Original Research

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Application of an implant-supported provisional crown in the esthetically critical zone in prosthodontic clinical practice

Angela Sh. Ildarova[1, 2] ✉, **Irina M. Makeeva**[2]

[1] SoloDent Dental Clinic LLC, Saint Petersburg, Russian Federation

[2] Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russian Federation

✉ angela-da1@yandex.ru

Abstract

AIM. To evaluate the attitude of practicing prosthodontists toward the use of implant-supported provisional crowns in the esthetic zone and to identify the main clinical challenges and complications associated with temporary restorations.

MATERIALS AND METHODS. A pilot survey study was conducted using a structured electronic questionnaire consisting of nine questions. A total of 120 prosthodontists with more than 10 years of clinical experience in implant-supported restorations participated. Forty percent worked in public dental institutions and 60% in private clinics. The survey analyzed the frequency of provisional crown use, treatment protocols, application of digital technologies, and soft tissue complications.

RESULTS. Sixty percent of respondents routinely use provisional crowns in the esthetic zone. Immediate implantation is performed by 86% of clinicians. However, 66.7% reported soft tissue complications, including gingival recession, loss of interdental papillae, and changes in gingival contour and color. Digital workflows are implemented by 66.7% of clinicians, while only 20% possess 3D crown modeling skills. Notably, 73% of respondents do not follow a standardized prosthetic protocol in the esthetic zone.

CONCLUSIONS. Implant-supported provisional crowns represent a critical component of esthetic rehabilitation. The absence of a unified treatment protocol highlights the need for evidence-based clinical guidelines. The integration of digital technologies and 3D modeling enhances treatment personalization and improves predictability of esthetic outcomes.

Keywords: esthetics, implant-supported provisional crown, restoration in the esthetically critical zone

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Применение провизорной коронки с опорой на имплантат в эстетически значимой зоне в практике стоматолога-ортопеда

А.Ш. Ильдарова[1, 2] ✉, **И.М. Макеева**[2]

[1] ООО «СолоДент», г. Санкт-Петербург, Российская Федерация

[2] Первый Московский государственный медицинский университет имени И.М. Сеченова (Сеченовский Университет), г. Москва, Российская Федерация

✉ angela-da1@yandex.ru

Резюме

ЦЕЛЬ. Оценить отношение практикующих стоматологов-ортопедов к применению провизорной коронки с опорой на имплантат в эстетически значимой зоне, а также выявить основные клинические проблемы и осложнения, возникающие при использовании временных конструкций.

МАТЕРИАЛЫ И МЕТОДЫ. Проведено пилотное социологическое исследование с использованием электронной анкеты, включающей 9 вопросов. В опросе приняли участие 120 стоматологов-ортопедов со стажем работы более 10 лет, специализирующихся на протезировании с опорой на имплантаты. Из них 40% работали в муниципальных учреждениях, 60 % – в частных клиниках. Анализировали частоту применения временных конструкций, предпочтения протоколов лечения, использование цифровых технологий и характер осложнений в области мягких тканей.

РЕЗУЛЬТАТЫ. Большинство респондентов (60 %) применяют временные коронки в эстетически значимой зоне. Одномоментную имплантацию используют 86 % клиницистов. При этом 66,7 % врачей

отмечают осложнения в области мягких тканей (рецессия десны, утрата межзубных сосочков, изменение цвета и формы десны). Цифровой протокол применяют 66,7 % опрошенных, однако только 20 % владеют навыками 3D-моделирования коронок. У 73 % респондентов отсутствует единый протокол протезирования в зоне улыбки.
ВЫВОДЫ. Провизорная коронка является важным элементом реабилитации пациентов в эстетически значимой зоне. Отсутствие стандартизированного протокола лечения требует разработки клинических рекомендаций. Внедрение цифровых технологий и 3D-моделирования расширяет возможности индивидуализации лечения и повышения предсказуемости эстетических результатов.

