

Implant impression technique preferences – survey study among dental practitioners

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Abstract

Introduction: Accurate impression techniques relative to adjacent implants or relative to natural teeth is of paramount importance for the precision fit of the restorations. The elastomeric impression materials are the most commonly used in fixed prosthodontics. Digital technologies are taking up an increasing part of the planning and fabrication of fixed restorations, both on natural teeth and on implants.

Aim: The purpose of the present study was to investigate the dental practitioners' preferences for impression taking techniques in the fabrication of implant superstructures.

Materials and methods: A survey was conducted among dentists regarding the preferences of impression taking on implants in the city of Varna. The survey was available on the website of BDA (Bulgarian Dental Association) Varna. The survey was conducted in a digital environment using Google Forms. For the period from April to May 2023. 61 dentists were surveyed. The obtained results were processed with SPSS v.20.0 for Windows.

Results: The majority of respondents are general practitioners in dentistry, 68.5%, 26.3% have a specialty in prosthetic dentistry, and the rest 5.2% are dentists with a specialty in oral surgery and operative dentistry. Although digital technologies are increasingly entering dentistry and in particular implantology, most of them indicate that they prefer conventional methods of taking impressions and prosthodontics on implants.

Conclusion: From the present study, it can be concluded that the incorporation of digital technologies into clinical practice still presents some difficulty for dental practitioners.

Keywords: *Conventional impression, digital impression, intraoral scanner*

Introduction

Dental implantology has varied since ancient times, but the foundations of modern implantology were set by Branemark, who introduces the concept of osseointegration in 1982. At a conference in North America, in collaboration with his team, he presented data from their study on endosseous osseointegrated implants, and subsequently the conclusions of this study were published in a book. (1)

Branemark's concept of the osseointegration connection was later proven in a number of scientific studies, as a result of which various implantology systems were developed and introduced.

One of the most important steps in making permanent superstructures on both natural teeth and implants is taking an accurate impression. It can be taken conventionally or digitally. (2,3,4,5)

The elastomeric impression materials are the most commonly used in fixed prosthodontics. Digital technologies are taking up an increasing part of the planning and fabrication of fixed structures, both on natural teeth and on implants. Through Standard Tessellation Language STL files, files obtained from intraoral scanning with scanners can be transferred to CAD software for implant treatment planning and construct design. (6,7,8,9)

Intraoral scanners, used for impression taking are becoming more and more useful in clinical practice, due to a number of advantages. Such as reduced time to take an impression, improved comfort for the patient, elimination of the use of impression trays, elimination of errors in displacement of impression materials related to subsequent deformation, errors in the laboratory casting protocol (4,10,11). However, many clinicians still prefer conventional clinical protocol. Studies have shown close accuracy for conventional and digital approaches when fabricating small frameworks and single crowns on implants, but when taking an impression of an entire dental arch, conventional impressions give smaller inaccuracies. (3,12,13)

Accurate transfer of implant position, whether digitally or conventionally to adjacent teeth or to natural teeth, is paramount to accurate fit of the construction as well as adequate planning of the construction design. There are insufficient clinical studies on the subject, which is related to the difficulty of evaluating the accuracy of the impressions, since the impression of the actual position of the implants is approximate. (14,15)

Aim

The purpose of the present study was to investigate the dental practitioners' preferences for impression taking techniques in the fabrication of implant superstructures.

Material And Methods

The survey investigated the preference for a method of fabrication of prosthetic structures in cases of prosthetics on implants, (conventional, digital or hybrid), choice of impression technique, as well as difficulties in taking impressions with an intraoral scanner. A total of 61 dentists participated in the survey conducted in the period April – May 2023 in a digital environment through Google forms. After the survey was completed, statistical analysis was performed and the information was presented through graphs and charts.

