

Attitudes of Oral Surgeons and Periodontists towards Immediate Dental Implant Placement

Zemyna Bineviciute¹, Gintaras Juodzbaly¹

¹Department of Maxillofacial Surgery, Faculty of Odontology, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania.

Corresponding Author:

Zemyna Bineviciute

Department of Maxillofacial Surgery, Faculty of Odontology, Medical Academy

Lithuanian University of Health Sciences

Eivenių g. 2, LT-50028, Kaunas

Lithuania

E-mail: zemyna.bineviciute@stud.lsmu.lt

ABSTRACT

Objectives: This cross-sectional study aimed to evaluate the factors that determine the choice of oral surgeons and periodontists to perform immediate dental implant placement.

Material and Methods: An anonymous survey was carried out from January 6, 2024 to February 29, 2024. The questionnaire was distributed online to Lithuanian specialists - oral surgeons and periodontists, who perform implantation procedures. A total of 186 professionals were included in this survey. Chi-square test, its degrees of freedom was used for the analysis of variables.

Results: The main reason for refusing immediate implant placement is a periapical lesion greater than 5 mm, reported by 91.7% of oral surgeons and 96.9% of periodontists. Good aesthetics and preservation of anatomical structures are identified as an advantage by 99.2% of oral surgeons and 92.3% of periodontists. In the aesthetic zone, for periodontists, the main criterion for choosing a method is the quantitative and qualitative indicators of the soft tissue of the extraction socket 96.9%, and for oral surgeons - the morphology of the bone walls of the socket 87.6%. Only 43.1% of periodontists and 33.9% of oral surgeons are familiar with and use extraction socket morphology assessment classifications for immediate dental implant placement.

Conclusions: Taking into account study's results, it is recommended to adjust the teaching programs at Universities and to increase the knowledge of specialists performing dental implantation procedures, by carrying out continuous educational programs.

Keywords: bone resorption; immediate dental implant loading; knowledge; peri-implant tissues; surveys and questionnaires.

Accepted for publication: 28 June 2024

To cite this article:

Bineviciute Z, Juodzbaly G.

Attitudes of Oral Surgeons and Periodontists towards Immediate Dental Implant Placement

J Oral Maxillofac Res 2024;15(2):e3

URL: <http://www.ejomr.org/JOMR/archives/2024/2/e3/v15n2e3.pdf>

doi: [10.5037/jomr.2024.15203](https://doi.org/10.5037/jomr.2024.15203)

INTRODUCTION

Dental implants have become a significant treatment method that helps to restore the aesthetics and function of patients who have partially or completely lost teeth [1,2]. Delayed implantation requires a period of several months for the bone to regenerate after tooth extraction before the implant is placed. However, the immediate dental implant placement (IDIP) protocol into the post-extraction socket has recently become popular, characterized by faster functional and aesthetic restoration of the tooth [3,4]. IDIP helps improve the final aesthetic result by reducing the bone resorption that naturally occurs after tooth extraction [4]. This method is associated with many other advantages - shorter treatment time, fewer surgical operations, and higher patient satisfaction [3]. However, IDIP is associated with a higher risk of failure [4]. This has been attributed to inadequate assessment and/or management of the peri-implant soft and hard tissues and their subsequent remodelling, which ultimately results in peri-implant soft tissue defects that may compromise the aesthetic outcome in the long term [5]. Clinicians must consider various elements that affect the aesthetic outcome including tooth position, adjacent tooth root position, periodontal phenotype, tooth shape, smile line, implant site anatomy and location [3]. The knowledge of the specialist and the selected surgical technique are the main factors influencing the overall result of implant treatment [1].

In 2022, the research by Fatani et al. [6], aimed to compare the knowledge and skills of dental professionals related to new implantation methods, and it was concluded that dentists of each subspecialty had significant, albeit different, knowledge about implantation methods and this could be related to different training institutions programs [6]. Therefore, it is necessary to constantly increase the knowledge of specialists performing dental implantation procedures, by carrying out continuous educational programs and seminars and to carry out regular evaluations of practical knowledge [7].

Therefore, based on the null hypothesis that both oral surgeons and periodontists have similar attitudes to immediate dental implant placement, this cross-sectional study aimed to evaluate the factors that determine the choice of oral surgeons and periodontists to perform immediate dental implant placement.

MATERIAL AND METHODS

Study design

A cross-sectional study was conducted at the Lithuanian University of Health Sciences (LSMU), Kaunas, Lithuania and at the Vilnius University (VU), Vilnius, Lithuania from 6 January 2024 to 29 February 2024.

Materials and subjects

The protocol of present survey study was approved by the Bioethics Centre of LSMU (2024-BEC2-033) on 16/01/2024.

The survey was compiled by the authors based on the material of the scientific literature examined (Appendix 1). Twenty questions were divided into the following groups: the first group is demographic data, the second is a special questionnaire about the factors that determine: 1) the choice of oral surgeons and periodontists to perform IDIP, 2) the advantages and most common complications of the method, 3) the evaluation criteria used by professionals in planning the IDIP, 4) the necessity of additional soft and hard tissue augmentation, and use and knowledge of extraction socket morphology assessment classifications.

The questionnaire was created on the questionnaire creation website (<https://apklausa.lt/>) and distributed online in the Facebook space, in the private group "Dental professionals" from 6 January 2024 to 29 February 2024. The questionnaire was filled out anonymously, so violations of personal rights and dignity were certainly avoided.

Determination of the study sample

Paniotto's formula with 95% confidence intervals was used to find out how many specialists had to answer the questionnaire:

$$n = 1/(\Delta^2 + 1/N)$$

Where n is the sample size (number of specialists to be surveyed), Δ is the sample error size (the standard error is considered 5%, which we get with 0.95 probability), and N is the general size of the study population.

According to the data provided by the Lithuanian State Accreditation Service for Health Care Activities (<https://vaspvt.lrv.lt/>), there are currently 159 oral surgeons and 92 periodontists with active licenses in Lithuania. Therefore, 154 specialists were identified as the research sample.