Ключевые слова: эстетика, временная коронка с опорой на имплант, реставрация в эстетически значимой зоне

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INTRODUCTION

The scientific literature reports favorable outcomes in the management of anterior edentulous defects through dental implant therapy [1]. Contemporary treatment protocols require comprehensive aesthetic, functional, and social rehabilitation of the patient from the moment of tooth extraction, throughout osseointegration, and until placement of the definitive crown [2]. Implant-supported provisional prostheses are recommended for defects located in the anterior region or in cases of complete edentulism of the jaws, irrespective of the patient's age or professional activity [3; 4]. The fabrication techniques, component characteristics, and selection criteria for provisional prosthetic restorations – determined by specific clinical scenarios, as well as the potential complications and risks associated with provisional crowns – remain highly relevant issues and warrant further investigation [5; 6].

This article presents the results of a pilot study aimed at assessing practicing prosthodontists' attitudes toward the use of implant-supported provisional restorations in patients requiring reconstruction in the esthetically critical zone of the jaw, as well as the complications and challenges arising from the application of such prosthetic designs [7].

MATERIALS AND METHODS

The study was conducted using a specifically designed electronic questionnaire developed for prosthodontists with expertise in implant dentistry. The survey consisted of nine questions aimed at evaluating clinicians' perspectives regarding the rationale for fabricating provisional restorations, their clinical application in the esthetically critical zone, as well as their perceived advantages and limitations.

The survey targeted practicing prosthodontists specializing in implant-supported restorations with more than 10 years of professional experience. A total of 120 respondents participated in the study. Dentists employed in public dental clinics accounted for 40% (50/120) of the sample, whereas 60% (70/120) were affiliated with privately owned dental practices.

RESULTS

Although current treatment protocols for patients presenting with anterior bounded edentulous defects recommend the use of provisional crowns, this approach has not been formally established as a standardized treatment modality. The availability of a dedicated specialist position and appropriate technological infrastructure within a clinical setting enables the fabrication of implant-supported provisional prosthetic crowns during the patient's rehabilitation period.

Alterations of the peri-implant soft tissues may occur as a consequence of inflammatory processes or may be iatrogenic in nature, resulting from surgical and prosthetic interventions [4].

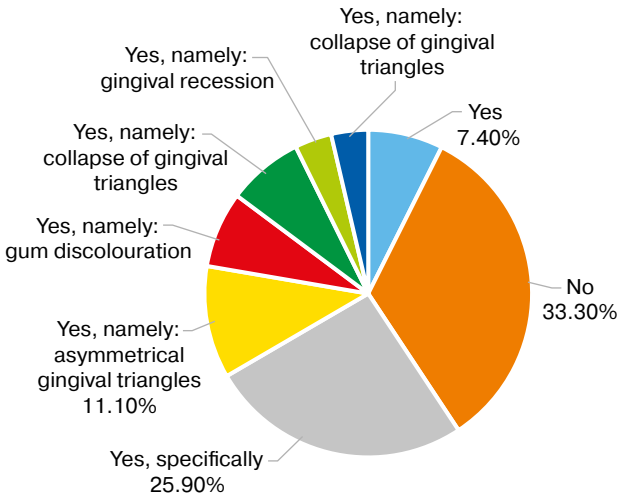

Fig. 1. Distribution of respondents' answersto the question: Do your patients have problems related to the condition of the soft gum tissue in the implant area, and if so, what are they? (27 responses)

Рис. 1. Распределение ответов респондентов на вопрос: бывают ли у ваших пациентов проблемы, связанные с состоянием мягких тканей десны в области имплантатов, и если да, то какие? (27 ответов)

According to the survey findings, 33.3% of respondents reported no experience with soft tissue complications in the area of implant-supported crowns. However, 66.7% of clinicians indicated the occurrence of the following complications:

– asymmetry of the interdental papillae (gingival triangles);

– changes in gingival color and contour;

– loss of the interdental papilla;

– marginal gingival recession.