Results

The majority of respondents are general practitioners in dentistry, 68.5%, 26.3% with a specialty in prosthetic dentistry, and the rest 5,2% are dentists with a specialty in oral surgery and operative dentistry. Of them, 50,82% answered that they make restorations on implants in their clinical practice (fig.1). Most of them 30 dentists (49,2%) prefer to work by the conventional method, by digital 4 (6,56%) and hybrid 23 (37,68%). A very small proportion of dentists, only 4 (6,56%) could not make an estimate (fig.2).

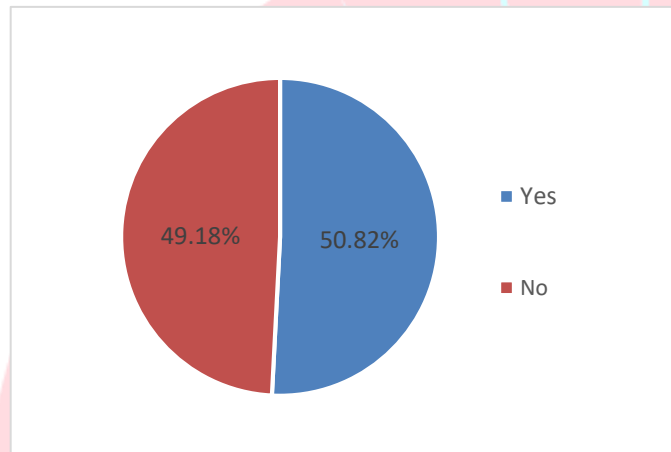


Fig. 1 - Distribution of answers to the question: " Are you making restorations on implants?"

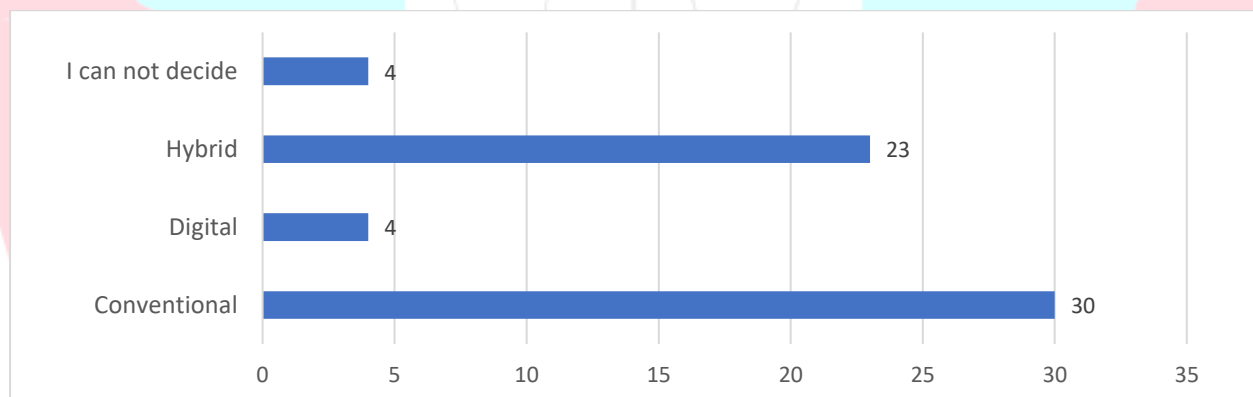


Fig.2 Distribution of answers to the question: " What method of manufacturing prosthetic restorations do you use in your practice? "

Regarding the choice of impression technique, the largest percentage of dentists prefer the conventional transfer impression 27 dentist (44,28%), with intraoral scanner and scan body 4 (6,56%), more than one method 15 (24,58%) and 15 dentists can not decide (24,58%) (fig.3).