Statistical analysis

The responses received from the respondents were summarized in Microsoft Excel® 2019 (Microsoft Corp., Seattle, WA, USA), statistical data analysis was performed using the SPSS® Statistics version 19.0 (IBM Corp.; Armonk, NY, USA) for data collection and analysis. The statistical relationship of qualitative features was studied by the method of linked groups. Based on the data of the groups, chi-square (χ^2) test, number of degrees of freedom (df) and statistical significance (P-value) were calculated.

To verify the statistical hypotheses conclusions, the difference in results was considered significant when $P < 0.05$.

RESULTS

General characteristics of the study sample

Overall 186 specialists performing implant procedures participated in the survey: 121 (65.1%) were oral surgeons, of which 107 (88.4%) were male and 14 (11.6%) were female (Table 1). Also, 65 (34.9%) were periodontists, of which 12 (18.5%) were male and 53 (81.5%) were female. A statistically significant difference was found between different specializations in terms of gender ($P = 0.000$, $df = 1$).

In terms of age, there are reliable differences between

oral surgeons and periodontists in the 20 to 29 years ($P = 0.000$, $df = 2$), 30 to 39 years ($P = 0.003$, $df = 2$), and 50 to 59 years age groups ($P = 0.002$, $df=2$). Regarding the workplace, there is no significant difference between periodontists and oral surgeons ($P = 0.233$, $df = 2$). Similarly, a statistically not significant difference ($P = 0.77$, $df = 2$) was found between periodontists and oral surgeons according to completed dental studies at different universities. The largest percentage is those who graduated from the Lithuanian University of Health Sciences: 52 (80%) periodontists and 96 (79.3%) oral surgeons (Table 1).

Selection of oral surgeons and periodontists to perform IDIP

When oral surgeons and periodontists were asked to choose the reasons why they refuse to perform an IDIP, the answers were evenly distributed among specialists and statistically insignificant ($P > 0.05$, $df = 1$) (Table 2). The main reason for refusing an IDIP is the size of the periapical lesion more than 5 mm, which was indicated by 111 (91.7%) of oral surgeons and 63 (96.9%) of periodontists ($P = 0.17$, $df = 1$). The second most frequent reason was a displaced tooth due to periodontal pathology and resorbed bone around the tooth, which was indicated by 28 (33.9%) of oral surgeons and 47 (30.8%) of periodontists ($P = 0.666$, $df = 1$).

Table 1. Characteristics of the respondents

Parameter	Specialists (n [%])		χ^2	df	P-value
	Periodontists (n = 65)	Oral surgeons (n = 121)			
Gender					
Woman	53 (81.5%)	14 (11.6%)	89.824	1	0.000 ^a
Man	12 (18.5%)	107 (88.4%)	89.824	1	0.000 ^a
Age (years)					
20 to 29	8 (4.2%)	19 (10.2%)	37.059	2	0.000 ^a
30 to 39	35 (16.6%)	69 (36.9%)	37.059	2	0.003 ^a
40 to 49	20 (10.7%)	20 (10.7%)	37.059	2	0.175
50 to 59	2 (1.1%)	13 (7%)	37.059	2	0.002 ^a
Workplace					
Private clinic	57 (87.7%)	101 (83.5%)	2.917	2	0.233
Public health service	1 (1.5%)	0	2.917	2	0.233
Private clinic and public health service	7 (10.8%)	20 (16.5%)	2.917	2	0.233
University					
Lithuanian University of Health Sciences (LSMU)	52 (80%)	96 (79.3%)	0.523	2	0.77
Vilnius University	12 (18.5%)	21 (17.4%)	0.523	2	0.77
Another University	1 (1.5%)	4 (3.3%)	0.523	2	0.77

^aStatistically significant ($P < 0.05$), degree of freedom for the chi-square (χ^2).
n = number of respondents.

Table 2. Selection of oral surgeons and periodontists to perform IDIP

Parameter	Specialists (n [%])		χ^2	df	P-value
	Periodontists (n = 65)	Oral surgeons (n = 121)			
The main reason for refusing immediate implant placement					
Periapical lesion greater than 5 mm	63 (96.9%)	111 (91.7%)	1.855	1	0.17
Periapical lesion less than 5 mm	11 (16.9%)	16 (13.2%)	0.466	1	0.495
Periapical periodontitis (bone resorption)	12 (18.5%)	13 (10.7%)	2.165	1	0.141
Tooth extraction due to trauma, alveolar bone intact	2 (3.1%)	7 (5.8%)	0.674	1	0.412
Displaced tooth due to periodontal pathology	28 (30.8%)	47 (33.9%)	0.186	1	0.666
Implant site for IDIP selection					
Non-aesthetic areas	58 (89.2%)	114 (94.2%)	1.509	1	0.219
Aesthetic areas	61 (93.8%)	120 (99.2%)	0.458	1	0.032 ^a

^aStatistically significant at P < 0.05 (chi-square [χ^2] test).

IDIP = immediate dental implant placement; n = number of respondents; df = degree of freedom.

Oral surgeons and periodontists choose both aesthetic and non-aesthetic zones for IDIP. In the aesthetic zone, 120 (99.2%) of oral surgeons and 61 (93.8%) of periodontists choose IDIP (P < 0.032, df = 1). When in the non-aesthetic zone - 114 (94.2%) of oral surgeons and 58 (89.2%) of periodontists (P = 0.219, df = 1).

Advantages and common complications of IDIP method

Specialists of both professions (P = 0.191, df = 1) name the quick procedure as the least useful (Table 3). In contrast, the reduced number of surgical procedures is considered an advantage by 64 (98.5%) of periodontists and 121 (100%) of oral surgeons

(P = 0.171, df = 1). Similarly, good aesthetics and preservation of anatomy are preferred by 120 (99.2%) oral surgeons and 60 (92.3%) periodontists (P = 0.012, df = 1).

