue gets poorer. In such cases, modern tools come in handy – use of 3D planning and surgical guides might help to lower complication risk (5, 8-10). Additional to that, a tight cooperation between

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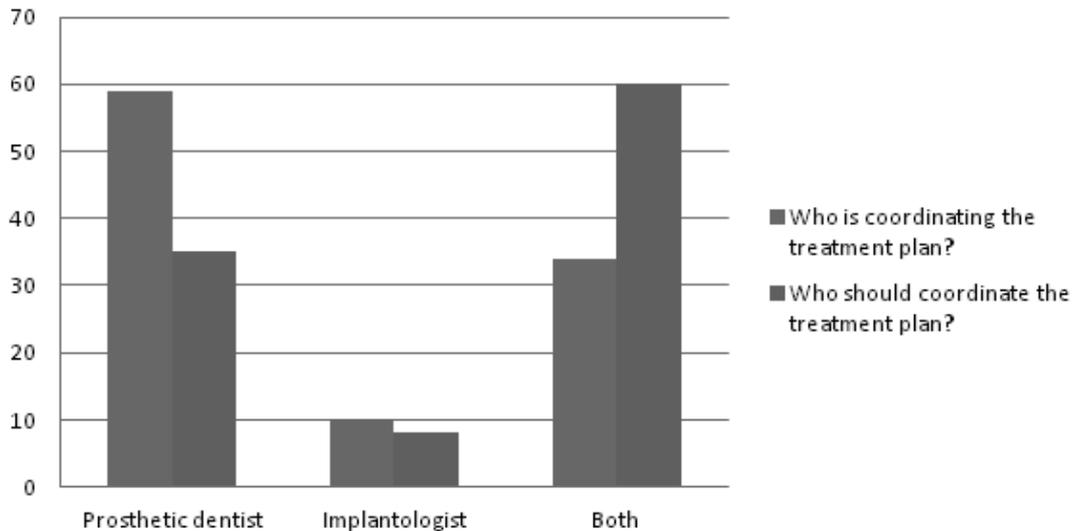


Fig. 1. Coordinator of treatment plan

surgeon and prosthodontist is recommended in order to avoid failure. The current situation shows that usually implant-supported prosthetic treatment plan is set up by either a surgeon or a prosthodontist but not a team of dentists.

The purpose of our research was to evaluate a current situation in Kaunas city – whether dentists tended to cooperate, use modern or conventional diagnostic tools and to find out the most frequent complications among dentists and dental specialists.

MATERIALS AND METHODS

To collect data, a questionnaire in Lithuania, Kaunas city was constructed, between December 2017 and February 2018. For this study ethical approval was acquired by the Lithuanian University of Health Sciences Bioethics Committee (approv-

Table. Demographic information

Demographic information		N	%
Gender	Male	43	41.7
	Female	60	58.3
Graduated university	Lithuanian University of Health Sciences	100	100
	Vilnius University	0	0
Specialization	Dentist	57	55.3
	Prosthodontist	24	23.3
	Oral surgeon	22	21.4
Work experience	<5 years	47	45.6
	5 – 10 years	34	33
	> 10 years	22	21.4
Practice	Private institutions	36	35
	Government clinic	15	14.6
	Both	52	50.4

al number BEC-OF-91).

The questionnaire was distributed by hand to randomly selected government clinics and private practice dental offices. An original sample of 103 Kaunas dentists was randomly selected. The confidentiality of the respondents was secured.

The questionnaire consisted of two parts: demographic information and the second part-multiple choice type questions. The demographic part of the questionnaire consisted of 5 questions about dentist’s general personal information: sex, university of graduation, specialization, professional work experience and workplace. The second part of questionnaire was formed with 14 questions, which revealed dentists and dental specialists’ aspects of prosthetic treatment on implants. The dentists were allowed to choose more than one answer in the second part.

Statistical analysis was performed using IBM SPSS 25 software package. P value of 0.05 or less was considered as statistically significant for hypotheses. Kolmogorov-Smirnov test was used to check variable distribution normality. To determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories the chi-squared test was used. Nonparametric Student t-test were used for comparison of two groups.

RESULTS

The survey was completed by 103 dentists and dental specialists: response rate was 85.8%. Majority of the participants were females (58.3%). All participants graduated in Lithuanian University of Health Sciences. Work experience up to 10 years was the most common among respondents. The majority of specialists are general practice dentists (55.3%). 35% of the participants are working in private institutions, 14.6% in government clinics and 50.4% in both of them (Table).

Implantation is done by all oral surgeons, more than a half of dentists (50.87%) and minority of prosthodontists (25%).

Implant-supported prosthesis is done by 93% of dentists, 96% of prosthodontists and 13.6% of oral

surgeons. Nevertheless, 66.7% of prosthodontists do it on a daily basis or often and 61.4% of dentists do it rarely.