These complications ultimately contribute to an esthetically unsatisfactory treatment outcome.

Rehabilitation protocols for the esthetically critical zone require the use of a provisional restoration during the treatment period. The survey data indicate that this protocol is implemented in routine clinical practice by a majority of clinicians, with 60% of the surveyed dentists reporting its application.

The data obtained from the survey provide insight into the challenges encountered when managing cases in the esthetically critical zone without the fabrication of a provisional crown. Although structural changes within the dentoalveolar system in the area of the defect are individualized and patient-specific, the absence of a provisional restoration consistently contributes to the development of unfavorable clinical outcomes.

According to the survey results, removable provisional restorations are used in the esthetically critical zone to a comparable extent. However, 50% of the respondents consider the use of removable provisional prostheses to be unjustified, noting that their presence may contribute to complications affecting both soft and hard tissues.

The immediate (one-stage) implant placement protocol in the esthetically critical zone is employed by the majority of clinicians (86% of respondents), which is justified by the following advantages:

– reduction in the number of surgical interventions;

– shortening of treatment duration and faster restoration of the dental arch defect;

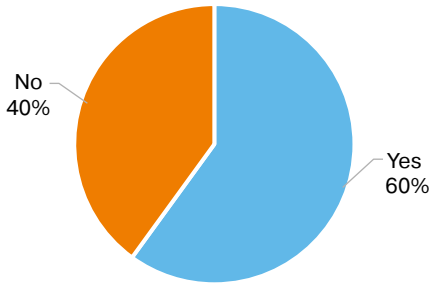

Fig. 2. Distribution of respondents' answers to the question: Do you use provisional prosthetic crowns for implant-supported restorations in the esthetically critical zone? (30 responses)

Рис. 2. Распределение ответов респондентов на вопрос: применяете ли вы временные ортопедические коронки при протезировании на имплантатах в эстетически важной зоне? (30 ответов)

Fig. 4. Distribution of respondents' answers to the question: Do you use removable provisional crowns during implant treatment in the esthetically critical zone? (30 responses)

Рис. 4. Распределение ответов респондентов на вопрос: применяете ли вы съемные временные коронки во время имплантологическом лечении пациента в эстетически важной зоне? (30 ответов)

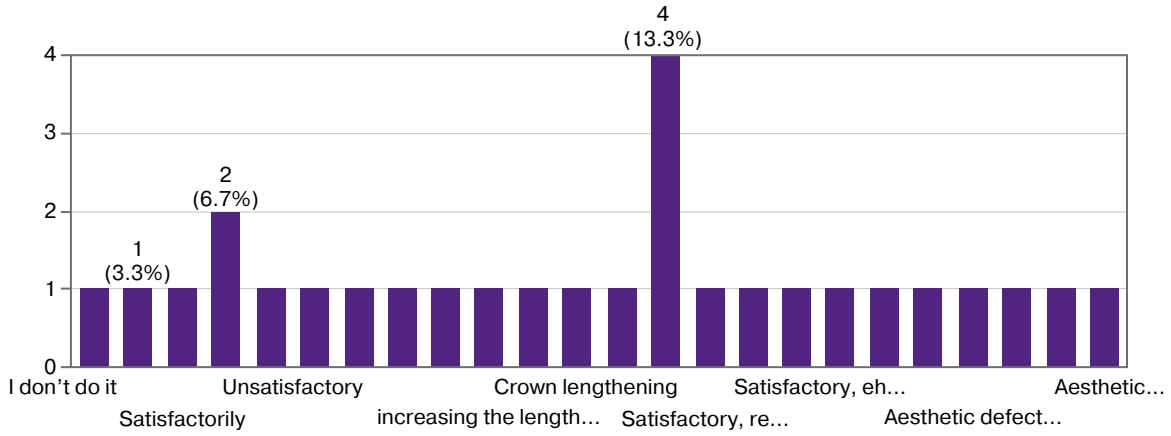

Fig. 3. Distribution of respondents' answers to the question: How do you evaluate the results of prosthetics on implants without the temporary crown stage? What problems arise? (30 responses)

Рис. 3. Распределение ответов респондентов на вопрос: как вы оцениваете результат протезирования на имплантатах без этапа временных коронок? Какие проблемы возникают? (30 ответов)

– ability to position the dental implant in an axially optimal, prosthetically guided orientation;

– minimization of patient stress during treatment.