The most common complication is unpredictable bone resorption, which is indicated by 77 (63.6%) oral surgeons and 45 (69.2%) periodontists (P = 0.444, df = 1). The second most common complication noted by specialists is gingival recession (P = 0.171, df = 1). Other answers also do not differ significantly between respondent groups (P > 0.05, df = 1) (Table 3).

Assessment criteria when planning IDIP

In the aesthetic zone, periodontists consider the quantitative and qualitative indicators of soft tissue -

Table 3. Advantages and common complications of the IDIP method

Parameter	Specialists (n [%])		χ^2	df	P-value
	Periodontists (n = 65)	Oral surgeons (n = 121)			
The advantages of IDIP					
Less stress for the patient during the procedure	53 (81.5%)	85 (70.2%)	2.815	1	0.093
Reduced number of surgical procedures	64 (98.5%)	121 (100%)	1.872	1	0.171
Preservation of anatomical structures and good aesthetic result	60 (92.3%)	120 (99.2%)	6.385	1	0.012 ^a
Quick procedure	16 (24.6%)	41 (33.9%)	1.709	1	0.191
The most common complications during IDIP					
Insufficient aesthetics	5 (7.7%)	10 (8.3%)	0.019	1	0.891
Rejection of implant	24 (36.9%)	46 (38%)	0.022	1	0.883
Peri-implantitis	1 (1.5%)	3 (2.5%)	0.178	1	0.673
Soft tissue recession	32 (49.2%)	72 (59.5%)	8.585	1	0.171
Unpredictable bone resorption	45 (69.2%)	77 (63.6%)	0.586	1	0.444

^aStatistically significant at P < 0.05 (chi-square [χ^2] test).

IDIP = immediate dental implant placement; n = number of respondents; df = degree of freedom.

63 (96.9%) as the main selection criterion for IDIP (Table 4). In contrast, this criterion was indicated by 99 (81.8%) of oral surgeons (P = 0.003, df = 1). Other criteria did not differ significantly between respondent groups (P > 0.05, df = 1).

In the non-aesthetic zone as the main parameter determining whether to perform IDIP, 56 (86.2%) periodontists indicate a wide septum, and 102 (84.3%) oral surgeons - the morphology of the bony walls of the extraction socket. Periodontists consider the morphology of the bony walls of the extraction socket and the amount of bone above the socket to be equally important parameters - 55 (84.6%), while oral surgeons consider the wide septum to be the second most important parameter - 94 (77.7%), and the amount of bone above the socket to be the third - 92 (76%) (P = 0.163, df = 1). In both groups, quantitative and qualitative indicators of soft tissue are considered to be the least decisive parameter for performing IDIP in a non-aesthetic zone. Only 51 (42.1%) of oral surgeons and 39 (60%) of periodontists appropriate this criterion (P = 0.02, df = 1).

In the presence of an infected socket, when a periapical lesion is observed, 101 (83.5%) of oral surgeons and 38 (58.5%) of periodontists perform IDIP (P = 0.000, df = 1). In case of an infected socket, when a pus secretion is observed from the periodontal pocket of one tooth, 31 (25.6%) of oral surgeons and only 6 (9.2%) of periodontists perform IDIP (P = 0.002, df = 1) (Table 4).

Additional soft and hard tissue augmentation

Soft tissue augmentation in the aesthetic zone when there is a vertical gingival thickness < 2 mm is performed by 60 (92.3%) periodontists and 96 (79.3%) oral surgeons (P = 0,022 df = 1) (Table 5). Similarly, 58 (89.2%) periodontists and 107 (88.4%) oral surgeons perform soft tissue augmentation in the aesthetic zone, when the width of keratinized gingiva is < 2 mm (P = 0.869, df = 1). Another criterion that significantly differentiates the answers of both groups of respondents is observed interdental papilla and gingival contour defects. When an interdental papilla and gingival contour defect is observed, soft tissue augmentation in the aesthetic zone is performed by 54 (83.1%) periodontists and by 79 (65.3%) oral surgeons (P = 0.01, df = 1). Other selection criteria do not differ significantly between groups (P > 0.05, df = 1).

When specialists were asked when they choose to perform hard tissue augmentation, the answers were evenly distributed (P > 0.05, df = 1) (Table 5).

Extraction socket morphology assessment classifications

Oral surgeons 76 (62.8%) and periodontists 32 (49.2%) know, but do not use extraction socket morphology assessment classifications (P = 0.136, df = 2) (Table 6). Other answers between respondent groups are also statistically insignificant (P = 0.136, df = 2).

Table 4. Assessment criteria that professionals use when planning IDIP

Parameter	Specialists (n [%])		χ ²	df	P-value
	Periodontists (n = 65)	Oral surgeons (n = 121)			
Evaluation of the aesthetic zone					
The amount of apical bone beyond the extraction socket	31 (47.7%)	49 (40.5%)	0.893	1	0.345
The quantitative and qualitative indicators of the soft tissues	63 (96.9%)	99 (81.8%)	8.585	1	0.003 ^a
The morphology of the bone walls of the extraction socket	58 (89.2%)	106 (87.6%)	0.107	1	0.743
Evaluation of non-aesthetic zone					
A wide septum of extraction socket	56 (86.2%)	94 (77.7%)	1.943	1	0.163
The amount of apical bone beyond the extraction socket	55 (84.6%)	92 (76%)	1.879	1	0.17
The quantitative and qualitative indicators of the soft tissues	39 (60%)	51 (42.1%)	5.396	1	0.02 ^a
The morphology of the bone walls of the extraction socket	55 (84.6%)	102 (84.3%)	0.003	1	0.995
IDIP into infected extraction socket with chronic periapical infections					
Yes	38 (58.5%)	101 (83.5%)	14.006	1	0.000 ^a
No	27 (41.5%)	20 (16.5%)	14.006	1	0.000 ^a
IDIP into infected extraction socket when suppuration is observed from the periodontal pocket of one tooth					
Yes	6 (9.2%)	31 (25.6%)	7.127	1	0.002 ^a
No	59 (90.8%)	90 (74.4%)	7.127	1	0.007 ^a

^aStatistically significant at P < 0.05 (chi-square [χ²] test).

