



Aesthetic Closure of Anterior Spaces in Mature Dentition

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Yes

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None

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Aesthetic Closure of Anterior Spaces in Mature Dentition

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Introduction

The presence of diastema in the anterior esthetic zone may be displeasing to a person's smile and many patients are motivated to improve their appearance either by orthodontic treatment or restoratively by veneers, crowns or composite resin bonding.

Composite bonding between teeth fills spaces and improves the appearance of diastemas. As part of a comprehensive esthetic treatment and part of an overall dental treatment plan, the result of diastema closure must produce a beautiful smile and fulfill the goals of overall smile design.

Increased patient demand for esthetic rehabilitation with less invasive procedures has led to extensive use of composite bonding in the anterior region. This resin bonding is conservative and relatively inexpensive means of enhancing one's smile and often carried out in a single visit in most dental practices.

In selecting composite resin materials certain features are essential

1. Sculptability; Material should be easy to shape and sculpt with minimal slumping.
2. Fracture Toughness: Resistance to fracture in stress bearing areas.
3. Modulus of Elasticity: Similar modulus of elasticity to natural tooth substances.
4. Polish ability; Easy to attain polish and maintain gloss for long time.
5. Shrinkage; Minimal polymerization shrinkage to reduce microleakage and stress at restorative/tooth interface.

IPS Empress Direct by Ivoclar Vivadent, microhybrid composite resin was chosen as restorative material for this case. Use of this resin not only provides strength needed in these situations but also good polish ability and luster needed for aesthetics.

The Bis-GMA resin contains fillers consisting of barium aluminium boron fluoride, silica glass and highly dispersed silicon dioxide.

To achieve a natural life like restorations, the clinician needs to establish a chromatic colour map and layer the restoration with successive layers of enamel,

dentine and translucent effect s so that the final restoration has good optical properties that reflect ,refract and absorb light naturally.

This gives the restoration a polychromatic effect with depth of color that looks like natural teeth.

Case Report(s)

Case

The following case describes the use of direct composite resin to close diastemas in the anterior teeth to address the aesthetic concerns of the patient (Fig 1)

Restorative Sequence

1. Pre-operative assessment: Assessment of the patient should be made along with any contraindications to treatment. Special attention must be made if there are any occlusal concerns like bruxing or in "deep bite" situations. Shade selection is made prior to treatment to compensate for the elevated value of teeth if dehydrated. Due to the different opacities/translucencies of the different tooth substrate-with dentine more opaque and enamel translucent ,we need to a choose material that mimics these characteristics.

2. Mock-Up: It can be difficult to select the correct shade and opacity and it is the author's preference to begin with a trial mockup of the different shades/opacities of materials to ensure correct colour and Translucency after matching the appropriate shade(Fig 2). This is a very quick buildup that gives the clinician a preview to the final result with minimal time and effort.

3. Isolation: The teeth were isolated with non-latex rubber dam using a full arch approach.

4. Preparation: is completed with a pumice slurry, judicious use of a diamond bur to give necessary bevels and clean the surface for optimal adhesion.(Fig3)Teeth were acid etched for 20 seconds with Ultra-Etch (Ultradent) (Fig. 4), rinsed and air dried. The enamel exhibited an excellent etch pattern. No dentin was exposed; therefore only Dentin/ Enamel resin (D/E resin, Bisco) was used. The D/E resin was applied in a thin layer, and lightly air-thinned. It is important not to allow the unfilled resin to

pool around the gum tissue. If this occurs, the microfill will not be able to be placed subgingivally.

