

Списък резюмета на представените публикации и доклади¹

1. Tomov, G.; Zlatev, S.; Ivanov, R.; Kazakova, R. & Atanassova, N.
Occupational dental abrasion from medieval plovdiv
Acta morphologica et anthropologica, **2021**, 28, 119-123

Abstract: Dental abrasion is a natural phenomenon with universal occurrence that has existed from the origin of humankind and depends on the lifestyle, diet and occupation. Dental abrasion was very serious in ancient populations up to the late medieval period. The paper presents a male skeleton from medieval Plovdiv with marked dental abrasion which is considered to be occupational, possibly related to carpentry or shoemaking. The hypothesis of occupational abrasion is tested in archeological experiment.

2. Todorov, R.; Zlatev, S.; Uzunov, T. & Apostolov, N.
Translucent zone registration with spectrophotometry and transillumination
C. R. Acad. Bulg. Sci., **2021**, 74, 619-628

Abstract:

Recreating the location and profile of the translucent zone, especially in the esthetic area of the dentition, has an increasing significance in contemporary aesthetic dentistry. The purpose of the current study is to compare the methods of spectrophotometry and transillumination in the visualization of the translucent zone in maxillary incisors. Nineteen central and sixteen lateral maxillary incisors were investigated using two clinical devices – SpectroShade Micro and “ARTIZ”. The comparison of the % vestibular area, which was translucent, showed a statistically significant difference between the two methods for registration ($t(34) = 4.12$, $p = 0.0002$). This result is expected, to some extent, because of the different nature of the methods used in the current study. Along with visual investigation, spectrophotometry and transillumination are methods which can be used in clinical investigation of the translucent zone. Both suggested methods provide sufficient information about the individual position of the translucent zone.

Key words: translucency, spectrophotometry, transillumination

¹ Резюметата са представени според езика на отпечатване.

3. Ivanova, V.; Chenchev, I.; Zlatev, S. & Mijiritsky, E.
Correlation between Primary, Secondary Stability, Bone Density, Percentage of Vital Bone Formation and Implant Size

International Journal of Environmental Research and Public Health, MDPI AG, 2021, 18, 6994

Abstract:

Background:

This study aims to evaluate whether there is a correlation between implant stability, bone density, vital bone formation and implant diameter and length.

Methods:

Ninety patients were enrolled in this study. They underwent a socket preservation procedure with allograft or PRF and after 4 months, a total of 90 implants were placed. CBCT scans were assigned prior to implant placement in order to assess the bone density. During the surgical re-entry, a bone biopsy was harvested with a trephine drill. Immediately after implant insertion, the primary stability was measured. The secondary stability was measured 4 months after implant placement.

Results:

Primary stability showed a significant positive linear correlation with bone density ($r = 0.471$, $p < 0.001$) as well as with percentage of new bone formation ($r = 0.567$, $p < 0.001$). An average significant association of secondary stability with bone density ($r_s = 0.498$, $p < 0.001$) and percentage of newly formed bone ($r = 0.477$, $p < 0.001$) was revealed. The mean values of primary stability in all three implant sizes, regarding the diameter of the implants, were similar (narrow 67.75; standard 66.78; wide 71.21) with no significant difference ($p = 0.262$). The same tendency was observed for secondary stability (narrow 73.83; standard 75.25; wide 74.93), with no significant difference ($p = 0.277$).

Conclusions:

The study revealed a high correlation between primary and secondary implant stability, and bone density, as well as with the percentage of vital bone formation. Implant length and diameter revealed no linear correlation with the implant stability.

Keywords: dental implants; primary stability; secondary stability; bone density; implant diameter; implant length

4. Ivanova, V.; Chenchev, I.; Zlatev, S. & Mijiritsky, E.

Comparison Study of the Histomorphometric Results after Socket Preservation with PRF and Allograft Used for Socket Preservation—Randomized Controlled Trials

International Journal of Environmental Research and Public Health, MDPI AG, **2021**, 18, 7451

Abstract: The aim of the present clinical study was to assess and compare the histomorphometric results and efficacy of freeze-dried bone allograft (FDBA) in combination with platelet-rich fibrin (PRF), and PRF as a sole grafting material for socket preservation. Ninety patients in need of tooth extraction and implant restoration were included in this study. The participants were randomly divided into three groups based on post-extraction clinical protocol: socket preservation procedure with allograft in combination with a PRF membrane (PRFm), PRF as a sole grafting material, and a control group. A total of 90 implants were placed four months post extraction. During the surgical re-entry a bone biopsy was harvested with a trephine drill. Histological samples were prepared and analyzed for percentage vital bone and connective tissue. One-way ANOVA with Bonferroni post-hoc analysis were used to assess the results. Both test groups revealed a significantly higher percentage of vital bone formation compared to the control group. No statistically significant differences regarding vital bone formation and connective tissue quantity between the tested groups were observed (FDBA + PRFm: $3.29 \pm 13.03\%$; and PRF: $60.79 \pm 9.72\%$). From a clinical and histological point of view, both materials in the test groups are suitable for the filling of post-extraction sockets without bone defects. Both of the tested groups revealed a significantly higher percentage of vital bone formation compared to the control group.

Keywords: dental implants; allograft; PRF; vital bone; histology; bone biopsy

5. Hadzhigaev, V.; Zlatev, S.; Apostolov, N.; Kazakova, R.; Yankova, M. & Todorov, R.
Use of endocrowns in everyday practice - a survey
Dental Medicine, 2021, 103, 20-25

Abstract:

Introduction: In everyday practice, it is often necessary to restore severely damaged endodontically treated teeth. An alternative to the classic post and core treatment approach is to use the pulp chamber for additional retention without affecting the root-canal system, through restorations called endo-crowns.

Purpose:

The purpose of this study is to collect and assess the opinion of dentists within the Republic of Bulgaria on the use of endocrowns in their daily practice.

Materials and methods:

A questionnaire with nine closed questions was developed, which was distributed during seminars of BgDA. Correctly filled questionnaires were collected from 116 dentists. Three of the questions characterize the units of observation, four are focused on the use of endocrowns in the dental practice and the difficulties encountered by dentists in their daily routine, and one on the future use of this type prosthetic restorations. Statistical analysis includes descriptive and chi-square methods.

Results and discussion:

The most frequent age group of the respondents is 31-40 years with equal distribution between sexes. Approximately two-thirds have a clinical specialty. 35.34% of the respondents have used an endocrown with 21% of them having difficulties in different clinical stages. The majority of the sample – 83.75 expressed a positive opinion regarding the future use of endocrowns.

Conclusion:

The lack of sufficient information in the specialized literature on the reliability, special features of the construction and survival of this type of prosthetic structures, as well as the low prevalence of the problem in undergraduate and postgraduate education, are probable reasons for the rare use of endocrowns in everyday practice of dentists in Bulgaria.

Key words: Endocrown, Survey.

Резюме:

Въведение:

В ежедневната практика често се налага възстановяването на силно разрушени ендодонтски лекувани зъби. Алтернативен подход за лечение е използването само на пулпната камера за допълнителна задръжка, чрез възстановявания наречени ендокорони.

Цел:

Целта на настоящото проучване е да се запознае с мнението на лекарите по дентална медицина в рамките на Република България относно използването на ендокорони в ежедневната им практика.

Материали и методи: Разработи се анкетна карта с девет затворени въпроса, която се попълни от 116 лекари по дентална медицина по време на семинари на БЗС. Три от въпросите характеризират единиците на наблюдение, четири са насочени към използването на ендокорони в практиката и затрудненията, които лекарите по дентална медицина срещат, и един относно бъдещата употреба на този тип конструкции. Статистическата обработка включва вариационен и корелационен анализи, чрез критериите за нормално разпределение и критерия на Пирсън за съгласие.

Резултати и обсъждане: Разпределението по пол на участвалите е равномерно, като най-често възрастта им е между 31 и 40 години. Около две трети от анкетиранияте притежават клинична специалност. Общо 35.34% от анкетиранияте са прилагали ендокорона, като 21% от тях срещат затруднения в определени етапи. По-голямата част от респондентите – 83.75% смятат, че този тип конструкции имат бъдеще. Сравнително малък относителен дял от респондентите – 21.57% срещат затруднения в етап от изработването им.

Заклучение:

Липсата на достатъчно информация в специализираната литература относно надеждността, особеностите при изработката и преживяемостта на подобен тип конструкции, както и слабата застъпеност на проблема в студентското и следдипломно обучение, са вероятна причина за рядката употреба на ендокорони.

Ключови думи: Ендокорона, Анкетно проучване.

6. Todorov, R.; Yordanov, B.; Peev, T. & Zlatev, S.

Shade guides used in the dental practice

Journal of IMAB - Annual Proceeding (Scientific Papers), Peytchinski Publishing Ltd., 2020, 26, 3168-3173

Abstract: The aim of the article is to present a narrative review of the literature related to the different shade guides available for dental practitioners.

A literature search was performed in the online databases – PubMed, Science Direct, MedLine and GoogleScholar with the following keywords – shade guide, shade matching, dental, dentistry. Furthermore, a hand search, including “grey” literature and printed resources available to the authors, was conducted. More than 2100 unique articles, including the selected keywords, were identified. After a critical review and elimination process, 39 of the papers were included. Dental shade guides are a set of color standards mimicking the color of tissues, which dentists aim to restore – tooth structures, gingival tissues, or facial structures in facial prosthodontics - skin, mucosa, eyes etc. They can be systematized based on the following principles – fabrication process, the material of manufacturing or restoration and according to the tissues, which are restored.

The most commonly used shade guides in the dental practice are structured around Munsell’s 3-dimensional color system and are aimed at the restoration of tooth color. The color standards for gingival and facial restoration are not routinely utilized since they are aimed at specialists in prosthetic dentistry and facial prosthodontics and are underdeveloped to some degree in comparison with the aforementioned.

The contemporary development in aesthetic restorative materials and procedures requires an adequate follow up in the evolution of shade guides since they present the only means of communication between the dental office and laboratory.

Keywords: shade guide, shade-matching, dental, dentistry, color

7. Zlatev, S.; Ivanova, V.; Chenchov, I.; Todorov, R. & Chenchov, L.
Crestal bone loss around tilted or axial implants with single unit restorations
IOSR Journal of Dental and Medical Sciences, 2020, 19, 06-09

Abstract:

Background:

The stability of peri-implant tissues, especially the marginal bonelevel in tilted implants restored with single crowns has not been investigated extensively. The current study aims to determine the potential influence of implant inclination on peri-implant marginal bone loss after 12 months of functional loading.

Materials and Methods:

The study population included patients who received 96 single crowns on axial or tilted implants. Parallel radiographs made at baseline and 12 months after loading, were analyzed to evaluate the marginal bone loss at the mesial and distal side. A cumulative score was calculated, and both groups were compared using T-test.

Results: The measured peri-implant marginal bone loss was 0.23 ± 0.8 mm around axial implants and 0.22 ± 0.7 mm around the tilted implants restored with single crowns. The T-test showed no statistically significant difference between the two studied groups $t(90.75) = 0.55$, $p = 0.58$].

Conclusion:

Within the limitations of the current study, it can be concluded that single unit constructions can be a reliable restoration technique over tilted implants regarding the peri-implant marginal bone loss. The later might bring advantages to both patients and operators.

Keywords: Dental implants; Peri-implant tissues; Tilted implants; Single crowns; Peri-implant marginal bone loss

8. Ivanova, V.; Chenchev, I.; Zlatev, S. & Atanasov, D.

Association between bone density values, primary stability and histomorphometric analysis of dental implant osteotomy sites on the upper jaw

Folia Medica, Pensoft Publishers, 2020, 62, 563-571

Abstract:

Introduction:

Sufficient bone volume, as well as the bone quality characteristics are necessary prerequisites to ensure optimal mechanical stability of the implants and subsequent osseointegration.

Aim:

The aim of the present study was to assess the correlation between bone density values obtained by cone-beam computed tomography (CBCT), the primary stability of dental implants and the histomorphometric analysis of bone quality.

Materials and methods:

Following tooth extraction, socket preservation with freeze-dried bone allograft or protein-rich fibrin (PRF) was performed on 30 patients with 30 maxillary teeth in the region from second premolar to second premolar. Four months after the procedure, CBCT was used to assess the bone density (Hounsfield units) in the area of extraction. Thirty bone samples were harvested from implant sites using a trephine drill. They were analyzed with Image J software. Immediately after placing the implant, the implant stability quotient was measured using the Osstell Idx device.

Results:

The results revealed significant correlations between bone density and primary stability along the vestibulo-oral ($r=0.392$, $p=0.032$) and mesiodistal axes ($r=0.407$, $p=0.026$). Bone density also correlated strongly with the percentage of newly formed bone ($r=0.776$, $p<0.01$). Conclusion: Bone quality, in terms of bone density measured in CBCT and new bone formation are correlated to the primary stability of the dental implants and vice versa.

Keywords

bone density, dental implants, primary stability, osseointegration, histomorphometric analysis

9. Zlatev, S.; Ivanova, V.; Chenchov, I.; Todorov, R. & Chenchov, L.
Influence of ridge preservation on marginal bone loss in single unit implant restorations
Clinical Oral Implants Research, Wiley, 2020, 31, 182-182

Abstract:

Background : Single- unit implant restorations are considered as a standard of treatment for replacing a single missing tooth. One of the parameters determining the success of the treatment is the marginal bone loss around the implants.

Aim/Hypothesis : The current study aims to determine the potential influence of socket preservation on peri-implant marginal bone loss after 12 months of functional loading in single- unit implant restorations.

Materials and Methods: The study population included patients who received 96 single crowns on implants placed in three groups even groups (n = 32) of bone- sites: 1) Preserved with allograft, 2) preserved with PRF 3) control, left to heal naturally. Parallel radiographs were made at baseline and 12 months after loading and were analyzed to evaluate the marginal bone loss at the mesial and distal side. A cumulative score and mean difference were calculated, and the groups were compared using Welch ' s one- way ANOVA.

Results: The measured peri- implant marginal bone loss was 0.44 ± 0.16 mm for the control group, 0.48 ± 0.14 mm for the artificial bone and implants restored 0.42 ± 0.17 mm for PRF. Welch ' s one-way ANOVA showed no statistically significant difference between the studied groups [FWelch = 1.45, P = 0.241].

Conclusions and Clinical Implications : Within the limitations of the current study, it can be concluded that socket preservation techniques with allograft or PRF don't influence the peri-implant marginal bone level after functional loading for 12 months.

Keywords : Ridge preservation, Marginal bone loss, PRF, allograft

10. Zlatev, S.; Todorov, R.; Apostolov, N.; Kazakova, R. & Kissov, C.
Parallelism between the smile and pupillary lines
Dental Medicine, 2020, 102, 33-37

Abstract:

Introduction:

Parallelism between the smile line and the pupillary line is considered a major macro-aesthetic component in smile esthetics.

Aim:

The aim of the study is to assess the frequency and magnitude of deviations from parallelism between the line of the incisal edges of central maxillary incisors and the pupillary line and its association with gender.

Materials and Methodology:

Dental Medicine students (n = 100, 51 female and 49 male) from the Faculty of Dental medicine at Medical University – Plovdiv, were included in the present research. A standard frontal (full-face) photograph during voluntary smile was taken with Canon EOS 350D camera and a macro-lens. The head of the participants was positioned with the Frankfurt plane parallel to the floor of the room at 100 cm from the camera's sensor. ImageJ was used to measure the angle between the two studied lines. Statistical analysis was performed using R.

Results and discussion:

Lack of parallelism between the two reference lines was established in 45% of the study sample. The mean deviation was 2.38 ± 0.83 degrees with a minimum of 1.13 and a maximum value of 4.58 degrees. There were no statistically significant associations between the gender of the participants and frequency and magnitude of deviations from parallelism [pfisher = 0.113; t(30.19) = 1.31, p = 0.20].

Conclusion:

Within the limitations of the current study, it can be concluded that true parallelism between the pupillary line and the frontal area of the occlusal plane occurs only $\frac{1}{2}$ of the times.

Key words: pupillary line, reference lines, parallelism, incisal edge

Резюме:

Въведение:

Успоредността между линията на усмивката и бипупилната линия е фактор с ключово значение за естетичния вид на зъбно-лицевата композиция.

Цел:

Целта на настоящото изследване е да установи честотата на отклонение между тангентата спусната по режещите ръбове на централните резци и бипупилната линия.

Материал и методика:

В проучването се включиха 100 студенти (51 жени и 49 мъже) по дентална медицина учащи във ФДМ МУ-Пловдив. На всеки от тях се направи стандартизирана фотоснимка ан-фас с фотоапарат Canon EOS 350D (Canon, Япония) и макро обектив при състояние на волева усмивка. В програмата за обработка на изображения ImageJ се измери успоредността между бипупилната линия и тангентата спусната по режещите ръбове на фронталните горночелюстни зъби. Статистическата обработка на резултатите се извърши в програмната среда „R“.

Резултати и обсъждане:

В резултат на проведените измервания се установи липса на успоредност между двете референтни линии в 45 % от изследваните лица. Средната измерена стойност на ъгъла получен между перпендикуляра спуснат от бипупилната линия и тангентата на режещите ръбове на централните резци е $2.38 \pm 0.83^\circ$ като минималната стойност е 1.13° а максималната 4.58° . Резултатите от точният тест на Фишър за сравнение на категориите „Пол“ и „Наличие на успоредност“ [$p = 0.113$] както и от Т-теста [$t(30.19) = 1.31$, $p = 0.20$] за сравнение на средните стойности на измерените отклонения между мъжете и жените включени в проучването не показаха значима разлика.

Заклучение:

В рамките на настоящото изследване се установи, че успоредност между бипупилната линия и фронталния участък на оклузалната равнина има в половината изследвани случаи.

Ключови думи: бипупилна линия, референтни линии, успоредност, режещи ръбове

11. Ivanova, V.; Chenchov, I.; Zlatev, S.; Iordanov, G. & Mijiritsky, E.
Comparative Study between a Novel In Vivo Method and CBCT for Assessment of Ridge Alterations after Socket Preservation-Pilot Study.

International journal of environmental research and public health, 2019, 16

Abstract: The aim of this study was to compare two different methods for evaluation of alveolar bone resorption after the socket preservation procedure. In the current study, 9 patients with a total of nine teeth indicated for extraction were included. Patients received alveolar ridge preservation with allograft (BoneAlbumin™, OrthoSera Dental, Győr, Hungary) or Platelet-Rich fibrin (PRF). CBCT (Planmeca ProMax 3D, Helsinki, Finland), was taken at 1 week and 4 months after the socket preservation procedure. A 3D scan, obtained with Trios (3Shape, Copenhagen, Denmark) of the alveolar bone of the surgical site and the adjacent teeth at the place of extraction was performed during the surgical procedure, immediately after the graft placement in the alveolar socket, and after 4 months. Virtual study models were generated using the three-dimensional file processing software "Meshlab" (ISTI-CNR Rome Italy). The changes of alveolar height and width were measured and analyzed. Results were taken from both methods. Radiographic examination revealed that the average value of horizontal resorption is 0.6-2.4 mm, and vertical resorption is 0.46-2.8 mm. On virtual models, the average value for horizontal resorption is 1.92-3.64 mm, the vertical resorption value is 0.95-2.10 mm. The Trios intraoral scan can provide non-invasive and more accurate quantitative insights into the dimensional changes in the alveolar ridge after the bone remodeling process. More research is needed for verification of these results.

Keywords: alveolar ridge preservation; socket preservation; CBCT; bone resorption; intraoral scanner; CAD/CAM; in vivo; virtual models

12. Chenchev, I.; Ivanova, V.; Kanazirski, N. & Zlatev, S.
Evaluation of primary and secondary stability of dental implants placed after socket preservation with allograft or prf - a randomized controlled clinical trial
Clinical Oral Implants Research, Wiley, 2019, 30, 453-453

Abstract:

Background:

Implant stability is a combination of both mechanical and biological stability. Hence implant stability is associated with the quality and quantity of local bone. After tooth loss the alveolar ridge undergoes dimensional alterations which lead to reduction of the alveolar ridge. Extraction sites treated with socket preservation show increased healing and vital bone formation which is beneficial for the primary stability of the dental implants.

Aim/Hypothesis :

The aim of this study is to evaluate the stability of dental implants placed after socket preservation with allograft or PRF as a sole grafting material.

Material and Methods:

Tooth extraction and socket preservation were performed on 28 patients with allograft, on 23 patients with PRF as a sole grafting material and 12 patients were included in a control group - spontaneous healing. Each patient had one tooth with indications for extraction. The post-extraction socket had no bone deficiencies - buccal wall was intact. Four months after the procedure a dental implant was placed. Primary stability was measured according to the ISQ scale. Four months after placing the dental implant - using the two- stage method, during a reentry the secondary stability of the implant was measured.

Results:

Results of the study reveal no significant difference between the primary stability of the dental implants placed 4 months after socket preservation procedure with allograft or PRF. Primary stability of the dental implants in the control group was significantly lower. In the first group - allograft, mean ISQ value for the primary stability was 70.33 ± 8.13 . In the second group - PRF, primary stability was 70.45 ± 12.13 . In the control group mean ISQ value for primary stability was 58.25 ± 6.39 . Secondary stability values were significantly higher in all of the groups compared to their primary stability (allograft - 77.00 ± 5.23 and PRF - 78.05 ± 5.18 ; control group - 69.13 ± 5.99).

Conclusion and Clinical Implications:

The presented clinical study reveals rapid and uncomplicated patient recovery after socket preservation with two different materials, with very good primary stability. The statistical findings revealed no significant difference between the primary stability in both of the tested groups. Secondary stability was higher which supports the thesis that formation of new bone cells around the implant surface increases the biological stability of the dental implant.

