2021 SCIENTIFIC POSTER COMPETITION WINNERS

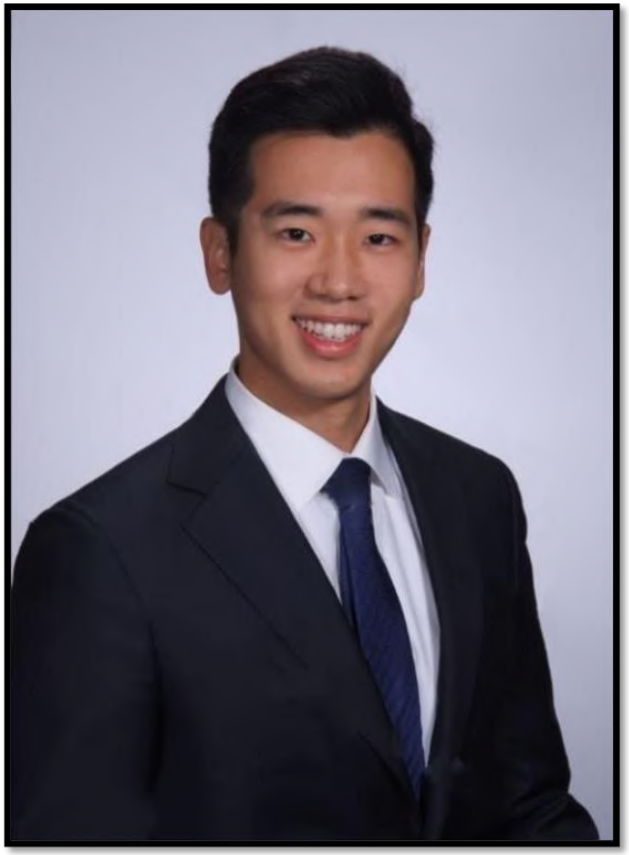
1st Place Winner Undergraduate Clinical Case

Kevin Tan
Virginia Commonwealth University School of Dentistry

Restoring Incisal Length: Addressing Aesthetics by Opening VDO Using In-House CADCAM Monolithic Lithium Disilicate

Patient presented with the desire for a more uniform and proportionate smile. Clinical examination revealed evidence of occlusal dysfunction leading to a canted smile and loss of vertical dimension of occlusion (VDO). Diagnostic wax-ups were used to establish a new VDO and fabricate bis-acryl provisionals. Function, phonetics, and aesthetics were assessed and accepted by the patient. An in-house CADCAM workflow was used to scan the new bite in centric relation, design, and fabricate lithium disilicate veneers, crowns, and overlays in shade B1 LT. Milled restorations were seated and contours were adjusted intraorally prior to custom staining and glazing. Final restorations were delivered using Variolink Esthetic DC and LC warm shade cements. Treatment successfully improved functional occlusion and satisfied the patient's chief complaint.

Faculty Mentors: Rami Ammoun DDS, MS, CDT, FACP; Sompop Bencharit DDS, MS, PHD, FACP



2nd Place Winner Undergraduate Clinical Case

Andrew Chang
New York University College of Dentistry

Addressing Peg Laterals with Porcelain Veneers

24 year old male patient ASA I and NKDA presents with the following chief complaint: My laterals are too small for my smile.

Patients present with their own preconceived “ideal smile”. While it is important to address their concerns and bring their ideas into consideration, it is ultimately up to the clinician to make them esthetically and biologically compatible. Accurate photography, digital smile analysis, and preliminary wax-up/try-in were used to gather the patient’s input. This was effectively communicated to the lab in order to finalize wax-ups that served as reduction guides for conservative preparations and 8 Feldspathic porcelain veneers that balanced both hard/soft tissue harmony & health. It is essential to systematically predict and communicate the final esthetic outcome before irreversibly reducing any tooth structure, so that preparations can remain conservative and effective.

Faculty Mentor: John Calamia, DMD

3rd Place Winner Undergraduate Clinical Case

Andrew Mai
University of Texas Health Science Center at Houston

Out with the Old, In with the New

Chairside composite veneers are a great alternative to laboratory fabricated porcelain veneers, especially when the patient has large Class III restorations. Providers must understand the indications for composite veneers and how to execute the procedure in esthetically driven patients to yield an outcome that is satisfactory to the patient, functional and provides longevity. The current clinical case was performed to address large interproximal lesions and existing fractured composite veneers. While it is possible to crown the patient's anterior teeth, composite veneers were chosen to offer a more conservative approach. Using a diagnostic wax-up and silicone preparation guides, composite veneers were fabricated using controlled layers of dentin and enamel shade resins.