IDIP = immediate dental implant placement; n = number of respondents; df = degree of freedom.

Table 5. The need for additional soft and hard tissue augmentation

Parameter	Specialists (n [%])		χ^2	df	P-value
	Periodontists (n = 65)	Oral surgeons (n = 121)			
The need for soft tissue augmentation at the site of the planned implant in an aesthetic zone					
A vertical gingival defect	54 (83.1%)	95 (78.5%)	0.553	1	0.457
An interdental papilla and gingival contour defects	54 (83.1%)	79 (65.3%)	6.566	1	0.01 ^a
The vertical gingival thickness is > 2 mm,	4 (6.2%)	7 (5.8%)	0.01	1	0.919
The vertical gingival thickness is < 2 mm	60 (92.3%)	96 (79.3%)	5.257	1	0.022 ^a
The width of keratinized gingiva is > 2 mm	2 (3.1%)	7 (5.8%)	0.674	1	0.412
The width of keratinized gingiva is < 2 mm	58 (89.2%)	107 (88.4%)	0.027	1	0.869
The need for hard tissue augmentation at the site of the planned implant in a non-aesthetic zone					
The thickness of the buccal bone wall is < 1 mm	52 (80%)	97 (80.2%)	0.001	1	0.979
Hard tissue defects (intra-socket defects, dehiscence, fenestration),	60 (92.3%)	103 (85.1%)	2.014	1	0.156
Significant or complete loss of one socket bone wall	58 (89.2%)	114 (94.2%)	1.059	1	0.219
The gap between the implant and the socket wall is > 2 mm	54 (83.1%)	99 (81.8%)	0.046	1	0.83

^aStatistically significant at P < 0.05 (chi-square [χ^2] test).
n = number of respondents; df = degree of freedom.

Table 6. Use and knowledge of extraction socket morphology assessment classifications

Parameter	Specialists (n [%])		χ^2	df	P-value ^a
	Periodontists (n = 65)	Oral surgeons (n = 121)			
Use and knowledge of extraction socket morphology assessment classifications					
Yes I know and use	28 (43.1%)	41 (33.9%)	3.988	2	0.136
Yes, I know, but do not use them	32 (49.2%)	76 (62.8%)	3.988	2	0.136
I do not know	5 (7.7%)	4 (3.3%)	3.988	2	0.136
An X-ray is usually performed before IDIP					
Orthopantomogram (OPG)	1 (1.5%)	8 (6.6%)	4.166	2	0.125
Periapical radiographs	1 (1.5%)	0	4.166	2	0.125
CBCT	63 (96.9%)	113 (93.4%)	4.166	2	0.125

^aStatistically significant at P < 0.05 (chi-square [χ^2] test).
IDIP = immediate dental implant placement; n = number of respondents; df = degree of freedom.

The most common radiological examination method used for extraction socket assessment is CBCT, which is chosen by 63 (96.9%) of periodontists and 113 (93.4%) of oral surgeons (P = 0.125, df = 2).

DISCUSSION

This investigative research work aims to evaluate the factors that determine the choice of oral surgeons and periodontists to perform IDIP. Oral surgeons and periodontists who perform implant procedures participated in this study.

Reasons to refuse IDIP

Analysis of the obtained data revealed that

periodontists and oral surgeons usually refuse to perform an IDIP due to the existing periapical lesion, the size of which is more than 5 mm, and the second most common reason is a mobile tooth due to periodontal pathology, when the bone around the tooth is resorbed. Blanco et al. [2] state that he implants successfully osseointegrates after IDIP when the tooth is extracted due to periodontal and/or periapical lesion, but proper clinical preparation of the extraction socket is required prior to implantation, i.e. careful socket curettage and irrigation with chlorhexidine solution. Kim et al. [8] discussed chronic extraction socket pathologies by classifying them according to residual bone morphology and soft tissue condition before tooth extraction. The authors consider a good healing prognosis when a tooth is extracted due to pathology of endodontic origin, fracture, severe

carious tooth damage, periodontal pathology or combined endodontic-periodontal pathology, and the pathological processes are limited to the area of the apex of the tooth or resorption of one socket wall is observed, and the soft tissues are intact and maintains a physiological status. If a tooth is extracted due to the pathologies listed above and a defect of one extraction socket wall and gingival recession is present or up to 50% of the socket bone is lost and there is no loss of soft tissue, healing prognosis is considered poor. Very poor healing prognosis is considered when > 50% of the extraction socket walls are lost and gingival recession is present. Shamir et al. [3] and Juodzbaly et al. [9] stated that it is necessary to identify the pathology of the extracted tooth, which is due to any infectious process, such as periodontal or endodontic abscess, cyst, tumour, or other causes, because the growth of fibrous tissue in affected areas can increase the rate and type of bone resorption, thus disrupting normal healing and bone regeneration.

Implant site for IDIP selection

In both groups of respondents, IDIP is chosen in both aesthetic and non-aesthetic areas, the quality and quantity of bone is assessed, which will depend on the primary and secondary stability of the implant. Ragucci et al. [10] consider IDIP in a non-aesthetic area as a predictable treatment method that shows a high implant survival and success rate with minimal marginal bone resorption. Hamilton et al. [11], consider IDIP into type 1A extraction socket and immediate implant loading in the maxillary aesthetic zone as a successful treatment option, but emphasize that proper evaluation of the patient and implant site is essential. Regarding bone quality and quantity, Buser et al. [12] recommend that there should be sufficient bone volume beyond the extraction socket and on the palatal side for an immediate implant in the maxillary aesthetic area for correct implant positioning and sufficient primary stability achievement during implantation.

The advantages of IDIP

Both groups of respondents consider a reduced number of surgical procedures, preservation of anatomical structures and good aesthetic result to be the greatest advantage of IDIP. This is also supported by Krawiec et al. [13], who indicates the following advantages of IDIP: Shortened treatment time, which positively affects patient satisfaction, and reduced number of surgical procedures in case of restoration of a missing tooth with immediate loading of the implant

and reduction of negative psychological impact on the patient. This is in coincidence with Juodzbaly et al. [9], who claim that IDIP is associated with the same advantages - shortened treatment time, fewer surgical operations, and higher patient satisfaction. Mustakim et al. [14] believe that the advantages of IDIP are reduced treatment time and cost, fewer surgical interventions, preservation of the alveolar ridge, patient satisfaction and comfort, and better bone integration.