13. Ivanova, V.; Chenchov, I.; Zlatev, S. & Kanazirski, N.
Dimensional ridge alterations and histomorphometric analysis following socket preservation with prf or allograft. Randomized controlled clinical study
Journal of IMAB - Annual Proceeding (Scientific Papers), Peytchinski Publishing Ltd., 2019, 25, 2853-2861

Abstract:

Purpose:

The aim of this randomized controlled clinical trial was to evaluate the efficacy of A-PRF alone or in combination with freeze-dried bone allograft in improving vital bone formation and decreasing alveolar bone resorption.

Materials and methods:

The study included 60 patients with 63 post-extraction sockets. They were divided into three groups – socket preservation with freeze-dried bone allograft (BoneAlbumin™, OrthoSera Dental, Gyor, Hungary), which consisted of 28 patients. The second group presented post-extraction sockets filled with PRF as a sole grafting material – 23 patients and the third group was the control group - 12 patients. Two scans with Trios intraoral scanner were performed on each patient – one during the socket preservation procedure and one 4 months after. The changes of alveolar height and width were assessed on the superimposed virtual models obtained from the intraoral scanner. Bone biopsy was harvested from the preserved area with a trephine drill 4 months after the extraction.

Results:

Results reveal that vertical and horizontal bone resorption were less pronounced in both of the tested groups as opposed in the control group, where these values were significantly higher. There was a significant difference between the quantity of the newly formed bone in the control group and both of the tested groups – PRF and allograft.

Conclusions:

The study reveals that A-PRF as a sole grafting material or FDBA in combination with PRF membrane are both suitable for ridge preservation procedures. The study demonstrates a novel in vivo method for measuring bone resorption after ridge augmentation procedures.

Keywords: socket preservation, dental implants, allograft, PRF, Trios intraoral scanner, CAD/CAM

14. Vlahova, A.; Hadzhigaev, V. & Zlatev, S.
Implant-Supported Screw-Retained Vs Cemented Single Crown Fabricated By CAD/CAM
Technology: A Clinical Case Report
Journal of Dentistry and Oral Care, 2018, 4, 5-7

Abstract:

CAD/CAM technologies in Dental Implantology present opportunities for preliminary implant planning, surgical template design, guided surgery, and fabrication of immediate and permanent implant-supported restorations. The aim of this publication is to compare two types of implant-supported single crowns—screw-retained and cemented, illustrated with a clinical case. Advantages and disadvantages of both types of restorations are described. The choice between screw-retained and cemented implant-supported restoration is individual and depends on each clinical case.

15. Dimova-Gabrovska, M.; Todorov, R.; Apostolov, N. & Zlatev, S.
Errors in the partial dentures fabrication process during PPDM lessons
J of IMAB, 2018, 24, 2272-2231

Abstract:

Aim:

The aim of the research is to make an analysis of the most often FDM-Sofia students' errors in the partial dentures fabrication process.

Materials and methods:

A number of 155 partial dentures were analyzed after practical exam of the 2nd year FDM-Sofia students. Some of the basic fabrication errors were analyzed such as: proper resin polymerization, finishing and polishing process, denture borders shaping, inter-dental spaces, teeth setup, clasps, and major connector profile.

Results:

The results from the research revealed significant theoretic and practical errors, due to inadequate training process of the students. We found a necessity to introduce a problem-based education in the PPDM training process.

Conclusion:

The contemporary education in prosthetic dental medicine, should lead the students into understanding the frames of problem based education.

Keywords: partial dentures, student training process, problem based education

16. Kazakova, R. T.; Tomov, G. T.; Kissov, C. K.; Vlahova, A. P.; Zlatev, S. C. & Bachurska, S. Y. Histological Gingival Assessment after Conventional and Laser Gingivectomy *Folia Medica, Pensoft Publishers, 2018, 60, 610-616*

Abstract:

Background:

Gingivectomy is a procedure often performed in everyday clinical practice using numerous instruments.

Aim:

To evaluate and compare the gingival cut surface after gingivectomy with 6 different surgical instruments – a surgical scalpel, an Er:YAG laser, a CO2 laser, a ceramic bur, an electrocautery device, and a diode laser.

Materials and methods:

Gingivectomy using the above listed instruments was performed in 18 patients. The histological samples excised with a surgical scalpel were assigned as a control group and the other five types – as test groups. The following histological parameters were measured: coagulation layer thickness (in μm); presence or absence of a microscopic rupture and presence or absence of hemostasis in-depth.

Results:

The best instrument of the above listed ones which demonstrated excellent results is the CO2 laser. The Er:YAG laser has a thin coagulation layer and lack of hemostasis in-depth. The diode laser has the widest coagulation layer which is an advantage from a clinical point of view. Electrocautery proved to be as effective as the diode laser, but it should not be used around metal restorations. The ceramic bur has less pronounced hemostasis in-depth.

Conclusions:

Modern dentistry uses a wide variety of methods that are designed to be applied in everyday practice. Good knowledge of the ways to use them, their advantages and disadvantages are essential to obtaining the optimal result depending on the clinical case.

17. Hadzhigaev, V.; Zlatev, S. & Manchorova, N.
Clinical evaluation of tree-unit FPD with endocrown preparation of the distal abutment tooth.
J of IMAB, 2017, 23, 1773-1777

Abstract:

Introduction:

The endocrown is a mean for restoring endodontically treated teeth. It has a circumferential preparation with a butt-joint border and accessory retention within the pulp chamber. It does not require root preparation for placement of posts or post and cores making it a more conservative restoration that evades the short-comings of the above-mentioned.

Aim:

Evaluation of the clinical performance and longevity of three-unit FPDs with endocrown preparation for the distal abutment tooth and comparison with a con-ventional FPDs employing the Split-mouth method.

Methods and materials:

Patients with identical defects on the maxillary or mandibular dental arches are examined. Twenty-two patients are chosen amongst them with a minimal step of randomization (n=3). The design of the study is based on the method of auto-control and consistent with the CONSORT Statement. The type of the preparation design for the distal abutment tooth is randomly chosen for each side of the dentition. Both FPDs are fabricated from Laboratory resin composite (Vita LC/VM) with infrastructure made from glass fibers - Turka GS/CSB (Stick Tech). Silane agent is applied to the inner aspects of the bridges and a 3 Steps ad-hesive system is used (Optibond (Kerr/Hawe). Luting is carried out with Resin ce-ment (RelyX Ultimate Adhesive Resin Cement (3M ESPE)). In order to assess the clinical performance of the FPDs' a modified USPHS criteria was used. All patients were examined at pre-determined time periods by one of the researchers. Analyses of the results are performed with descriptive statistics and Kaplan-Meier longevity test.

Results:

The evaluation period is 4 years for all FPD's. Regular control appoint-ments were conducted at 6 months, 1, 2, 3 and 4 years post cementation. The mod-ified USPHS criteria showed full Alfa scores on colour match and anatomic con-tour. Kaplan Meier survival analysis showed 93.22% survival rate for all FPD's – conventional and endocrown retained. No statistical difference was observed be-tween the different types of distal abutment preparation designs as well as be-tween genders with an exception for the variable "Chipping" (p=0.018). The success rates were generally lower than the survival rates at 71.45%.

Conclusion:

Within the limitations of this study, it is concluded that both classic and endocrown retained FPDs made from laboratory composite resin, reinforced with FR achieve a satisfactory performance for the 4 year evaluation period.

Keywords: FPD, endocrown, FRC, longevity

18. Hristov, I.; Bojkova, T.; Yankov, S.; Shopova, D. & Zlatev, S.
Degree of awareness of soft relining materials by dental technicians
J of IMAB, 2017, 23, 1726-1730

Abstract:

The aim of the current investigation is to analyze the dental-technicians' awareness of the soft relining materials, their characteristics, advantages, shortcomings and methods for relining.

Materials and methods:

For the purpose of this investigation a standard questionnaire has been presented. A direct survey method, documentary and statistical method, as well as graphical methods, including tables, charts, graphics and figures, were used. Data were analysed with the help of IBM SPSS Statistics (ver. 19).

Results:

One hundred and eight dental technicians were included in the survey, evenly distributed by gender. Removable and fixed prosthodontics is the most commonly mentioned spheres of dental activities. Almost all included in the investigation point out the laboratory relining method as the most frequently used. Acrylic and silicone SRM are the most used groups of relining materials. Change of colour and hardness are the most frequently noticed shortcomings of these materials. The majority of the dental technicians declare that they have never done replacement of SRM or the relining has lasted more than a year.

Discussion:

The correlation between the age and the years of labour service among the participants is quite obvious. Most of them start working soon after their graduation. Removable prosthodontics is among the priorities for the majority of the labs.

Conclusion:

Although their unambiguous advantages, the soft relining materials have lots of shortcomings as well. The major problems are connected with their change of colour and hardness. Nevertheless, the dental technicians find them useful and reliable in overcoming specific prosthetic problems.

Keywords: awareness, questionnaire, soft relining materials,

19. Kissov, C.; Bunchev, N.; Zlatev, S. & Todorova-Plachiyska, K.
Aesthetic correction in a case with a canted dental midline
Esthetic Dentistry and Implantology, **2017**, 2, 15-17

Abstract: A very important feature in smile design is to ensure coincidence between the facial and dental midlines. When this is not possible, the practitioners should concentrate their efforts on creating parallelism between the two.

The purpose of the current article is to evaluate the importance of the parallelism between the dental and facial midlines and to illustrate its importance with a clinical case. A 27-year-old female patient sought treatment because of esthetic complaints connected with a shifted dental midline. After the smile analysis, it was determined that the discrepancy between the two is less than one millimeter and it is visually augmented due to the inclination of the central incisors. A treatment plan including the fabrication of laminate veneers and correction of the canted dental midline was devised and accepted by the patient. The inclination of the dental midline is a major aesthetic concern. Its relatively easy correction is sufficient to greatly improve the overall smile design, even when there are other substantial aesthetic problems.

20. Todorova-Plachiyska, K.; Krasteva, S.; Zlatev, S. & Krasteva, S.
Cephalometric evaluation of the cranial base in the Bulgarian population
Scripta Scientifica Medicinæ Dentalis, **2017**, 3, 41-46

Abstract:

Introduction:

The cranial base is a relatively stable area of the craniofacial region used in many radiographic cephalometric analyses. The cephalometric analyses are generally based on the Caucasian cephalometric standards and there has been concern about elaborating the cephalometric analysis to be more specific for the Bulgarian patients.

Aim:

The aim of the present study was to determine the cephalometric norms of the cranial bases for the Bulgarian population and to compare them to other standards.

Materials and methods:

Lateral cephalograms of 90 orthodontically untreated Bulgarian adults with clinically excellent occlusion were evaluated and the anteroposterior skeletal measurements of the cranial base were assessed using standard cephalometric analyses. The data were processed with statistical package SPSS 19.0.

Results:

Based on gender, we established statistically significant differences. The mean values of cranial base indicators did not differ between subjects of different age in the sample.

Conclusion:

The mean values for the total sample can be used as cephalometric standards for Bulgarians. Cephalometric values identified for Bulgarian subjects are expected to help in the simplification of orthodontic diagnoses.

Keywords: Bulgarian population, cranial base, cephalometric assessment

21. Zlatev, S.; Kissov, C.; Hadzhigaev, V. & Hristov, I.
Natural language processing as a method for evaluation of factors influencing smile attractiveness

J of IMAB, 2017, 23, 1784-1789

Abstract:

Introduction:

A drastic increase in the number of published medical papers per year is observed. This makes the identification, analysis and categorization of significant studies a difficult task. Natural (human) Language Processing and text mining are methods, part of the scientific branch computer linguistics that transfer the informational overload from a human to a computer. It enables easier processing and analysis of large volumes of unstructured textual data.

Purpose:

The current study aims to familiarize researchers working in the field of dentistry with the capabilities of NLP and TM for a quick and concise analysis of large volumes of unstructured textual information and identification of dependencies between different factors important for a given subject.

Materials and Methods:

To demonstrate the capabilities of text mining, an important topic in the field of dentistry was chosen – factors influencing the esthetics of a smile. The analysis was carried out with “R” - a computer language for statistical processing. A literature search was conducted in the “PubMed” database with key-words – “dental, esthetic and factor”. The resulting abstracts were saved as a local copy, imported and processed. Word frequencies and associations between different terms were analyzed.

Results and discussion:

Weak to moderate correlation was established between the significant, most frequent terms in the text - “esthetics, „smile“, „arc“, „buccal“, „gingival“, “lip” and “midline” [0.1<r<0.45]. Word combinations and frequencies resulting from the analysis are in agreement with other reported findings.

Conclusion:

NLP and text mining are valuable tools which decrease the time necessary for analysis of large volumes of data. The results can aid further research with increased accuracy.

Keywords: text mining, natural language processing, smile, factors, esthetics,

22. Zlatev, S.; Ivanova, V. & Chenchov, I.

A method for volumetric evaluation of post-extraction site's alveolar bone change in human subjects

IOSR-JDMS, 2017, 16, 76-78

Abstract:

Background:

Tooth extraction is one of the most common procedures in the dental practice. The treatment of the extraction site is a daily challenge, which influences the post-extraction bone resorption.

Purpose:

The purpose of the current short communication is to showcase a novel methodology for volumetric evaluation of bone resorption after tooth extraction.

Materials and Methods:

In order to present the proposed methodology a plaster cast from a silicon mold is prepared. The upper first molar is trimmed simulating a fresh extraction site. A 3D scan is performed with the Trios intraoral scanner and a virtual study model is generated. A second trimming procedure is performed in order to simulate bone resorption and a second model is digitized. The volumetric change of the bone in the post-extraction site is assessed via superimposition of 3d models. The resulting stereolithography models are imported in suitable software. An alignment procedure is performed with the "best fit" algorithm. After scaling, Hausdorff distance and volume of the differences between the models are measured. A color map and histogram are generated for visualization purposes.

Results:

The results obtained from stereolithographic models processed with appropriate software make it possible to make a very accurate assessment of linear and volumetric bone changes preoperatively and postoperatively.

Conclusion:

The proposed method might become a very useful tool for assessing postoperative bone resorption. It is necessary to evaluate the proposed methodology in a clinical setting.

Keywords: bone resorption, 3D scan, bone volume, Hausdorff distance

23. Vlahova, A.; Hadzhigaev, V.; Kissov, C.; Todorov, G.; Kazakova, R. & Zlatev, S.
CAD/CAM dental implant planning and surgical guide fabrication
JCBPS, **2017**, 7, 1307-1314

Abstract: Modern Prosthetic Dentistry and Dental Implantology can benefit from the use of digital technologies, in particular CAD / CAM. The aim of this study is to present dental implant planning and surgical guide design and fabrication. Preliminary implant planning is the key of the final Prosthodontics success.

Keywords: CAD / CAM, dental implant planning, surgical guide

24. Hristov, I.; Slavchev, D.; Zlatev, S. & Aleksandrov, S.
Visco-elastic properties of soft relining materials - review
J of IMAB, **2017**, 23, 1571-1574

Abstract:

Despite the achievements of modern dentistry in fields of implantology and CAD-CAM technologies, the challenges associated with edentulous patients, treatment are still remaining. Difficulties are getting even greater, when it is a matter of highly atrophied alveolar ridges, covered with very thin mucosa, people suffering from xerostomia, exostosis, very well developed torus palatinus or tuberae maxillae.

Problems of the patients with removable dentures usually are poor adhesion and stability, pain, wounds, difficult adaptation with the new dentures, etc. At this moment there are only two possibilities to help these people. The first one is the use of implants; the second one is to use soft relining materials. There are some obstacles that reduce the use of implants in all patients, because of medical, anatomical, psychological, and financial concerns. While in the second option for the contraindications are quite less.

Keywords: soft relining materials, implantology, 'two-layer' denture

25. Hristov, I.; Slavchev, D.; Yankov, S.; Chuchulska, B. & Zlatev, S.
Influence of different ways of treatment on hardness of soft relining materials
IJSR, 2017, 6, 1769-1972

Abstract:

Statement of problem:

Hardness of soft relining materials is influenced by different solutions, coatings, and physical procedures.

Purpose:

To estimate the significance of different treatment procedures to the change in hardness of SRM.

Materials and methods:

A total number of 360 test samples were made and divided into 12 groups.

Results:

The highest values of hardness belong to Mollosil, covered with sealer after thermocycling. The VPS materials are less affected by different ways of treatment. Alcohol has a deteriorating effect to the SRM, especially the PMMA ones.

Conclusion:

After application of a sealer the hardness of the test samples increases at an average of 2 max 3 units in Shore's scale (for both of the testing groups). The sealer protects the SRM from disintegration, that is way it is strongly recommendable to use it in order to elongate the durability of these materials.

Keywords: Soft relining materials, Shore A hardness

26. Kazakova, R.; Tomov, G.; Kissov, C.; Vlahova, A.; Todorov, R.; Zlatev, S. & Tomova, Z.
Comparison of the Coagulation Effect of Different Types of Laser Crown Lengthening
JCBPS, 2017, 8, 120-126

Abstract:

Lasers are a new alternative to the classical methods for gingivectomy and crown lengthening. Three different types of lasers were used in order to examine their coagulation effect on the gingival tissues – an Er:YAG, a diode and a CO2 laser. Their advantages and disadvantages vary and the clinicians must be aware of the results in order to choose the best instrument according to the clinical case.

Keywords: Laser, gingivectomy, crown lengthening, histology, coagulation

27. Todorov, R.; Todorov, G. & Zlatev, S.

Clinical protocol for the registration of individual translucent zones of frontal teeth [version 1; referees: 1 approved, 1 approved with reservations]

F1000Research, 2017, 6, 1935

Abstract:

In contemporary dentistry, a successful restoration should not only restore the shape and function of the impaired dentition, but also contribute to the overall aesthetic appearance. In order to achieve this goal, the dental team should possess complete information about the different optical dimensions of the tooth structure. Besides the standard properties of the color, it is important to define, register and interpret the shape and position of the individual translucent zone. With the help of a device and software developed by the authors, a five step clinical protocol has been developed by the authors for individual translucent zone registration, with the help of trans-illumination. The translucent areas are then shown in a digital photograph of the teeth, analyzed, and interpreted. The translucent zone is finally visualized as a 'translucent map', which is clearly defined, and is easily interpreted and used by the dental team.

Keywords: trans-illumination, translucent zone, frontal teeth

28. Кисов, Х.; Златев, С. & Плачийска, К.

Клинична значимост на несъвпадението на средната линия на зъбите със средната линия на лицето

Естетична стоматология и имплантология, 2016, 1, 89-95

Резюме:

Коригирането на отклоненията между средната линия на лицето и зъбите е трудно дори невъзможно в част от клиничните случаи. Това налага при обсъждането на естетичния план с пациента да се прояви гъвкавост и да не се акцентира върху него. Когато отклонението на средните линии е комбинирано с липсата на успоредност между тях, коригирането на наклона на резците и привеждането им в успоредност със средната линия на лицето е препоръчително и достатъчно за решаване на естетичните проблеми на повечето пациенти.

29. Тодоров, Р.; Тодоров, Г.; Златев, С. & Александров, С.
Сравнителна цвeтова характеристика на горни фронтални зъби
Дентална Медицина, 2015, 63, 63-68

Abstract:

Introduction/Background:

Ensuring color uniformity of the complex "Prosthetic construction natural teeth", and recovery of the transparent area, especially in the esthetic zone, has significant social and aesthetic effect. Color matching is the first criteria with which a new construction is valued.

Purpose:

Using clinical spectro-photometry to investigate the shade distribution in frontal maxillary teeth.

Material and Methods:

One hundred and seven students from the Faculty of Dental Medicine - Medical University Plovdiv, aged from 18 to 27 were examined. One hundred and four of them who met our pre-determined criteria were included in the present study. The shade of 538 maxillary incisors and canines was determined with the use of SpectroShade Micro (MHT, Verona, Italy).

Results and discussion:

The most common shade found amongst all of the tested teeth is within group "A" in the shade guide Vita Classic. When Vita 3D Master was used for shade determination the most common color was found to be within the group "2". The shade distribution of the different thirds of the tested teeth - incisal, middle and cervical, collaborates with the results found for the primary color.

Conclusion:

The method of spectrophotometry is easy and convenient for determining the shade characteristics of tooth groups and thirds.

Key words: Spectrophotometry, shade determination

Резюме:

Въведение:

Осигуряването на цветово единство на комплекса "протетична конструкция-естествени зъби" и възстановяване на транспарентната зона особено във видимата фронтална област има значителен социален и естетичен ефект. Цветовото съвпадение е първият критерий, по който се оценява една нова конструкция.

Цел:

Да се изследва разпределението на цветовите нюанси при горни фронтални зъби, като се използват възможностите на метода на спектрофотометрията.

Материали и Методи:

Бяха изследвани 107 студенти от Факултета по дентална медицина - Медицински университет - Пловдив, на възраст от 18 до 27 години. При 104 от тях имаше съвпадение с критериите за включване в проучването. Изследвани бяха общо 538 фронтални зъби на горната зъбна редица. Събирането на първичната информация е осъществено посредством спектрофотометър SpectroShade Micro (МНТ, Verona, Italy).

Резултати и Обсъждане:

Основен цвят на зъба при всички изследвани зъби по разцветката Vita Classic е от група "А". При Vita 3D Master най-разпространеният цвят е от група "2". Разпределението на цвета при отделните третини на изследваните зъби - шиечна, средна и инцизална повтаря резултатите установени за основен цвят.

Изводи:

Методът на спектрофотометрията е лесен и удобен за добиването на информация за цветовото разпределение по групи зъби и третини.

Ключови думи: спектрофотометрия, цветоопределяне

30. Pavlov, B.; Vlahova, A.; Chenchev, I.; Zlatev, S.; Hadzhigaev, V. & Kanazirska, P.
Clinical evaluation of the digital CAD/CAM planning and immediate loading of single implants
of two different systems

Abstract Book of the 7th Scientific Congress "Science and Practice - Hand-in-Hand", 2021, 16-17

Abstract:

Introduction:

Preliminary planning of the optimal Prosthodontics positions is the key to the final success of the implant treatment.