Faculty Mentor: Joe Ontiveros, DDS, MS

1st Place Winner Undergraduate Material Science

Shann Sehgal
Harvard University, School of Dental Medicine

Influence of Irrigation Protocols on Root Canal Treatment for Bond Strength to Enamel and Coronary Dentin

The success of root canal treatment is directly associated with infection control and final restoration sealing. Irrigant solutions play an important role in compensating for instrumentation shortcomings and complementing disinfection procedures. Chemical substances used during the biomechanical preparation of root canals can alter the composition of dentin and enamel and their interaction with restorative materials. A possible modification in the dental structure may impair the final restauration sealing. Therefore, this study proposed to evaluate different concentrations of chitosan solution used as a final rinse during root canal treatment on the shear bond strength of composite resin to enamel and coronary dentin. The results of this research will provide clinical guidelines for the endodontic irrigation protocol to minimize the negative action of NaOCl and prevent damage by EDTA to dentin. It may favor the best bio-adhesion performance which is considered a critical factor for the success of the restorative technique. The hypotheses tested were as follows: (i) the irrigation protocols did not influence the resin-dentin/enamel bond strength; (ii) substrate type did not modify the resin dentin/enamel bond strength; (iii) Chitosan did not affect the fracture failure pattern between resin-dentin/enamel.

Faculty Mentor: Hiroe Ohyama, DDS, DMD, MMSc, PhD and Shelyn A. Yamakami, DDS, MSc

1st Place Winner Post Graduate Clinical Case

Nicolas Aguilera
University of Rochester Medicine, Eastman Institute for Oral Health

Restoring a Complex Case in the Esthetic Zone

A 52-year-old male patient presented to EIOH, his concern being that his maxillary anterior dentition (teeth #7-#8-#9-#10) was missing. This extensive tooth loss was due to trauma after which the patient had been wearing a transitional removable partial denture and provisional crowns on teeth #6 and #11. His medical history was uneventful. On the past dental history, the patient had a bone graft and two implants were placed on the site of #7 and #10 (Zimmer 4.1x 10mm). Clinical and radiograph examination and photography protocol were completed. The implants were fully osseo-integrated, with no mobility, pain nor infection. The patient presented a defect in the anterior maxilla requiring hard and soft tissue augmentations.

Treatment options were explained, and the patient elected to do an implant-supported fixed dental prosthesis. Gingival esthetic challenges were addressed specifically using externally placed pink porcelain on prosthetic components to simulate natural gingiva. The diagnostic phase included preliminary impressions, interocclusal records, and facial and smile analysis. The esthetic concerns of the patient were addressed with a Digital Smile Design to help with the new proportions of the teeth. A diagnostic wax-up was fabricated and it was used as a reference for the fabrication of a PMMA screw-retained implant-supported fixed dental prosthesis and provisional single crowns on teeth #6 and #11.
During the provisional phase, the incisal edge position, lip support, esthetics, phonetics, and function were evaluated. The patient was satisfied, and the definitive restorative phase was initiated. The teeth preparation of #6 and #11 were completed with a chamfer finish line. Double retraction cord technique was used on #6 and #11 and medium body VPS (Express 3M) was syringed into the sulcus and around implants and light body VPS (Express 3M) was placed in the tray and a maxillary final impression was completed. Zirconia framework was used to fabricate a 4-unit screw-retained implant-supported prosthesis. The return framework was checked intraorally for passive fit and was sent to the laboratory (ADL Laboratory) for the cementation of lithium disilicate single crowns over the framework and also for the fabrication of single crowns on teeth #6 and #11.

