FINAL SCRIPT: APPROVED FOR FILMING

Submission ID #: 67762
Scriptwriter Name: Debopriya Sadhukhan
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Title: Evaluating the Effects of Different Polishing Methods on Color Stability of Dental Restorations in Pediatric Dentistry

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Author Questionnaire

1. We have marked your project as author-provided footage, meaning you film the video yourself and provide JoVE with the footage to edit. JoVE will not send the videographer. Please confirm that this is correct.

XCorrect

2. Microscopy: Does your protocol require the use of a dissecting or stereomicroscope for performing a complex dissection, microinjection technique, or something similar? **No.**

3. Software: Does the part of your protocol being filmed include step-by-step descriptions of software usage? **No.**

4. Proposed filming date: To help JoVE process and publish your video in a timely manner, please indicate the proposed date that your group will film here: MM/DD/YYYY

When you are ready to submit your video LAB MEDIAs, please contact our Content Manager, Utkarsh Khare.

Current Protocol Length
Number of Steps: 13
Number of Shots: 19

Introduction

Videographer: Obtain headshots for all authors available at the filming location.
NOTE TO VO: Please record the Introduction and Conclusion statements

INTRODUCTION:

1.1. The given research aims to evaluate how different polishing methods affect the color stability of composite and compomer restorations in pediatric dentistry.

1.1.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested B.roll:3.1.1*

What are the current experimental challenges?

1.2. Maintaining consistent specimen preparation and color measurement conditions can be challenging, but standardizing these steps is crucial to ensure accurate and reproducible results.

1.2.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested B.roll:3.1.2*

CONCLUSION:

What advantage does your protocol offer compared to other techniques?

1.3. The given protocol provides a standardized and practical method to evaluate color changes after polishing.

1.3.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested B.roll:3.2.1*

How will your findings advance research in your field?

1.4. The provided findings will guide pediatric dentists in selecting optimal polishing systems, improving the color stability and durability of restorations in children's teeth.

1.4.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested B.roll:3.2.2-3.2.4*

Videographer: Obtain headshots for all authors available at the filming location.

Protocol

2. Color Stability and Finishing for Restorative Dental Materials

Demonstrator: Merve Nur Aydin

2.1. To begin, place the restorative material into a silicone mold **[2-TXT]**.

2.1.1. Talent filling the silicone mold with the restorative material using a spatula. **TXT: Silicone mold: 8 mm diameter, 4 mm thickness**
NOTE: Use video Jove 1

2.2. Press the materials between 1-millimeter glass plates with Mylar strips to match the mold's thickness **[1-TXT]**. Now, cure the restorative materials from one side using a light-emitting diode for 20 seconds with an intensity of 1.47 milliwatts per square centimeter **[2-TXT]**.

2.2.1. Talent pressing the materials between 1-millimeter glass plates with Mylar strips. **TXT: These glass plates ensure flat surfaces and reduce color measurement variations**
NOTE: Use video Jove 2

2.2.2. Talent curing the restorative materials from one side using a light-emitting diode. **TXT: Ensure a single operator prepares all the specimens**; **Assign the discs into subgroups 1.1 - 1.5 and 2.1 - 2.5**
NOTE: Use video Jove 3

2.3. Finish the specimens in groups 1.1 and 2.1 using a series of four-step aluminum oxide discs for 20 seconds each **[1]**.

2.3.1. Talent polishing specimens in groups 1.1 and 2.1 with a series of aluminum oxide discs. **NOTE: Use videos Jove 4 and Jove 5**

2.4. For groups 1.2 and 2.2, after polishing the specimens with aluminum oxide discs, finish them with a one-step polishing rubber kit for 20 seconds at low pressure **[1]**. Similarly, for groups 1.3 and 2.3, after polishing with aluminum oxide discs, finish the specimens with one-step polishing felt discs for 20 seconds each, while subjecting the felt discs to continuous water irrigation **[2]**.

2.4.1. Talent finishing the specimens in groups 1.2 and 2.2 using a one-step polishing rubber kit, applying low pressure.
NOTE: Use video Jove 6

2.4.2. Talent finishing the specimens in groups 1.3 and 2.3 using one-step polishing felt discs for 20 seconds each under continuous water irrigation.
NOTE: Use video Jove 7

2.5. In groups 1.4 and 2.4, after applying aluminum oxide discs, apply two-step spiral wheels for 20 seconds **[1-TXT]**.

2.5.1. Talent applying spiral wheels for groups 1.4 and 2.4. **TXT: Do not perform any finishing or polishing procedures for groups 1.5 and 2.5**
NOTE: Use video Jove 8

2.6. Place the prepared specimens in distilled water **[1]** and store them at 37 degrees Celsius for 24 hours to allow rehydration and complete polymerization **[2]**.

2.6.1. Talent placing specimens in distilled water.
NOTE: Use video Jove 9

2.6.2. Talent placing the specimens in distilled water in an incubator.
NOTE: Use video Jove 10

2.7. Use a spectrophotometer to evaluate the baseline color measurements of all groups relative to a standard illuminant **[1-TXT]**.