Aim:

The aim of this study was to make clinical evaluation of the digital CAD/CAM planning and immediate loading of single implants of two different systems.

Materials and methods:

Alpha Bio Tec and AB-Dental (Israel) implantological systems were investigated. Totally 40 patients were planned to be treated and clinically evaluated during a scientific project of Medical University-Plovdiv (20 with each system). TRIOS Intraoral Scanner, Computer Tomograph ProMax 3D, Planmeca, 3Shape Implant Studio Software, 3D Printer Formlabs and CAM S2-Impression, VHF 5-axis milling machine were used. Surgical guides of two patients were designed and 3D printed of biopolymer SG resin, Formlabs. Screw-retained PMMA crowns, for immediate loading, were milled of PMMA Telio CAD, Ivoclar Vivadent. Fully guided surgical procedures were performed to the patients – each one with different implantological system. Digital planning precision was evaluated according to the fit of the crowns for immediate loading to the implant platform, to the adjacent teeth and to the antagonists.

Results:

A precise implants positioning was established with both used systems. An immediate loading was also performed but the results will be evaluated after the osseointegration.

Conclusion:

A clinical protocol for fully guided surgery and immediate loading of single implants with Alpha Bio Tec and AB-Dental (Israel) implantology systems is planned to be approved.

31. Zlatev, S. & Hadzhigaev, V.

Surface area available for bonding in different crown preparation designs

99th General Session and Exhibition of the IADR, 2021

Abstract:

Objectives:

The aim of this study is to quantify the differences in tooth preparation-area (TPA) between different crown preparation designs.

Materials and methods:

Fifteen extracted molars were disinfected and prepared for full-coverage crowns following the minimally invasive concept - V-prep. All preparations were done by a single calibrated operator with the same bur set – ref-num: 1721 (NTI, Germany), compiled for the specific preparation technique. The V-prep crown design in all test-specimens, was modified for an endocrown-design with accessory retention cavity in the pulp chamber, conserving the axial walls. Trios (3Shape, Denmark) was used to scan the two designs in the following order – V-prep crown, endocrown. Virtual replicas were imported in Blender and their TPA's measured using the add-on Neuromorph. R was used for descriptive statistics, graphical analysis, and a t-test group comparison.

Results and discussion:

The mean preparation area for the V-prep design was 150.47 ± 17.96 mm² with a minimum and maximum values of 109.53 and 176.56 mm². The endocrown design had a mean TPA of 203.74 ± 35.04 mm², with minimum and maximum values of 142.99 and 253.05 mm². Comparison between the two studied groups revealed a significant difference with a large effect size [$t(14)=8.19$, $p < .001$, $g=2.00$]. The mean difference in TPA calculated for the two designs was 25.91%. This is comparable to either an increase in abutment-height of two millimeters in a pyramidal tooth preparation model with a 6 degrees TOC or axial wall inclination of 18° with a 4 mm axial wall height. Further studies isolating TPA as a separate variable are necessary to establish its relation to clinical success, longevity, and various mechanical properties of single-unit FPDs with the proposed preparation designs.

Conclusion:

The significant change of TPA between the different designs reported in the current study may be an influencing factor for outcomes in clinical and laboratory research.

32. Zlatev, S.; Hadzhigaev, V. & Stanev, I.

Difference in preparation surface area - endocrown vs. Classical crown. A rapid communication.

Scientific Reports: Science and Youth 2021, 2021

Abstract:

Introduction:

Resistant tooth preparation form and retention are among a variety of factors influencing clinical success, survivability, and longevity of indirect fixed restorations. Retention is proportional to the surface area of the preparation. An alternative preparation for endodontically treated teeth is the endocrown. This design may provide an increase in adhesive area in combination with a more conservative preparation approach.

Aim/Purpose:

The purpose of the current rapid communication is to objectively demonstrate the difference in preparation surface of two designs – classical crown and endocrown.

Material and methods:

A standard typodont first lower right molar (FrasacoGmbH, Germany) was prepared for full coverage crown following standard protocol. The preparation was digitized with an intraoral scanner and subsequently modified for an endocrown design. This design was also scanned, and both were imported in the Blender system for 3D modeling. The Add-on Neuromorph was used to calculate the surface area of the preparation.

Results and discussion: The measured surface area of the classical crown preparation design is 144.76 mm², whereas in the endocrown design it is 161.79 mm². The difference between them is 11.11%. The surface gain with the endocrown design is comparable to a 9° axial wall inclination change in a molar preparation.

Conclusion:

The increased surface area can partially explain the similar and better published results for endocrown restorations, in relation to the classical full-coverage crown design.

Keywords: Endocrown, Surface area, Preparation design, Bonding area, Adhesive area

33. Hristozova, M.; Vlahova, A. & Zlatev, S.

A fully digital approach in esthetic rehabilitation. Case report

Scientific Reports Science and Youth 2021, 2021

Abstract:

Background:

Recent developments in 3D facial scanning technology allows the adoption of facially driven rehabilitation as part of the standard prosthetic treatment protocol in esthetically challenging cases.

Purpose:

The aim of this case report is to present a fully digital approach for case managing, that combines intraoral and face 3D scanning, virtual smile design, followed by computer assisted manufacturing of the final restorations.

Case report:

A 61-year-old woman came to us with an esthetic concern in her upper frontal teeth – a metal-ceramic fixed partial denture on 12, 11 and 21 with unsatisfying appearance. The adjacent teeth were with severe incisal abrasion, disproportionate crown heights and uneven gingival line. Intraoral and facial scans were obtained using Trios and Bellus3D face scanner and superimposed in Dental Designer Studio to create a virtual patient. DSD and virtual wax-up were performed using the patient’s facial and intraoral features as guidelines. A diagnostic model was printed, and a vacuum formed matrix produced for motivational mock-up, control of the tooth preparation and guided gingivectomy on 13 and 12. The prostheses prototypes were 3D printed from castable wax and the restorations fabricated from lithium disilicate ceramics. The veneers on teeth 13, 22, 23 and the FPD on 12,11,21, were cemented with self-adhesive resin cement. The ability to build a virtual patient in 3 dimensions during routine prosthodontic treatment, creates new opportunities for a patient-centered approach towards esthetics.

Conclusion:

3D facial scans facilitate patient-dentist-lab communication, improve predictability, and reduce chair time by providing valuable guidelines for treatment planning and execution.

34. Hadzhigaev, V. & Zlatev, S.
Success and Longevity of Posterior Metal-Free FPDs
99th General Session and Exhibition of the IADR, 2021

Abstract:

Objectives:

Materials designed for fabrication of metal-free indirect restorations are developed rapidly, leading to an increased number of new products with little to no information on clinical success and longevity. This research aims to evaluate the success and survival rates of three-unit, metal-free fixed partial dentures in the distal area of the dentition.

Material and methods:

Patients with a symmetrical single missing tooth in the distal quadrants of the dentition (n = 22) were selected at random for inclusion in the study. This research was approved by the MU-Plovdiv ethical committee and an informed consent was obtained from each participant. A total of 44 FPDs were made from fiber-reinforced composite by a team consisting of a dentist and a dental technician at the Department of Prosthetic Dental Medicine, Faculty of Dental Medicine, MU – Plovdiv. Two types of preparation designs for the distal abutment - classical and endocrown, were randomly distributed across the sample. Follow-ups were scheduled once per year for up to 8 years, performed by a calibrated researcher, not involved in the clinical procedures. Descriptive and association statistics derived from clinical findings (modified USPHS-criteria) as well as survival and success analysis were computed in R.

Results and discussion:

Modified USPHS criteria showed Alfa scores for the variables “color match” and “anatomical form” for all FPDs.

Success levels were considerably lower at 33.2% (SE 7.82%). There was a trend towards better survival rates for FPDs with endocrown preparation design, but differences were not significant.

Conclusion:

FRC posterior FPDs showed an acceptable clinical performance for the evaluation period. The type of preparation design for the distal abutment did not influence the overall clinical outcome.

35. Hadzhigaev, V.; Pavlov, B.; Vlahova, A.; Chenchev, I.; Zlatev, S. & Kanazirska, P.
Clinical protocol for digital planning of single implants: a pilot study
Science and Youth Conference, 2021

Abstract:

Introduction:

The planning and positioning of dental implants in an optimal site, are very important for the durability and trouble-free maintenance of the implant-prosthetic restorations. Besides their diagnostic value, 3D images give the chance for precise planning and positioning of dental implants and subsequent constructions.

Aim:

The aim of our study was to create a protocol for digital planning and guided implantation of single implants in partially edentulous patients with single tooth missing and control method as well.

Materials and methods:

TRIOS Intraoral Scanner, CBCT Radiograph, Implant Studio Software, 3D Printer and CAD/CAM Equipment were used. The images of intraoral scanning and CBCT were superimposed digitally through benchmark points. The precise matching of both images gives the chance to plan the implant position and temporary crown as well. The correct crown position according to the implant, adjacent and opposite teeth was one of the criteria for implant placement estimation. After planning, the surgical guide was made by 3D printing. The temporary crown was fabricated by CAD/CAM before implantation too. The operation was made by guided surgery.

Results:

The result was a very precise implant positioning.

Conclusion:

Placing digitally planned single implants by guided surgery gives predictable results. The analysis of all stages is meant to create a simplified and reliable protocol for placing single or several implants.

36. Vlahova, A.; Pavlov, B.; Chenchev, I.; Zlatev, S. & Tomova, Z.

Clinical and laboratory protocol for computer-assisted planning and immediate loading of single implants using two different systems

Ways of science development in modern crisis conditions: abstracts of the 2nd International Scientific and Practical Internet Conference, June 3-4, 2021. – Dnipro, Ukraine, 2021

Abstract:

Introduction:

Computer-aided planning in modern prosthetically-driven implantology is a key factor ensuring predictability and successful final treatment outcome.

Purpose:

The aim of this study was to clinically evaluate digital planning and immediate loading of single implants with two different systems.

Materials and methods:

A pilot study on two patients missing a single mandibular first molar was performed. Fully-guided protocols for the two implant systems – AB Dental and Alpha Bio-Tech were randomly assigned to each participant. The computer-assisted planning, performed with 3Shape Implant Studio (Denmark), included prosthetically driven choice and optimal position of both implants over superimposed surface scans and a cone-beam CT's. Additionally, a virtual wax-up and generation of surgical guides and a long-term temporary screw-retained restorations were performed. Surgical appliances were printed from SG resin (Formlabs, USA) and crowns were milled from Telio-CAD (Ivoclar-Vivadent, Lichtenstein). Planning accuracy was evaluated based on the crown's fit and relation to adjacent teeth and antagonists.

Results and discussion:

An accurate implant and crown positions were observed using both systems. There were no surgical and technical complications in both patients. The short- and long-term survivability, success and longevity are yet to be determined. Despite of the limitations of this pilot study the statement that the combination of digital surface scanners and CT's facilitate predictability of the results in guided implant surgery was approved.

Conclusion:

The clinical and laboratory protocols for fully-guided surgery and immediate loading of single implants with Alpha Bio Tec and AB-Dental (Israel) implant-systems showed high accuracy in both pilot cases.

Keywords: CAD/CAM, implants, loading, evaluation, planning

37. Zlatev, S.; Ivanova, V. & Chenchov, I.

Technical complications in implant-supported fixed prosthetic restorations. Case series.
Jubilee Annual Assembly of International Medical Association Bulgaria - 30 years IMAB, 2020

Abstract:

Purpose:

This case series report aims to present three cases of technical complications in implant-supported fixed prosthetic restorations.

Case series:

A 57-year-old woman came to our practice with complaints of pain and mobility of an implant-supported FPD at the area of 35-37. After x-ray diagnostics, an implant fracture at 35 was observed. The crown on 37 was preserved whereas the other part of the FPD was removed. The implant was explanted, and a socket preservation technique was performed with allograft. Three months later at a recall appointment, a fracture of the second implant was observed on an x-ray. The same procedure was performed for the second implant. Two patients – a 46-year-old male and a 49-year-old female, came to us with complaints of mild gingival inflammation, bleeding, and construction mobility. The clinical examination revealed a titanium base fracture and crown chipping of a screw-retained single-unit restoration over the implant in both cases. The restorations were replaced on the next day using the existing computer-generated models for the production of new constructions.

Discussion:

Implant fracture is one of the most unpleasant, but fortunately rare technical complication in implant-rehabilitation. The treatment protocol in such cases is difficult and includes explantation and immediate or delayed implant placement. Augmentation procedures or socket preservation is often a necessity in these situations. An enormous advantage in restorations manufactured with the CAD/CAM technology is the ability of quick and easy replacement when the failure of the prosthetic superstructure is irreparable.

Conclusions:

An accurate diagnosis and treatment options analysis are necessary, in order to select an optimal rehabilitation plan. Regular recall visits with radiographic control can prevent further biological complications in compromised implant cases.

Keywords: implant treatment, technical complications, fracture. case series report

38. Urumova, M.; Todorov, R.; Zlatev, S. & Aleksandrov, S.

Device for mechanical-cyclic loading of test specimens

Scientific works of the Union of Scientists in Bulgaria-Plovdiv, series G. Medicine, Pharmacy and Dental medicine,, 2020

Introduction:

Precision attachments have different design. During the chewing process, the elements of this type of constructions are repeatedly subjected to mechanical stress. In the case of precision attachments, the matrix-patrix design adheres to the cyclic repeated chewing cycle.

Purpose:

Our aim is to design and provide a device for multiple mechanical and cyclic loading of various constructions of matrix and patrix precision attachments on a project implemented with the participation of lecturers from the Technical University, department "Electronics".

Materials and Methods:

The device concerns a cyclic laboratory examination of the retention of telescope crowns made by different methods. The unit has the following main parts : the mechanical part consists of upper, middle, and lower plates connected by strictly parallel guiding axes. Each plate carries different activating elements. The retentive part secures the support element and has a reservoir and container for artificial saliva attached to it. The electronic-processing unit records the values the number of cycles, the time to complete one cycle and regulates the pressure forces.

Results:

The constructive principle of the developed device, which detects multiple insertion and separation cycles, in artificial saliva, is used to test telescope crowns. There were prepared four groups test specimens in advance for various double crown modifications designed using CAD/CAM and produced using 3D-printer.

Conclusion:

Preliminary tests for working with the device, with participation of professors from the Technical University of Plovdiv give us a reason to apply the repeated insertion-separation cycles approach to other prosthetic elements.

Keywords: telescope crowns, device, insertion-separation cycles

39. Georgieva, Y.; Rusev, M. & Zlatev, S.
A hybrid treatment approach using CAD/CAM technology. Case report
Jubilee Scientific Conference “Medicine of the Future, 2020

Abstract:

Introduction:

Intraoral scanners have an important role in the transformation of dentistry towards a completely digital workflow. Does it mean that every dentist should acquire intraoral scanner in his/her dental practice?

Purpose:

The aim of this case report is to present a hybrid approach towards the use of CAD/CAM technology without possessing an intraoral scanner, a combination of conventional impression and digital methods for design and production.

Case report:

A partially edentulous 76-year-old woman was referred to our practice with a chief complaint of maxillary frontal teeth abrasion – around 2.5 mm in the incisal edge area. Loss of the mastication center, VDO reduction and a mandibular deviation towards the right were registered. The treatment plan included full arch rehabilitation of the upper jaw with a metal ceramic bridge with cantilevers. Diagnostic impressions were taken, and stone models were poured and mounted in an articulator (ASA dental). A diagnostic wax-up with the newly established VDO and position of the lower jaw was done. The vertical dimension was validated with provisional crowns (Dentalon, Kulzer, Germany). After tooth preparation full arch impressions and bite registration were taken and digitized with a laboratory scanner E2 (3Shape, Denmark). The fPD's framework was designed in EXOCAD and produced with SLM printer (EOS M100 Deantal, EOSgmbh). The metal framework was adjusted in the mouth, veneered with EX3 (Noritake, Japan) and cemented with fuji One (GC, Japan).

Conclusion:

The hybrid treatment approach in complex prosthetic cases allows clinicians to take advantage of all the design and production benefits of the CAD/CAM technology, without investing in an intraoral scanner.

Keywords: CAD/CAM, intraoral scanner, lab scanner, abrasion

40. Kazakova, R.; Kissov, C.; Tomov, G.; Vlahova, A.; Dimitrova, M.; Todorov, R. & Zlatev, S. Classical mechano-chemical and surgical retraction techniques, used in fixed prosthodontics *Scientific Works of the Union of Scientists in Bulgaria - Plovdiv, 2019*

Abstract:

The retraction methods are divided into two main groups – classical mechano-chemical and surgical. The first one includes the single-cord and the double-cord technique, whereas the second one includes electrosurgery, rotary curettage, and laser retraction.

Key words: retraction, classical retraction, single-cord, double-cord, electrosurgery, rotary curettage, laser retraction

41. Kazakova, R.; Kissov, C.; Tomov, G.; Dimitrova, M.; Vlahova, A.; Todorov, R.; Zlatev, S. & Stanev, J.

Literature review of the healing process after conventional and laser gingivectomy

Scientific Works of the Union of Scientists in Bulgaria - Plovdiv, 2019

Abstract: The initial tissue response after conventional gingivectomy is forming a coagulum. The total healing process lasts two weeks, whereas the final restoration of the epithelium takes about a month. The healing process when using a laser device is per secundam intentionem. It is faster and more predictable than the conventional one.

Key words: healing, laser, gingivectomy, per secundam intentionem

42. Kazakova, R.; Kissov, C.; Tomov, G.; Dimitrova, M.; Vlahova, A.; Todorov, R. & Zlatev, S. Comparative analysis of the postretractional changes in the gingival height after application of classical mechano-chemical retraction methods

Scientific Works of the Union of Scientists in Bulgaria - Plovdiv, 2019

Abstract:

Introduction:

Nowadays, there is a variety of different retraction methods. Dentists must be well informed about them, so that they can choose the proper one according to the clinical case.

Purpose:

The aim of the current study is to compare the postretractional changes in the gingival height after 3 classical mechano-chemical retraction methods – a retraction cord, Expasyl retraction paste, Astringent retraction paste.

Material and methods:

The gingival height of 263 teeth was measured the first and the second week after retraction.

Results:

There is practically a lack of recession of the gingiva the first and the second week after the retraction.

Conclusion:

The 3 different mechano-chemical retraction methods are safe to be used in the dental practice.

Key words: classical retraction, mechano-chemical retraction, retraction cord, retraction paste

43. Kazakova, R.; Kissov, C.; Tomov, G.; Vlahova, A.; Dimitrova, M.; Todorov, R. & Zlatev, S.
Comparative analysis of the post-retractational changes in the gingival height after application of
surgical retraction methods

Scientific Works of the Union of Scientists in Bulgaria - Plovdiv, 2019

Abstract:

Introduction:

Nowadays, there is a variety of different retraction methods. Dentists must be well informed about them, so that they can choose the proper one according to the clinical case.

Purpose:

The aim of the current study is to compare the post-retractational changes in the gingival height after 3 classical surgical retraction methods – rotary curettage with a ceramic bur, a diode laser and an Er:YAG laser.

Material and methods:

The gingival height of 263 teeth was measured the first and the second week after retraction.

Results:

There is practically a lack of recession of the gingiva the first and the second week after the retraction, except for the rotary curettage with the ceramic bur.

Conclusion:

The 3 different surgical methods are safe to be used in the dental practice, but the clinician has to be more cautious with the rotary curettage.

Key words: surgical retraction, ceramic bur, rotary curettage, diode laser, Er:YAG laser

44. Казакова, Р.; Кисов, Х.; Томов, Г.; Влахова, А.; Караславова, Е.; Златев, С. & Стаменов, Н.
Проучване информираността на лекари по дентална медицина относно различните
методи за хирургична ретракция на гингивалния сулкус
Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 197-200

Abstract:

Introduction:

Nowadays, there is a variety of different retraction methods. Dentists must be well informed about them, so that they can choose the proper one according to the clinical case. The aim of the current study is to evaluate the dentists' awareness of the surgical methods of gingival retraction, dental lasers in particular.

Material and methods:

A survey was conducted among 94 dentists. It included two questionnaires with open questions about the different surgical methods of gingival retraction.

Results:

Dentists are less familiar with the surgical methods, compared to the classic ones. There is a lack of information, especially about the contemporary retraction devices, e.g., dental lasers. The most commonly used surgical retraction method is the rotary curettage with a diamond or a ceramic bur.

Conclusion:

An information campaign should be held on the modern means of gingival retraction.

Key words: survey, surgical gingival retraction, dental lasers

45. Казакова, Р.; Кисов, Х.; Томов, Г.; Влахова, А.; Стаменов, Н.; Златев, С.
Зависимост между трудов стаж и информираност на лекарите по дентална медицина
относно хирургичните методи за ретракция на гингивалния сулкус
Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 201-204

Abstract:

Introduction:

Nowadays, there is a variety of different retraction methods. Dentists must be well informed about them, so that they can choose the proper one according to the clinical case.

Purpose:

The aim of the current study is to evaluate the interdependence between dentists' work experience and awareness of the different surgical methods of gingival retraction – dental lasers in particular.

Material and methods:

A survey was conducted among 94 dentists. It included two questionnaires with open questions about the different surgical methods of gingival retraction.

Results:

Dentists are less familiar with the surgical methods, compared to the classic ones. Young dentists are more informed about the different means of gingival retraction, especially dental lasers. They are also more willing to buy and use contemporary devices in their practices.

Conclusion:

The interdependence between work experience and awareness of the surgical retraction methods is inversely proportional.

Key words: survey, work experience, surgical gingival retraction, dental lasers

46. Казакова, Р.; Кисов, Х.; Томов, Г.; Влахова, А.; Караславова, Е.; Златев, С. & Стаменов, Н.
Зависимост между специалност и информираност на лекарите по дентална медицина
относно хирургичните методи за ретракция на гингивалния сулкус
Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 205-208

Abstract:

Introduction:

Nowadays, there is a variety of different retraction methods. Dentists must be well informed about them so that they can choose the proper one according to the clinical case.