Complications during IDIP

Both groups of respondents nominate unpredictable bone resorption and soft tissue recession as the most frequent complication. This is in agreement with Rijal et al. [15], where it was reported that the incidence of soft tissue recession on the buccal side of alveolar ridge was approximately 26% higher after IDIP compared with early implantation. Buser et al. [12] agree that gingival recession is a common complication after IDIP, which develops due to malposition of the implant in relation to the buccal socket wall. Ragucci et al. [10] in a systematic review and meta-analysis, found a mean buccal wall resorption in the non-aesthetic zone of 1.29 (SD 0.24) mm in IDIP, while Seyssens et al. [16] determined the average horizontal buccal wall resorption in the aesthetic zone reaches almost 0.7 mm.

Evaluation of the aesthetic zone

The results of this study showed that specialists, when assessing the aesthetic area of the dental arch, pay the most attention to the quantitative and qualitative indicators of the soft tissues and the morphology of the bony walls of the extraction socket. The data of Buser et al. [12] are consistent with previous authors and distinguish intact extraction socket buccal wall, a thick socket wall phenotype (> 1 mm) and a thick gingival phenotype to be the most important determinants of IDIP in aesthetic zone. Lee et al. [17] agree that gingival phenotype is an important factor that affects the buccal gingival margin and buccal ridge resorption. Meanwhile, Ruales-Carrera et al. [18] emphasize the importance of adapting a healing abutment after IDIP that supports the peri-implant soft tissue and its architecture.

Non-aesthetic zone evaluation

In the non-aesthetic zone, periodontists indicate a wide septum of extraction socket as the main parameter determining whether to perform IDIP,

while oral surgeons indicate the morphology of the bone walls of the socket. Periodontists consider the morphology of the extraction socket and the amount of apical bone beyond the extraction socket as equally important parameters, while oral surgeons consider the wide septum as the second most important parameter, and the amount of bone beyond the extraction socket as the third. Smith and Tarnow [19] also agree that the amount of bone above the extraction socket is an important factor in planning the insertion of the implant, but due to the anatomical limitations above the apices of the roots of the molars in the maxillary sinus and mandibular canal areas, it may be difficult to ensure the primary stability of the implant, therefore they consider it a more important parameter bony septum. In the classification proposed by the authors, in type C extraction sockets, where there is no bony septum, it is recommended to use alveolar bone walls to obtain the primary stability of the implant, which coincides with the parameters chosen by our respondents, due to the assessment of the morphology of the bony walls. Bleyan et al. [20] agree that the osseous septum is the preferred site for IDIP in a non-aesthetic area, not only for correct implant position but also for implant survival. The authors proposed a new classification based on the width of the osseous septum assessed prior to implant site preparation and consider a septum width of only < 2 mm unsuitable for IDIP.

The results of this study showed that both groups of respondents consider soft tissue quantitative and qualitative indicators to be the least decisive parameter in the non-aesthetic zone. Meanwhile, Wipawin et al. [21] indicate that when performing IDIP in a non-aesthetic area, the width of the keratinized mucosa is very important, which should be > 2 mm, because then less gingival recession is observed compared to those areas where the width of the keratinized mucosa was < 2 mm. In addition, the authors note that in insufficiently keratinized mucosa, there is a greater accumulation of plaque, bleeding during probing, and inflammation of the gums.

Infected extraction socket

Hamilton et al. [11] in their review state that IDIP into extraction socket with chronic periapical infections is a successful treatment method if appropriate clinical procedures for cleaning the socket are performed prior to insertion of the implant, but it is important to note that the systematic review did not include studies that would include acute periapical infections and chronic infections with an open fistula. Meanwhile, the results of present study show that 83.5% of oral surgeons and

58.5% of periodontists perform IDIP when periapical focus is observed, and 41.5% of periodontists and 16.5% of oral surgeons refuse the operation. In the case where the socket is infected and suppuration is observed from the periodontal pocket of one tooth, specialists more often refuse to perform IDIP and only 25.6% of oral surgeons and 9.2% of periodontists perform IDIP. Buser et al. [12] note that the extraction site should not have an acute purulent infection for immediate implantation.

Soft tissues and the importance of augmentation

Both groups of respondents perform soft tissue augmentation at the site of the planned implant in the aesthetic zone when the vertical gingival thickness is < 2 mm, the width of keratinized gingiva is < 2 mm, when there is a vertical gingival defect, and an interdental papilla and gingival contour defect is observed.

This is supported by Juodzbaly et al. [9], who recommend IDIP with soft tissue augmentation to be performed when the thickness of the gingiva is < 2 mm, the width of keratinized gingiva is < 2 mm, a vertical gingival defect > 1 mm is observed, an interdental papilla defect is observed, where the apex of the interdental papilla is at or above the interproximal cemento-enamel junction and the observed soft tissue contour is > 2 mm compared to the contour of adjacent teeth. Similarly, Hamilton et al. [11] recommend that alveolar sites with moderate risk factors, such as a thin buccal wall, a thin soft tissue phenotype, and mild gingival recession, undergo a soft tissue augmentation procedure, such as connective tissue grafting. In this way, the soft tissue profile is improved, and recession is reduced, which helps to achieve a successful aesthetic result. Meanwhile, the European Association of Osseointegration (EAO) in the recommendations presented during the 6th EAO Consensus Conference (2021) indicates that soft tissue augmentation, which is performed together with IDIP in the aesthetic zone, results in a smaller recession of the buccal mucosa (0.34 mm, P = 0.002) and a thicker gingiva (0.66 mm, P < 0.001) [22].