Mucoperiosteal flap elevation is chosen by 71.9% of implantologists.

Majority of respondents (57.3%) stated that in their own practice implant-supported prosthetic treatment is planned by prosthetic dentist. Meanwhile, 58.3% of them stated that treatment plan should be created by both doctors - implantologist and prosthetic dentist (Figure 1).

Only 4.9% of prosthodontic dentists don't inform surgeons about treatment plan ($p < 0.05$).

Almost two thirds of implantologists don't use surgical guides, nevertheless almost all of them (93.2%) believe they should use them in specific cases, such as placing more than 3 implants (31.1%), bridges (28.2%) and all on 4 (21.4%) ($p < 0.05$).

Almost half of respondents (47,6%) constantly use panoramic x-ray. CT is mostly used by oral surgeons (68.2%) and prosthodontists (58.3%), and least used by dentists (19.3%). CBCT is mostly used by oral surgeons by oral surgeons (86.4%).

9% of surgeons use intraoral scanner 33.3% of prosthodontists use this diagnostic method – although only 4% of them use it constantly. Dentists do not use oral scanner often (3.5%).

Talking about complications, respondents stated that incorrect implant position occurs for 45.6% of them, dental lab mistakes occur for 44.7% and improper soft tissue adjustment occurs for 36.9% of them.

Figure 2 illustrates disagreements between doctors while planning implant-supported prosthetics and the time it occurs.

DISCUSSION

Dental implant therapy is complex, of high value and has the potential for considerable harm in the case of hasty treatment plan (7). These results

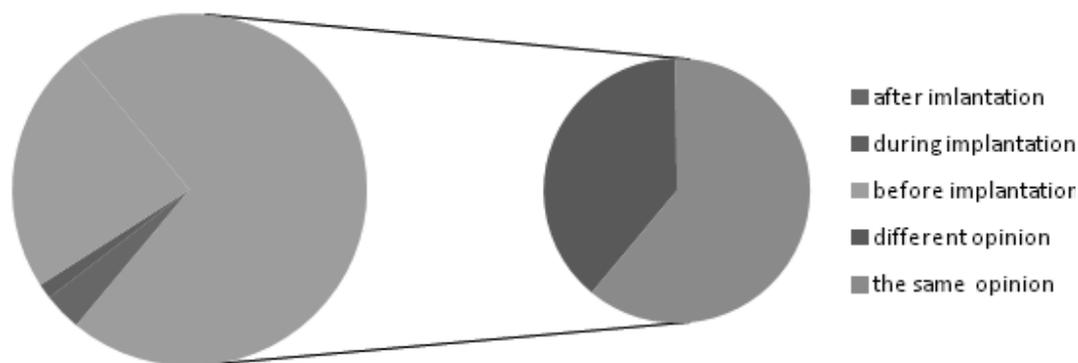


Fig. 2. Disagreements on treatment planning

show that Kaunas city dentists and dental specialists, in general, use more advanced diagnostic methods including intraoral cameras, CBCT and surgical guides.

Almost two thirds of respondents (58.3%) believe that treatment should be led by a team of doctors, including an implantologist and prosthetic dentist. This would give an ultimate advantage for the patient as a live discussion between several doctors provides fast, precise and optimal treatment plan without a need for reconsultation (6, 13). Nearly the same percentage of doctors (57.3%) state that in reality treatment plan is led by prosthetic dentist – contrary to recommendations (14, 15), meaning that disagreements in treatment plan may arise in the future – therefore leading to possibility for either occurring complications or additional consultations. These unnecessary consequences could be easily avoided by sharing clinical case information with colleagues before setting up the final treatment plan.

Our findings showed a high usage of modern diagnostic tools – CT and CBCT have become or, at least, are becoming a golden standard during implant placement planning. These tools are possibly the reason for a low frequency of complex complications such as sinus membrane perforation or alveolar ridge fracture. However, intraoral scanner and surgical guides are used rarely among Kaunas city dentists and dental specialists. The most obvious reasons for this should be fairly high additional charges and information lack among doctors. While surgical guides provide a precise access to surgical site, the cost might repel patients from choosing a treatment plan with surgical guides. Intraoral scanning is still a rarity among dentists possibly due to lack of reliance of this diagnostic tool (12).

A successful treatment depends on cooperation and understanding between different specialists. Looking forward, a standardized guidelines concerning implant-supported prosthetics treatment

planning is required in order to achieve unanimous treatment plan.

CONCLUSIONS

Based on our gathered results, we made a few conclusions:

1. The creation of treatment plan does not depend on specialization of dentist.
2. The elevation of mucoperiosteal flap is

more common than flapless technique.

3. The most used diagnostic method is panoramic x-ray.
4. The most prevalent complications are improper adjustment of soft tissues and errors of dental technicians.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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