permanent teeth than females. (OR=2.17 (0.830-5.654); p<0.05).
Of all the participants, only 12 people impressions weren’t taken, all of them under the age of 30. We attribute this to the fact that the majority of these patients did not receive treatment to restore missing teeth.

Although in most patients the treatment with fixed partial dentures was performed using impressions, taken with stock impression trays, in a large number of them this happened after taking an impression with a triple tray. We believe that this could have a serious impact on the quality of the impression, as well as on the final result of the treatment with fixed partial dentures due to the shortcomings of this type of impression trays [1-6].

The discomfort that half of the surveyed patients experience during the taking of conventional impressions is mainly expressed by the appearance of nausea and the urge to vomit, profuse salivation and the long duration of this type of impression technique. Evidence confirming these results are also found in the literature [7,8,9].

The analysis of the results of the conducted surveys shows a relatively small percentage of patients, who have had a digital impression taken. In our opinion, this is due to the still small number of dentists who have an intraoral scanning system in their practice, although these systems have been on the market since the 20th century and have since undergone great development and improvement. Despite this small percentage, almost all patients who underwent both impression techniques indicated that they preferred the digital impression technique.

Conclusion: The results obtained from the patients’ questionnaires show a relatively high percentage of people who report having at least one extracted tooth. Our results show that males are at a higher risk for premature loss of permanent teeth than females. (OR=2.17 (0.830-5.654); p<0.05). A negative relation was found between the patient's age and tooth loss (p<0.001).

The analysis of the discomfort of teeth loss according to gender revealed a significant difference in women and men (p <0.05), as women mostly experience discomfort from impaired aesthetic function, while in men the discomfort is associated with impaired masticatory and speech function.

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CLINICAL AND LABORATORY WORKFLOW WITH FIXED PARTIAL DENTURES – A SURVEY AMONG DENTISTS AND DENTAL TECHNICIANS

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АННОТАЦИЯ

Введение: С развитием медицины и новых технологий все больше и больше фирм-производителей интересуются мнением стоматологов относительно определенных зубных техник, материалов и устройств с целью их улучшения и усовершенствования. Целью данной статьи является изучение и сравнение мнения стоматологов и зубных техников о лечении дефектов зубных рядов при помощи несъемных циркониевых конструкций, изготовленных по традиционным и цифровым слепкам. Материал и методы: В рамках анонимного анкетирования из 20 вопросов относительно протокола клинико-лaborаторной работы и конечного результата лечения дефектов зубных рядов при помощи несъемных мостовидных конструкций из диоксида циркония в полном объеме, было опрошено 72 стоматолога и 53 зубных техника. Результаты: Большинство стоматологов устраняют дистально ограниченный дефект с отсутствием небольшого количества зубов при помощи несъемной мостовидной конструкции (86,1%). Чаще всего используются металлокерамические конструкции с каркасом из недрагоценных сплавов (83% зубных техников и 93,1% стоматологов соответственно), за ними следуют конструкции из диоксида циркония (39,60% зубных техников и 37,50% стоматологов соответственно). Заключение: Основным способом устранения дистально ограниченных дефектов зубного ряда, как стоматологами, так и зубными техниками является использование несъемных металлокерамических протезов. Большинство стоматологов используют технику двухэтапного двухслойного слепка с использованием аддитивных силиконов и стандартных металлических ложек.

АБСТРАКТ

With the advancement of medicine and the development of new technologies, more and more manufacturing companies consult dental specialists about their opinion on certain techniques, materials and devices in order to improve and refine them. The purpose of this article is to compare and study the opinion of dentists and dental technicians on the treatment with fixed restorations of zirconium dioxide, made using a conventional and digital impression technique. Materials and methods: Using anonymous questionnaires of 20 questions, the opinion of 72 dentists and 53 dental technicians was documented regarding the clinical and laboratory workflow protocol and the final result in the treatment with fixed partial dentures made of zirconium dioxide. Results: The majority of dentists treat a distally limited defect with a small number of missing teeth with a fixed partial dentures (86.1%). The most commonly used are porcelain-fused to metal with a non-precious alloy framework (83% for dental technicians and 93.1% of dentists, respectively), followed by zirconium dioxide structures (39.60% for dental technicians and 37.50% for dentists, respectively). Conclusion: The main way in which dentists and dental technicians treat distally limited defects of the dentition is through fixed porcelain-fused to metal restorations. Most dental professionals use a two-stage two-layer impression technique with addition silicones and standard metal impression trays.