Hard tissue and the importance of augmentation

Both groups of respondents perform bone augmentation when there is significant or complete loss of one socket bony wall, when hard tissue defects are observed (intra-socket defects, dehiscence, fenestration), when the thickness of the buccal bone wall is < 1 mm and when the gap between

the implant and the socket wall is > 2 mm. This is in agreement with the recommendations of Kabi et al. [23] to perform hard tissue augmentation when the gap between the implant and the buccal extraction socket wall is > 2 mm. Meanwhile, Stefanini et al. [5] always recommend the use of bone substitutes during IDIP, thereby reducing horizontal bone resorption. According to the authors, if an intact buccal wall is observed, the gap should be filled with bone graft material and autogenous bone mixture, and if a buccal wall with dehiscence is observed, hard tissue augmentation should be performed using bone substitute materials with autologous bone chips and covered with a resorbable barrier membrane. Furthermore, Bleyan et al. [20] note that hard tissue augmentation in a non-aesthetic area with customized healing abutment acts as a prosthetic socket sealing tool that minimizes changes in alveolar crest contour after tooth extraction and IDIP. However, Tarnow and Chu [24] state that osseointegration will take place even without additional bone tissue augmentation, especially if the bony walls of the extraction socket are intact.

Extraction socket morphology assessment classifications

Our study showed that only 43.1% of periodontists and 33.9% of oral surgeons know and use the extraction socket morphology assessment classifications. Extraction socket morphology classifications for IDIP are designed to facilitate the evaluation of key soft and hard tissue parameters and allow specialists to collaborate more easily with other clinicians. These classifications are considered a useful tool for achieving successful outcomes and are associated with greater patient satisfaction with immediate implantation [3,25]. When choosing IDIP, proper planning of the procedure is necessary, which according to Blanco et al. [2] should include performing a cone-beam computed tomography (CBCT) examination. Buser et al. [12] consent that a high-quality CBCT examination is necessary to visualize the state of the buccal bone wall at the implant site before IDIP. Respondents in present study also usually choose a CBCT test before planning an IDIP.

Limitations

Regarding the limitations of this study, it should be noted that the sample is restricted to professionals in Lithuania, which may limit the generalizability of the findings to other geographical regions or countries with different

training and practice standards. Additionally, the study relies on quantitative survey data, which might miss deeper insights into the reasons behind the attitudes and choices of the professionals. Qualitative data from interviews or open-ended questions could provide richer context and understanding. Also, the survey was conducted online, which might exclude professionals who are less comfortable with or have less access to digital technologies. The anonymity of the survey could lead to less accountability in responses, potentially affecting the reliability of the data. Addressing these limitations in future research could enhance the robustness and applicability of the findings.

CONCLUSIONS

1. No statistically significant differences were found between periodontists and oral surgeons when examining the use of indications for immediate dental implantation. Oral surgeons are more likely to perform immediate dental implantation in the presence of an infected socket. In the aesthetic zone, periodontists consider the quantitative and qualitative indicators of soft tissues as the main factor of immediate dental implant placement, while oral surgeons consider the morphology of extraction socket walls. In the non-aesthetic zone, oral surgeons indicate the morphology of the bony walls of the socket, and periodontists - a wide septum as the main factor determining whether to perform immediate implantation.
2. Specialists of both groups similarly evaluated the advantages of immediate dental implant placement. However, oral surgeons consider good aesthetics and preservation of anatomical formations to be a greater advantage compared to periodontists. Oral surgeons and periodontists indicate unpredictable bone resorption and gingival recession as the most common complication.
3. Periodontists are more likely than oral surgeons to perform soft tissue augmentation when vertical gingival thickness is < 2 mm and when interdental papilla and gingival contour defects are observed. Meanwhile, indications for hard tissue augmentation combined with immediate dental implant placement are chosen equally by specialists of both professions.
4. Extraction socket morphology assessment classifications for immediate dental implant placement are known and used by less than half of periodontists and a third of oral surgeons, but no statistically significant difference between

the groups was found. Most specialists choose a CBCT examination when planning immediate dental implant placement.

5. Taking into account the lack of knowledge identified during the research, it is recommended to adjust the teaching programs at Universities. Likewise, it is recommended to increase the knowledge of specialists performing dental implantation procedures, by carrying out continuous educational programs.

ACKNOWLEDGMENTS AND DISCLOSURE STATEMENTS

The authors report no conflicts of interest related to this study.