Faculty Mentor: Dr. Alexis Ghanem, DDS, MS

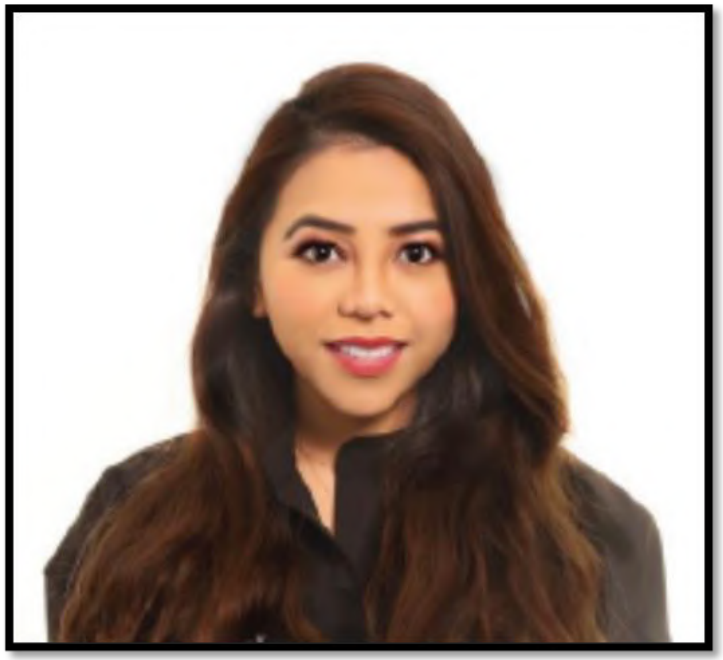
2nd Place Winner Post Graduate Clinical Case

Abdullah Bokhary
Tufts University School of Dental Medicine

An Esthetic Rehabilitation of the Anterior Maxilla with a Digital Workflow

The purpose of this case report is to present a digital workflow of an anterior maxilla esthetic rehabilitation. A 25-year-old male presented for rehabilitation of his missing maxillary central and fractured lateral incisors. A comprehensive examination, smile analysis, digital wax-up design and mock-up were completed. A CBCT and 2 Standard Tessellation Language (STL) files (diagnostic scan and mock-up scan) were used to plan the implant placement digitally. After the healing of the autogenous bone graft, implant placement on # 8 and #9 was done using a 3D printed stereolithographic surgical template. Tooth whitening was followed, and a minimally invasive veneer preparation was done on teeth #7 and #10. An IOS digital impression was taken, and a screw retained PMMA interim prosthesis was designed and milled. Due to the presence of vertical soft tissue deficiency, pink composite was added to the design for ideal tooth proportions. Finally, a monolithic 4Y-TZP zirconia screw-retained fixed partial denture with porcelain micro-layered on the facial, was fabricated for #8 and #9 and e.max veneers on #7 and #10. Through the digital workflow, ideal 3-D implant position and contour of the interim implant prosthesis were predictably reproduced. High esthetic results were achieved, and patient's expectations were met.

Faculty Mentors: Aikaterini Papathanasiou DMD, DDS, Aikaterini Kostagianni DMD, DDS, MSc



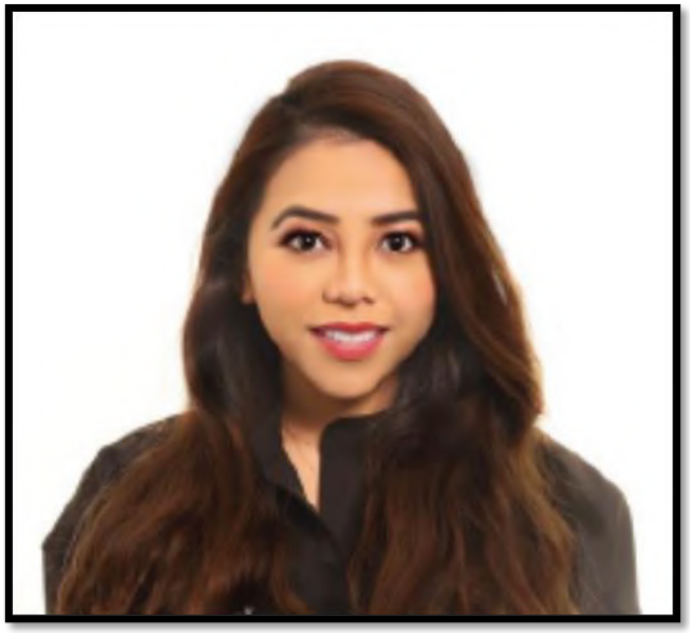
3rd Place Winner Post Graduate Clinical Case

Layal Abdeen
Tufts University School of Dental Medicine

Esthetic Rehabilitation of Maxillary Anterior Teeth Using a Minimal Invasive Approach: A Case Report