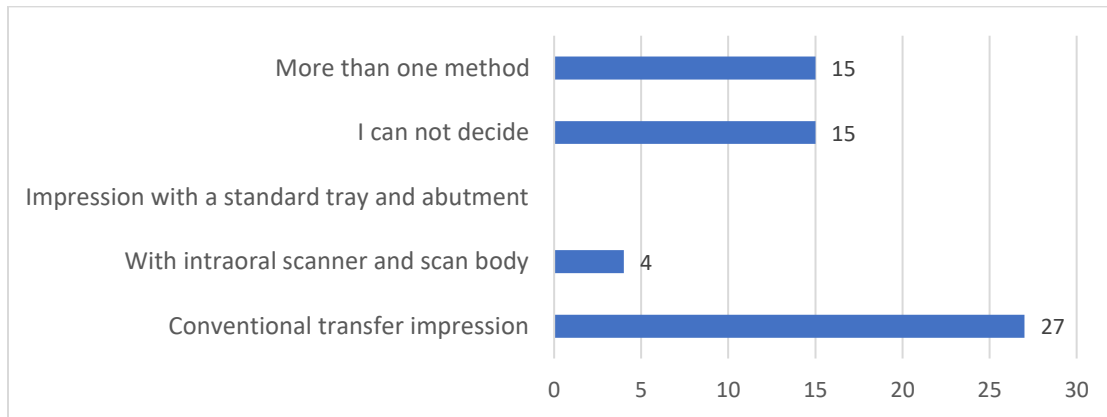


Fig.3 Distribution of answers to the question: What technique do you use to take impression of implants?"

Of the people who use more than one technique 8 prefer conventional transfer impression and impression with intraoral scanner and scan body (13,12%), conventional transfer impression, with intraoral scanner and scan body or impression with a standard tray and abutment, depending on the clinical case 2 (3,28%), conventional transfer impression or impression with a standard tray and abutment 4 (6,56%) and only 1 (1,64%) use the technique with intraoral scanner and scan body or impression with a standard tray and abutment (fig.4).

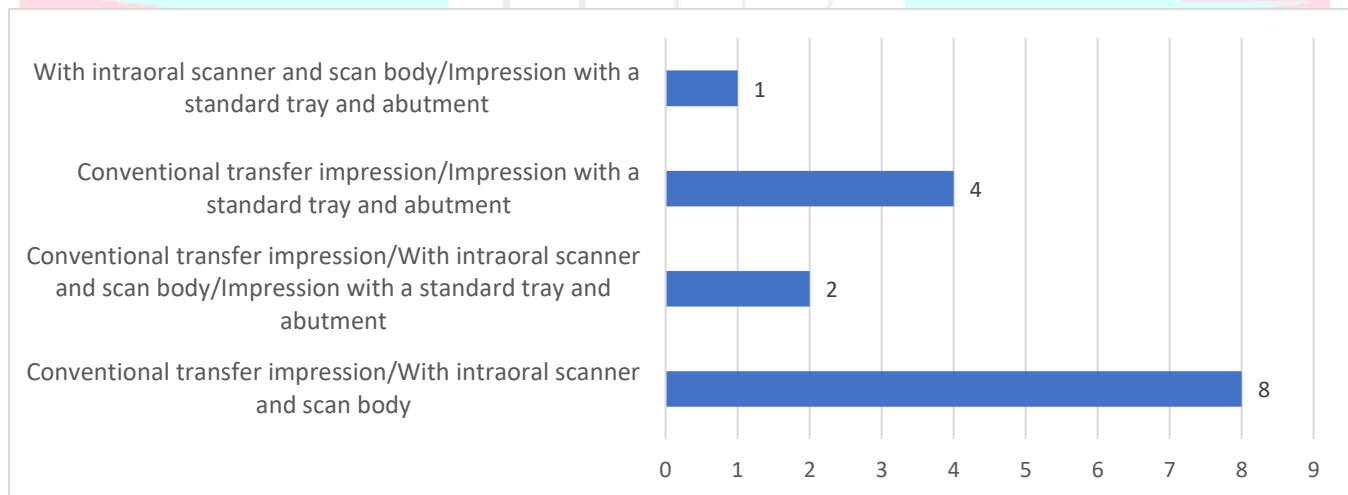


Fig.4 Distribution of answers to the question: What technique do you use to take impression of implants?"

