

Original Research

A comparison of Mylar strip, Sof-Lex and Shofu on the surface roughness of nanofilled composite

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ABSTRACT:

Background: The present study assessed the role of different finishing and polishing procedures on the surface roughness of nanofilled composite. **Materials & Methods:** The present study was conducted on 60 recently restored composite teeth. Group I had Shofu finishing and polishing kit, group II had Sof-Lex composite finishing and polishing kit and group III had Mylar Strips. Surface roughness was compared. **Results:** The mean value of surface roughness was 0.84 in group I, 0.78 in group II and 0.52 in group III. The difference was significant ($P < 0.05$). The mean value of surface roughness in group I was 0.74, in group II was 0.72 and in group III was 0.46. The difference was significant ($P < 0.05$). **Conclusion:** Author found that maximum smooth surface was found with Mylar strip followed by Sof-Lex followed by Shofu.

Key words: Composite, Mylar, Shofu.

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INTRODUCTION

The search for esthetic materials has led to advances in the study of dental materials, especially composite resins. The main advantages of resins are related to the material's esthetic properties, decrease of marginal leakage, increased resistance of the tooth remnant, and less need for removal of healthy tooth structure.¹ In addition, the reduced polymerization contraction and improved wear resistance of resins permit their use not only in anterior but also in posterior teeth. Both esthetics and longevity of restorations strongly depend on the quality of the surface finishing and polishing.² Early studies have shown that the smoothest surface of a resin restoration is attained when the resin is polymerized against an appropriate matrix strip. When a matrix is not used, polymerization of outer layer is inhibited, resulting in a surface layer rich in organic binder with stick and soft consistency.³ Carbide and

diamond finishing burs, abrasive impregnated rigid points, impregnated rubber cups and points, aluminium oxide coated abrasive discs, abrasive strips, and polishing pastes are commonly used for finishing and polishing tooth-colored restorative materials.⁴ Each of these instruments or devices remove the oxygen inhibited layer of resin but leave the surface of restorative materials with varying degrees of surface roughness. Thus it is important to understand which type of surface-finishing treatments would significantly affect the surface irregularities of different composite resin restorations.⁵ The present study assessed the role of different finishing and polishing procedures on the surface roughness of nanofilled composite.

MATERIALS & METHODS

The present study was conducted 60 recently restored composite teeth in the department of Endodontics after

obtaining ethical approval from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

All restorations were classified into 3 groups of 20 each. In group I we used Shofu finishing and polishing kit, in group II we used Sof-Lex composite finishing and polishing kit and in group III we used Mylar Strips. Three measurements in different directions were

recorded in each group, the mean Ra value was determined for each specimen, and mean Ra for each group then was determined. Then surface sealant was applied to all treated specimens and the average roughness (Ra) was measured. Results thus obtained were statistically analysis. P value less than 0.05 was considered significant.

RESULTS

Table I: Distribution of teeth

Groups	Group I	Group II	Group III
System	Shofu kit	Sof-Lex kit	Mylar Strips
No of teeth	20	20	20

Table I shows that group I had Shofu finishing and polishing kit, group II had Sof-Lex composite finishing and polishing kit and group III had Mylar Strips. There were 20 teeth in all groups.

Graph I Assessment of surface roughness before sealant application

Groups	Mean	P value
Group I	0.84	0.02
Group II	0.78	
Group III	0.52	

Table II, graph I shows that the mean value of surface roughness was 0.84 in group I, 0.78 in group II and 0.52 in group III. The difference was significant (P< 0.05).