Conversely, 14% of clinicians do not adhere to the immediate implant placement protocol for anterior edentulous cases due to insufficient bone and soft tissue volume, difficulty achieving primary stability, and factors that may compromise implant survival and long-term esthetic outcomes.

The survey revealed that 73% of clinicians do not follow a defined protocol for implant-supported prosthetic rehabilitation in the esthetically critical zone. This underscores the need for formalized guidelines for the fabrication of implant-supported restorations in the smile zone, developed with consideration of both patient-specific clinical factors and crown fabrication techniques.

The majority of clinicians (66.7% of respondents) adhere to a digital protocol for treatment and fabrication of prosthetic restorations. This approach enables precise treatment planning, increases procedural accuracy and minimally invasive intervention in the oral cavity, enhances the frequency of favorable clinical outcomes, and allows longitudinal monitoring of treatment stability through the maintenance of a digital database of patients' intraoral scan projects.

In contrast, 33.3% of respondents rely on conventional analog methods. In these cases, clinical experience and available technological resources permit the fabrication of hybrid prosthetic constructions.

Only 20% of clinicians possess skills in 3D crown modeling. The development and refinement of CAD/CAM technology enable the dentist to design both provisional and definitive implant-supported restorations while accounting for all parameters of the defect within the dentoalveolar system. Digital modeling allows clinicians to monitor changes in soft tissue architecture throughout treatment via intraoral scanning. The acquired data are cumulative, permitting repeated milling of the crown at each treatment stage without additional intraoral interventions.

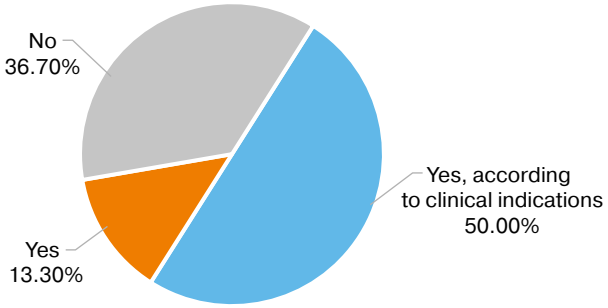

Fig. 5. Distribution of respondents' answers to the question: Do you use an immediate (one-stage) implant placement protocol in the anterior region of the jaw? (30 responses)

Рис. 5. Распределение ответов респондентов на вопрос: применяете ли вы одномоментный протокол установки имплантата в переднем отделе челюсти? (30 ответов)

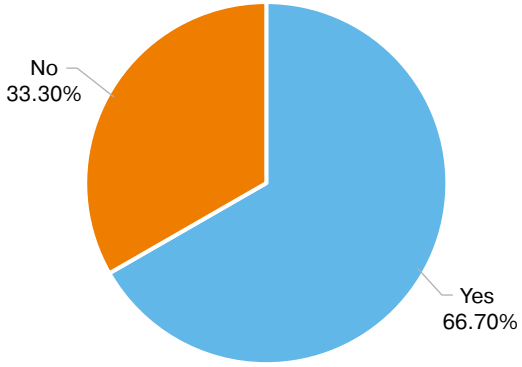

Fig. 7. Distribution of respondents' answers to the question: Do you use a digital protocol for implantological treatment? (30 responses)

Рис. 7. Распределение ответов респондентов на вопрос: используете ли вы цифровой протокол имплантологического лечения? (30 ответов)