Ключевые слова: анкетирование, стоматология, зубные техники

Key words: survey, dentists, dental technicians

Introduction: One of the most important clinical stages in the treatment fixed partial dentures (FPD) is taking an accurate impression of the abutments [1]. This impression serves to create a model on which the prosthetic restoration will be made. In modern prosthetic dentistry, there are basically two approaches of creating any prosthetic restoration: conventional and digital. In these two approaches, the methods for recreating the prosthetic field can be divided into: conventional impression methods, digital impression methods and combined impression methods [2].

With the advancement of medicine and the development of new technologies, the manufacture of various restorations is carried out using newer methods and techniques that save both time for the dental technician and ensure greater accuracy in the manufacture of the restoration itself. More and more manufacturers are consulting dental professionals about their opinion about certain techniques, materials and devices in order to improve and refine them.

Aim: The purpose of this article is to compare and study the opinion of dentists and dental technicians on the treatment with fixed restorations of zirconium dioxide, made using a conventional and digital impression.

Materials and methods: To achieve the aim of the article, two types of anonymous questionnaires have been prepared, aimed at the target groups of participants - dentists and dental technicians. The total number of completed questionnaires is 125 distributed respectively: dentists -72 and dental technicians - 53. Within 20 questions, the opinion of the dentist and dental technician was documented regarding the clinical and laboratory workflow and the final result of treatment with fixed partial dentures made of zirconium dioxide.

Results: The distribution of dentists by gender shows that men are predominant (58.3%). There is an even distribution according to age, as only in the group over 60 the participants are less - 8.3%.

Dentists without a specialty are predominant (45.83%), while those with an acquired specialty are 37.5%. On the other hand, 16.67% of the participants indicate that they are specializing at the moment, mainly Prosthetic Dental Medicine.

Regarding the opinion of the dental technicians, the survey was attended by 53 people, who represent 27.6% of the registered dental technicians in the Regional College in Varna and are sufficient to accept the reliability of the result.

The results of the analysis show that the age distribution is approximately equal between men and women with a slight predominance of men (52.8% for men and 47.2% for women, respectively).
Figure 1 presents a comparative analysis of the most commonly used material for the manufacture of fixed partial dentures according to dental technicians and dentists. The results show that both groups of specialists mostly use porcelain-fused to metal (PFM) constructions with a non-precious alloy framework (83% for dental technicians and 93.1% for dentists, respectively), followed by zirconium dioxide constructions (39.60% for dental technicians and 37.50 for dentists, respectively). There is a significant difference in the opinion of the two groups of specialists, concerning the other materials (p <0.05).

There is a significant difference in the materials for manufacturing FPD, used by dentists according to experience (p <0.001), as the acrylic-fused to metal restoration is used only by older dental specialists with experience over 30 years (p <0.001). A similar trend is observed in the use of a non-precious alloy framework with a partial ceramic veneering, where the relative share of the used material increases with the increasing length of the experience (p=0.398; p=0.001).

When examining the type of impression materials used, according to the age of the dental specialist, a significant difference was found (p <0.001) (Fig. 2). Condensation silicones (C-silicones) are mainly used by older specialists, with a positive correlation with age (p=0.460; p <0.001). Addition silicones (A-silicones) are preferred by younger dentists, with a negative correlation with age (p=-0.546; p <0.001).

Fig. 3 presents a comparative analysis of the opinions of dental technicians and dentists regarding the type of impression tray with which the impression is taken. In their practice, dentists mainly use a standard metal perforated tray (65.3%). The second most commonly used type is the standard plastic tray (37.50%), while the triple tray ranks third with 34.7%. Although the same trend was observed in the responses of the two groups of specialists, a significant difference was found (p <0.05). Only with regard to the use of a standard metal perforated tray, the opinion of the two groups coincides. With other types of trays there is a significant difference in the opinion of dentists and dental technicians.
When examining the correlation between age and the impression technique used, it can be said that dentists of each age have a preferred technique ($p < 0.001$). A significant difference was found in terms of the impression technique used and the impression materials ($p < 0.01$) (Fig. 4).

