



UNIVERSITÀ POLITECNICA DELLE MARCHE FACOLTÀ DI MEDICINA E CHIRURGIA

Dipartimento Scienze Cliniche Specialistiche e Odontostomatologiche: XXXIII° ciclo



Effect of a finishing and polishing system on gloss retention and surface morphology of four resin composites

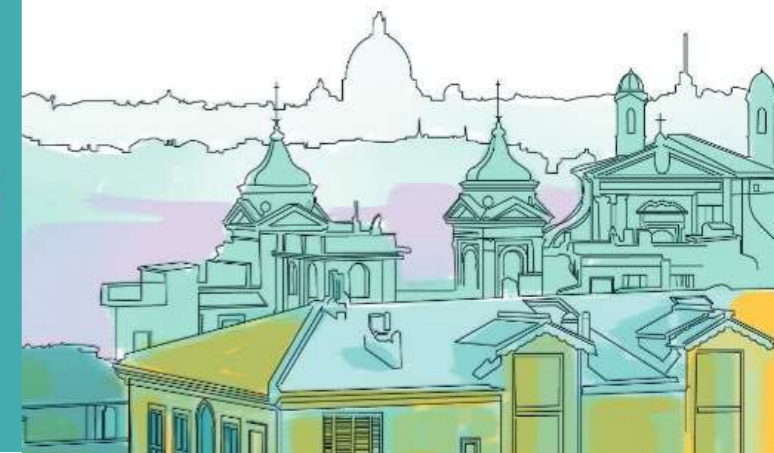
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The great esthetic demand by the patients, simplification of bonding systems and the physical and mechanical improved properties demand of composites, have developed the application of the nanotechnology to resin composite

The gloss retention and a smooth morphology surface represent the most important properties affecting the appearance of composite material and their clinical success.