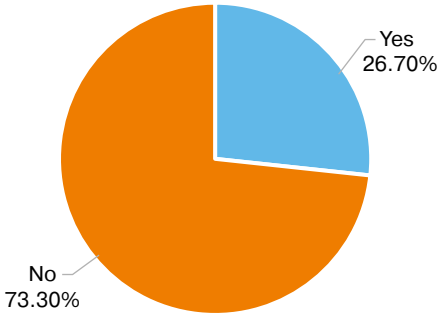

Fig. 6. Distribution of respondents' answers to the question: Do you follow a specific prosthetic protocol for implant-supported restorations in the esthetic zone of the jaw? (30 responses)

Рис. 6. Распределение ответов респондентов на вопрос: применяете ли вы определенный шаблон протезирования на имплантатах в эстетической зоне челюсти? (30 ответов)

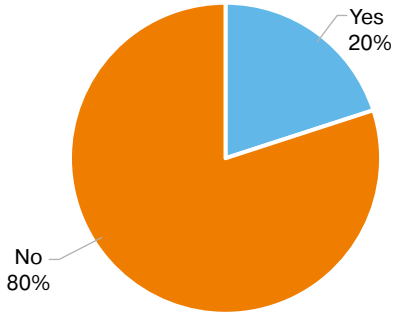

Fig. 8. Distribution of respondents' answers to the question: Do you have modeling skills in the exocad software product or other similar programs? (30 responses)

Рис. 8. Распределение ответов респондентов на вопрос: владеете ли вы навыками моделирования в программном продукте ExoCAD или других аналогичных программах? (30 ответов)

CONCLUSION

Based on the results of the survey, the following conclusions can be drawn:

1. Provisional prosthetic restorations constitute an essential component in the fabrication of implant-supported constructions.

2. To date, there is no universally accepted treatment protocol for the esthetically critical zone, nor are there standardized guidelines regarding the anatomical characteristics of artificial crowns recommended for preserving the morphology of hard and soft gingival tissues.

3. The advancement of 3D technologies provides the opportunity to implement an individualized approach in each clinical case.

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INFORMATION ABOUT THE AUTHORS

Angela Sh. Ildarova – Oral surgeon at SoloDent Dental Clinic LLC., Saint Petersburg, Russian Federation; Applicant of the Department of Therapeutic Dentistry, Sechenov First Moscow State Medical University (Sechenov University), 8c2 Trubetskaya Str., Moscow 119048, Russian Federation;

Irina M. Makeeva – Dr. Sci. (Med.), Professor, Head of the Department of Therapeutic Dentistry, Sechenov First Moscow State Medical University (Sechenov University), 8c2 Trubetskaya Str., Moscow 119048, Russian Federation; https://orcid.org/0000-0002-7878-0452

ИНФОРМАЦИЯ ОБ АВТОРАХ

Ильдарова Анжела Шагимардановна – стоматолог-хирург стоматологической клиники ООО «СолоДент», г. Санкт-Петербург, Российская Федерация; соискатель кафедры терапевтической стоматологии, ФГАОУ ВО «Первый Московский государственный медицинский университет имени И.М. Сеченова» (Сеченовский Университет), 119048, Российская Федерация, г. Москва, Трубецкая ул., д. 8 стр. 2

Макеева Ирина Михайловна – д.м.н., профессор, заведующий кафедрой терапевтической стоматологии, ФГАОУ ВО «Первый Московский государственный медицинский университет имени И.М. Сеченова» (Сеченовский Университет), 119048, Российская Федерация, г. Москва, Трубецкая ул., д. 8 стр. 2; https://orcid.org/0000-0002-7878-0452

AUTHOR'S CONTRIBUTION

All the authors made equal contributions to the publication preparation in terms of the idea and design of the article; data collection; critical revision of the article in terms of significant intellectual content and final approval of the version of the article for publication.

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