This case report describes a minimally invasive approach to treat a 25 y.o. male, who presented to Tufts Dental Clinics with esthetic concerns about spacing between his maxillary anterior teeth, gummy smile and a chipped front tooth. A comprehensive examination, facial and smile analysis revealed diastemas, short clinical crowns and a deep anterior bite. An interdisciplinary approach through orthodontics, periodontics, and minimal invasive prosthetic treatment was utilized. The treatment plan consisted of orthodontics to improve space distribution and anterior bite, followed by crown lengthening to enhance clinical crown dimensions and gummy smile. Finally, the esthetics and prosthetic rehabilitation entailed bleaching and feldspathic veneers for teeth #6-11. All patient's concerns were addressed in a predictable manner and high esthetic results were achieved. In addition, a maximum amount of the initial tooth structure was preserved through conservative porcelain veneers.

Faculty Mentors: Aikaterini Papathanasiou DMD, DDS, Aikaterini Kostagianni DMD, DDS, MSc



1st Place Winner Post Graduate Material Science

Layal Abdeen
Tufts University School of Dental Medicine

Zirconia Prototype Prosthesis Fit Accuracy Assessment on 3-D Printed Casts

Objective: To compare the accuracy of the fitting of a zirconia implant supported prosthesis on stone models (Control) and 3-D printed models generated from four 3D printers, which were produced from a digital implant impression with one intraoral scanner (IOS).
Methods: A master cast with a scenario of partially edentulous anterior maxilla was fabricated with two internal connection implants. Stone models (n=10) were fabricated from conventional impressions with splinted open-tray technique (Control). Digital impression of master model was taken using a white light IOS (TRIOS, 3shape) to print forty casts using four 3D printers (Straumann® P30+, BEGO® Varseo S, Formlabs® Form 3b and M2 Carbon) (n=10) from each printer. Fifty Standard Tesselation Language (STL) files were obtained from digital impressions of all models. Files were superimposed to the master model STL file to evaluate the 3D discrepancy with an inspection software to calculate the root mean square (RMS) error. The zirconia prosthesis was placed on all models. Accuracy of fit was assessed by two calibrated evaluators independently using the single-screw test and radiographic test.
Results: The highest median RMS was found in the stone model group (94.6 Î¼m), while the lowest median was in M2 Carbon group (46.9 Î¼m). The Kruskal-Wallis test revealed a statistically significant difference between the groups ($p<0.001$). The Holm-Bonferroni correction resulted in a statistically significant difference in four tests. In the post-hoc tests, the lowest p-value was for the comparison between the M2 Carbon and P30+ groups ($p=0.002$), with M2 Carbon exhibiting significantly lower RMS. Zirconia prosthesis fit adequately in all models.
Conclusion: Within the limitations of this in-vitro study, M2 Carbon printer had better 3D accuracy than the P30+ printer. Models generated from M2 Carbon, Form 3b and Varseo S had better 3D accuracy than stone models. Zirconia prosthesis fit was clinically acceptable in all models.

Faculty Mentors: Aikaterini Papathanasiou DMD, DDS, Aikaterini Kostagianni DMD, DDS, MSc, Matthew Finkelman, Yo-Wei Chen, DDS Panagiois Papaspyrikakos, DDS, MS

HEAPS Winner

Nick Mavrostomos
New York University College of Dentistry

Restorative Space Management Utilizing a Combination of Lithium Disilicate and Layered Feldspathic Porcelain

While traditional orthodontic therapy for space management issues remains the gold standard in dental practice, often times restorative considerations can be taken to satisfy patient's desires. With the use of contemporary dental materials and diligent aesthetic smile design principles, the restorative approach to space management can be effective in rehabilitating patient's form, function, and aesthetics.

Faculty Mentors: John Calamia, DMD and Nicholas Giannuzzi, DDS

Restorative space management utilizing a combination of lithium disilicate and layered feldspathic porcelain

Nick Mavrostomos, NYU Honors Aesthetics, Dr. Nicholas Giannuzzi, Case Mentor, Dr. John Calamia, Program Director, New Dent Dental Laboratory
New York University College of Dentistry, NY

Abstract

While traditional orthodontic therapy for space management issues remains the gold standard in dental practice, often times restorative considerations can be taken to satisfy patient's desires. With the use of contemporary dental materials and diligent aesthetic smile design principles, the restorative approach to space management can be effective in rehabilitating patient's multifaceted needs.