E. Can Say et al. Dental Material Journal. 2014

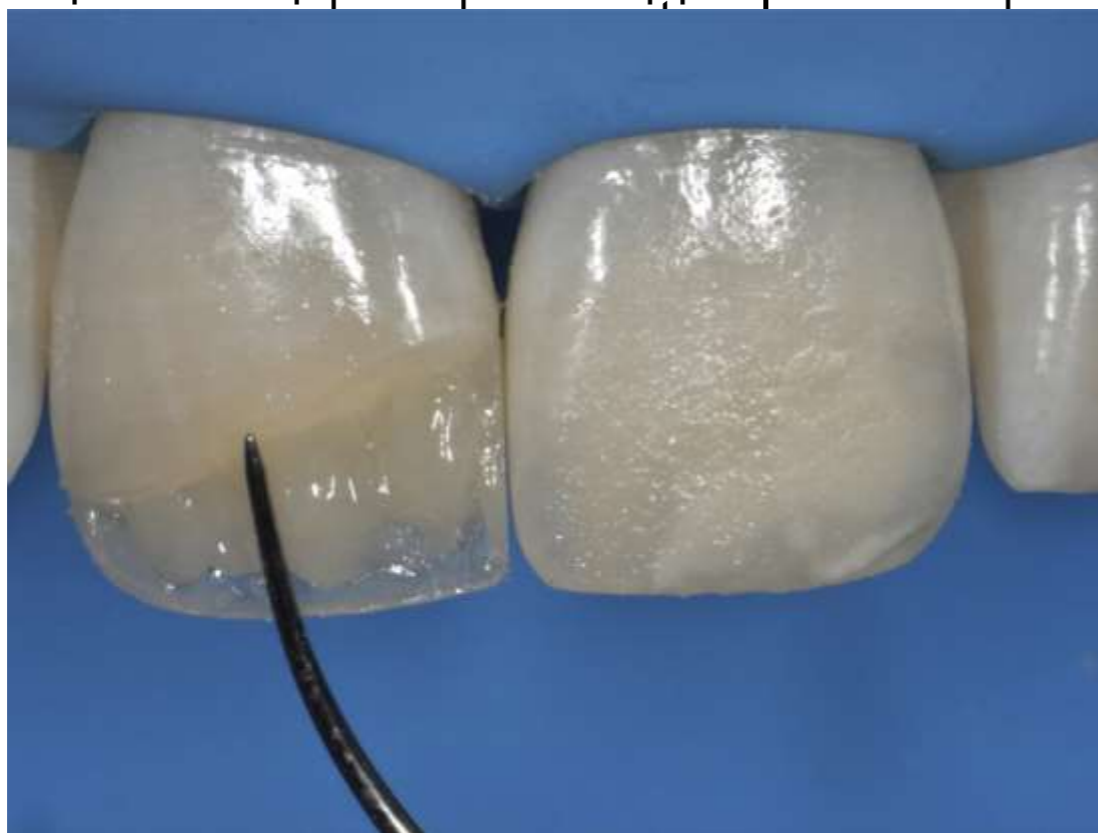


Prof. A. Putignano

Hardness describes the deformation degree of the material thus being

considered an important property for resin composites. The use of materials with a hardness similar to the one of dentin is mandatory to achieve an optimum clinical restoration performance.

The surface treatment with a suitable finishing and polishing technique



C. O' Neil et al. J Esthet Restor Dent. 2018



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The Aim

The aim of this *in vitro* study was to investigate the gloss retention and morphology of four different resin composites performed with the same finishing and polishing system.



Effect of a finishing and polishing system on gloss retention and surface morphology of four resin composites. Tosco et al.



Materials and Methods

Harmonize (Kerr Corporation)



TPH Spectra (Dentsply Sirona)



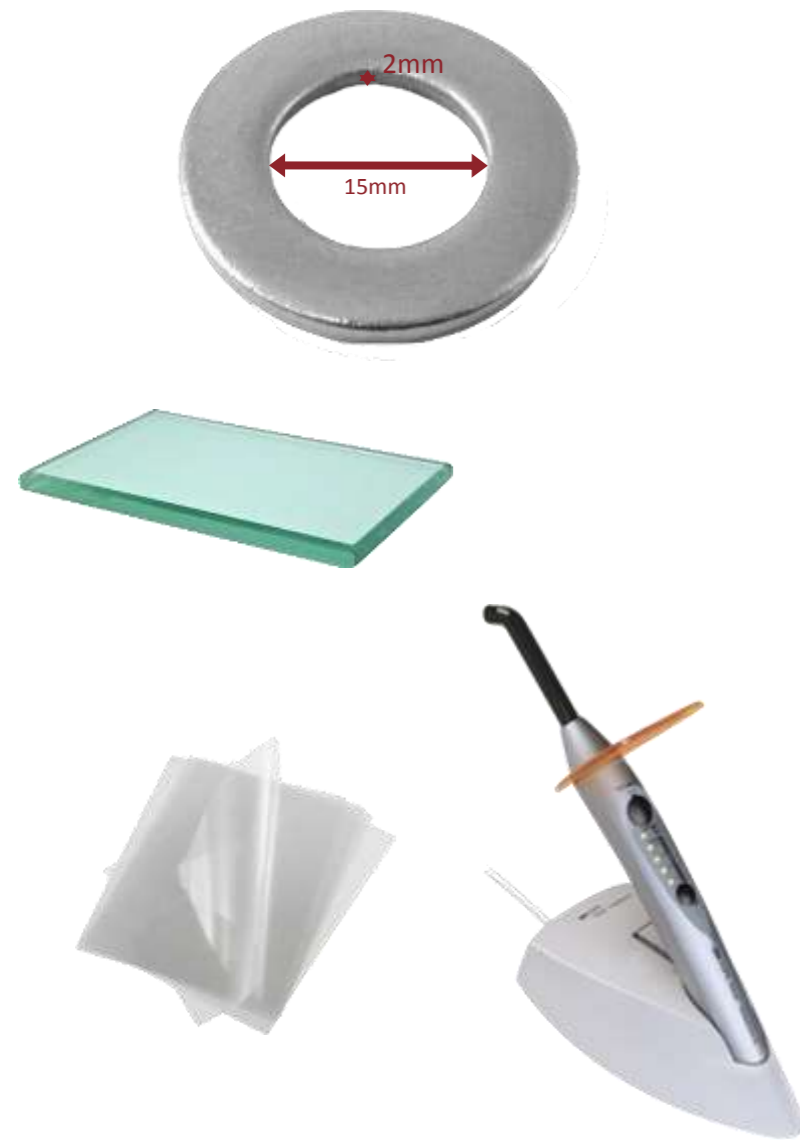
Estelite Σ Quick (Tokuyama Dental)



Gradia Direct X (GC Dental)