Purpose:

The aim of the current study is to evaluate the interdependence between dentists' specialty and awareness of the different surgical methods of gingival retraction, dental lasers in particular.

Material and methods:

A survey was conducted among 94 dentists. It included two questionnaires with open questions about the different surgical methods of gingival retraction.

Results:

Dentists are less familiar with the surgical methods, compared to the classic ones. Prosthetic specialists are more informed about the different means of gingival retraction, including dental lasers. They are also more willing to buy and use contemporary devices in their practices.

Conclusion:

Specialists in prosthetic dentistry are more aware of the surgical retraction methods than the others.

Key words: survey, specialty, surgical gingival retraction, dental lasers

47. Казакова, Р.; Кисов, Х.; Томов, Г.; Влахова, А.; Стаменов, Н.; Златев, С. & Караславова, Е. Зависимост между местоживеене и информираност на лекарите по дентална медицина относно хирургичните методи за ретракция на гингивалния сулкус
Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 209-212

Abstract:

Introduction:

Nowadays, there is a variety of different retraction methods. Dentists must be well informed about them, so that they can choose the proper one according to the clinical case.

Purpose:

The aim of the current study is to evaluate the interdependence between dentists' location and awareness of the different surgical methods of gingival retraction – dental lasers in particular.

Material and methods:

A survey was conducted among 94 dentists. It included two questionnaires with open questions about the different surgical methods of gingival retraction.

Results:

Dentists are less familiar with the surgical methods, compared to the classic ones. Dentists in big cities are more informed about the different means of gingival retraction, especially dental lasers. They are also more willing to buy and use contemporary devices in their practices.

Conclusion:

An information campaign should be held on the modern means of gingival retraction.

Key words: survey, location, surgical gingival retraction, dental lasers

48. Влахова, А.; Хаджигеаев, В.; Томова, З. & Златев, С.
CAD/CAM винтово фиксирана керамична корона върху имплант. Клиничен случай
Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 213-215

Abstract:

In the modern Dentistry digital technologies and Implantology are with priority. The aim of this study is to present a clinical case of a screw-retained ceramic implant-supported crown made by CAD / CAM technology. The main clinical steps are described and discussed. CAD / CAM manufacturing is an extremely precise alternative of the conventional prosthetic treatment.

Key words: CAD / CAM, screw-retained, implant-supported, ceramic crown

49. Христов, С.; Кисов, Х.; Златев, С.; Грозев, Л. & Аврамова, М.
Влияние на трудовия стаж върху предпочитаните методи и средства за изграждане на силно разрушени ендодонтски лекувани зъби
Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 236-242

Abstract:

Introduction:

Caries and its complications often lead to irreversible loss of hard dental tissues. Although many new materials and techniques are developed, the problem with the restoration of a highly compromised dentine core after an endodontic treatment remains unresolved. The question about the optimal method for restoration of such teeth is important for the practicing dentists.

Purpose:

The purpose of the current article is to present the opinion of dentists regarding their preferences for restoration of endodontically treated teeth in correlation with their working experience.

Materials and Method:

In order to accomplish the stated purpose, a survey including 248 dentists from different municipalities of Bulgaria, was conducted in 2016-2017. A questionnaire with 8 closed items was developed. The correctly filled 171 surveys were statically processed with descriptive graphical analysis and Pearson chi-square, Cramer's V, t.test and Wilcoxon Mann-Witney.

Results and discussion:

The working experience distribution is not homogeneous with most respondents in the group between 1-15 years. The mean working experience of the participants is 19.57 years. There is a significant correlation between years of 237 working experience and gender ($p < 0.001$), specialty ($p < 0.001$), usage of composite posts ($p < 0.01$), opinion about the fracture resistance of composite posts ($p < 0.05$) and opinion regarding the advantages of sonic and ultrasonic instruments for root canal preparation ($p < 0.001$).

Conclusion:

With the increase of dentists' years of working experience a negative tendency towards the usage of composite posts and sonic and ultrasonic instruments for root canal preparation is observed.

Key words: survey, fiber-reinforced, restoration, preparation

50. Златев, С.; Тодоров, Р.; Влахова, А. & Христов, И.

Регистриране на полупрозрачната зона и приложение на „карта на полупрозрачната зона“ при протетично лечение на силно оцветен централен резец. Клиничен случай
Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 268-272

Abstract:

Introduction:

The goal of contemporary dentistry is to restore both the shape and function of the impaired dentition and also contribute to the overall aesthetic appearance. In order to achieve this, the dental team should possess complete information about the optical dimensions of the tooth structures. Besides the standard properties of color, it is important to define, register and interpret the shape and position of the individual translucent zone.

Materials and Method:

With the help of a device and software developed by the authors, a clinical protocol has been implemented for individual translucent zone registration, with the help of trans-illumination. The translucent areas are then shown in a digital photograph of the teeth, analyzed and interpreted.

Results:

The translucent zone is visualized as a ‘translucent map’, which is clearly defined and is easily interpreted and used by the dental team for the successful completion of a clinical case.

Conclusion:

The correct representation of the translucent zone in the final restoration is a key element in the successful esthetic outcome of the prosthetic treatment, especially in the aesthetic zone.

Keywords: trans-illumination, translucent zone, aesthetic zone

51. Хаджигаев, В.; Златев, С.; Влахова, А. & Христов, И.

Използване на алтернативен метод за препарация при къси клинични корони. Клиничен случай

Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 273-277

Abstract:

Introduction:

Prosthetic treatment of patients with short clinical crowns is challenging for the dentist since both sufficient abutment height and volume of prepared tissues are essential for the long-term success of the restoration. When the teeth in question are endodontically treated, the array of materials and methods used for the core build-up can further complicate the clinical situation.

Materials and method:

With an all-digital approach (3shape Dental System, 3Shape Denmark) a complex clinical case was assessed and a treatment plan including occlusal plane equilibration and fabrication of tree FPD's and two crowns was devised.

Results and discussion:

The correction in the occlusal plane necessitated aggressive occlusal reduction and root-canal treatment of tooth 26. After the abutment preparation the axial walls were of insufficient height for adequate retention, therefore an endocrown preparation design was used. The implementation of this approach doubled the total height of the abutment's contact surface and increased the adhesive area 1.56 times, which presented more favorable conditions for a long-term clinical success.

Conclusion:

An alternative preparation design (endocrown) might be considered as a viable option in cases where endodontically treated teeth with short clinical crowns will be restored.

Key words: short clinical crown, endocrown, preparation design

52.Златев, С.; Кисов, Х.; Казакова, Р. & Ченчев, Л.

Устройство за автоматизирано записване на резултати при провеждане на Q-SORT изследване

Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 291-296

Abstract:

Introduction:

W. Stephenson introduced the Q-sort method in 1935 and developed it fully by 1953. This “inverted factor” analysis is applicable in dentistry, when the researcher is interested in the trends of people's subjective opinion for a given topic. This particular study design is created and validated more than 50 years ago but has gained popularity only recently. One reason is the development of different software aimed at making the “labor-intensive and time-consuming process” of conducting a Q-study easier. Many researchers criticize the all-digital approach since it strays from the original method's ideas. Therefore, a combination of hardware and software solutions might be a preferable option for this particular study design.

Purpose:

The aim of this paper is to introduce a device for automatic results recording in a Q-sort study design.

Materials and methods: The proposed instrument is based on RFID technology and has a software and hardware parts. A box housing contains RFID readers (MFRC-522 RFID), single board computers (Raspberry Pi Zero W) and a Router (D-link Model No.: GO-RT-N300). The top panel is made from Forex and has a printed Q-grid with 18 items. A card form is chosen for the RFID tags (MIFIRE 530). The software part has a Flask API and a python script.

Results and discussion:

The Q-board is scalable, which allows conducting a Q-study with different number of objects and categories. However, because of item specific and study design constrains, a five-step scale

with 18 items is chosen. Research conducted with the proposed instrument allows for efficient recording, recoding, and processing of the results. It also helps preserving the important researcher-respondent interaction as well as the observations and note taking during the interview, leading to a better, fuller understanding of the participant's perspective.

Conclusion:

Combining hardware and software solutions while conducting a Q-sort study increases efficiency, objectivity and reduces the chance of error without violating the specific requirements of the method.

Key words: Q-sort, Q-method, RFID, aesthetics, smile

53. Хаджигаев, В.; Златев, С.; Влахова, А. & Друмева, С.

Създаване и апробиране на тестова установка за сравняване на фрактурната резистентност при CAD/CAM изработени безметални мостове с различен препарационен дизайн на дисталния крепител

Научни трудове на Съюза на Учените в България Пловдив, СУБ Пловдив, 2018, 22, 297-301

Abstract:

Introduction:

The usage of metal-free FPDs is increasing due to their excellent aesthetic properties and biocompatibility. However, at the present moment because of their superior mechanical properties, PFM-FPDs are still considered the golden standard for posterior restorations. The stress-concentration zone and weakest point in a bridge restoration is the area of the distal connector. In order to solve this issue a full-contour ZrO₂ based all-ceramic constructions are indicated. Given the increased translucency of the material an adequate esthetic appearance in the distal regions is achievable. Moreover, a connector with bigger area, resulting in increased fracture resistance, can be constructed. Unknown at this point is the influence that the preparation design of the distal abutment has on the construction's fracture resistance and stress distribution.

Purpose:

The aim of the current publication is to present the development and a pilot study of a test setting for fracture resistance comparison of CAD/CAM fabricated metal-free FPDs with different preparation designs of the distal abutment.

Materials and Method:

An artificial defect for the fabrication of a 3-unit FPD, with a missing second premolar, was created on a standard study model A3 (Frasaco, Italy). The teeth adjacent to the defect were prepared for full coverage crowns with a different design of the distal abutment and digitized with an intraoral scanner. Both the bases (the prepared teeth and edentulous area) and the FPDs, were constructed and manufactured with a full digital approach employing different techniques, namely 3D printing and milling. For loading element, a hardened steel sphere with a diameter of 5 mm was chosen and positioned in the central fossa of the second premolar. The construction was luted on the base with Panavia V5(Kuraray, Japan).

Results and discussion:

The pilot test resulted in a fracture of the sample in the distal connector area. The crack propagated distally and ended at the preparation border, splitting the crown in half. The chosen manufacturing approach ensures identical constructions and bases with a discrepancy of less than 50 µm. Furthermore, the researcher has very fine control over each aspect of the specimens during the construction phase.

Conclusion:

CAD/CAM technologies present the means to construct and produce identical test samples with altered areas of interest, which is crucial for the validity, accuracy and precision of a comparison test for fracture resistance.

Acknowledgements:

This research was financed with a Medical University Plovdiv Grand number HO-03/2017.

Key words: Fracture resistance, CAD/CAM, FPD

54. Hadzhigaev, V.; Vlahova, A.; Manchorova-Veleva, N.; Zlatev, S. & Kazakova, R.
Evaluation of tooth preparation system for all-ceramic crowns
2018 IADR/PER General Session (London, England), 2018

Abstract:

Objectives:

Preparation features for CAD/CAM manufactured, all-ceramic crowns have been periodically reported in the specialized literature. It is universally accepted that finish line configuration and position in relation to the gingival tissues as well as the volume of prepared tissues can influence the longevity and esthetics of the final restoration. The optimal thickness required for all-ceramic crowns, depend on the material used, type of tooth and area of preparation. Different systems propose an array of instruments to achieve easy to follow steps for appropriate and consistent preparation. The objective of this study is to evaluate the ease of use and consistency of the fully guided system for tooth preparation developed by Jacques Raynal.

Methods:

Twenty-five acrylic maxillary central incisors were prepared according to the “V-prep” system by dentists with different clinical specialties as a part of a hands-on workshop held at the FDM MU Plovdiv. The tooth-replicas were model “Frassaco” type A3 mounted on phantom heads in order to mimic clinical conditions. All models were scanned using Trios (3Shape) intraoral scanner and virtual models were obtained. Both conditions – pre- and post-preparation were acquired. Two cutting planes – one vestibulo-lingual and one mesio-distal were constructed. In order to assess the preparation depth, five measurements were taken on each cross-section. A comparison with the proposed ideal was performed with One-sample T-test. Bland-Altman analysis was used to assess the inter-operator agreement.

Results:

The Bland Altman analysis revealed acceptable overall agreement between operators. The results from the One-sample T-test showed a statistically significant difference at two areas – pala-

tal lingual surface and cingulum – $t(24)=5.31$, $p=0.000$ and $t(24)=3$, $p=0.006$ respectively.

Conclusions:

Within the limitations of this study, it can be concluded that the investigated preparation system is easy to use and the obtained results are close to the proposed ideal.

55. Ivanova, V.; Chenchov, I.; Zlatev, S. & Bachurska, S.

Radiological, Histological and Three-dimensional Assessment of Bone Resorption: Case Report 2018 IADR/PER General Session (London, England), 2018

Abstract:

Introduction:

Tooth extraction is followed by a progressive bone resorption, which could eventually lead to difficulties in the implant and prosthetic treatment. There are several types of bone graft materials and methods used for socket preservation. Researchers keep looking for the ideal bone substitute material and preservation procedure in order to ensure optimal treatment outcome. There are a few studies measuring the alveolar ridge resorption after tooth extraction. The methods used for volumetric change evaluation are restricted to linear measurements and are prone both to human and instrument inaccuracies.

Objective:

To demonstrate a novel method for 3D quantification of bone resorption.

Methods:

A 37-year old male with a non-restorable molar tooth was treated with tooth extraction and socket preservation with allograft (BoneAlbumin) and PRF membrane. Radiological, histological and three - dimensional evaluation were performed in order to assess the outcome of the procedure. Four intraoral scans were made at different stages of the treatment. Two initial – before the extraction and during the preservation procedure. And another two 4 months post extraction - of the soft tissue and bone prior to implant placement. Two of them were used to assess the Hausdorff distance, isolate the resorption area and calculate its volume and various linear measurements.

Results:

The Hausdorff distance is: mean linear resorption is 1.04mm. The volume loss was estimated at 0.6387 mm³=0.63ml. The CT made prior to the implant placement showed mean 414 Hounsfield units.

Conclusions:

The results revealed that socket preservation with BoneAlbumin and PRF membrane is beneficial for preserving the volume of the alveolar ridge. Measuring the resorption on the virtual models help for a precise and accurate assessment of the change in the bone volume.

56. Hadzhigaev, V.; Zlatev, S.; Vlahova, A.; Todorov, G. & Georgieva, I.
Cementation in the age of digital dentistry. A review of the literature
22nd Congress of the BaSS, 2017

Abstract:

Introduction:

Cementation is the final stage in clinical cases restored with FPD's. Since the introduction of CAD/CAM technology a rapid increase in the usage of constructions based on zirconium dioxide is observed. This material and its modifications may require a different cementation protocol.

Purpose:

The aim of the current review of the literature is to organize the current knowledge regarding the cementation of ZrO₂ based FPD's manufactured utilizing the CAD/CAM technology.

Materials and Method:

A literature search concerning cementation of ZrO₂ based FPD's manufactured using CAD/CAM technology was conducted in the PubMed (US National Library of Medicine) database and Elsevier's search engine for scientific literature - ScienceDirect. A combination of key words and Mesh terms were used with the Boolean operators: "OR", "AND" and "NOT". Time filter for research conducted during the last 5 years was applied.

Results and discussion:

The search yielded 268 results. After a complex study selection protocol, 42 articles relevant to the topic were chosen. The papers were divided by their type – "in vitro" and "in vivo". The results of the studies were organized in different sections according to their main topic.

Conclusion:

The identified articles differ in their methodology and purpose, thereby it is not possible to conduct a meta-analysis of the reported results. In conclusion, there is no universal protocol for luting of CAD/CAM fabricated restorations but a preference towards composite cements is observed, when there isn't sufficient macro-mechanical retention.

57. Hristov, I.; Slavchev, D.; Zlatev, S.; Hristov, S. & Doshev, V.
Survey of degree of awereness of dentists about the qualities of soft relining materials
22nd Congress of the BaSS, 2017

58. Zlatev, S.; Kissov, C.; Hadzhigaev, V.; Kazakova, R. & Vlahova, A.
Coincidence between the facial and dental midlines during posed smile
22nd Congress of the BaSS, 2017

Abstract:

Introduction:

The coincidence between the midline of the face and the dental midline is of great clinical significance and can determine the successful outcome of a restorative treatment. Different assessment methods are proposed, but the majority of them are noninvasive, utilizing standardized

facial photographs.

Purpose:

The aim of the current study is to assess the frequency of deviations between the facial and dental midline in a selected sample.

Methods and Materials.

A sample of 148 students were selected from the undergraduate students of the FDM, MU Plovdiv from 231 willing to participate in the current study. The included healthy volunteers had no visible craniofacial anomalies and were chosen randomly with the application “RnGenerator”. A photometric setting was developed, which gave the means for fixed face to camera lens distance and reproducible head position for all of the participants. The resulting photographs were evaluated with the ImageJ software. Descriptive statistics and Pearson Chi square tests were used.

Results and discussion:

148 frontal photographs were made and evaluated for facial and dental midline discrepancy. A deviation was found in 20.95% of the studied sample. No statistically significant difference was observed between genders. The results of the current study are in agreement with other reported findings.

Conclusion:

The analysis of the coincidence of the dental and facial midlines is an important part of the pre-treatment diagnostic procedures and can be beneficial for the overall facial esthetic outcome. It has an important clinical meaning in the area of prosthetic dentistry.

Key words: esthetics, dental midline, facial midline

59. Hristov, I.; Shopova, D.; Zlatev, S. & Chuchulska, B.

The role of chemical composition, sealers, disinfectants and polymerisation process on changes in hardness of sof relining materials - a review

Scientific Works of the Union of Scientists in Bulgaria - Plovdiv, 2017, 8

Abstract:

The major disadvantage of the soft relining materials is that despite of the fact that they are soft from the very beginning, after certain period of time in oral conditions, they become hard. Because of the differences in their chemical composition this period is different. The use of sealer is strongly recommended.

Key words: hardness, disinfectants, sealer.

60. Hristov, I.; Yankov, S.; Zlatev, S.; Aleksandrov, S. & Kolev, A.
Influence of natural pigments in some beverages over the change in color of soft relining materials

Scientific Works of the Union of Scientists in Bulgaria - Plovdiv, 2017, 8

Abstract:

Purpose:

The aim of this investigation is to study the change of color of soft relining materials /SRM/ caused by the natural pigments in some beverages.

Materials and methods:

Ufi Gel Plus (VOCO); Flexacryl Soft (LANG); Villacryl Soft (ZHERMACK) – soft relining materials were used. The samples were exposed to solutions of Nescafe, sour cherry juice and red wine for a week.

Discussion:

Coffee leads to the greatest staining of SRM. Natural juice does not change the color of SRM so dramatically. The silicone relining materials are more stable in comparison with the acrylic and the pigments in red wine have less effect on them.

Conclusion:

As far as our results are concerned we can conclude that the natural pigments in some beverages have adverse effect on the color stability of SRM. That is why the patients must be informed about this fact.

Key words: pigments, beverages, acrylic and silicone materials.

61. Zlatev, S.; Hadzhigaev, V.; Todorov, R. & Drumeva, S.

Z*sample - an application for sample size determination

Scientific Works of the Union of Scientists in Bulgaria - Plovdiv, 2017, 8

Abstract:

Introduction:

One of the major stages in research preparation is the determination of an appropriate sample size to answer the research question.

Purpose:

The current work presents an open source, internet based application for sample size determination, developed by the authors. Materials and Method: The application is written in “R” – the functional computer language for statistical processing. The graphical interface is created with “Shiny”.

Results and discussion:

The application is hosted under the domain zlatev.science:3838/zsample/. The program has a menu with 3 divisions. The first one is “Instructions” and covers the usage as well as the formulas used for sample size determination. The second is “conventional effect size” based on Cohen’s suggestions. The third one is a drop down menu offering the user sample size determination.

tion for the two most frequently used statistical tests in the field of dentistry - ANOVA and t-test.

Conclusion:

The usage of the proposed application is easy and intuitive.

Key words: sample size, R, Shiny

62. Vlahova, A.; Zlatev, S.; Hadzhigaev, V.; Kazakova, R.; Kissov, C. & Todorov, R.
Preparation differences for CAD/CAM monolithic and veneered fixed restorations made of zirconia ceramics: a literature review
12th Edition CAD/CAM and Digital Dentistry Conference, 2017

Abstract:

Introduction:

Preparations for crown and bridge restorations made of ZrO₂ ceramics depend on the preferred cad/cam milling protocol – in full contour (monolithic) or a framework that is additionally veneered with ceramic masses.

Purpose:

The aim of the current literature review is to summarize the best practices for abutment teeth preparation differences for cad/cam monolithic and veneered fixed restorations made of ceramics based on zirconium dioxide.

Materials and methods:

A literature search was conducted in the pubmed data base entering the query items: „dental, preparations, zirconia ceramics”, combined by the boolean operator “OR”, with no limitation in the publication dates. Only studies focusing the preparation requirements for fixed monolithic and veneered ZrO₂ restorations were considered.

Results and discussion:

Minimal invasive chamfer or even knife-edge preparations with axial and occlusal reduction of 0, 3 - 0, 5 mm are needed for teeth restored with monolithic zro₂ restorations. For veneered frameworks the classical all-ceramic preparation protocol is preferable - radial shoulder or chamfer with axial reduction of 1 – 1, 5 mm and occlusal reduction in the range of 1, 5 – 2 mm. For monolithic restorations the only additional material on the top of the crown or bridge is the glaze, its fracture resistance is extremely high and this fact defines minimal required thickness. for veneered frameworks more space is necessary for decreasing the risk of adhesive and cohesive fractures of the additional ceramic layers.