The putty made from the mock up was used to build up the incisal edges. (Fig 5)

The restorations were placed according to an anatomical technique that involved the use of a highly chromatic dentin shade composite overlaid with a colorless enamel value composite. In addition to a full complement of enamel and dentin shades that correspond to the A-D shade range, the selected composite system also features 3 unique value shades (high, medium, and low) that mimic natural enamel in the manner in which it diffuses the underlying dentin color to create a natural-looking depth and appearance. The restorations were shaped and contoured using medium, fine, and superfine discs (Sof-Lex XT, 3M ESPE (Fig6)), and the final contours were made with a finishing bur (TDF9 Finishing Bur, Axis). To achieve a nice, polished surface, a PoGo Wheel (DENTSPLY Caulk) and Astropol points (Ivoclar Vivadent) were used. The final restorations were photographed at completion. (Figures 7)

Discussion

Bleaching is done before composite bonding to achieve color change; 10 to 14 days are allowed to pass before bonding as the bleaching material oxidizes the teeth, making bond strengths weaker. After the bleaching period, then composite can be bonded between teeth to increase the size of adjacent teeth and close spaces.

The results of diastema closure must conform to the esthetic ideals of smile design.(1-2) Because tooth dimension is being changed, maintaining symmetry and tooth proportion (both in terms of height to width and tooth to tooth) is challenging. Symmetry and tooth proportion (one tooth compared to the next) is easier when multiple diastemas are being closed; however, it cannot always be accomplished depending on tooth position.

Psychological limitations include apprehension about composite strength and longevity as well as final appearance. Excessive force will shear and fracture composite. It is the author's experience that diastema closure limits exposure to direct force on the incisal edge and little fracture occurs. Composite does slightly change color with time, and leakage around the margins can occur. Touch-ups to composite are usually required every 7 to 10 years.(3-4) There are several psychological advantages to composite bonding. Patients who worry that the results of

diastema closure will result in teeth that look too large in comparison to the other teeth or compared to the framework of the lips and face have the option of composites being easily changed. Composite can be added or reduced to fit a patient's desired goal. Indeed, it can be completely removed if necessary. Composite also can be placed without bonding to confirm patient acceptance. Flexibility is a very desirable feature. Patients also like that little to no tooth reduction is done and the dentistry can be completed without anesthetic.

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Illustrations

Illustration 1

Fig 1: Pretreatment Clinical View With Anterior Spacing In Between The Teeth



Illustration 2

Fig 2: Shade Matching With The Color Of The Teeth



Illustration 3

Fig 3: Beveling On The Teeth For Composite Build Up



Illustration 4

Fig 4: T Etching Of Teeth With Total Etch Technique



Illustration 5

Fig 5: Translucent Shade Being Depicted After Putty Adaptation Build After Mock Up



Illustration 6

Fig 6: Finished Composite Add Ups All Around The Teeth



Illustration 7

Fig 7: Final Polishing With Contouring And An Aesthetic Smile



Reviews

Review 1

Review Title: Review of Aesthetic Closure of Anterior Spaces in Mature Dentition

Posted by Dr. George Raymond on 15 Jan 2014 07:02:44 PM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 7

Comment:

Overall, well written article and case report. More detail could have been presented when reviewing the various materials but in the context given was a well written case report. I feel this is an excellent article to be presented to dental students/residents.

Competing interests: None

Invited by the author to make a review on this article? : Yes

Experience and credentials in the specific area of science:

General dentist, full time clinical educator New York University College of Dentistry

Publications in the same or a related area of science: No

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Review 2

Review Title: Aesthetic Closure of Anterior Spaces in Mature Dentition

Posted by Dr. Vidya S Bhat on 24 Dec 2013 08:12:29 AM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 4

Comment:

Whose psychological limitations does the author mention?

Competing interests: None

Invited by the author to make a review on this article? : Yes

Experience and credentials in the specific area of science:

Teaching since 15 years.

Publications in the same or a related area of science: No

References:

None

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Review 3

Review Title: Aesthetic Closure of Anterior Spaces in Mature Dentition

Posted by Dr. William J Maloney on 09 Dec 2013 10:04:16 PM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 8

Comment:

In providing aesthetic restorations for a patient, the practitioner must select certain composite resin materials. Certain essential features for these aesthetic materials include polishability, fracture toughness, modulus of elasticity and shrinkage.

A very thorough case report is provided by the author. The ideals of smile design are also discussed with respect to diastema closure.

Competing interests: None

Invited by the author to make a review on this article? : Yes

Experience and credentials in the specific area of science:

Clinical Associate Professor

Publications in the same or a related area of science: No

References:

None

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