Graph I Assessment of surface roughness before sealant application

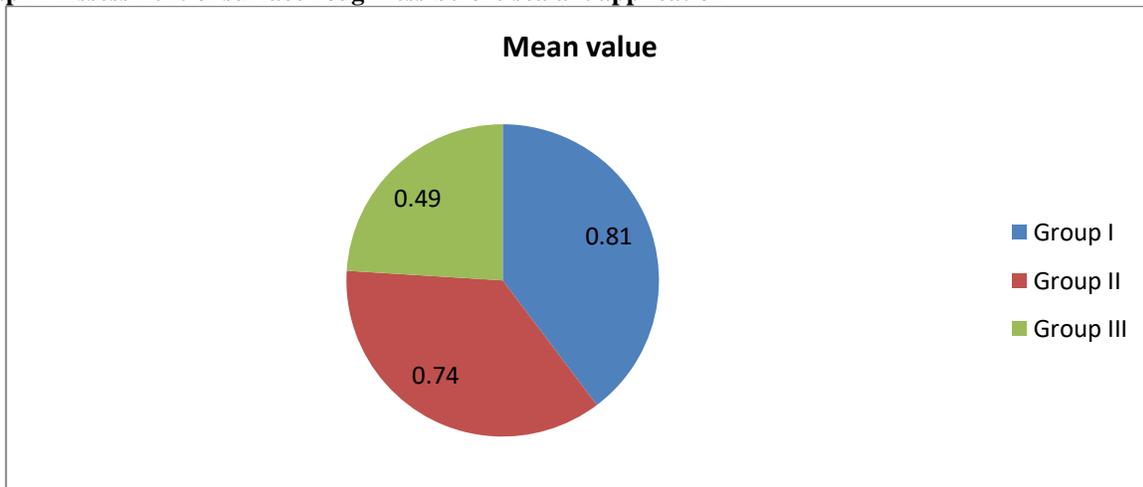
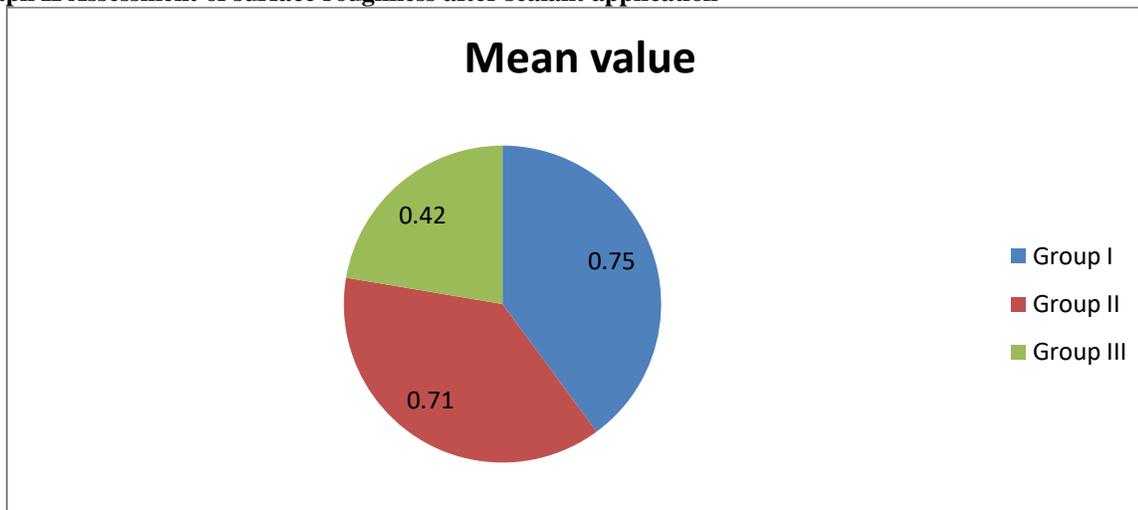


Table III Assessment of surface roughness before sealant application

Groups	Mean	P value
Group I	0.74	0.05
Group II	0.72	
Group III	0.46	

Graph III, graph II shows that the mean value of surface roughness in group I was 0.74, in group II was 0.72 and in group III was 0.46. The difference was significant (P< 0.05).

Graph II Assessment of surface roughness after sealant application

DISCUSSION

Finishing is necessary to remove excess material and to adjust the occlusion. Final polishing using extremely fine abrasives reduces the remaining roughness and is of special importance since rough surfaces accumulate more plaque and stains and may cause excessive enamel wear of the antagonistic tooth in areas of occlusal contact.⁶ The primary goal of finishing is to obtain a restoration with good contour, occlusion, healthy embrasure forms and a smooth surface.⁷ Tight margins of the restorations should blend aesthetically into the tooth's natural contours. The resin matrix and the filler particles of composite resins do not abrade to the same degree due to different hardness.⁸ The present study assessed the role of different finishing and polishing procedures on the surface roughness of nanofilled composite.

In this study, group I had Shofu finishing and polishing kit, group II had Sof-Lex composite finishing and polishing kit and group III had Mylar Strips. There were 20 teeth in all groups. St-Georges et al⁹ used 30 composite discs of dimension 6mm x 3 mm using a custom made stainless steel mould and then randomly divided into 3 subgroups for finishing and polishing by three different methods. Statistically significant difference was observed in surface roughness values before and after sealant application when finished and polished with shofu system. The lowest roughness values, before and after sealant application, was obtained when cured under a Mylar strip and the highest values were obtained when treated with Shofu.

We found that the mean value of surface roughness was 0.84 in group I, 0.78 in group II and 0.52 in group III. The difference was significant ($P < 0.05$). The mean value of surface roughness in group I was 0.74, in group II was 0.72 and in group III was 0.46. The difference was significant ($P < 0.05$). It has been reported that the

colour measuring geometry influenced the colour measurement of composite resins with different surface roughness. If the surface configuration has a matte finish there would be an excessive amount of light reflected at the surface level and a reduction of light transmission through the material.¹⁰ Surface texture controls the degree or scattering or the reflection of the light striking on the natural tooth or restorative material. For this reason clinicians experience problems in establishing harmony of the shade, obtained with the original shade that was selected using a shade guide especially after finishing and polishing procedures.¹¹ Erdemir et al¹² included 112 specimens prepared in a metal mold using four different tooth-colored restorative materials. After the light curing and setting cycle, seven specimens from each group which received no polishing treatment were used as controls. Specimens were randomly polished with Sof-Lex disks, Poli-pro disks, and the Hiluster^{plus} systems for 30 seconds. The mean surface roughness of each polished specimen was determined. The type of tooth-colored materials, polishing technique, and their interactions were statistically significant ($P < 0.001$). The smoothest surfaces of all materials were obtained with the Mylar strip. Glass-ionomer cement demonstrated statistically significantly higher R_a values (1.36 ± 0.77) than the other restorative materials tested ($P < 0.05$). Compomer (0.65 ± 0.28) produced the smoothest surface and did not significantly differ from the microhybrid composite. No significant difference was observed between the microhybrid and nanofil composites (1.08 ± 0.83 ; $P > 0.05$). According to the scanning electron microscopy observations, the surface irregularities of the materials were consistent with the surface roughness profilometric findings.

CONCLUSION

Author found that maximum smooth surface was found with Mylar strip followed by Sof-Lex followed by Shofu.

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