Conclusion:

Monolithic ZrO₂ restorations offer more versatile preparation protocol, which makes them more sparing to the hard dental tissues of the abutment teeth.

63. Vlahova, A.; HadzhigaeV, V.; Kazakova, R.; Zlatev, S. & Kissov, C.
Cad/Cam protocol for a single all-ceramic crown design with 3shape software
20th Congress of the BaSS, 2016

Abstract:

Introduction:

CAD/CAM (computer aided design/computer aided manufacturing) is a technology of prosthetic restorations design by the help of a computer software and their fabrication by milling of proper material (ceramics, laboratory composite, acrylic resin, metal alloy).

Purpose:

The aim of this presentation is to describe the clinical and laboratory CAD/CAM design protocol of single all-ceramic crowns with 3Shape Dental System software.

Materials and methods:

The clinical protocol of taking a digital impression with TRIOS (intraoral) scanner and the laboratory scanning of dental stone models with 3Shape WIELAND Dental D 800 (laboratory) scanner were presented. The used materials and instruments were mentioned. The design process of a single all-ceramic crown with 3Shape Dental System was followed out.

Results and discussion:

All single design steps were described: choice of the insert direction, the margin line outlining, the cement gap releasing, the choice of an optimal crown shape, the primary position and shaping, the final shaping, the choice of distance to the adjacent teeth and antagonists, the smoothing and finishing.

Conclusion:

3Shape Dental System software provides especially precise and accurate design and fabrication of CAD/CAM single crowns.

Key words: CAD/CAM protocol, design, single crowns

64. Alexandrov, S.; Hristov, S.; Georgiev, J.; Zlatev, S. & Hristov, I.
Double-phase double-layer impression technique - modified with a composite ring.
16th scientific congress of the BgDA, 2016

Abstract:

Introduction:

The wash impression technique is one of the most frequently used in the daily practice. One of the main drawbacks is the need to ensure adequate space for the corrective phase.

Aim:

Modification and improvement of an existing method, with which adequate space around the prepared teeth is freed, ensuring a guided flow of the corrective silicone impression material.

Materials and methods:

After the stage of preparation a composite resin material with low viscosity Metaflow (Metabioned) is applied in the area of the cervical area and inside the gingival sulcus. The material is

light cured following with the first impression alongside the putty phase OrmaPlus (Major, Italy), is applied. The light cured material - composite rings, is included in the first impression. Their removal ensures even quantity of the corrective material Sushy4 (Bisico, Germany), in the following impression phase.

Results:

We have ensured sufficient corrective layer that reproduces the exact details of the preparation border.

Conclusion:

The ease of use of the modified technique, makes it applicable when single and multiple teeth are prepared.

Резюме:

Въведение:

Двуфазната двуслойна (Wash) отпечатъчна техника е една от най-често прилаганите в ежедневната практика. Съществен недостатък, свързан с нея, остава необходимостта от адекватно освобождаване на необходимо пространство за компресивната (коректурна) фаза.

Цел:

Модифициране и подобрене на съществуващ метод, чрез който се освобождава равномерно пространство около препарирани зъби, осигуряващо насочено движение на коректурния силиконов материал.

Материали и методи:

След етапа на препариране на зъбите, аплицирахме композитен материал с нисък вискозитет Metaflow (Metabiomet), в областта на венечната бразда и препарационната граница. Полимеризирахме материала и пристъпихме към снемане на първичния отпечатък - с тестообразната силиконова маса – OrmaPlus (Major, Italy). Полимеризираните композитни пръстени, останаха включени в първичния отпечатък. Премахването им осигури равномерно, хармонично количество от коректурния материал Sushy4 (Bisico, Germany) в последвалата втора фаза на отпечатъчната техника.

Резултати:

Получихме достатъчен, обективен коректурен слой, който детайлно възпроизвежда, релефа на препарационната граница.

Заклучение:

Лесното приложение на модифицираната методика, дава основание да бъде предложена от нас като вариант на избор при снемане на отпечатък от единични и няколко на брой препарирани зъби носители.

65. Hadzhigaev, V.; Vlahova, A.; Zlatev, S.; Todorov, R. & Kissov, C.
Special features of interjaws relationships registration in CAD/CAM FPDs fabrication.
16th scientific congress of the BgDA, 2016

Abstract:

Introduction:

Proper fixation of the occlusion in the design of CAD/CAM fixed restorations is essential for their optimal function in terms of the oral cavity.

Aim:

The aim of this presentation is to provide information about some special features of interjaws relationships registration in fixed partial dentures (FPDs) fabrication by CAD / CAM technology.

Materials and methods:

Intraoral occlusal scanning in patients which teeth are prepared for abutments (on one side or on both sides of the dental arch) is closely connected with the opportunity of improper bite registration. The use of a full arch digital impression and the laboratory scanning of plaster models fixed by a silicone key – bite registration are the basic methods applied for accurate interjaws relationships registration.

Results and discussion:

Intraoral scanning has a number of features regarding the specifics of taking a snapshot and carries the risk of formation of artifacts and gaps (non-shot sections) in the digital impression. The absence of a distal abutment tooth support further impedes the interjaws relationships fixation. This can lead to the construction of a restoration with greater occlusal thickness and establishing preliminary contacts, or vice versa, a restoration with less occlusal thickness and perforation during the milling process. The use of the method of the full arch digital impressions ensures accurate interjaws relationships registration by bilateral bite scanning. The other method of the laboratory scanning of plaster models fixed by a silicone key – bite registration, taken from the patient's mouth, is an alternative to the intraoral optical impression.

Conclusion:

Knowledge about the capabilities of intraoral and laboratory scanning in the CAD / CAM technology creates options for an individual approach aimed to optimal interjaws relationships registration.

Keywords: fixation, interjaws relationships, CAD/CAM fixed partial dentures

Резюме:

Въведение:

Правилното фиксиране на оклузията при конструирането на CAD / CAM неподвижни възстановявания е от изключителна важност за оптималното им функциониране в условията на устната кухина.

Цел:

Целта на настоящата презентация е да предостави информация за някои особености в регистрирането на междучелюстните съотношения при изработване на неподвижни кон-

струкции по CAD/CAM технология.

Материали и методи:

Интраоралното сканиране на оклузията при пациенти, чиито дистални зъби са препарирани за мостокрепители (едностранно или двустранно), е свързано с възможност за неправилно регистриране на ухапката. Използването на дигитален отпечатък от целите зъбни редици и лабораторното сканиране на гипсови модели, фиксирани чрез силиконов ключ – ухапка са основните методи, прилагани за точно регистриране на междучелюстните съотношения.

Резултати и обсъждане:

Интраоралното сканиране има редица особености по отношение на спецификата на заснемане и крие риск от образуване на артефакти и празнини (незаснети участъци) в дигиталния отпечатък. Липсата на дистална опора допълнително затруднява фиксирането на междучелюстните съотношения. Това може да доведе до конструирането на възстановяване с по-голяма оклузална дебелина и създаване на предварителни контакти или обратното, на възстановяване с по-малка оклузална дебелина и перфорирането му по време на изрязването. Използването на метода с дигитален отпечатък от целите зъбни редици осигурява точна регистрация на междучелюстните съотношения чрез двустранно сканиране на ухапката. Другият метод за лабораторното сканиране на гипсови модели, фиксирани чрез силиконов ключ – ухапка, снет от устата на пациента, е алтернатива на интраоралния оптичен отпечатък.

Заклучение:

Познаването на възможностите на интраоралното и лабораторното сканиране при CAD/CAM технологията създава опции за индивидуален подход с цел оптимална регистрация на междучелюстните съотношения.

Ключови думи: фиксиране, междучелюстни съотношения, CAD/CAM неподвижни конструкции

66. Влахова, А.; Хаджигаяев, В.; Казакова, Р.; Божкова, Т. & Златев, С.

Влияние на дебелината на керамиката върху цвета на CAD/CAM изработени конструкции. Клиничен случай.

Наука и Младост, Медицински университет - Пловдив, 2016, 209-211

Резюме:

Въведение:

Керамиките на основата на циркониев диоксид са с изцяло кристална структура и се характеризират с висок опакитет. През последните няколко години са разработени такъв тип керамики с повишена транспарентност, например DDcubeX2, Dental Direct.

Цел:

Целта на настоящата публикация е да илюстрира отражението на дебелината на керамичния слой върху цвета на мостовите тела и мостокрепителите на CAD/CAM мостови конструкции, изработени от керамика на основата на циркониев диоксид с повишена транспарентност.

Материали и методи:

Представен е клиничен случай с две тричленни мостови конструкции, изработени от DDcubeX2, Dental Direct в дисталните участъци на съзъбието. Възстановяването вдясно е конструирано с медиален мостоносител цяла обвивна корона и дистален мостоносител ендокорона а това вляво – с класически мостокрепители обвивни корони.

Резултати и обсъждане:

DDcubeX2, Dental Direct съдържа 55% циркониев диоксид в тетрагонална форма и 45% циркониев диоксид в кубична форма, което определя по-високата прозрачност на материала, в сравнение с конвенционалните керамики на основата на циркониев диоксид. Визуално се установява разлика в цветовото съответствие между мостовите тела и крепежите поради разликата в дебелината на керамичния слой. Това несъответствие е по-малко при мостокрепителя ендокорона поради по-голямата дебелина на материала. Транспарентността (прозрачността) е физично свойство на материалите, отразяващо способността им да пропускат светлинните вълни. За прозрачност се говори, когато почти цялото количество падаща светлина преминава през облъчваното тяло. Това качество на практика се проявява с възможността да се вижда през прозрачното тяло. Върху окончателния цвят на транспарентните керамични конструкции оказват влияние както цвета на подлежащите зъбни тъкани, така и цвета на използвания цимент.

Заключение:

Керамиките на основата на циркониев диоксид с висока транспарентност са подходящи за единични възстановявания. Използването им за мостови конструкции води до разлика в цвета на мостовите тела и мостокрепителите, в резултат от различната дебелина на керамиката, което само до около 10% може да се повлияе от цвета на композитния цимент.

67. Златев, С.; Казакова, Р.; Хаджигаяев, В.; Петров, В. & Влахова, А.

Създаване на експериментална постановка за фотометрично изследване на антропометрични зависимости в сагитална и трансверзална равнина в анфас и профил
Наука и Младост, Медицински университет - Пловдив, 2016

Резюме:

Увод:

При сложни протетични случаи свързани с пълна рехабилитация на съзъбието, често са загубени ориентирите за форма и големина. Възстановяването на такива дефекти разчита на използване на различни антропометрични ориентирни – биоконстанти, които не се повлияват от загубата на зъбите както и от други фактори, като например възраст.

Цел:

Целта на настоящото изследване е да предложи разработена установка за проучване и установяване на различни антропометрични зависимости, които да подпомогнат планирането на протетично лечение.

Материали и методи:

Предложената от нас установка за проучване на антропометрични зависимости, свързани с протезирането, се състои от няколко части – поставка, рамка, подборник, фотоапарат с „твърд“ обектив и статив с вграден нивелир за две равнини. Фотометричното изследване се осъществява чрез направата на поредица от снимки в профил и фас, които се обработват в програма за графична обработка – Image J. Чрез статистически анализи се извличат общовалидни закономерности.

Резултати:

В резултат на създаването на установката и разработването на методика за фотометрично изследване на анфас и профил бяха направени снимки на 100 човека пожелали да вземат участие.

Обсъждане:

Фотометрините изследвания имат редица преимущества пред алтернативни методи за снемане на антропометрични ориентери. Проучването става с минимален ангажимент за изследваното лице, тъй като снимките се правят за кратко време. Предложената от нас установка позволява позиционирането на главата на пациента във фиксирана позиция, като същевременно интересуващите ни зони остават изцяло открити. Разграфяването на рамката и позиционирането на пациента дават възможност за реални измервания върху изследваното лице.

Заклучение:

Предложеният от нас метод и разработената установка за фотометрично изследване отговарят на принципите на ергономията и ефикасността. Прилагането на получените резултати в практиката би улеснило вземането на окончателно решение при протезиране на комплексни случаи.

Abstract:

Introduction:

In complex cases of prosthetic rehabilitation, it is frequent, that guidelines for the form and size of the dentition, to be restored, are lost. The restoration of such defects relies on the usage of different anthropometric guidelines – bio constants, which are not affected from tooth loss and from other factors such as age.

Purpose:

The purpose of the current study is to propose a newly developed setting for photometric research of anthropometric dependencies in the sagittal and transversal planes in full face and profile.

Materials and methods:

The proposed setting for research of anthropometric dependencies is compiled from the following parts – stand, frame, chin holder, camera with fixed lens and a tripod with leveling option for two planes. The photometric study is carried out with series of full face and profile photographs, which are processed in a computer software – Image J. With statistical analyses different dependencies are established.

Result:

The development of the setting and protocol for the photometric research led to the participa-

tion and footage of 100 people.

Discussion:

Photometric research has certain advantages over other methods for anthropometric landmark registration. It is less time consuming for the person undergoing research, because the shots are taken in a controlled environment. The proposed setting allows a fixed position of the head, while all the areas of interest remain uncovered. The frame divisions and the fixed position of the subject allow easy 1:1 scale measurement to be carried out.

Conclusion:

The proposed method and setting for photometric research comply with the principles of ergonomics and efficiency. The implementation of the results in the clinical practice would facilitate decision taking in the prosthetic rehabilitation of complex cases.

68. Казакова, Р.; Златев, С.; Влахова, А.; Кепчелева, А.; Къртева, А. & Илиев, Х.

Лазерна фотодинамична терапия за оздравяване на гингивалните тъкани и подготовка на венечната стена преди снемане на отпечатък

Наука и Младост, Медицински университет - Пловдив, 2016

Резюме:

Въведение:

Подготовката на венечните тъкани за снемане на отпечатък е важен етап от отпечатъчната техника. Снемането на прецизен отпечатък е от изключителна осигурява успеха и точността на протетичните възстановявания. За да стане това, отпечатъчният материал трябва да влезе в плътен контакт с венечния джоб. Наличието на възпалени и оточни гингивални тъкани компрометира сухотата на полето и точността на бъдещия отпечатък. G. Christensen съобщава, че при пациенти, подлежащи на фиксирано протезиране, е добре да се прилага разтвор на 0.12% хлорхексидинов глюконат 2 седмици преди изпиляването, както и по време на периода с временни конструкции. Това се прави с цел да се поддържа здравето на гингивалните тъкани. Нова съвременна алтернатива на този метод е прилагане на лазерната фотодинамична терапия.

Цел:

Целта на настоящето изследване е да се докаже лазерната фотодинамична терапия като метод за оздравяване на гингивалните тъкани преди снемане на отпечатък.

Материали и методи:

Работи се на две контролни групи – при едната се прилага разтвор на хлорхексидин глюконат (Parodontax), с който пациентите се жабурят 2 седмици, а на другата –двукратно прилагане на фотодинамична терапия с индоцианиново зелено Emundo и диоден лазерFOX.

Резултати и обсъждане:

Хлорхексидиновите разтвори са лесен и достъпен метод за поддържане здравето на гингивалните тъкани с добър ефект. Недостатъкът на тяхното приложение е, че стоматологът не може да контролира редовната им употреба и че след редовно ползване те предизвикват оцветяване на зъбите и лигавицата, както и промени във вкуса. Предимството на те-

рапевтичната лазерна светлина е, че тя стимулира естествените биологични процеси и повлиява основно клетките с ниско ниво окислително редукиращи процеси. Клетка в ниско окислително състояние е с кисело рН, но след лазерното облъчване клетката става по-алкална и способна да функционира оптимално. Здравите клетки не могат да увеличат значително своя окислително-редукиращ потенциал, следователно няма да реагират значително на лазерната енергия, докато клетки в ниско окислително-редукиращо състояние ще бъдат стимулирани. Фотоактивираната дезинфекция – ФАД (photoactivated disinfection) с лазер е метод, който вече е навлязъл и се използва за третиране на пародонтални джобове, дълбоки кариозни лезии и инфектирани коренови канали. Лазерът трябва да работи в рамките на дължината на поглъщане на използваното багрило, а дължините на вълните са обикновено в червения спектър, с изходяща мощност между 50 и 100 mW. Избраният оцветител се прилага и се оставя да дифундира за няколко минути, след което се прилага лазерно облъчване. Могат да се наблюдават преходни оцветявания в областта на зъбните тъкани, гингивата или лигавицата.

При фотодинамична терапия (photodynamic therapy) се използва или „студен“ (нискочестотен) лазер или традиционен лазер с дължина на вълната, абсорбираща се от пигмента (в случая диоден). Дължините на лазера се привличат от багрилото и взаимодействат с него, разрушавайки мембраните на бактериалните клетки. Светлинната енергия активира багрилото, взаимодейства с вътреклетъчния кислород и унищожава бактериите чрез липидна пероксидация и разрушаване на мембраната. Индоцианиновото зелено в комбинация с терапевтичните дължини на лазера има широк спектър на действие и влияе върху Грам (+), Грам (-) микроорганизми, както и върху *Candida albicans*. Ето защо прилагането на този нов метод за третиране на декубитални язви има много по-бърз и благоприятен ефект в сравнение с другите.

Заклучение:

Фотодинамичната терапия има бърз и благоприятен оздравяващ и биостимулиращ ефект върху гингивалните тъкани. Предимството пред използването на хлорхексидинови разтвори е съкратеното време експозиция, непрестанен контрол от страна на стоматолога, както и липсата на оцветяване на зъбите и лигавицата или промени във вкуса.

69. Казакова, Р.; Николов, Н.; Влахова, А.; Божкова, Т. & Златев, С.

Снемане на отпечатък за щифтови пънчета при дълбоко подвенечно фрактурирани зъби след изрязване с хирургичен лазер и с керамичен борер
Наука и Младост, Медицински университет - Пловдив, 2016

Резюме:

Въведение:

За възстановяване на дълбоко фрактурирани зъби се извършва изрязване на излишъка от гингивална тъкан с цел да се освободи място за навлизане на отпечатъчния материал. За да се снее точен и подробен отпечатък от протезното поле, отпечатъчният материал трябва да я обгърне и да влезе в плътен контакт с нея. Освен това при снемането на отпечатъка дебелината на материала трябва да е достатъчна, за да не разкъса прилежащата към венечната бразда част. Отстраняването на венечните тъкани се извършва с различни

хирургични средства – електроскалпел, диамантен борер за маргинално-ротативен кюретаж, хирургичен лазер или керамичен борер.

Цел:

Целта на настоящето изследване е да направи оценка на предимствата и недостатъците на два различни метода на хирургично изрязване на гингивата – с два вида хирургичен лазер – CO₂ и диоден, както и с керамичен борер.

Материали и методи:

Вземат се хистологични препарати, за да се направи оценка на срезната повърхост и се проследява възстановяването на тъканите във времето. В настоящето изследване при пациенти с необходимост от изрязване на гингивалната тъкан с цел снемане на отпечатък за щифтово пънче се прилагат двата вида ретракция на гингивата – маргинално-ротативен кюретаж с керамичен борер лазерна ретракция с два вида хирургични лазери – въглерод-диоксиден и диоден с дължина на вълната 810 nm.

Резултати и обсъждане:

Керамичният борер е средство за хирургична гингивална ретракция. Неговите предимства са, че той е лесен за употреба, за работата с него не е необходимо наличие на допълнително оборудване. Той изрязва само меките тъкани, без да засяга твърдите зъбни тъкани. Негов основен недостатък е наличието на обилно кървене и недостатъчната хемостаза, което може да наложи отлагането на отпечатването на протезното поле за следващото посещение. Изрязването с помощта на хирургичен лазер е по-бързо, поудобно и с по-добър хемостатичен ефект в сравнение с метода с керамичен борер. Възстановяването на тъканите е ускорено поради това, че лазерите намаляват количеството бактерии в областта на полето и имат добро оздравително и регенеративно действие, особено комбинирани с метода на фотодинамична дезинфекция.

Заклучение:

При лазерното изрязване на гингивата при дълбоко фрактурирани зъби отпечатъкът може да бъде снет в същото посещение, докато при ретракция с керамичен борер недобрата хемостаза може да компроментира точния отпечатък.

70. Hadzhigaev, V.; Manchorova, N.; Zlatev, S. & Kalachev, Y.

One-year clinical evaluation on conventional and endo-crown retained three-unit FPDs. Pilot study

Continental European and Scandinavian Divisions Meeting of the IADR (Antalya, Turkey), 2015

Abstract:

Objectives:

Clinical evaluation and longevity of five three-unit FPDs with endo-crown on the distal abutment tooth and five conventional FPDs are assessed and compared.

Methods:

Twenty five patients with identical tooth lost on the maxillary or mandibular dental arch are examined. Five of them are chosen with step of randomization (n=5). A Split-mouth study design is applied consistent with the CONSORT Statement. The type of the preparational design (conventional or endo-crown) on distal abutment tooth is also randomly chosen for each side of

the dentition. Both FPD's are fabricated with laboratory resin composite (Vita LC/VM) and frame of glass fibers (Stick Tech, GS/C&B). Silan agent is applied on the inner aspects of the bridges and three-step etch-and-rinse adhesive Optibond FL (Kerr/Hawe) is used on tooth surfaces. Luting is performed with RelyX U200 Adhesive Resin Cement (3MESP). Clinical evaluation is rated according modified USPHS criteria at 3, 6, and 12 month postoperatively. Descriptive statistics were used for frequency distributions of the evaluated criteria. Parametric t-test or nonparametric Mann-Whitney test are chosen depended on the type of empirical distribution, verified One-Sample Test (α was set at 0.05). Analysis of longevity is carried out by Kaplan-Meier survival test.

Results:

The modified UHPS criteria showed A (Alfa) scores on all test parameters. The statistical analysis revealed insignificant differences in marginal adaptation and marginal discoloration at any recall time. Kaplan Meier survival analysis showed 100% survival rate for all FPD's – conventional and endo-crown retained.