Introduction

Patient ZY presented with a chief complaint of, "I hate the way my teeth look and I am tired of replacing my old bonding. I want a healthy and beautiful smile."

This patient presented with multiple failing composite and amalgam restorations, missing first premolars (teeth #5,12,21,28) from previous orthodontic therapy, crowded and misaligned anterior teeth on both arches, as well as endodontically treated teeth without definitive restorations.

Comprehensive orthodontic therapy was recommended prior to initiating restorative therapy, but the patient declined. Attention was then placed on utilizing restorative approaches to satisfy the patient's aesthetic, functional, and biological desires.

Treatment Plan

The treatment objectives of this case were to restoratively re-align the patient's crowded dentition and to remove her failing restorations and residual decay in a manner that was functional, biologically respected, and aesthetic.

The accepted treatment plan included:
Laser Gingivectomy: #7
Full-Coverage Crowns: #3, 4, 6-11, 13, 14, 24, 25, 26
Veneers: #20, 22, 23, 27, 29

Waxup

After diagnosis and treatment planning, the proposed smile design was created through the diagnostic wax-up shown above. Emphasis was placed on balancing the maintenance of her original smile character while improving axial inclinations, incisal anatomy, buccal corridor volume, gingival discrepancy, and lip support.

This image shows the provisionals made from the previously shown wax-up during the preparation phases of care, and were used as a guide for replication for the final restorations. The provisionals were made using a putty index of the wax-up and B1 luxatemp (Bis-acryl).

Occlusal View

Pre-operative occlusal analysis shows widened arch forms, with rotated maxillary central incisors and severely crowded mandibular anteriors. The final results show more harmonious and ideal arch forms, leading to improved protrusive relationships and excursive guidance.

Results

Pre-operative analysis for this patient showed that her mandibular crowding and rotated maxillary anteriors were creating a destructive protrusive relationship. It was determined that approaching the case in an additive manner would improve functional relationships, create a more harmonious and aesthetic result, while also reducing the amount of preparation needed. Building-out the maxillary anterior region facially would create the space needed to minimize the amount of facial preparation on the mandibular anteriors. By doing so, the anterior mandibular region could be restored additively with ceramic to the relative position of tooth #24, rather than to be prepared back into the existing arch form.

Workflow

Ceramic Artistry

Above shows the feldspathic layering process of hand layered porcelain over waxed and pressed lithium disilicate (GC Lisi) copings. This was done in order to achieve optimal aesthetics, while ensuring adequate strength and stability. The final shade selection was 1M1 with incisal transluency and tertiary texture to satisfy the patient's desire for a natural appearance. The last photo shows the try-in of ceramic vs the temporary design.

Summary

Restorative approaches to space management are not to replace the necessity of orthodontic therapy when needed, but rather provide clinicians another means of satisfying patient needs when appropriate.

HEAPS Winner

Duc Le
Nova Southeastern University College of Dental Medicine

Anterior Porcelain-Fused-to-Metal Fixed Dental Prosthesis #6 - #11

The selection of an appropriate material to be used as a definitive restoration has a high impact on the treatment prognosis. The location of the restoration, the patient's occlusion, and the cost of treatment all significantly impact the choice of material. A thorough clinical evaluation must be completed prior to treatment planning and presenting different options to a patient. Angle classification and malocclusion, anterior guidance, overbite, and overjet are some important factors to evaluate during an initial clinical exam. Endodontically treated teeth, periodontal disease, and other factors affecting a tooth's prognosis must be accounted for as well. It is important to communicate all possible outcomes, risks, and benefits of a specific procedure when presenting treatment options to a patient.

Faculty Mentors: Tulia Gonzalez, DDS

Anterior Porcelain-Fused-to-Metal Fixed Dental Prosthesis #6 - #11

NSU Florida
College of Dental Medicine
NOVA SOUTHEASTERN UNIVERSITY

Duc M. Le, Senior Dental Student; Tulia M. Gonzalez, DDS, Department of Cariology and Restorative Dentistry
Nova Southeastern University, College of Dental Medicine

Clinical Case

Chief Complaint: "I want to check my sensitive tooth"

Medical History: Atorvastatin 20mg for high cholesterol and Losartan 50mg for hypertension. Patient denies any allergies, tobacco, drug or alcohol use.