REFERENCES

1. Enabulele J, Omo J, Ibhawoh L. Knowledge and attitude to dental implant placement amongst a group of Nigerian dentist. *Afr Health Sci.* 2022 Jun;22(2):678-689. [Medline: [36407332](#)] [PMC free article: [9652664](#)] [doi: [10.4314/ahs.v22i2.77](#)]
2. Blanco J, Carral C, Argibay O, Liñares A. Implant placement in fresh extraction sockets. *Periodontol* 2000. 2019 Feb;79(1):151-167. [Medline: [30892772](#)] [doi: [10.1111/prd.12253](#)]
3. Shamir R, Daugela P, Juodzbaly G. Comparison of Classifications and Indexes for Extraction Socket and Implant Supported Restoration in the Aesthetic Zone: a Systematic Review. *J Oral Maxillofac Res.* 2022 Jun 30;13(2):e1. [Medline: [35949544](#)] [PMC free article: [9358603](#)] [doi: [10.5037/jomr.2022.13201](#)]
4. Santhanakrishnan M, Ramesh N, Kamaleeshwari R, Subramanian V. Variations in Soft and Hard Tissues following Immediate Implant Placement versus Delayed Implant Placement following Socket Preservation in the Maxillary Esthetic Region: A Randomized Controlled Clinical Trial. *Biomed Res Int.* 2021 Oct 4;2021:5641185. [Medline: [34646885](#)] [PMC free article: [8505071](#)] [doi: [10.1155/2021/5641185](#)]
5. Stefanini M, Rendón A, Zucchelli A, Sangiorgi M, Zucchelli G. Avoiding errors and complications related to immediate implant placement in the esthetic area with a mucogingival approach. *Periodontol* 2000. 2023 Jun;92(1):362-372. [Medline: [37365042](#)] [doi: [10.1111/prd.12491](#)]
6. Fatani B, Almutairi ES, Almalky HA, Mubarki MI, Al-Safadi A. A Comparison of Knowledge and Skills Related to Up-to-Date Implant Techniques Among Prosthodontists, Periodontists, and Oral Surgeons: A Cross-Sectional Study. *Cureus.* 2022 Oct 17;14(10):e30370. [Medline: [36407191](#)] [PMC free article: [9667219](#)] [doi: [10.7759/cureus.30370](#)]
7. Dutta SR, Passi D, Singh P, Atri M, Mohan S, Sharma A. Risks and complications associated with dental implant failure: Critical update. *Natl J Maxillofac Surg.* 2020 Jan-Jun;11(1):14-19. [Medline: [33041571](#)] [PMC free article: [7518499](#)] [doi: [10.4103/njms.NJMS_75_16](#)]
8. Kim JJ, Ben Amara H, Chung I, Koo KT. Compromised extraction sockets: a new classification and prevalence involving both soft and hard tissue loss. *J Periodontal Implant Sci.* 2021 Apr;51(2):100-113. [Medline: [33913633](#)] [PMC free article: [8090797](#)] [doi: [10.5051/jpis.2005120256](#)]
9. Juodzbaly G, Sakavicius D, Wang HL. Classification of extraction sockets based upon soft and hard tissue components. *J Periodontol.* 2008 Mar;79(3):413-24. [Medline: [18315423](#)] [doi: [10.1902/jop.2008.070397](#)]
10. Ragucci GM, Elnayef B, Criado-Cámara E, Del Amo FS, Hernández-Alfaro F. Immediate implant placement in molar extraction sockets: a systematic review and meta-analysis. *Int J Implant Dent.* 2020 Oct 13;6(1):40. [Medline: [32770283](#)] [PMC free article: [7413966](#)] [doi: [10.1186/s40729-020-00235-5](#)]
11. Hamilton A, Gonzaga L, Amorim K, Wittneben JG, Martig L, Morton D, Martin W, Gallucci GO, Wismeijer D. Selection criteria for immediate implant placement and immediate loading for single tooth replacement in the maxillary esthetic zone: A systematic review and meta-analysis. *Clin Oral Implants Res.* 2023 Sep;34 Suppl 26:304-348. [Medline: [37750515](#)] [doi: [10.1111/clr.14109](#)]
12. Buser D, Chappuis V, Belser UC, Chen S. Implant placement post extraction in esthetic single tooth sites: when immediate, when early, when late? *Periodontol* 2000. 2017 Feb;73(1):84-102. [Medline: [28000278](#)] [doi: [10.1111/prd.12170](#)]
13. Krawiec M, Olchowy C, Kubasiewicz-Ross P, Hadzik J, Dominiak M. Role of implant loading time in the prevention of marginal bone loss after implant-supported restorations: A targeted review. *Dent Med Probl.* 2022 Jul-Sep;59(3):475-481. [Medline: [35611847](#)] [doi: [10.17219/dmp/150111](#)]
14. Mustakim KR, Eo MY, Lee JY, Myoung H, Seo MH, Kim SM. Guidance and rationale for the immediate implant placement in the maxillary molar. *J Korean Assoc Oral Maxillofac Surg.* 2023 Feb 28;49(1):30-42. [Medline: [36859373](#)] [PMC free article: [9985995](#)] [doi: [10.5125/jkaoms.2023.49.1.30](#)]
15. Rijal AH, Dhami B, Ghimire P, Humagain M, Lamichhane S. Early Implant Placement with Immediate Loading in the Mandibular Anterior Region: A Rapid Solution to Edentulism. *Case Rep Dent.* 2023 Dec 18;2023:8487094. [Medline: [38146421](#)] [PMC free article: [10749726](#)] [doi: [10.1155/2023/8487094](#)]

16. Seyskens L, Eghbali A, Cosyn J. A 10-year prospective study on single immediate implants. *J Clin Periodontol*. 2020 Oct;47(10):1248-1258. [Medline: [32748983](#)] [doi: [10.1111/jcpe.13352](#)]
17. Lee CT, Sanz-Miralles E, Zhu L, Glick J, Heath A, Stoupe J. Predicting bone and soft tissue alterations of immediate implant sites in the esthetic zone using clinical parameters. *Clin Implant Dent Relat Res*. 2020 Jun;22(3):325-332. [Medline: [32346981](#)] [doi: [10.1111/cid.12910](#)]
18. Ruales-Carrera E, Pauletto P, Apaza-Bedoya K, Volpato CAM, Özcan M, Benfatti CAM. Peri-implant tissue management after immediate implant placement using a customized healing abutment. *J Esthet Restor Dent*. 2019 Nov;31(6):533-541. [Medline: [31268244](#)] [doi: [10.1111/jerd.12512](#)]
19. Smith RB, Tarnow DP. Classification of molar extraction sites for immediate dental implant placement: technical note. *Int J Oral Maxillofac Implants*. 2013 May-Jun;28(3):911-6. [Medline: [23748327](#)] [doi: [10.11607/jomi.2627](#)]
20. Bleyan S, Gaspar J, Huwais S, Schwimer C, Mazor Z, Mendes JJ, Neiva R. Molar Septum Expansion with Osseodensification for Immediate Implant Placement, Retrospective Multicenter Study with Up-to-5-Year Follow-Up, Introducing a New Molar Socket Classification. *J Funct Biomater*. 2021 Nov 25;12(4):66. [Medline: [34940545](#)] [PMC free article: [8708493](#)] [doi: [10.3390/jfb12040066](#)]
21. Wipawin R, Amornsettachai P, Panyayong W, Rokaya D, Thiradilok S, Pujareern P, Suphangul S. Clinical outcomes of 3-5 years follow-up of immediate implant placement in posterior teeth: a prospective study. *BMC Oral Health*. 2024 Mar 8;24(1):312. [Medline: [38454439](#)] [PMC free article: [10921638](#)] [doi: [10.1186/s12903-024-04058-3](#)]
22. Thoma DS, Cosyn J, Fickl S, Jensen SS, Jung RE, Raghoobar GM, Rocchietta I, Rocuzzo M, Sanz M, Sanz-Sánchez I, Scarlat P, Schou S, Stefanini M, Strasing M, Bertl K; working group 2 of the 6th EAO Consensus Conference 2021. Soft tissue management at implants: Summary and consensus statements of group 2. The 6th EAO Consensus Conference 2021. *Clin Oral Implants Res*. 2021 Oct;32 Suppl 21(Suppl 21):174-180. [Medline: [34145925](#)] [PMC free article: [8596754](#)] [doi: [10.1111/clr.13798](#)]
23. Kabi S, Kar R, Samal D, Deepak KC, Kar IB, Mishra N. Immediate dental implant placement with or without autogenous bone graft: A comparative study. *Natl J Maxillofac Surg*. 2020 Jan-Jun;11(1):46-52. [Medline: [33041576](#)] [PMC free article: [7518474](#)] [doi: [10.4103/njms.NJMS_59_19](#)]
24. Tarnow DP, Chu SJ. Human histologic verification of osseointegration of an immediate implant placed into a fresh extraction socket with excessive gap distance without primary flap closure, graft, or membrane: a case report. *Int J Periodontics Restorative Dent*. 2011 Sep-Oct;31(5):515-21. [Medline: [21845246](#)]
25. Sabri H, Barootchi S, Heck T, Wang HL. Single-rooted extraction socket classification: A systematic review and proposal of a new classification system based on morphologic and patient-related factors. *J Esthet Restor Dent*. 2023 Jan;35(1):168-182. [Medline: [36196906](#)] [doi: [10.1111/jerd.12967](#)]