Conclusions:

Within the limitations of this study it is concluded that both conventional and endo-crown retained FPDs have excellent clinical acceptance for one-year evaluation.

71. Hristov, I.; Kissov, C.; Pavlov, B.; Zlatev, S. & Stanev, Y.

Soft relining materials - an aid in overcoming difficult clinical situations

20th Congress of the BaSS - New Interdisciplinary Approaches in Oral and General Reahbilitation, 2015

72. Zlatev, S. & Hadzhigaev, V.

Natural Tooth Pontic as a part of fiber-reinforced composite resin splint. Case report

15th scientific congress of the BgDA, 2015

Abstract:

Introduction:

The necessity of tooth extraction in the frontal area of the dentition is associated with considerable discomfort for the patient. Besides aesthetics, speech and masticatory function are impaired. This requires short term replacement of the missing tooth.

Purpose:

Clinical case demonstrating the usage of an extracted tooth as a pontic – part of fiber-reinforced composite resin splint

Materials and Methods:

A 48 year old male reported with a chief complaint of mobility and pain during chewing of the mandibular left lateral incisor. On examination third degree mobility of tooth 32 which has a large carious defect, and first degree mobility of the other incisors is detected. The decision was made to extract the left lateral incisor and fabricate a bonded fiber-reinforced composite resin FPD using the crown of the extracted tooth as a natural tooth pontic that would also serve as a periodontal splint. After extraction, all infected tissues were removed and etchant and bonding agent were applied. In order to reproduce the initial situation a silicone key was made. Using

silicone guide the missing tooth structures were restored and the correct position in the patient's mouth ensured. Periodontal splint design followed a standard clinical protocol – preparation of retention grooves on the lingual surfaces of the frontal teeth application of etching gel, bonding agent, and fixation with flowable composite resin.

Results:

The use of natural tooth as a pontic included in the fiber reinforced composite periodontal splint enables a short-term restoration of speech, masticatory function and aesthetics.

Conclusion:

The main advantages of this technique are satisfactory aesthetics, restored function, conservative approach, and the possibility to evaluate other restorative options if needed.

Резюме:

Въведение:

Необходимостта от екстракция на зъб във фронталната зона е свързана със значителен дискомфорт за пациента. Освен естетиката се нарушават говорната и дъвкателната функция. Това налага заместване на липсващият зъб в кратки срокове.

Цел:

Представяне на клиничен случай, при който екстрахиран зъб на пациент се използва като мостово тяло включено в подсилена с влакна композитна пародонтална шина.

Материали и Методи:

Пациент на 48г. от мъжки пол е с основно оплакване от подвижност и болка при хранене на долночелюстният ляв страничен резец. При прегледа се установи подвижност трета степен на зъб 32, който е с голям кариозен дефект, както и първа степен подвижност на останалите резци. Взе се решение за шиниране на долночелюстните фронтални зъби, екстракция на левия латерален резец и използване на короната му за мостово тяло. За възпроизвеждане на началната ситуация се сне силиконов ключ. След екстракцията от короната на зъба се отстраниха всички инфектирани тъкани и се извърши обработка с ецващ агент. С помощта силиконовият водач с директен композит се възстановиха липсващите тъкани и се осигури правилно позициониране в устата на пациента. Пародонталната шина се изработи по стандартен клиничен протокол – препариране на ретенционни улеи по лингвалната повърхност на фронталните зъби нанасяне на ецващ гел, бонд и фиксиране с течен композит.

Резултати:

Използването на естествен зъб като мостово тяло включен в подсилена с фибровлакна композитна пародонтална шина възстановява говорната, дъвкателната функция и естетичния вид в кратки срокове.

Заклучение:

Основните преимущества на тази техника са задоволителна естетика, възстановяване на функцията, консервативен подход и запазване на възможността за направа на друг тип възстановяване при нужда.

73. Хаджигаев, В.; Влахова, А.; Златев, С.; Тодоров, Р. & Попов, И.
Изработване на CAD/CAM конструкция по оптичен отпечатък. Клиничен случай
Сборник научни трудове "45 години Факултет дентална медицина, Медицински университет
- Пловдив", 2015

Резюме:

Увод:

Навлизането на дигиталните технологии в зъболекарската практика осигурява добра алтернатива на класическия протокол за снемане на отпечатъци в неподвижното зъбопротезиране.

Цел:

Целта на настоящата презентация е да представи клиничен случай с изработване на CAD/CAM мостова конструкция в пълен размер (на англ. full contour) по оптичен отпечатък.

Материали и методи:

На пациентка с липсващ зъб 46 беше планирано протетично възстановяване с тричленна мостова конструкция от керамика на основата на циркониев диоксид. След изпиляване на зъбите мостокрепителите 45 и 47 беше проведено интраорално сканиране с TRIOS, 3Shape. Създаденият по оптичния отпечатък дигитален работен модел беше използван за дизайн на мостова конструкция, която беше изрязана монолитно, в пълен размер от керамика на основата на циркониев диоксид.

Резултати и обсъждане:

Интраоралното сканиране на дистални зъби с цел създаване на дигитален работен модел е отлична алтернатива на класическия протокол за снемане на отпечатъци от протезното поле. При full contour CAD/CAM технологията последващото оцветяване и глазиране могат да бъдат проведени без необходимостта от реален модел. Монолитното изрязване на конструкцията осигурява необходимата здравина и задоволителна естетика в тези участъци.

Заклучение:

Използването на дигитален CAD/CAM работен модел, създаден по оптичен отпечатък от интраорално сканиране значително улеснява клиничния и лабораторен протокол при изработване на неподвижни конструкции върху дистални зъби.

Ключови думи: CAD/CAM, оптичен отпечатък, дигитален работен модел.

Abstract:

Introduction:

The pervasion of digital technologies in the dental practice provides a good alternative to the classical protocol for taking impressions in the Fixed Prosthodontics.

The purpose of this presentation is to describe a clinical case with CAD/CAM bridge restoration fabrication in full contour pursuant to optical impression.

Material and Methods:

The Patient with a missing tooth 46 was planned for prosthetic treatment with a three-unit bridge restoration made of ceramics based on zirconium dioxide. After preparation of the

abutment teeth 45 and 47, intraoral scanning process with TRIOS, 3Shape was performed. The created digital working cast was used for design of the bridge restoration, which was milled in full contour of ceramics based on zirconium dioxide.

Results and discussion:

Intraoral scanning of distal teeth in order to create a digital working cast is an excellent alternative to the classical protocol for taking impressions of the prosthetic field. In full contour CAD/CAM technology the subsequent staining and glazing can be conducted without the need for a real model. The monolithic milling process provides the necessary strength and satisfactory aesthetics in these areas.

Conclusion:

Using digital CAD/CAM working cast created pursuant to optical impression of intraoral scanning greatly facilitates the clinical and laboratory protocol in the fabrication of fixed prosthetic restorations on distal teeth.

Keywords: CAD/CAM, optical impression, digital working cast

74. Vlahova, A.; Kazakova, R.; Bojkova, T.; Hadzhigaev, V.; Zlatev, S. & Kissov, C.
First steps with CAD/CAM: A single crown design by 3shape dental system
Folia Medica, Folia Medica, 2015, 57, 50-51

Abstract:

Introduction:

Computer aided design / computer aided manufacturing (CAD/CAM) is a technology for prosthetic restorations design using software and fabrication by milling from a suitable material (ceramics, laboratory composite, plastic, metal alloy). The aim of this presentation is to acquaint the audience with the technology for taking an optical impression - with TRIOS (intraoral) scanner, optical working cast - with 3Shape WIELAND Dental D 800 (laboratory) scanner and the design possibilities with 3Shape Dental System software by presenting a clinical case finished with a single ceramic crown.

Materials and methods:

The clinical protocol for taking an optical impression and the laboratory scanning of plaster models were considered. The application possibilities of 3Shape Dental System for construction of various prosthetic restorations were summarized - single crowns and bridges, post-and-core restorations, splints, partial and complete dentures, individual impression trays, implant surgical guides, implant prostheses, orthodontic appliances, temporary restorations, prognostic wax-up. The materials and working tools were considered. The process of a single crown design with 3Shape Dental System was presented.

Results and discussion:

All steps of the design were described: insertion of direction, outlining preparation junction, providing a cement gap, choice of an optimal shape of the crown, initially positioning and shaping, final shaping, selecting distance between adjacent teeth and antagonists, smoothing and completion. The computer software 3Shape Dental System provides extremely precise and accurate design and fabrication of the prosthetic restoration.

Conclusion:

3Shape Dental System is an optimal solution for modern and efficient clinical and laboratory practice.

Key words: CAD/CAM, design, a single crown

75. Hadzhigaev, V.; Zlatev, S.; Todorov, G.; Georgieva, D. & Petrov, V.

Application of CAD/CAM technology in the construction of temporary FPD's as a stage of the prosthetic rehabilitation of the dentition

Folia Medica. Suppl. 1, 2015

Abstract:

Introduction:

An important stage in the construction of FPD is the preparation of temporary construction. They ensure keeping of function, esthetics, and the ability to conduct proper oral hygiene. Temporary constructions have a prophylactic effect during the treatment thus preserving the vitality of the prepared teeth. They prevent any movements of the prepared, adjacent and antagonist teeth in the area of the defect. With the utilization of a temporary construction a controlled regeneration of soft tissues is ensured.

Materials and methods:

The patient V. I. 43 years old contacted us with complaints of difficulties during eating. The clinical examination established two defects of the dentition with missing 26 and 46 teeth. Rehabilitation with two fixed partial dentures was proposed. A preliminary impression was taken, and a diagnostic model was poured. The model was scanned with 3D laboratory scanner – D800. The virtual models were analyzed in the software of 3Shape dental and two FPDs were modelled. The bridges were constructed in a 5-axis milling machine from PMMA. The FPD's are cemented with temporary cement (MetaBiomed, Korea).

Results:

The temporary bridges have with high precision. They have excellent color stability over a long period of time and good mechanical properties because of the pre-polymerized PMMA. Because of the ability to be polished perfectly, they improve hygiene, soft tissue regeneration and formation. Clinical and laboratory time is reduced.

Conclusion:

The utilization of CAD/CAM technology in the construction of temporary constructions gives excellent results.

Key words: provisional restoration, CAD/CAM

76. Hadzhigaev, V.; Zlatev, S.; Manchorova, N. & Kalachev, Y.

A survey of dentists on the application of endocrowns in their daily clinical practice

Folia Medica. Suppl. 1, 2015

Abstract:

Introduction:

The choice of method for rehabilitation of endodontically treated teeth with severely compromised tooth substance is of great importance, for ensuring good and long-lasting clinical results. One of the possibilities is the usage of endocrown. AIM: To survey the opinion of dentists in Bulgaria on the usage of endocrowns in their daily clinical practice. MATERIAL AND

Methods:

A group survey was conducted among 116 dentists during a general assembly of the Bulgarian Dental Association. It was anonymous and consisted of 9 questions. Five of these are about the usage of endocrowns as a method of choice in the clinical practice. Four of the questions are alternative with a positive or a negative answer. Two of the questions are about the difficulties which dentists encounter during the application of endocrowns. For statistical data processing the Student-Fisher and chi-square criterion were used.

Results:

With respect to gender respondents are equally distributed. The most frequent age group ranges from 31 to 40 years, and the least frequent is below 30 years. 72.41% of the participants have clinical specialty. Three quarters of the respondents have never used endocrowns. Dentists, who have difficulties using endocrowns are 21.57%. More than half of the respondents think that this type of construction will be used frequently in the future.

Conclusion:

With the development of dental materials, the usage of endocrowns is becoming easier and the clinical indications are increasing.

Key words: survey, endocrown

77. Vlahova, A.; Bozhkova, T.; Todorov, G. & Zlatev, S.

Modern CAD/CAM dental ceramics. Part 2. Ingots

15th Jubilee Scientific Congress of the BgDA, 2015

Abstract:

Introduction:

Today the most commonly used in dentistry CAD/CAM ceramics in the form of blocks are based on silicon-dioxide (so-called glass-ceramics) - traditional feldspar with increased leucite content and lithium-disilicate ones, ceramics based on zirconia dioxide and combinations between them, and so-called hybrid ceramics - ceramic-polymer network structure.

Aim:

The purpose of this presentation is to provide basic information about these materials, as well as the features of processing them.

Material and methods:

Some representatives of glass-ceramics were described - feldspar (VITABLOCS Mark 2 and VITABLOCS Trilux forte, Vita Zahnfabrik, Germany) and lithium-disilicate (IPS e.max CAD, Ivoclar Vivadent, Liechtenstein). The hybrid ceramic VITA ENAMIC CAD/CAM, Vita Zahnfabrik, Germany was presented. Combinations of lithium-disilicate and zirconium ceramics were mentioned (VITA SUPRINITY, Vita Zahnfabrik, Germany and IPS e.max ZirCAD, Ivoclar Vivadent, Liechtenstein).

Results:

The technological features of processing of CAD/CAM ceramics in the form of blocks were presented. In most of the cases they are previously partially and fully sintered and milling under water cooling is obligatory.

Conclusion:

Development of the ceramic CAD/CAM industry is a dynamic and continuously enriches dental and laboratory practice with new materials.

Резюме:**Въведение:**

Днес най-често използваните в зъболекарската практика CAD/CAM керамики под формата на блокчета са на основата на силициевия диоксид (т.нар. стъклокерамики) - традиционни фелдшпатови с увеличено левцитно съдържание и литиево-дисиликатни, керамики на основата на циркониевия диоксид и комбинации между тях, както и т. нар. хибридна керамика - керамично-полимерна мрежеста структура.

Цел:

Целта на настоящата презентация е да представи основна информация за тези материали, както и за особеностите по обработката им.

Материал и методи:

Описани са представители на стъклокерамиките - фелдшпатови (VITABLOCS Mark 2 и VITABLOCS Trilux forte, Vita Zahnfabrik, Germany). Представена е хибридната керамика VITA ENAMIC CAD/CAM (Vita Zahnfabrik, Germany). Споменати са и комбинации между литиево-дисиликатна стъклокерамика и керамика на основата на ZrO₂ - VITA SUPRINITY (Vita Zahnfabrik, Germany) и IPS e.max ZirCAD (Ivoclar Vivadent, Liechtenstein).

Резултати:

Представени са технологичните особености по обработката на CAD/CAM керамиките под формата на блокчета. В повечето случаи те са предварително частично и напълно синтеровани и изрязването им е задължително под водно охлаждане.

Заклучение:

Развитието на Керамичната CAD/CAM индустрия е динамичен процес и непрекъснато обогатява зъболекарската и зъботехническата практика с нови материали.

78. Yankov, S.; Hristov, S.; Slavchev, D.; Zlatev, S. & Alexandrova, V.
Retrospective analysis of the luting agents for cementation of the metal-free restoration
19th Congress of the BaSS, 2014

Abstract:

Background:

The cementation of aesthetic constructions requires a precise approach in the choice of a luting agent.

Purpose:

The aim of the present study is to make a retrospective analysis of so far used luting agents in particularly for aesthetic constructions.

Materials and Methods:

We make a description of the so far used cements, from the moment of their invention, until today, while reviewing different types of cementing agents and their application for aesthetic restorations. We start with the first cements used in the dental practice – magnesium-chloric and phosphate, mention the polycarboxylate and silicate, and end up with glass-ionomer, resin and hybrid cements. We note the advantages and disadvantages of the different types of cements and how this reflects on distribution amongst dentists, for fixation of aesthetic constructions.

Results:

We follow up the development and the application of the different types of cements over time.

Conclusion:

The phosphate and glass-ionomer cements, along with the modern resin cements are the most used for cementing aesthetic constructions.

Key words: Cements, aesthetic constructions

79. Todorov, R.; Zlatev, S.; Dimitrov, D.; Aleksandrov, S. & Bozhkova, T.
A novel device for individual determination of the transparent zone of maxillary frontal teeth.
19th Congress of the BaSS, 2014

Abstract:

Introduction & Aim:

Achieving anatomical, physiological, and esthetic recovery of the dentition is the goal of contemporary restorative dentistry. This process requires an adequate restoration of color and translucency of missing or damaged dental tissues. In dentistry the method of transillumination is used mainly for diagnosis and detection of carious lesions in areas which are not visible directly and for visualization of cracks and presence of subgingival calculus. The purpose of the current publication is to present a novel device for visualization of transparency zone in frontal natural dentition using the principles of transillumination.

Materials and Method:

We propose a new application of transillumination. The enamel and dentine have different behaviour under illumination and scatter light in different manner. Our device is using visible light, which is illuminated from the lingual part of the dentition. In this way the transparent

zone is visible, and the individual configuration of this zone may be used by the dentist or transmitted to the dental technician.

Results:

The device was tested in-vivo. The results are satisfactory. The transparent zone of incisors is clearly visible and defined. This information can be transmitted to the dental laboratory. We believe that the suggested device may contribute and support the aesthetic treatment.

80. Александров, С.; Божкова, Т.; Димитров, Д.; Златев, С. & Александрова, В.
Изцяло керамични корони клиничен протокол при циментиране
Сборник с резюмета от 14ти научен конгрес на БЗС, 2014

81. Христов, И.; Павлов, Б.; Александров, С. & Златев, С.
Изследване промяната на твърдостта на три вида меки ребазиращи материали след термоциклиране
Научни трудове на Съюза на учените в България – Пловдив, 2014

Резюме:

Въведение:

Меките ребазиращи материали се използват в стоматологията от средата на миналия век. Те са претърпяли дълга еволюция за да се стигне до познатите ни днес материали. Въпреки своите многобройни предимства, те имат и редица недостатъци. Един такъв основен проблем се явява повишаването на тяхната твърдост, след по-продължителен престой в условията на устната кухина и по този начин превръщането им от резилентни в ригидни. За нуждите на изследването изработихме по 10 пробни тела от три различни ребазиращи материала с дебелина 2,5мм. и диаметър 20мм. Чрез метода на термоциклирането ние си поставихме за цел изкуствено да „състарим“ пробните тела (подобно на престоя им в устната кухина) и в последствие използвайки апарата на Шор да видим каква е разликата в твърдостта им.

82. Хаджигаяев, В.; Ничева, С. & Златев, С.
Сравнителна оценка на два метода за изработване на адхезивни мостови конструкции от посилен с фибровлакна композит
14 ти научен конгрес на БЗС, 2014

Abstract:

Адхезивната мостова конструкция от посилен с фибровлакна композит е известна със своите щадящи твърдите зъбни тъкани характеристики. Тя (inlay-retained FRC FDPs) се счита за алтернатива на конвенционалната мостова конструкция и поставянето на имплант. Фиброкомпозитната мостова конструкция може да бъде изработена директно в устата на пациента или индиректно в лаборатория. Индиректната техника изисква две посещения на пациента, но улеснява клинициста от гледна точка на манипулативност. При директната техника, от друга страна, е по-добра адхезията на композиционните материала

ли към непосредствено препарираните емайл и дентин, тъй като така се елиминира тяхната контаминация от поставения временен obturativ материал. В настоящия доклад са представени два протокола за изработване на адхезивна композитна мостова конструкция и са сравнени техните предимства и недостатъци.

Индириктен протокол:

Първо посещение:

1. Анализ на клиничната ситуация
2. Анестезия, отстраняване на плака и зъбен камък, изолация
3. Препарация на ТЗТ
4. Снемане на отпечатък
5. Изработване на временна конструкция

Второ посещение:

6. Ажустиране и фиксиране на постоянната конструкцията.

Модифициран директен протокол:

1. Анализ на клиничната ситуация - индикации/ контраиндикации
2. Анестезия, отстраняване на плака и зъбен камък, изолация
3. Препарация на ТЗТ
4. Нанасяне на адхезив
5. Ажустиране и фиксиране на гингивалната част на мостовото тяло
6. Адаптиране на предварително подготвени фибровлакна
7. Моделаж на оклузалната част на мостовата конструкция
8. Ажустиране на оклузията, финалиране и полиране

83. Димитров, Д.; Влахова, А.; Кисов, Х.; Казакова, Р. & Златев, С.

Клинична оценка на мокренето на различни адитивни силиконови отпечатъчни материали

Наука и Младост, 2013, 242-245

Резюме:

Въведение:

Мокренето е физичен феномен, който е проява на повърхностното напрежение на течностите. При отпечатъчните материали степента на мокрене има голямо значение за точността на снетите отпечатъци.

Цел:

Целта на настоящата публикация е да представи лесен клиничен метод за оценка на мокренето на различни адитивни силиконови отпечатъчни материали.

Материали и методи:

За нашето клинично проучване ние използвахме една „heavy body“ и две различни „light body“ консистенции от адитивни силикони. Избрахме този клас отпечатъчни материали, тъй като се предлагат в контейнерни опаковки за смесителен пистолет (диспенсър), което улеснява едновременното използване на различни кремообразни силикони, а също така широко се използват в практиката за снемане на прецизни отпечатъци в неподвижното

зъбопротезиране. Подбрахме пациенти с минимум два, препарирани за неподвижни протезни конструкции, зъба, от които снемме двуфазни двупластови отпечатъци. За първоначалния отпечатък използвахме тестообразен („heavy body“) силикон, който коригирахме с по два вида „light body“ консистенции от различни адитивни силикони в областта на изпилените зъби.

Резултати и Обсъждане:

Използването на различни кремообразни адитивни силикони при един и същ пациент ни дава възможността за визуална сравнителна оценка на мокренето им при еднакви условия. Всяка фирма предлага силиконови отпечатъчни материали с подобрена хидрофилност, но не винаги те покриват очакването на стоматолозите. Това е един много лесен и обективен метод всеки стоматолог сам за себе си да прецени в дадена клинична ситуация кой отпечатъчен материал е по-подходящ да се използва.