In cases where a physical impression protocol is used instead of a digital one, 46 practitioners prefer an open tray technique (75,44 %), with a closed tray impression 2 (3,28 %) and an impression on the abutment level 4 (6,56%). Some clinicians use different techniques depending on the clinical situation: with open or closed tray impression technique 3 (4,92%), with open tray or impression with standart tray and abutment 1 (1,64%) and 5 dentists answered that they can not decide(8,2%) (fig4).

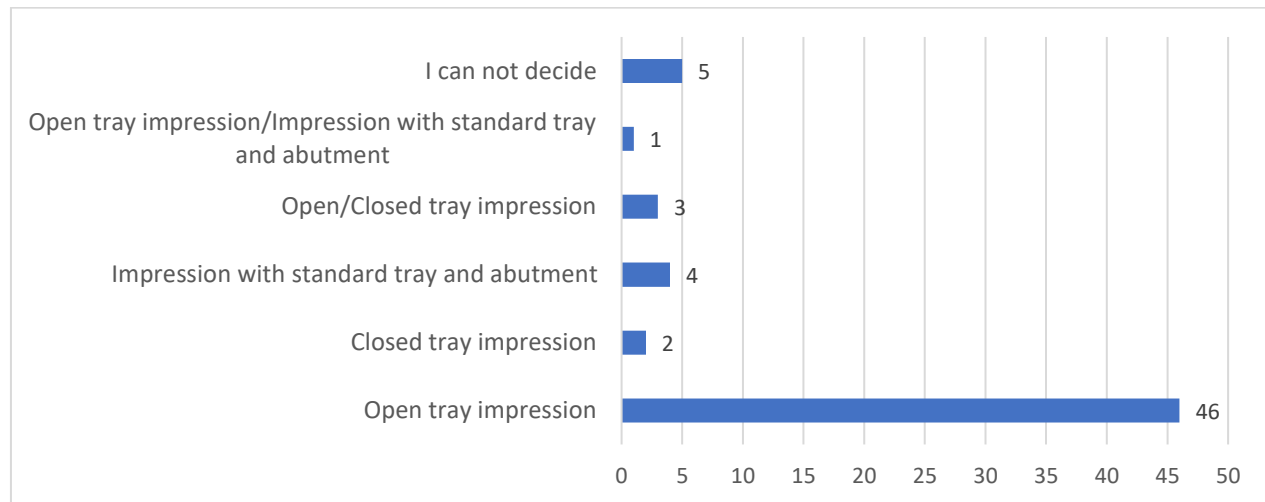


Fig. 5 – Distribution of answers to the question: “ In case that you are using a physical impression protocol instead of a digital one, which transfer method would you prefer?”

Discussion

Taking an accurate impression is a key point in the fabrication of permanent prosthetic suprastructures, both on natural teeth and on implants. More and more often, the conventional method of work is being replaced by a digital one. The rapid development of technologies provides a number of advantages for dentistry. The digital method of work offers more advantages compared to the conventional one, such as reduced working time, avoidance of clinical and laboratory errors, improved communication with the dental laboratory, reduced discomfort for the patients.

From the present study, it is clear that most of the dentists surveyed make in their practice constructions on implants. According to the results, it is clear that despite the advancement of digitalization, the conventional method of working is still preferred. Dental practitioners seem to be most familiar with the open tray impression technique and it is the most commonly used one in practice.

Conclusion

Digital technologies have a number of advantages over conventional technologies and are widely used in various fields of dentistry. In particular, taking an impression with an intraoral scanner is still not that common among dentists, and most of them prefer taking an impression with an open tray. From the present study, it can be concluded that the incorporation of digital technologies into clinical practice still presents some difficulty for dental practitioners.

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