To cite this article:

Bineviciute Z, Juodzbaly G.

Attitudes of Oral Surgeons and Periodontists towards Immediate Dental Implant Placement

J Oral Maxillofac Res 2024;15(2):e3URL: <http://www.ejomr.org/JOMR/archives/2024/2/e3/v15n2e3.pdf>doi: [10.5037/jomr.2024.15203](#)

Copyright © Bineviciute Z, Juodzbaly G. Published in the JOURNAL OF ORAL & MAXILLOFACIAL RESEARCH (<http://www.ejomr.org>), 30 June 2024.

This is an open-access article, first published in the JOURNAL OF ORAL & MAXILLOFACIAL RESEARCH, distributed under the terms of the [Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 Unported License](#), which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work and is properly cited. The copyright, license information and link to the original publication on (<http://www.ejomr.org>) must be included.

Appendix 1. Questionnaire

I. DEMOGRAPHIC QUESTIONNAIRE

1. What is your gender?

- a) Male
- b) Female

2. What is your age?

3. Qualification (held license):

- a) Oral Surgeon
- b) Periodontist

4. How many years of work experience do you have?

5. Where do you work?

- a) Private clinic
- b) Public institution
- c) Private and public institution

6. Which university did you graduate from in Dentistry?

- a) Lithuanian University of Health Sciences (LSMU)
- b) Vilnius University (VU)
- c) Other universities

7. Do you perform implantation procedures?

- a) Yes
- b) No

II. SPECIAL QUESTIONNAIRE

8. For which of the reasons listed below would you refuse to perform immediate implantation when removing a tooth?

- a) Loose tooth due to periodontal pathology
- b) Tooth removal due to trauma with the alveolar bone intact
- c) Tooth removal due to apical periodontitis (bone destruction)
- d) Periapical lesion size up to 5mm
- e) Periapical lesion size more than 5mm

9. When choosing immediate implantation, do you assess the quality and quantity of bone that will determine the primary and secondary stability of implants?

- a) Yes
- b) No

10. In which area do you choose immediate implantation? (you can select both)

- a) Aesthetic zone
- b) Non-aesthetic zone

11. Please mark the most important advantages of immediate implantation in your opinion? (select the three most suitable for you)

- a) Quick procedure
- b) Good aesthetics and preservation of anatomical structures
- c) Reduced number of surgical procedures
- d) The patient experiences less stress during the procedure

12. What are the most common complications you encounter when performing immediate implantation?

- a) Unpredictable bone resorption
- b) Gum recession
- c) Peri-implantitis
- d) Implant rejection
- e) Inadequate aesthetics

13. Main parameters determining the choice to perform immediate implantation in the aesthetic zone:

- a) Morphology of the alveolar bone walls
- b) Quantitative and qualitative indicators of soft tissues
- c) Amount of bone above the alveolus

14. Main parameters determining the choice to perform immediate implantation in the non-aesthetic zone:

- a) Morphology of the alveolar bone walls
- b) Quantitative indicators of soft tissues
- c) Amount of bone above the alveolus
- d) Wide septum

15. Do you perform immediate implantation when the alveolus is infected – observing a periapical lesion?

- a) Yes
- b) No

16. Do you perform immediate implantation when the alveolus is infected – observing pus from one tooth's periodontal pocket?

- a) Yes
- b) No

17. When do you choose to perform additional soft tissue augmentation in the aesthetic zone? (you can choose several options)

- a) When the width of keratinized gingiva is <2mm
- b) When the width of keratinized gingiva is >2mm
- c) When the vertical thickness of the gingiva is <2mm
- d) When the vertical thickness of the gingiva is >2mm
- e) Soft tissue defects

18. When do you choose to perform additional hard tissue augmentation during immediate implantation?

- a) When the gap between the implant and the alveolar wall is >2mm
- b) Significant or complete loss of one bony wall
- c) In the presence of hard tissue defects (intra-alveolar defects, dehiscence, fenestration)
- d) When the width of the buccal bony wall is <1mm

19. Do you know and use any alveolar classification?

- a) Yes, I know and use
- b) Yes, I know but do not use
- c) I do not know

20. Which radiological examinations do you use when planning immediate implantation?

- a) Dental radiograph
- b) Orthopantomogram
- c) CBCT