Заключение:

Приложената от нас комбинирана техника за снемане на отпечатък позволява изключително бърза и лесна преценка за качествата на използваните в клиничната практика адитивни силиконови отпечатъчни материали. Ние препоръчваме този метод за сравнение на мокренето също и за различни кондензационни силикони. Използваните материали на фиг.6, 7 и 8 са: Heavy body Swisstec, Coltene, Light body Swisstec, Coltene и Light body Zetaflow, Zhermack.

84. Хаджигаяев, В.; Манчорова, Н.; Тодоров, Г. & Златев, С.

Приложение на методът на крайните елементи в денталната медицина
Наука и Младост, 2013

Резюме:

Основна цел на стоматологичното лечение е възстановяването на увредената форма функция и естетика на зъба отделната зъбна дъга и съзъбието. За да се постигнат оптимални резултати са необходими голям опит и познания на клинициста осъществяващ лечението както и висококачествени материали наподобяващи в максимална степен качествата на естествените зъби и други тъкани в организма.

Цел:

В настоящата статия ще бъде представено историческото развитие на МКЕ в света и в България чрез анализ на публикациите (общ брой и година на издаване) в електронни научни бази данни PubMed и ScienceDirect. Ще бъде изведен алгоритъм за изграждане на триизмерен зъбен модел, въз основа на световен и собствен опит.

Заключение:

В бъдеще развитието на МКЕ следва да се насочи към опростяване на протокола по изграждане на биологични обекти чрез автоматизиране на процесите. Това би поставило началото на нов подход в лечебното планиране чрез виртуални прогностични модели по индивидуални стойности. Създаването на специфични за всеки пациент симулации и определянето на оптималната възстановителна конструкция за конкретния, индивидуален случай ще бъде част от ежедневната клинична практика на следващото десетилетие.

85. Казакова, Р.; Деянов, Д.; Кисов, Х.; Тодоров, Г.; Влахова, А. & Златев, С.
Психомедицинско изследване на болни, подлежащи на неподвижно протезиране, с оглед на психологията на преживяемостта
Наука и Младост Сборник научни съобщения от конкурсна сесия, 2013

86. Тодоров, Р.; Тодоров, Г. & Златев, С.
Сравняване цветовите характеристики на горни централни резци и горни кучешки зъби
Дни на медицинската наука. Сборник с резюмета., 2013

Резюме:

Въведение:

Адекватното цветоопределяне е съществен етап за постигане на качествени естетични възстановявания. В ежедневната си практика лекарят по дентална медицина все още най-широко използва визуалния метод за цветово регистриране. В последните десет години стана възможна употребата на апарати, подпомагащи цветовото определяне. По този начин информацията за цветовите нюанси на естествените зъбни тъкани става по-лесна за регистриране, по-точна и по-обективна.

Цел:

Да се съпоставят и оценят разликите в цветовото разпределение на горен централен резец и кучешки зъб, като се използва обективен метод за регистрирането им.

Материали и методи:

За целта на изследването беше използван клиничния спектрофотометър SpectroShade Micro (МНТ Optic Research, Verona, Italy). Това е устройство от цветоопределящите системи, което комбинира получаването на цифрови изображения със спектрофото-метричен анализ. Апаратът използва комбинацията на цифров апарат и LED спектрофотометър. Разполага с вграден компютър и аналитичен софтуер.

В настоящото изследване са снети стойностите на цветовите нюанси на 54 човека. Бяха направени необходимите регистрирания, следвайки инструкциите и протокола за работа на фирмата производител. След обработка на снетите данни посредством софтуерната програма, която се прилага в допълнение със Spectro Shade, данните бяха подложени на статистически анализ.

Резултати и обсъждане:

Открива се статистически значима разлика между отделните зони на всеки зъб и двете изследвани групи зъби.

Заклучение:

Имайки предвид получените данни чрез апаратно цветоопределяне, може да се посочат значителните му предимства- липсата на субективност, лесно манипулиране и съхранение и голяма точност на снетите данни.

87. Hadzhigaev, V.; Manchorova-Veleva, N.; Zlatev, S. & Todorov, G.
Bone support Influence on stress distribution in finite-element dental models
Continental European Division Meeting (Florence, Italy), 2013

Abstract:

Objective:

The main goal of dentistry is to restore the impaired form, function and esthetics of the single tooth, the dental arch, and the dentition. The clinical work includes the application of different biomaterials to treat impairments, which are various in natures. The system tooth-biomaterial is subjected to masticatory forces, thermal and volume changes. The classical methods of research are aimed at a specific material instead of the tissue-material complex. In order to solve the emanating problems finite element method can be used. FEM is a mathematical method for solving partial differential and integral problems, which enables numerical analysis of systems with unique form and combination of materials. The results are highly informative, representative, and reproducible.

Purpose:

The purpose of the current study is to evaluate the changes in stress distribution of finite element dental model with and without bone support.

Method:

A tooth model of a first upper premolar and molar with periodontal ligaments were created using Solid works. Bone support was added at a level representing a sound periodontal complex. Different single tooth restorations were simulated – direct restoration, inlay, onlay, overlay, crown. Three-unit FPD was simulated with standard full-coverage crowns.

Result:

In cases where single tooth restorations are tested the presence of bone support does not alter the results. When a FPD is simulated, bone support could produce different results, making the model more representative.

Conclusion:

When FEM models represent the anatomical details more accurately the obtained results are closer to the real in vivo conditions.

88. Hadzhigaev, V.; Zlatev, S.; Todorov, G. & Manchorova, N.
Prosthetic rehabilitation of patients with severe tooth wear
13th Scientific Congress of the BgDA, 2013

Abstract:

Introduction:

Tooth wear is a loss of hard tooth substance. When this process is a result of the normal function it is defined as abrasion. The type of occlusion and the dominating jaw movements determine the form of the abraded surface.

Purpose:

The aim of the current presentation is to show the prosthetic treatment protocol of cases with severe tooth wear.

Material and Methods:

In cases when severe tooth wear is present it is necessary to follow the clinical protocol strictly.

The prosthetic treatment includes 3 stages:

1. Diagnosis and treatment protocol
2. Change of VDO
3. Making of final construction

In the clinical cases that are presented, the treatment is carried out with thermo vacuum formed splint in the second stage and fixed partial dentures in the final stage.

Results:

In all the presented cases a balanced occlusion and recovery of the normal function and esthetics is achieved. The progression of the abrasion, the pathological change in vertical occlusal dimension and all their consequences are prevented.

Conclusion:

Following the clinical protocol is mandatory in order to achieve predictable, satisfactory result and to prevent the complication that can occur with lowering the VDO.

Резюме:

Въведение:

Износването на зъбите е загуба на твърдо зъбно вещество. Когато този процес е резултат от нормалната функция, той се определя като абразия. Видът на оклузията и доминиращите движения на челюстта определят формата на ожулената повърхност.

Цел:

Целта на настоящата презентация е да покаже протокола за протезно лечение на случаи с тежко износване на зъбите.

Материал и методи:

В случаите на силно износване на зъбите е необходимо стриктно да се спазва клиничният протокол. Протезирането включва 3 етапа:

1. Диагностика и протокол за лечение
2. Смяна на височината на захвапката
3. Изработване на окончателна конструкция

В клиничните случаи, които са представени, лечението се извършва с термо вакуумно оформена шина във втория етап и фиксирани частични протези в последния етап.

Резултати:

Във всички представени случаи се постига балансирана оклузия и възстановяване на нормалната функция и естетиката. Прогресирането на абразията, патологичната промяна във вертикалното оклузално измерение и всичките им последствия се предотвратяват.

Заключение:

Спазването на клиничния протокол е задължително, за да се постигне предсказуем, удовлетворителен резултат и да се предотвратят усложненията, които могат да възникнат при понижаване на височината на захвапката.

89. Александров, С.; Тодоров, Г.; Кисов, Х.; Златев, С. & Александрова, В.
Опитна постановка за тестване сила на сръзване, микроопън и микронатиск
Наука и Младост Сборник научни съобщения от конкурсна сесия 2013, 2013

Резюме:

Въведение:

Показателни за здравината на връзката между различни стоматологични материали, са силите на сръзване, микроопън и микронатиск, които се развиват на граничната им повърхност.

Цел: Проектиране и направа на задръжен елемент и оптни тела, които едновременно да осигурят възможност за тестване силите на сръзване, микроопън и микронатиск.

Материали и Методи: На платформата на апарат за микроопън и микронатиск LMT 100 (LAM Tehnologies), се проектира и изработи задръжен елемент с натоварваща част за определяне сила на сръзване. Допълнително се направи враждаща се част за тестване на опитни образци за микроопън и микронатиск. Модел на задръжното средство предложихме в графичен и триизмерен формат преди неговото изработване от неръждаема стомана. Готовите детайли допълнително бяха подложени на закаляване и поцинковане.

Резултати и Обсъждане: Тестовите проведени с разработения задръжен елемент, дадоха отличен резултат в изпитване на опитни образци от лабораторен композит и различни метални сплави, както и образци от зъбни тъкани адхезивно свързани с лабораторен композит.

Изводи: Универсалният потенциал на задръжното средство създава предпоставки за многоцелеви тестови изпитания на различни дентални материали.

90. Александров, С.; Тодоров, Г.; Христов, С.; Златев, С. & Александрова, В.
Предварителни конструкции, основен планиращ елемент в клиниката на естетичното зъбопротезиране
Дни на медицинската наука. Сборник с резюмета., 2013

Резюме:

Въведение:

Основен диагностичен прийом, при разрешаването на сложни клинични ситуации, с акцент във фронталната област на съзъбието е изработването на предварителни и прогностични конструкции. Детайли във форма, размери, контактни точки, микрорелеф, могат да бъдат реализирани и допълнително моделирани, чрез предварителен восьчен моделаж.

Цел:

Представяне на типови клинични ситуации, за чието разрешаване е приложен успешно предварителен и прогностичен моделаж.

Материали и методи:

Чрез адитивна, субстрактивна или комбинирана техника на моделиране се реализира прототипна конструкция, с високотопим воськ с цвят близък до този на естествените зъб-

ни тъкани.

Резултати и дискусия:

Прогностичните конструкции притежават висок естетичен, профилактичен и диагностичен потенциал.

Заключение:

Реализираните случаи предоставят информация и основание за категоричен подход при планиране и конструиране на протезните конструкции.

91. Влахова, А.; Хаджигяев, В.; Казакова, Р. & Златев, С.

Коригиране на височината и равнината на оклузия с термовакуумно оформени шини и с прогностичен восьъчен моделаж - предимства и недостатъци. Клинични случаи
Дни на медицинската наука. Сборник с резюмета., 2013

Резюме:

Въведение:

Височината на оклузия при пациентите се променя в резултат от различни фактори: сенилни (физиологично зъбна атриция), патологични (загуба и преместване на зъби; зъбна атриция, резултат от бруксизъм; абразия и ерозия] и ятрогенни (неправилно проведено протетично лечение).

Цел:

Целта на настоящото изследване е да предложи две различни техники за коригиране на височината и равнината на оклузия - чрез термовакуумно оформени шини и чрез изработени по прогностичен восьъчен моделаж временни конструкции.

Материали и методи:

Клиничният протокол при сложни протетични случаи започва със снемането на предварителни отпечатъци, отливане на диагностични гипсови модели и изготвяне на лечебен план. При големи корекции във височината на оклузия важен момент е избор на метод за фиксиране на ново-определените стойности. В настоящото изследване са представени две такива техники, използващи помощни конструкции. При използване на термовакуумно оформени шини се подбира подходящо по дебелина фолио, което се изтегля върху гипсов модел на запазената зъбна дъга. Друг метод на избор при фиксиране на ново-определената височина е изработването на временни конструкции директно в кабинета по прогностичен восьъчен моделаж. Представени са клинични случаи, при които се използват двата метода.

Резултати и обсъждане:

И двете описани техники за фиксиране на нов определена височина на оклузия могат да се приложат успешно при спазване на индикациите им.

Заключение:

Изпълнението на утвърдените протоколи на работа при трудни случаи на протетична рехабилитация повишава ефективността на работния процес и намалява риска от грешки и усложнения. При добро познаване на показанията и противопоказанията на различните методи за корекция на височината на оклузия и техните предимства и недостатъци ле-

карят по дентална медицина има възможност да реагира адекватно на различни клинични ситуации.

92. Hadzhigaev, V.; Manchorova-Veleva, N. & Zlatev, S.
Stress distribution in FPD with endocrown a 3D FEA study
2012 IADR/LAR General Session, 2012

Abstract:

Objective:

The objective of this in vitro study was to determine the functional stress distribution of a pontic-teeth interface with different designs of the preparation and the construction.

Method:

Two human teeth – a premolar and a molar were digitized using a micro-CT scanner with a resolution of 0.625 mm. A 3D solid model was prepared and exported into a 3D FE program (Solid Work Office Premium Edition 2011). A distal defect in the dentition was created, by positioning the two teeth at a distance of one molar and one premolar standart mesio-distal width. Periodontal ligaments, cortical and trabecular bone were added and assigned with modulus of elasticity. Two different preparation designs for endocrowns were created for the distal abutment tooth – standart and conservative. Tangential profile was chosen for the pontic's body. The cementing layer was created in the FE program with a thickness of 50 μm . In the current study was postulated that all of the materials are homogenous, isotropic and elastic. A validation procedure was executed based on comparison of theoretical calculations and experimental data according to the literature. Functional loading (300N axial and oblique forces) was carried out for each combination of materials, pontic design and type of preparation.

Result:

Functional stress distribution of teeth-cement-pontic interfaces have been observed in a series of experiments. The highest levels of stress were observed in the distal connector area of the pontic. Stress values at the preparational border of the distal tooth restored by the means of endocrown were low.

Conclusion:

An endocrown preparation design of the distal teeth in FPD is favorable in terms of functional stress distribution.

93. Кисов, Х.; Казакова, Р.; Влахова, А.; Христозова, М.; Стойкова, М.; Златев, С. & Шишманов, И.

Успоредност между линията на усмивката и бипупилната линия
12^{та} НАУЧЕН КОНГРЕС НА БЗС, 2012

Introduction:

In order to achieve esthetic dental reconstructions, different anthropometrical references are used to acquire maximal function and esthetics. To accomplish esthetic result at the frontal segment of the dentition, interrelations like the parallelism between the bipupillary line and the smile line should be followed. The aim of the present research is to check whether the parallelism between the bipupillary line and the smile line is a generally applicable rule, which can be applied to every patient

Materials and methods:

200 students at Faculty of Dentistry of Medical University, Plovdiv were included in the research. Each one of them has been photographed six times – three photos at frontal view and three photos at profile view, which were lined, using a program for graphic processing Corel draw. In order to achieve objective results, randomization via step two was used. The research was consistent to the protocol of Consort Statement for standardizing and publishing clinical researches. The data analysis was done by a program for statistical processing SPSS.

Results and discussion:

In 55,1% of the examined women and 37,5% of the examined men no parallelism between the two lines is present. As a whole, 46,1% of the examined people there is no parallelism. The deviation varies from 0,8° to 4,53°.

Conclusion:

Within this research it was established that every third man and every second woman lack parallelism between the bipupillary line and the smile line. In order to achieve results, close to individual peculiarities of the given patient, other anthropometrical references should be used – i.e., the lower lip line and the intercomissural line.

Key Words: Esthetics, anthropometric references, smile line, bipupillary line, intercomissural line

Резюме:

Въведение:

При естетичните възстановявания и реконструкция на съзъбието се използват различни антропометрични ориентирни с цел да се постигне оптимална функция и естетика. Във фронталния сегмент за добиване на естетичен резултат се спазват съотношения като успоредността на бипупилната линия с линията на усмивката.

Цел:

Целта на настоящото изследване е да се провери дали успоредността между бипупилната линия и линията на усмивката е общовалидна закономерност, която може да бъде използвана при всеки пациент.

Материали и методи:

В изследването са включени 200 студента от факултета по дентална медицина в МУ Пловдив. На всеки от тях са направени 6 фотоснимки – три в профил и три в анфас, които след това са разчертани чрез програма за графична обработка Corel draw. С цел получаване на обективни резултати се прилага принципа на случайният подбор със стъпка 2. Изследването е съобразено с протокола на група Consort за стандартизиране и публикуване на клинични проучвания. Анализът на данните се извърши чрез програма за статистическа обработка SPSS.

Резултати и дискусия:

При 55,1 % от изследваните жени и 37,5 % от изследваните мъже не се наблюдава успоредност между двете линии. Общо при 46,4 % от всички изследвани няма успоредност между линиите. Отклоненията варират от 0,8° до 4,58°.

Заклучение:

В рамките на това изследване се установи, че при всеки трети мъж и всяка втора жена липсва успоредност между бипупилната линия и линията на усмивката. С цел да се получат резултати по близки до индивидуалните особености на даденият пациент, следва да се използват други антропометрични ориентирни - като например линията на долната ус-тна и интеркомисуралната линия.

Ключови думи: естетика, антропометрични ориентирни, линия на усмивката, бипупилна линия, интеркомисурална линия

94. Hadzhigaev, V.; Hadzhigaev, I. & Zlatev, S.

Complex prosthetic rehabilitation in patient with changes in the occlusal plane by means of endo-crowns: case report

12th Scientific Congress Of The BgDA, 2012, 51

Introduction:

In cases where complex prosthetic rehabilitation combined with balancing of the articulation and protection of the temporo-mandibular joint from excessive loads it is necessary to create an overall plan for oral rehabilitation.

Case report:

The patient A.B. visited our practice because of missing teeth in the lower right quadrant of her dentition and pain in the temporomandibular joint. During the exam it was stated that teeth 45 and 46 are missing, and there are old FPDs with inadequate occlusal surfaces. The occlusal plane is highly compromised with evidence of Popov-Godon phenomenon type two, and fixed partial dentures made separately with no account for the overall function. With the informed consent of the patient a decision was taken for replacement of the old restorations and correction of all of the defects in her dentition. Because of insufficient height of the clinical crowns of the distal teeth, they were prepared for endocrowns in order to increase the contact surface and improve the retention of the restoration. The bite of the patient was raised with 1,5 mm with the use of provisional restorations placed on the mandible. After the fixation of the final restorations two FPDs were made for the maxillae – two endocrowns for the left quadrant and a bridge construction for the right quadrant. All the impressions were taken with single phase method and individual impression tray with “A” silicone.

Conclusion:

In complicated cases uniting insufficient crown height with Popov-Godon phenomenon the use of endocrowns ensures an excellent functional, prophylactic, and esthetically pleasing result.

Key Words: Prosthetic rehabilitation, occlusal plane, endocrowns

Резюме:

Въведение:

При случаи с необходимост от сложна протетична намеса, балансиране на оклузоартикуляционните взаимоотношения и предпазване на темпоромандибуларната става от прекомерни натоварвания е необходимо изготвянето на цялостен план за орална рехабилитация.

Клиничен случай:

Пациентката А.В. на 45 години посети кабинета ни поради липса на зъби в долният десен квадрант на съзъбието и, болки в темпоромандибуларната става с по голям интензитет в ляво. При прегледа се установиха липсващи зъби 45 и 46, наличие на стари протезни конструкции изработени без адекватен оклузален релеф и широки оклузални повърхности. Оклузионната равнина е силно компрометирана поради наличието на феномена на Попов-Годон втори тип и неподвижни възстановявания изработени „на парче“. Със съгласието на пациентката се одобри план за лечение включващ подмяната на старите протезни конструкции с нови и коригиране на наличните дефекти. Поради недостатъчната височина на дисталните мостоносители, препаратите им и конструкциите са с дизайн на ендокорони. Първо се направиха протезните конструкции на долната челюст. През време на изработването им на мястото на старите възстановявания се поставиха временни конструкции, които освен профилактичното си действие, се моделираха така че да повдигнат захапката с 1,5 мм. След фиксирането на мостовите конструкции на долна челюст се пристъпи към изработване на конструкциите за горна челюст представляващи две ендокорони в блок за горният ляв сегмент и мостова конструкция с мостоносители 14 и 17. Всички отпечатъци се взеха с едноетапен еднофазен метод посредством използване на индивидуални лъжици и „А“ силикон в течлива консистенция.

Заклучение:

Чрез използването на ендокорони при сложни случаи комбиниращи недостатъчна височина на зъбните пънчета и феномен на Попов-Годон се постига отличен функционален, профилактичен и естетичен резултат.

95. Казакова, Р.; Кисов, Х.; Златев, С.; Хаджигаяев, В.; Шишманов, И.; Тодоров, Р.; Шопова, Д. & Стойкова, М.

Взаимоотношение между перпендикулярите, спуснати от върха на каниновия режещ ръб и точката Аларе

Дни на медицинската наука, 2012

Introduction:

In order to achieve esthetic dental reconstructions, different anthropometrical references are used to acquire maximal function and esthetics. To accomplish esthetic result at the frontal segment of the dentition, interrelations like the parallelism between the bipupillary line and the smile line should be followed. The aim of the present research is to check whether the parallelism between the bipupillary line and the smile line is a generally applicable rule, which can be applied to every patient

Materials and methods:

200 students at Faculty of Dentistry of Medical University, Plovdiv were included in the research. Each one of them has been photographed six times – three photos at frontal view and three photos at profile view, which were lined, using a program for graphic processing Corel draw. In order to achieve objective results, randomization via step two was used. The re-search

was consistent to the protocol of Consort Statement for standardizing and publishing clinical researches. The data analysis was done by a program for statistical processing SPSS.

Results and discussion:

In 55,1% of the examined women and 37,5% of the examined men no parallelism between the two lines is present. As a whole, 46,1% of the examined people there is no parallelism. The deviation varies from 0,8° to 4,53°.

Conclusion:

Within this research it was established that every third man and every second woman lack parallelism between the bipupillary line and the smile line. In order to achieve results, close to individual peculiarities of the given patient, other anthropometrical references should be used – i.e., the lower lip line and the intercomissural line.