Samples preparation

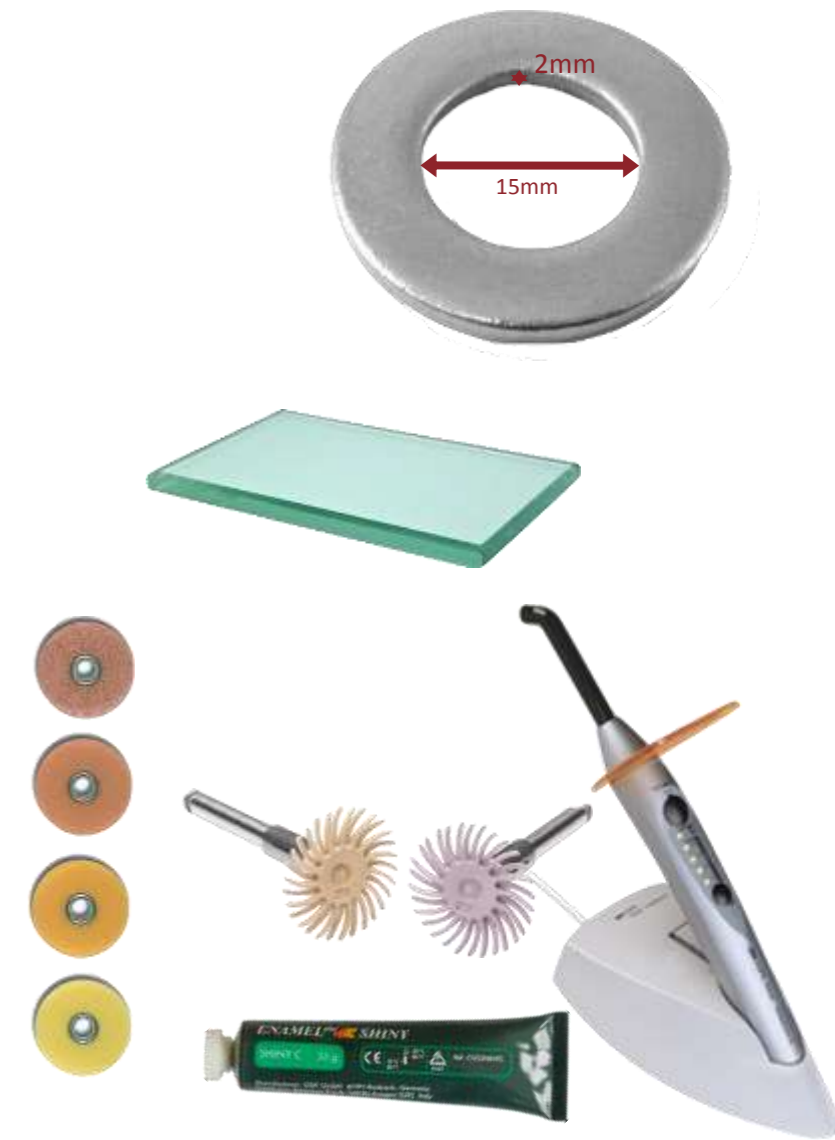
Control Group






Unpolished Group



Polished Group



Protocol

Polishing system	Application Method
<p>Sof-Lex Disc XT Coarse (C) Medium (M) Fine (F) Extra fine (XF)</p> 	<p><i>Each disk was used in dry conditions with light pressure for 20 sec with a hand piece speed of 10000-15000 rpm.</i></p>
<p>Sof-Lex Spiral Wheels Beige</p> 	<p><i>Each Spiral Wheels was used in dry and wet condition with light pressure for 20 sec with a hand piece speed of 10000-15000 rpm.</i></p>
<p>Sof-Lex Spiral Wheels Pink + Aluminium oxide paste Enamel Shiny C</p> 	<p><i>During the steps with the aluminium oxide paste, no irrigation was used.</i></p>

NB: All finishing and polishing instruments were used only once

Gloss was determined by a **NOVO-CURVE Glossmeter** (Rhopoint instruments), calibrated with a reference value of 95 gloss units (GU). Each sample was fixed into a silicon mold to avoid light interferences and was placed in the middle of the glossmeter.