Dental History: Patient presents with multiple amalgam restoration on the posterior teeth. Anterior PFM FDP #7-10 with #8 pontic. (Figure 1a-5a)

Assessment

Clinical exam: Clinical evidence of primary and recurrent caries. Generalized abfraction with sensitivity. Anterior FDP appears to be over-contoured and with incorrect shade matching to adjacent teeth.

Radiographic exam: Radiographic evidence of primary and recurrent caries. There is a PARL #9. #9 is asymptomatic and was previously treated. (Figure 7)

Figure 7

Comprehensive Treatment Plan

Patient expressed desire to replace existing anterior FDP as part of her treatment plan. Due to the concern with the removal of the existing metal post on #9, patient was given the choice of either an apicoectomy or extraction of #9. Patient decided to have #9 extracted. #6 and #11 was including as abutments for the new anterior PFM FDP to provide more support.

Treatment plan summary

- SRP D4342 on UL, LL; Adult prophy on UR, LR
- Composite restoration #4 B, #5 DOB, #13 MOD, #15 O, #17B, #20 B, #21 B, #28 B
- EXT #9
- PFM FDP #6-11

Revised Treatment Plan

During the preparation of #6, 7, 10 and 11 there was lack of adequate lingual clearance on #7 and 10. It was determined then to have elective endodontic treatment done on #7 and 10 in order to reduce more tooth structure on the lingual of #7 and 10. (Figure 8a & 8b)

Figure 8a

Figure 8b

Before **After**

Figure 1a

Figure 1b

Figure 2a

Figure 2b

Figure 3a

Figure 3b

Figure 4a

Figure 4b

Figure 5a

Figure 5b

Before

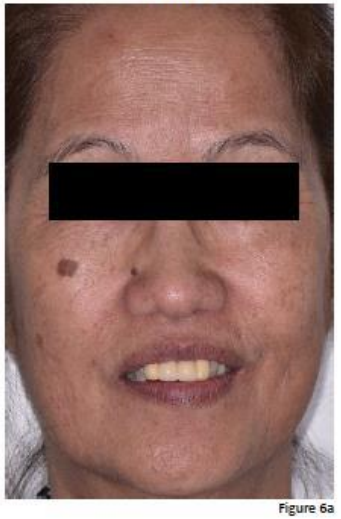


Figure 6a

After

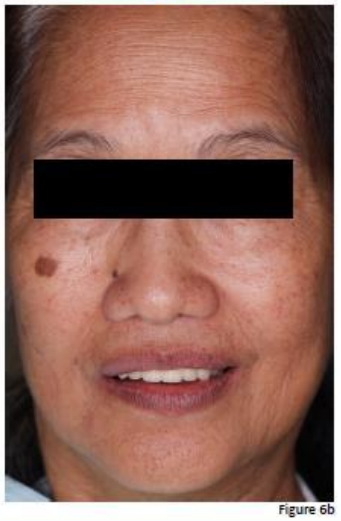


Figure 6b

Preparation Modification and Provisional

Butt margin preparation was done on all abutment teeth in order to hide the metal collar on the cervical and facial area. Adequate reduction to allow minimal metal on the lingual (Figure 9a & 10). Shade A2 was selected using Vita Classical Shade guide. Provisional was made using Coldpac Tooth Acrylic with a layer of A2 composite on the facial to improve esthetic (Figure 9b)

Figure 9a

Figure 9b

Bisque bake try-in

A bisque bake was requested in order to adjust the porcelain to patient's satisfaction before final glaze and polishing. (Figure 10)

Figure 10

Cementation

The final FDP was glazed and polished for delivery (Figure 11). Contact and occlusion was checked and adjusted accordingly. The FDP was cemented using GC Fuji PLUS®

Figure 11

REFERENCES

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HEAPS Winner

Tyler Munoz
University of Texas Health Science Center at Houston

Missing Laterals: Closing Anterior Spacing with Porcelain Veneers

Patient RZ presented to the UTSD clinic with longstanding esthetic concerns regarding her congenitally missing lateral incisors and anterior spacing. She had always been self-conscious of her smile and was ready to seek treatment for it. Several treatment plans were proposed and she opted for porcelain veneers of #5, #6, #8, #9, #11, and #12 to close all anterior spacing. The addition of #21 porcelain veneer was indicated to establish protective guidance with left excursive movements. Composite veneers were later added to #4 and #13 to further improve esthetics. This case is a great example of veneer lateralization of canines. This technique can be used to treat some cases of congenitally missing laterals. The patient was thrilled with the final outcome and is now smiling like never before.