2.7.1. LAB MEDIA: 2.11.jpg **TXT: Calibrate the spectrophotometer and take 3 measurements for each specimen**

2.8. Store the prepared discs in cherry juice to compare the discoloration resistance of the materials and polishing techniques **[1]** and incubate all samples at 37 degrees Celsius for seven days **[2-TXT]**.

2.8.1. Talent placing discs into a container filled with cherry juice.

NOTE: Use video Jove 11

2.8.2. Talent placing the container in an incubator. **TXT: Refresh the juice daily**
NOTE: Use video Jove 11

2.9. At the end of the experiment, rinse the discs thoroughly with distilled water **[1]** and dry them using tissue paper before conducting color measurements following the same procedure shown earlier **[2]**.

2.9.1. Talent rinsing the discs with distilled water.
NOTE: Use video Jove 12

2.9.2. Talent drying the discs with tissue paper.
NOTE: Use video Jove 13

Results

3. Representative Results

3.1. When comparing the composite resin and compomer discs, noticeable differences in color stability were observed **[1]**. Discoloration was more pronounced in the specimens polished with aluminum oxide discs alone **[2]** and in those additionally treated with felt discs, particularly among composite resin groups **[3]**.

3.1.1. LAB MEDIA: Figure 3.

3.1.2. LAB MEDIA: Figure 3. *Video Editor: Highlight the blue bars in both Compomer and Composite Resin*.

3.1.3. LAB MEDIA: Figure 3. *Video Editor: Highlight the blue and orange bars in both Compomer and Composite Resin.*

3.2. No significant differences in discoloration were found between the composite resin and compomer **[1]** in the aluminum oxide discs plus polishing rubber kit **[2]**, aluminum oxide discs plus spiral wheels **[3]**, and control groups **[4]**.

3.2.1. LAB MEDIA: Figure 3.

3.2.2. LAB MEDIA: Figure 3. *Video Editor: Highlight the red bars in both Compomer and Composite Resin.*

3.2.3. LAB MEDIA: Figure 3. *Video Editor: Highlight the green bars in both Compomer and Composite Resin.*

3.2.4. LAB MEDIA: Figure 3. *Video Editor: Highlight the yellow bars in both Compomer and Composite Resin.*

Pronunciation Guide:

 Pediatric
Pronunciation link: https://www.merriam-webster.com/dictionary/pediatric
IPA: /ˌpiːdiˈætrɪk/
Phonetic Spelling: pee·dee·at·rik
 Dentistry
Pronunciation link: https://www.merriam-webster.com/dictionary/dentistry
IPA: /ˈdɛn.tɪ.stri/
Phonetic Spelling: den·tuh·stree
 Polishing
Pronunciation link: https://www.merriam-webster.com/dictionary/polishing
IPA: /ˈpɑːlɪʃɪŋ/
Phonetic Spelling: pah·luh·shing
 Color stability
Pronunciation link: https://www.merriam-webster.com/dictionary/stability
IPA: /ˈkʌlər stəˈbɪlәti/
Phonetic Spelling: kuh·lur stuh·bil·uh·tee
 Composite
Pronunciation link: https://www.merriam-webster.com/dictionary/composite
IPA: /kəmˈpɑːzɪt/
Phonetic Spelling: kuhm·pah·zit
 Compomer
Pronunciation link: https://www.merriam-webster.com/dictionary/compomer
IPA: /ˈkɑːmpoʊmər/
Phonetic Spelling: kahm·poh·mur
 Restorations
Pronunciation link: https://www.merriam-webster.com/dictionary/restoration
IPA: /ˌrɛstəˈreɪʃən/
Phonetic Spelling: res·tuh·ray·shun
 Silicone
Pronunciation link: https://www.merriam-webster.com/dictionary/silicone
IPA: /ˈsɪlɪˌkoʊn/
Phonetic Spelling: sil·ih·kohn
 Mylar
Pronunciation link: https://www.merriam-webster.com/dictionary/Mylar
IPA: /ˈmaɪlɑːr/
Phonetic Spelling: my·lar
 Light-emitting diode
Pronunciation link: https://www.merriam-webster.com/dictionary/light-emitting%20diode
IPA: /ˌlaɪt ɪˈmɪtɪŋ ˈdaɪoʊd/
Phonetic Spelling: lyt ih·mit·ing dye·ohd

 Milliwatts
Pronunciation link: https://www.merriam-webster.com/dictionary/milliwatt
IPA: /ˈmɪlɪˌwɑːt/
Phonetic Spelling: mil·ih·wot
 Aluminum oxide
Pronunciation link: https://www.merriam-webster.com/dictionary/aluminum%20oxide
IPA: /əˈluːmɪnəm ˈɑːksaɪd/
Phonetic Spelling: uh·loo·mih·nuhm ok·side
 Polymerization
Pronunciation link: https://www.merriam-webster.com/dictionary/polymerization
IPA: /pəˌlɪmərəˈzeɪʃən/
Phonetic Spelling: puh·lim·er·uh·zay·shun
 Spectrophotometer
Pronunciation link: https://www.merriam-webster.com/dictionary/spectrophotometer
IPA: /ˌspɛktroʊfoʊˈtɑːmɪtər/
Phonetic Spelling: spek·troh·foh·tah·mih·ter