Leitz Micro-Hardness

tester (Wetzlar GMBH,

Wetzlar, Germany). The

method consisted in

indenting the sample by

using a pyramid-shaped

diamond with a load of

50 g for 15 secs. After

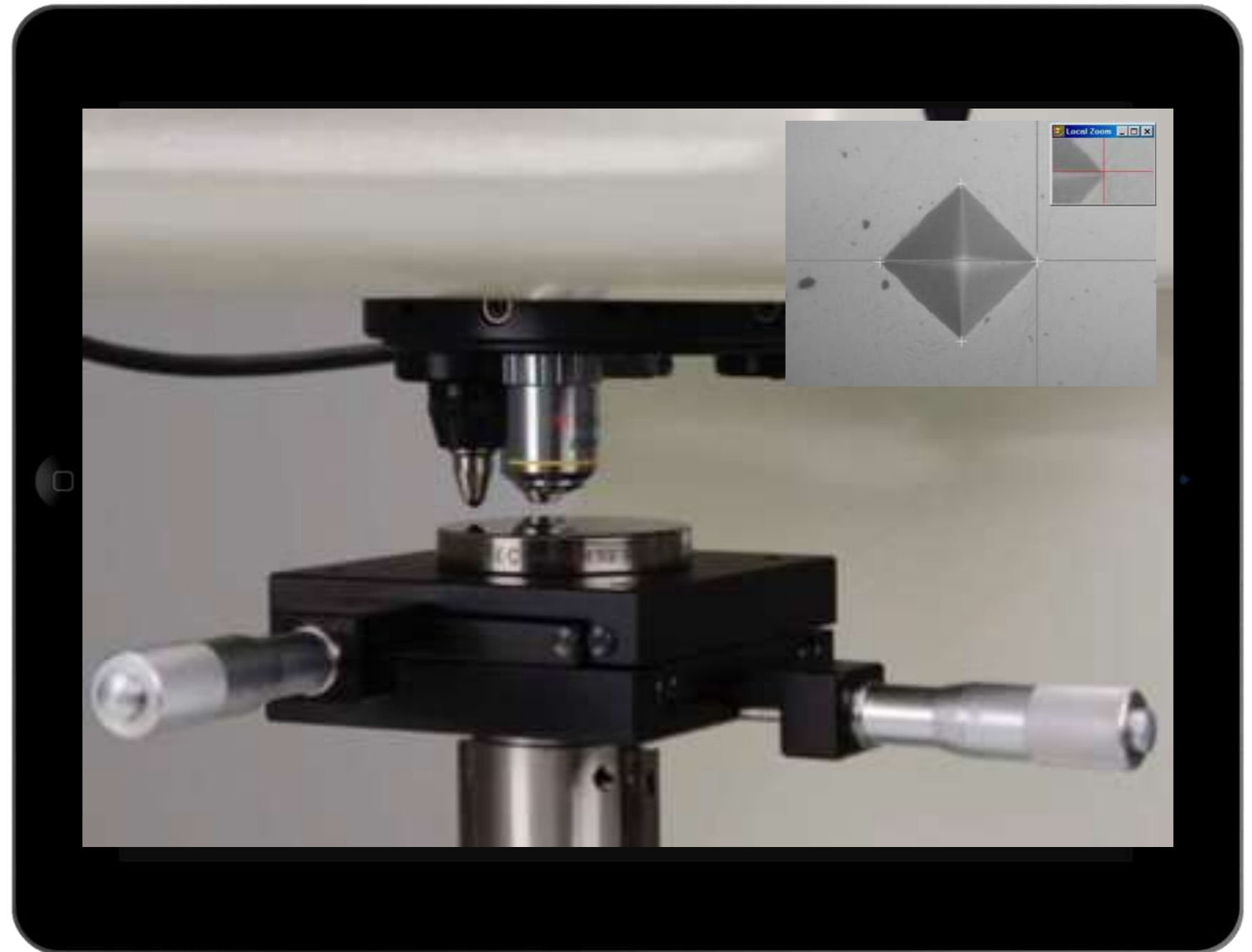
removing the load, the

values of the two

indentation diagonals

were evaluated by using

a microscope.



Each sample was analysed using **Scanning Electron Microscopy (SEM)** to examine composite morphology before and after finishing and polishing system. All the specimens were air-dried for 15s and cleaned with distilled water. Then, they were sputter-coated with graphite and morphologically evaluated using SEM.