Faculty Mentors: Joe C. Ontiveros, DDS, MS

UTHealth | School of Dentistry
The University of Texas Health Science Center at Houston

Missing Laterals: Closing Anterior Spacing with Porcelain Veneers

Tyler Munoz*, DS4. Chandler Pruitt, DS3. Mentor Joe C. Ontiveros DDS, MS[1]
University of Texas School of Dentistry, Houston Texas, USA
[1] Department of Restorative Dentistry and Prosthodontics

ABSTRACT

Patient RZ presented to the UTSD clinic with longstanding esthetic concerns regarding her congenitally missing lateral incisors and anterior spacing. She had always been self-conscious of her smile and was ready to seek treatment for it. Several treatment plans were proposed and she opted for porcelain veneers of #5, #6, #8, #9, #11, and #12 to close all anterior spacing. The addition of #21 porcelain veneer was indicated to establish protective guidance with left excursive movements. Composite veneers were later added to #4 and #13 to further improve esthetics. This case is a great example of veneer lateralization of canines. This technique can be used to treat some cases of congenitally missing laterals. The patient was thrilled with the final outcome and is now smiling like never before.

CASE DESCRIPTION

RZ is a 50 year old female that presented to the UTSD clinic with a chief complaint of congenitally missing lateral incisors with anterior spacing. Medical history was non-contributory. The patient's primary goal was to close all anterior spaces and maximize esthetics. Several treatment plans were proposed which included combinations of orthodontics, implant supported crowns, and veneers. The patient opted for porcelain veneers of #5, #6, #8, #9, #11, and #12 to close all anterior spacing without orthodontics or implants. It was planned that #6 and #11 will be restored to appear as lateral incisors, and #5 and #12 to appear as canines. The patient was counseled regarding expectations and she understood that this treatment plan would require larger restorations to close all of the anterior spacing. The patient later chose to add composite veneers to #4 and #13 to further improve esthetics.

Problem list:
Missing lateral incisors
Anterior spacing
Baseline left excursive guidance into space to be filled with porcelain

Pre-treatment

Post-treatment

Compromised Left Lateral Guidance

#21 Veneer Preparation

Spot Etch Technique

Provisional Restorations

Pre-treatment

Post-treatment

METHODS

An FMS and comprehensive oral evaluation were completed. Diagnostic casts were made and mounted. Baseline lateral and protrusive movements were studied so that protective guidance could be established with the final restorations. The addition of #21 porcelain veneer was indicated to establish protective guidance with left excursive movements.

Completed in-office external bleaching of the patient's lower teeth (Philips Zoom system). Pre-bleaching shade 1.5M2 was taken with VITA Bleachedguide. Four 15-minute treatments were done with 25% hydrogen peroxide. Post-bleaching shade 0.5M1 was taken after completion.

Veneer wax-ups were made for patient approval of esthetics and fabrication of provisional restorations. Teeth #5, #6, #8, #9, #11, #12, and #21 were prepared to receive lithium disilicate veneers (IPS e.max). PVS (Aquasil) final impressions were taken. A shade was taken for the final restorations. A provisional matrix was made using the wax-ups. Provisional restorations were made with bis-acrylic resin (Integrity) and seated with the spot-etch and bonding technique. The lab was sent a detailed prescription with photos indicating desired shade for the final restorations.

The final restorations were cemented with resin cement (RelyX Veneer). The patient later decided she wanted to add composite veneers to #4 and #13. Casts were made and mounted. Veneer wax-ups were made for #4 and #13. A matrix was made with clear bite registration material (ClearBite) from the wax-ups. #4 and #13 composite (Micerium) veneers were bonded in place using the clear matrix. Impressions were taken for the fabrication of a night guard. The patient was very happy with the final outcome, stating: "I can smile big now! I'm not embarrassed to smile anymore. It's great!".

CONCLUSION

This case demonstrated a blend of important principles in esthetic dentistry. Veneer lateralization of the canines can be an efficient, economical, and minimally invasive way to successfully manage cases of missing lateral incisors. However, the patient must understand that altered proportions of restorations are necessary when closing spaces with veneers. Additionally, it is paramount to establish protective guidance with all functional movements, particularly when closing excessive spaces. Additional restorations may be required to establish protective guidance. Esthetic cases can be complex, but very rewarding when a beautiful smile is created.