The results show that dentists combine different types of materials with the same impression technique. A significant part of the dentists reported (72.2%) that they observed errors in their impressions. Although dental technicians also report that they found errors in the impressions taken from the dentists, a significant difference was found in the responses of the two groups of specialists ($p < 0.05$). The most common error made by dentists is an uneven layer of the light body material (41.7%), followed by tearing of a part of the impression (30.6%) and its deformation (29.2%).

A significant difference was found between the errors and the impression materials used ($p < 0.05$) (Fig. 5). The most common inaccuracies when using c-silicones are tearing (48%) and deformation of the impression (40%). The most common error in addition silicones is the uneven layer of correction material (43.9%).
In the analysis of the most common errors, three types are distinguished, which are indicated by more than half of the dental technicians (Fig. 6). In the first place is the lack of a clear visible preparation margin (76.9%), followed by “dragging” in different parts of the impression (57.7%) and peeling off the impression material from the edge of the tray (53.8%).

The most common inaccuracies in the preparation of the teeth, which are found by dental technicians, are insufficient occlusal reduction (81.1%), followed by the lack of a clearly visible preparation margin (62.3%), the lack of mutual parallelism of the prepared abutment teeth (54.7%) and the least common is overpreparation of the abutment teeth (7.5%).

The most commonly used casting system for dental technicians is the Model-tray system (58.5%). The majority of dental technicians do not have a CAD / CAM system and a laboratory scanner (69.8%). Only 17.0% of the participants have both equipments, and 13.2% have only a laboratory scanner (13.2%). Only 9 dental technicians (17.0%) indicated that they make FPD using a digital impression, of which 8 dental technicians have a CAD / CAM system and a laboratory scanner in the dental laboratory, and 1 has only a laboratory scanner (p <0.001).

**Discussion:** Based on the results of the survey of dentists and dental technicians, it was found that the main way in which they treat distally limited defects of the dentition is through fixed PFM prosthetic restorations. In our opinion, some of the main reasons why dentists choose this material are: ignorance of the advantages and disadvantages of zirconium dioxide, its limited use depending on the clinical situation, as well as the higher final cost to the patient.

More than half of dentists use addition silicones due to their very good physical and mechanical properties [3,4,5]. In their 2018 survey, Alhoumaidan et al. confirm that dentists most often use addition silicones (38.3%), followed by condensation silicones (26.9%) and irreversible hydrocolloids (20.3%) [6].

Regarding the most commonly used type of impression tray, dentists indicate that they prefer the use of standard metal trays. Some authors report that the use of plastic trays in combination with harder polyvinyl siloxane materials leads to an increase in the bending of the trays, resulting in inaccurate prosthetic restorations. [7,8,9].

In our study, dentists most often use the two-stage two-layer impression technique in prosthetic treatment with FPDs. This technique is reported to be th most often used by dental professionals in the province of Qasim, Saudi Arabia [6]. We believe that this technique achieves the best and most predictable results in the treatment with FPD, especially when the preparation margin is located subgingivally, which is confirmed by the available literature [5,10,11,12].

The data obtained from dental technicians regarding the most commonly used impression trays by dentists corresponds to the results already described.

A large percentage of dentists report errors in conventional impressions. This is confirmed by the results of the survey of dental technicians. The assumption of these errors and inaccuracies is most likely due to non-compliance with the instructions of the manufacturers for working with impression...
materials, insufficient experience of the dentists with less professional experience, poorly performed retraction technique and uninsured dryness of the prosthetic field [13,14,15,16].

Despite the rapid pace at which digital technology is entering the daily work of both dentists and dental technicians, the majority of dental technicians report that they do not have a CAD / CAM system and a laboratory scanner. This is most likely due to the expensive investment to purchase this modern equipment. On the other hand, the reason for the small percentage of dental technicians who make fixed partial dentures by using digital impressions, is the limited use of intraoral scanning systems by dentists and the still largely used conventional impression technique. Like dentists, more than two-thirds of dental technicians also say they would invest in a CAD / CAM system, lab scanner and 3D printer to move to a partial or fully digital approach when manufacturing fixed prosthetic restorations.

Conclusion: The main way in which dentists and dental technicians treat distally limited defects of the dentition is through fixed porcelain-fused to metal restorations. Most dental professionals state that they use a two-stage two-layer impression technique with addition silicones and standard metal trays.

Despite the rapid pace at which digital technologies are entering everyday work, most dental technicians do not have a CAD / CAM system and a laboratory scanner.

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