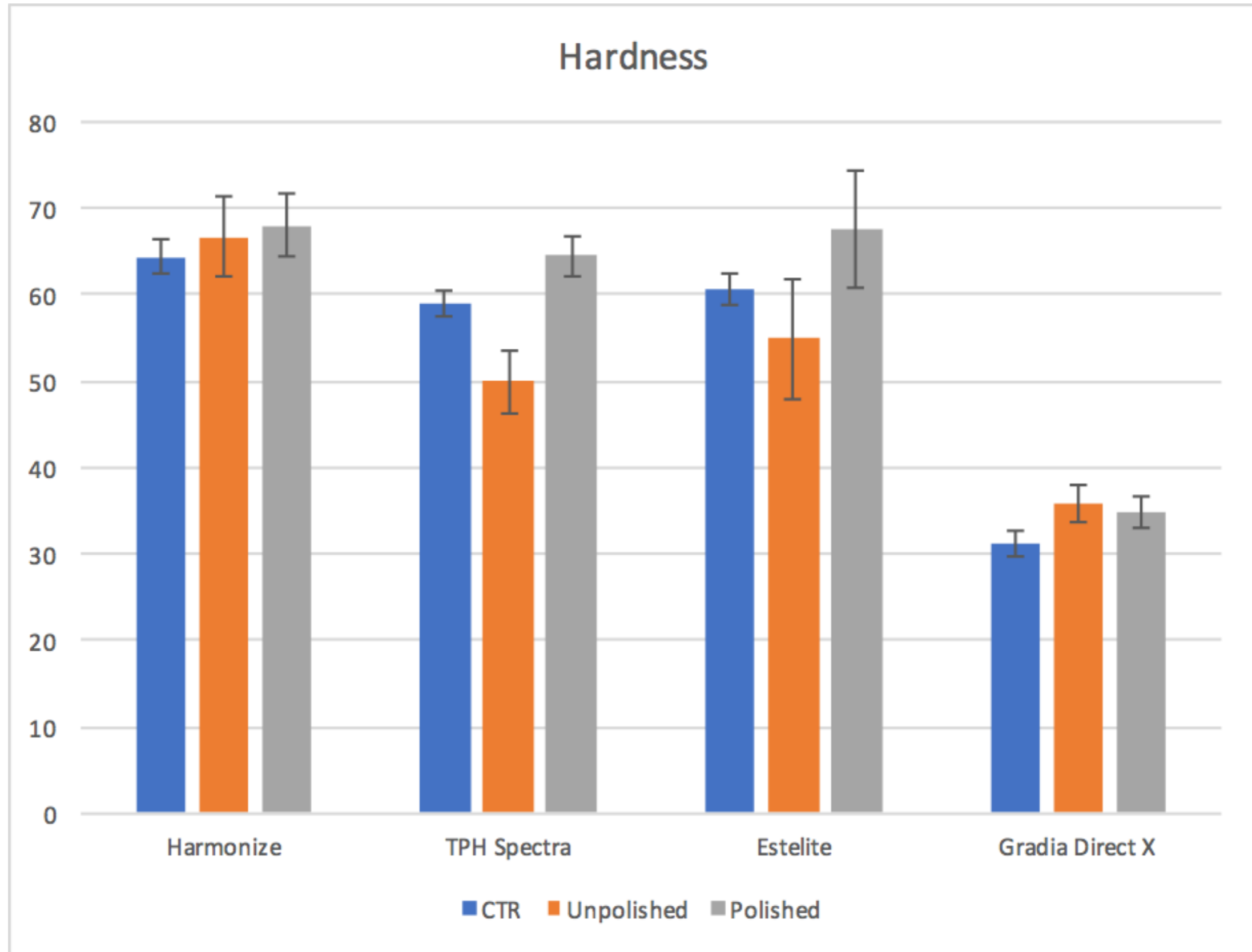


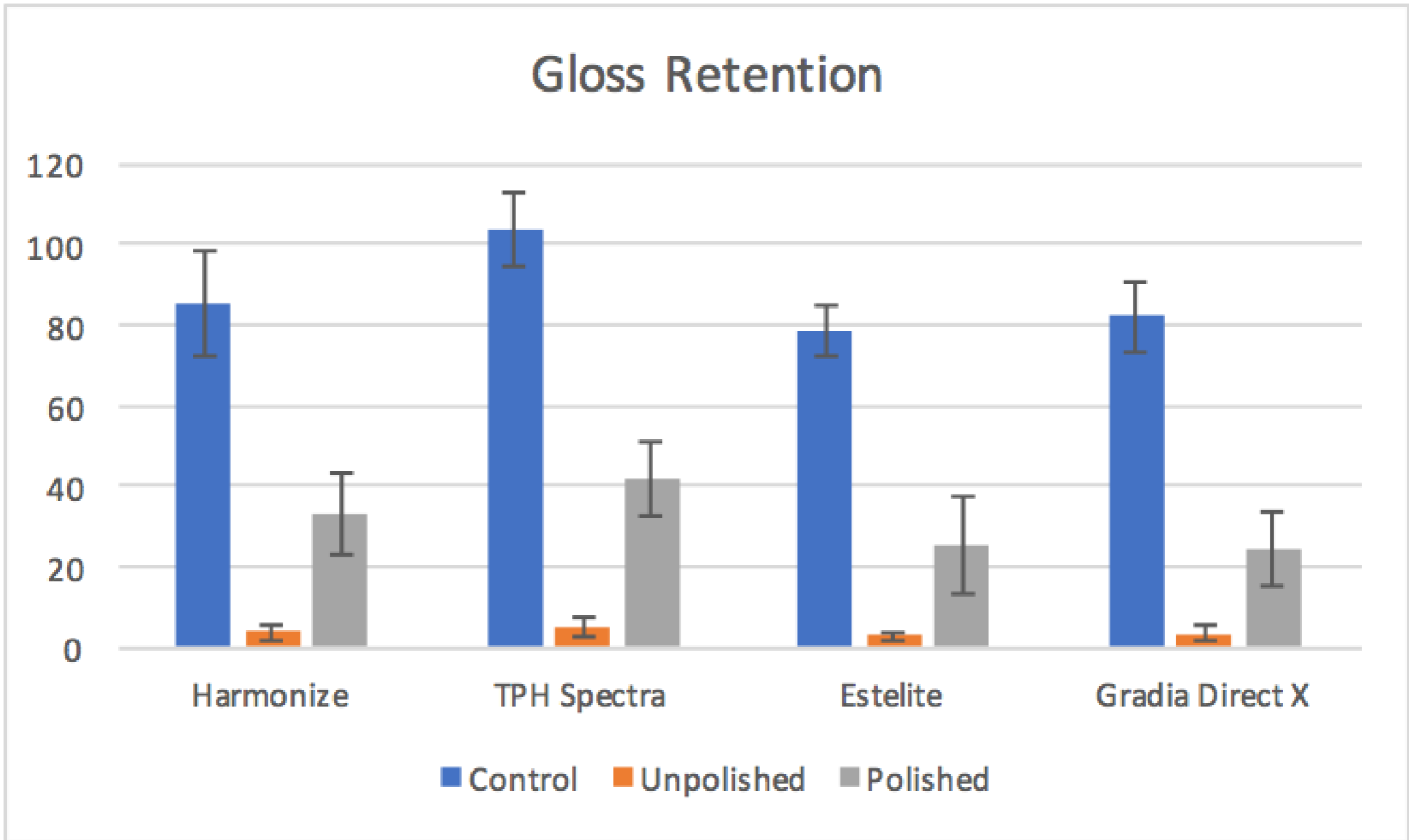


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Results







Conclusions



Hardness

- The effects of polishing and finishing procedures are material dependent.
- In Control Group, Harmonize showed the highest hardness. Gradia Direct showed the lowest one.
- In Unpolished Group, Harmonize showed the highest hardness. Gradia Direct showed the lowest one.
- In Polished Group, Harmonize and Estelite showed the highest hardness. Gradia Direct showed the lowest one.
- Estelite and TPH Spectra showed an improvement of hardness from unpolished to polished.

Clinical advices:

- We suggest to use Estelite, Harmonize and TPH Spectra on the occlusal surface
- The hardness of Harmonize is less influenced by polishing procedures.



Gloss

- Gloss is material dependent.
- In Control Group, Harmonize and TPH Spectra showed the highest gloss value.
- In Unpolished Group, Harmonize, Gradia Direct X, TPH Spectra showed the highest gloss value. Estelite showed the lowest one. The high standard deviation depends on material placement procedures.
- In Polished Group, Harmonize, Gradia Direct X, TPH Spectra, Estelite showed the highest gloss value. The gloss value of control group is always higher than the other two groups.
- Estelite and TPH Spectra showed an improvement of gloss from unpolished to polished

Clinical advices:

- We suggest to polish Estelite, Harmonize and TPH Spectra in order to improve the gloss value.