Key Words: Esthetics, anthropometric references, smile line, bipupillary line, intercomissural line

Резюме:

Въведение:

При естетичните възстановявания и реконструкция на съзъбието се използват различни антропометрични ориентир с цел да се постигне оптимална функция и естетика. Във фронталния сегмент за добиване на естетичен резултат се спазват съотношения като успоредността на бипупилната линия с линията на усмивката.

Цел:

Целта на настоящото изследване е да се провери дали успоредността между бипупилната линия и линията на усмивката е общовалидна закономерност, която може да бъде използвана при всеки пациент.

Материали и методи:

В изследването са включени 200 студента от факултета по дентална медицина в МУ Пловдив. На всеки от тях са направени 6 фотоснимки – три в профил и три в анфас, които след това са разчертани чрез програма за графична обработка Corel draw. С цел получаване на обективни резултати се прилага принципа на случайният подбор със стъпка 2. Изследването е съобразено с протокола на група Consort за стандартизиране и публикуване на клинични проучвания. Анализът на данните се извърши чрез програма за статистическа обработка SPSS.

Резултати и дискусия:

При 55,1 % от изследваните жени и 37,5 % от изследваните мъже не се наблюдава успоредност между двете линии. Общо при 46,4 % от всички изследвани няма успоредност между линиите. Отклоненията варират от 0,8° до 4,58 °.

Заклучение:

В рамките на това изследване се установи, че при всеки трети мъж и всяка втора жена липсва успоредност между бипупилната линия и линията на усмивката. С цел да се получат резултати по близки до индивидуалните особености на даденият пациент, следва да се използват други антропометрични ориентир - като например линията на долната устна и интеркомисуралната линия.

Ключови думи: естетика, антропометрични ориентир, линия на усмивката, бипупилна линия, интеркомисурална линия

96. Hadzhigaev, V.; Manchorova-Veleva, N. & Zlatev, S.
A 3D-FEA study on stress distributions in tooth-post interfaces
2012 Pan European Region Meeting (Helsinki, Finland), 2012

Abstract:

Objectives:

The purpose of this study was to investigate the functional stress distributions of dentin-post interfaces in a three-dimensional finite element (3D FE) model of a human upper premolar with various types of metal and fiberglass post systems.

Methods:

The human upper premolar was digitized with a micro-CT scanner with a resolution of 0.625mm. A 3D solid model was prepared and exported into a 3D-FE program (Solid Works Office Premium, 2011). Additionally four models of various passive and active metal posts and fiberglass once were simulated by a proper choice of mesh volumes. All models were restored adhesively with nanocomposite. A validation procedure of the FE model was executed based on comparison of theoretical calculations and experimental data according to literature. The polymerization shrinkage was modelled using temperature dependent expansion. The adhesive layer was produced in the FE program with a thickness of 30µm. FE simulations of functional loading (300 N axial and oblique forces) were carried out for each combination of post system, boundary conditions and material properties.

Results:

Functional stress distributions of tooth-post interfaces of restored premolars have been observed in a series of experiments and depended on the material of post system and the bond strength of cemented layer. In all metal post systems, root canal dentin is more stressed than in fiberglass posts.

Conclusions:

Fiberglass post systems have more favourable functional biomimetic behaviour when restoring endodontically treated teeth.

Резюме:

Цел:

Целта на това изследване е да се изследва разпределението на функционалните напрежения на интерфейсите на дентин-стълб в триизмерен модел с крайни елементи (3D FE) на човешки горен премолар с различни видове метални и стъклени системи от стъклени влакна.

Методи:

Горният премолар на пациент се дигитализира с микро-СТ скенер с разделителна способност 0,625 mm. Изготви се 3D солиден модел и се експортира в програма за 3D-FE (Solid Works Office Premium, 2011). Допълнително четири модела от различни пасивни и активни метални щифтове и такъв от фибростъкло пресъздадоха чрез дефиниране на оп-

тимални параметри в софтуера за омреждане. Всички модели бяха възстановени адхезивно с нанокompозит. Извърши се процедура за валидиране на модела на крайните елементи въз основа на сравнение на теоретични изчисления и експериментални данни според литературата. Свиването при полимеризацията се моделира с помощта на температурно зависимо разширение. Адхезивният слой се създаде софтуерно с дебелина 30 μm . Бяха проведени симулации на функционално натоварване (300 N аксиални и наклонени сили) за всяка комбинация от щифтова система, гранични условия и свойства на материала.

Резултати:

Разпределението на функционалното напрежение на контактните повърхности на щифтовите пълчета на възстановени премоляри е наблюдавано в поредица от експерименти и зависи от материала на опорната система и силата на свързване на циментиращия слой. Във всички метални щифтови системи дентинът на кореновия канал е по-напрегнат, отколкото при изграждане със щифтове от фибростъкло.

Заключение:

Системите със стъклени влакна имат по-благоприятно функционално-биомиметично поведение при възстановяване на ендонтски лекувани зъби.

97. Aleksandrov, S.; Hadshigaev, V.; Stoykova, M. & Zlatev, S.

TECHNIQUE FOR MANUFACTURING AN ESTHETICPROVISIONAL FPD: CLINICAL CASES

12th SCIENTIFIC CONGRESS OF THE BgDA, 2012

Introduction:

When teeth are to be extracted in the esthetic zone of the dentition and an immediate final restoration is not an option, it is necessary preserve the esthetic and function of the patient.

Clinical case:

The Patient S.U. visited our practice in a bad condition that required a multidisciplinary approach, during which the four mandibular incisors needed to be extracted. Because of the severely impacted periodontium of those teeth a significant bone resorption is expected, which will negatively influence the restoration with a FPD immediately after the healing of the extraction wounds. Because of that a provisional restoration from laboratory composite material with dental and gingival part was made. The technique of manufacturing includes several stages. Impressions from both jaws with alginate and standard metal trays were taken. Bite registration was made with C silicone material. From the impressions working models were cast which were then fixed in an articulation device. The four incisors were cut off from the working model and on there place standard plastic teeth from a total prosthesis set were fixed. The gingival figures were modeled with wax and a duplicate model was cast. Over the duplicate model a thermoplastic sheet with is used to create a splint, was pulled. Beside its use

as a matrix for the manufacturing of the temporary restoration, the splint is used for verification of the design of the preparation and orientation for the placement of the gingival figures. The dental part of the restoration was made with a composite material for provisional restorations. According to the marks on the splint place was made for the gingival part of the construction which consisted of the colors that were predetermined.

Conclusion:

The provisional restoration manufactured using this protocol has a satisfactory functional, esthetically pleasing and psychosocial effect on the patient.

Резюме:

Въведение:

При екстракции на зъби в естетичния сегмент от зъбната редица и невъзможност за имедиантно протезиране с окончателна конструкция е необходимо да се запази естетиката и функцията на съзъбието.

Клиничен случай:

Пациентката С. Ю. дойде при нас в тежко състояние изискващо мултидисциплинарно стоматологично лечение, в хода на което се наложи екстракция на четирите долночелюстни резци. Поради наличие на пародонтални лезии се очаква значителна костна резорбция, което би се отразило негативно, при възстановяване с фиксирана протезна конструкция непосредствено след заздравяване на екстракционните рани. Поради това се изработи временна конструкция от лабораторен композит със зъбна и гингивална част. Техниката на изработване включва няколко етапа. Снеха се предварителни отпечтъци с алгинат и стандартни метални лъжици и с тестообразен силикон се регистрира захапката. От тях се отляха работни модели, които се включиха в оклудатор. Зъбите подлежащи на екстракция се изрязаха от работният модел и на тяхно място се фиксираха стандартни пластмасови резци от гарнитура за тотални протези. С въськ се моделираха гингивалните контури, сне се отпечатък и модела се дублира. Върху него се изтегли термопластично фолио за изработване на шина, което да служи за изработване на временната конструкция. Освен като матрица шината се използва за нанасяне на гингивалните контури и за проверка на препарационния дизайн след изпиляването. Зъбната част на възстановяването се изработи от композиционен материал за временни конструкции, като според гингивалните маркери на шината в материала се направи място за гингивалната част от розов композит в определени предварително два цвята.

Заклучение:

Изработената по този начин временна конструкция има добър функционален, профилактичен, естетичен и социален ефект.

98.Zlatev, S. & Hadzhigaev, V.

FPD with a modified endocrown cemented on the distal molar

Proceedings of the 16th Congress of the Bass 2011, 2011

Abstract:

Introduction:

Even though in the initial exam a case seems relatively easy with a standard treatment plan for a fixed partial denture in the area of 14-17 a number of factors can make the clinical decision hard. Such factor that ensures the stability and thereby the longevity of the construction is the vertical crown height. In cases where the vertical crown height is insufficient for a proper retention of a construction there are a few options available. One of those options is the use of endocrowns. The endocrown is a restoration which consists of a circular butt-joint margin and a central retention cavity inside the pulp chamber and lacks intraradicular anchorage.

Case report:

A 46 year old patient came to us because of chewing difficulties and disturbed aesthetic appearance related to extracted teeth 15 and 16. A decision was made for a fixed partial denture to be made with abutment teeth 14 and 17. Tooth 17 was endodontically treated and with a severe crown destruction. The distance between the edge of the marginal gingiva around the distal abutment tooth and his antagonist was below 3 mm which imposed the use of the pulp chamber and the distal root canal for accessory retention. The distal root canal was prepared and an impression was taken for the fabrication of metal ceramic bridge manufactured with the model-cast technology. Because of the insufficient space for the construction a metal frieze was made to ensure a better fracture resistance in the distal connector area. Conclusions:

Even when a clinical case seems relatively easy during the preliminary exam a deep analysis for the clinical situation should be performed to ensure optimal results.

Keywords: endocrown, FPD

99.Hadzhigaev, V. & Zlatev, S.

Method of choice in cemented implant-supported bridge failure

Proceedings of the 16th Congress of the Bass 2011, 2011

Abstract:

Introduction:

The purpose of the current case report is to present a clinical case where the concept of the prosthetic treatment and the type of the prosthetic restoration are changed from a fixed implant supported construction to an implant supported overdenture due to a failed metal ceramic bridge and prosthetic abutments.

Case report:

A 61 year old patient came to us with a request for a repair of a failed fixed metal ceramic bridge placed on implants in the area of 14,24,11 and 21. During the initial exam it was stated that the old construction cannot be repaired due to a fracture in the area of the central incisors which caused a fracture in two of the prosthetic implant abutments in the area of 11 and 12 resulting in

parts of the screws being left in the implants. The parts of the fractured screws, which were in the implant bodies were carefully removed using an ultrasonic scaler (Satelec, 10P) and counter-clockwise pressure, thereby leaving the thread in-tact. The restoration was made with combined prosthetic construction distributing the masticatory pressure with the help of joints, locks, and bars. The overdenture was made without a palatal part.

Conclusion:

Using an ultrasonic scaler for the removal of the screw fragments, ensures that the inner thread and walls of the implant are not compromised, or perforated, which avoids complications and saves time and financial resources both for the patient and the clinician. With the change in the treatment plan and the prosthetic construction optimal results were achieved in the aspects of esthetics, function and prophylaxis, which satisfied all of the patients expectation and requirements. Although their advantages and the preferences of patients undergoing an implant treatment, for fixed prosthetic constructions in many clinical cases, a better option for treatment is an implant supported overdenture.

Key words: implants, fracture, prosthetic abutments, overdenture.

100.Hadzhigaev, V. & Stefan, Z.

Restoration of a molar diagnosed with altered passive eruption

Proceedings of the 16th Congress of the Bass 2011, 2011

Abstract:

Introduction:

Altered passive eruption is a rare diagnosed clinical situation. It is produced by excessive gum overlapping over the enamel limits, resulting in a crown with reduced vertical height which gives the sensation of hidden teeth. The most important aspect of APE are considered to be aesthetical, although in the case presented, there are difficulties in the tooth restoration related to this condition.

Case report:

A 46 year old patient came to us with a request for restoration of tooth 36, that presented itself with two large obturations, one of which was fractured and dark colored remaining hard tooth substance. An x-ray image, which showed a previous root canal treatment and the roof of the pulp chamber positioned at the level of the gingival margin, was made. Re-treatment was performed. Intraorally it was observed and tested with an explorer, that the gingival margin was above the dento-gingival junction. Bone-sounding was performed, which showed that the edge of alveolar bone is at the level of the DGJ. The performed tests, and the x-ray image mentioned above, determined the diagnosis altered passive eruption for tooth 36 and for the adjacent teeth. Because of insufficient hard tooth substance to retain a crown, the root canals were prepared and a two-part cast metal post was made. The tooth preparation was designed at the level of the gingival edge with a straight angle form. The tooth was restored with a metalo-ceramic crown.

Conclusion:

Although most authors consider altered passive eruption to present itself only with aesthetical issues when distal teeth are diagnosed with such a condition there are a few things to be considered if they are a subject of prosthetic restoration.

Giragosyan, K.; Chenchov, I.; Ivanova, V. & Zlatev, S.

Immunological response to nonresorbable barrier membranes used for GBR and formation of pseudo periosteum. A narrative review.

Folia Medica, 2021

Abstract:

Aim:

To review the knowledge on the biologic local immunological response - formation of “pseudo periosteum” of the host, to two types of nonresorbable membranes, used in the horizontal and vertical alveolar ridge augmentation – Ti reinforced PTFE and Ti mesh.

Materials and Methods:

A literature search was conducted including available in vitro, in vivo and available clinical studies on cellular and molecular immunological response to these two types of non- resorbable membranes, in particular – formation of “pseudo periosteum”.

Results:

Emerging data demonstrates that despite barrier membranes being considered as bioinert, they still elicit an immunological response from the body. The outcome of this reaction is the formation of a thin fibrous capsule, which is referred to as “pseudo periosteum”.

Conclusion:

There are almost no biomaterials that are truly bioinert and this makes no exception for the non-resorbable membranes used in GBR. This iatrogenically made tissue is hypothesized to have a number of advantages and drawbacks, however more research needs to be conducted in that area, in order to truly understand its nature and importance to the guided bone regeneration process.

Apostolov, N.; Zlatev, S.; Yordanov, B.; Yankova, M. & RangelTodorov
Oral hygiene habits in complete denture wearers.
Journal of Imab, 2021

Abstract:

Aim:

The aim of the present research is to establish the frequency and methods of cleaning used by patients with complete dentures.

Material and Methods:

A survey was conducted between 2016 and 2019 among 96 patients (54 female and 42 male). This study was carried out at the faculty of dental medicine, Medical University – Sofia, during the students' classes in Clinical Prosthetic Dental Medicine and Oral Surgery. A survey card was prepared, including questions addressing the period of total edentulism, period for rehabilitation with complete dentures, methods and frequency of cleaning and types of hygienic products used by the complete denture wearers. Descriptive statistics, graphical analysis, chi-square test and correlation analysis were computed in R.

Results:

Only 12 % of the respondents clean their dentures properly. Nearly 60% of the patients report a widespread but incorrect cleaning method using toothbrush and toothpaste and more than 25% use inappropriate, old, and disregarded hygienic means. 65% clean their dentures twice per day. The research showed strong positive correlation between the age and the time wearing dentures.

Conclusion:

The findings from the current survey suggest that complete denture wearers are either unaware or negligible towards the proper maintenance of their prostheses.

Key words: complete edentulism, oral hygiene, denture cleaning tablets

Apostolov, N.; Zlatev, S.; Deliverska, E. & Todorov, R.
Completely edentulous patients – part 1: morphological features of the upper and lower jaw
Journal of Imab, 2021

Abstract:

Aim:

The aim of the present research is to characterize the morphological features of the upper and lower jaws in cases of completely edentulous patients.

Materials and methods:

For the purpose of this study 96 patients, aged 49-88 were examined between 2016-2019. The research was conducted during the practical classes in prosthetic dental medicine and oral and maxilla-facial surgery at the Faculty of Dental Medicine, Medical University - Sofia. The study methods included an individual interview, observation, palpation, and clinical and laboratory measurements. The results were collected in a pre-made patient-cards.

The investigated variables were age, gender, stage of atrophy, the morphological features of the alveolar ridge, and the total period of edentulism and denture usage.

Results:

The results of the research showed that the second degree of atrophy is the most prevalent condition for both jaws. The third degree of atrophy was associated with the lower jaw, but rarely occurred in the upper. The vestibular inclination was typical for the maxillary frontal alveolar ridge, whereas in the distal areas the edentulous ridge was predominantly vertical. The vertical slope of the ridge was prevalent in the three examined areas on the lower jaw. Unequal and asymmetric alveolar ridges were more frequent in the mandible. An association between the time being edentulous and degree of atrophy was observed in both jaws.

Key words: complete edentulism, bone atrophy, alveolar ridge.

Apostolov, N.; Zlatev, S.; Todorov, R. & Deliverska, E.

Completely edentulous patients, Part 2 –alveolar ridge height in completely edentulous patients

Journal of IMAB, 2021

Abstract:

Aim:

The aim of the present research is to compare the alveolar ridge height, measured intraorally and on custom gypsum casts, cast by the individual impression.

Materials and Methods:

In the research 96 patients were included – 54 female and 42 male, aged 49-88. It was completed during clinical seminars of prosthetic dental medicine in the Faculty of Dental medicine of the medical University of Sofia in the period 2016-2019. At the examination of each patient the intraoral alveolar ridge height of each jaw was measured in three areas – in the area of central incisors and left and right first molar. Final impression was taken for each patient, and afterwards gypsum models were cast of them. Identical measurements were executed on them in the same areas. The statistic processing of the results was done in the environment for statistical processing R. Descriptive, graphical analysis and T-test for evaluation were used for assessment of the differences in the obtained results.

Results:

The intra oral measurements of the research showed mean 8 mm height of the upper jaw and highest frontal area (mean 9 mm). Both of the distal areas were almost with same height (8,2 mm) and close to the frontal one. The lower frontal area was about 5mm and both of the distal mean 3,5 mm. The comparison with the extra oral measurements showed higher mean results on the intra oral measurements.

Key words: complete edentulism, alveolar ridge height, final impressions

Vlahova, A.; Zlatev, S.; Pavlov, B.; Chenchev, I. & Hadzhigaev, V.
Clinically evaluated accuracy of single guided implantations with two different systems – preliminary results
ISEIC, 2021

Abstract:

Introduction:

Guided single implant placement ensures an optimal implant position, enables in-surgery immediate loading, and creates a predisposition for predictable treatment results.

Aim:

The aim of this article is to present the surgical and loading protocols and assess the accuracy of two guided implant-systems.

Materials and methods:

Ten patients missing a single molar were included. The semi-guided procedures with the two implant systems – AB Dental and Alpha Bio-Tec, were randomly assigned to each participant. The computer-assisted planning was performed with Implant Studio (3Shape, Denmark). Surgical guides and a long-term, temporary, screw-retained restorations were virtually generated within the 3Shape system. Surgical appliances were printed from SG resin (Formlabs, USA) and crowns were milled from Telio CAD (Ivoclar Vivadent, Lichtenstein). Planning accuracy was evaluated based on the crown's fit and relation to the adjacent teeth and antagonists.

Results and discussion:

The patients included for preliminary analysis (6 female and 4 male) were with a mean age of 33.42. The youngest was 24 and the oldest 49 years old. There were no surgical and technical complications for the period of evaluation, which ranged from 1 to 3 months. The crown's fit was excellent in 8 cases. In two cases minor adjustments were necessary – 1 in relation to the antagonists and 1 to the adjacent teeth. In one case a healing screw was placed for 48 hours to facilitate adequate soft-tissue space for the Ti-base.

Conclusion:

The preliminary results presented in this report suggest that the clinical and laboratory protocols used for guided implantation and immediate loading are highly efficient.

Key words: implantation, loading, planning, protocol

Chuchulska B, Zlatev S. Linear Dimensional Change and Ultimate Tensile Strength of Polyamide Materials for Denture Bases. *Polymers* 2021,

Abstract:

The aim of the current study was to evaluate the dimensional changes and ultimate tensile strength in three polyamide materials for denture bases fabrication through injection molding, subjected to artificial aging and different storage conditions. A total of 333 test specimens fabricated from Biosens (BS; Perflex, Israel), Bre.flex 2nd edition (BF; Bredent, Germany) and ThermoSens (TS; Vertex Dental B.V, Netherlands) – n=111 per material, were equally divided into three groups (n=37) based on different treatments and storage conditions. Test samples allocated to the “Control group” were not artificially aged and stored in water for 24 hours. Both “Treatment 1 group” and “Treatment 2 group” were subjected to thermocycling, the former dehydrated and the latter stored in water between cycle-sets. Linear changes and ultimate tensile strength were measured and analyzed for storage condition and material influence on the outcome variables. A Welch ANOVA test with Games-Howell post-hoc analysis was used to compare the influence of treatments across different materials. Significant differences were found for all three included materials with p values ranging from < .05 to < .001 for linear dimensional changes. The magnitude of alterations varied and was large for BS (Perflex, Israel) ($\omega^2 = .62$) and BF (Bredent, Germany) ($\omega^2 = .47$) and small but significant for TS (Vertex Dental B.V, Netherlands) ($\omega^2 = .05$). However, results seem to fall into clinically acceptable range. Significant differences were also observed for the Ultimate tensile strength test with the same range of p-values. All three materials showed different initial ultimate tensile strengths and varying reaction to artificial aging and storage with the lowest alterations observed for BF (Bredent, Germany) ($\omega^2 = .05$). Within the limitation of this study, it can be concluded that all three materials show different dimensional and mechanical properties when subjected to artificial aging and different storage. Although linear dimensions show significant changes, they seem to be clinically irrelevant, whereas the change in ultimate tensile strength after only 6-month equivalent clinical use was substantial for BS (Perflex, Israel) and TS (Vertex Dental B.V, Netherlands).

Keywords: denture base materials; polyamide; injection molding; dimensional stability; ultimate tensile strength; thermocycling