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Cast impression of sterilised impressions, a long term evaluation

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INTRODUCTION

Successful rehabilitation depends on many factors, such as dimensional stability, detail reproduction of impressions and models (Hamalian et al., 2011). Taking impressions is one of the crucial steps when it comes to oral rehabilitation. Impression quality determines the optimal adjustment of the restoration (Rupp et al., 2005; Balkenhol et al., 2010).

The aim of the impression material is to obtain a replica of the hard and soft tissues of the oral cavity in three dimensions and must be dimensionally stable (Craig e Powers, 2002; Hamalian et al., 2011).

Nowdays, elastomers are considered to be the standard of care as the material for definitive impressions in fixed prosthodontics (Lee, 1999). Within the family of elastomers, we can find polysulfides, condensation silicones, addition silicones and polyethers (Noort, 2007). The addition silicones and polyethers tend to be used most frequently due to their physical and mechanical properties (Lee, 1999; Hamalian et al., 2011).

Disinfection procedures weren't used until the twentieth century. Impressions are contaminated by plaque, blood or saliva, creating a vehicle for cross-infection for a variety of pathogens such as HIV, Hepatitis B, herpes and tuberculosis. Therefore it is necessary to control cross-infection in clinical practice (Drennon e Johnson, 1990; Martin et al., 2007; Thomas et al., 2008; Rentzia et al., 2011).

The ADA Specification nº19 (1977) states that the maximum negative change in dimension is 0.5%, and the ISO 4823:2000 has a maximum of 1.5%.

OBJECTIVES

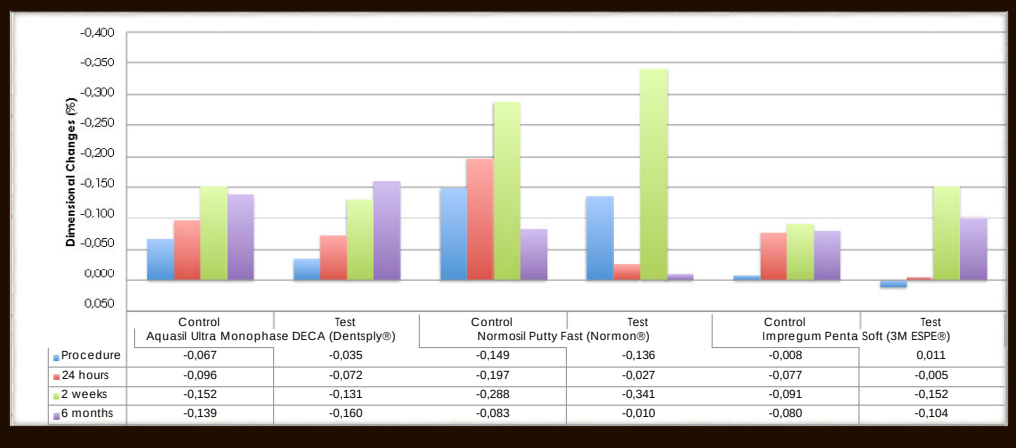
Study the dimensional changes on gypsum casts poured with 2 addition silicones and a polyether after the impressions were steam-autoclave sterilised and then stored.

HYPOTHESIS

When subjected to autoclaving, the addition silicones and polyether suffer dimensional changes, resulting in casts with different dimensions of the matrix.

When subjected to autoclaving, the addition silicones and polyether don't suffer dimensional changes, resulting in casts with similar dimensions to the matrix.

RESULTS



	Control Aquasil Ultra Monophase DECA (Dentsply®)	Test Aquasil Ultra Monophase DECA (Dentsply®)	Control Normosil Putty Fast (Normon®)	Test Normosil Putty Fast (Normon®)	Control Impregum Penta Soft (3M ESPE®)	Test Impregum Penta Soft (3M ESPE®)
Procedure	-0,067	-0,035	-0,149	-0,136	-0,008	0,011
24 hours	-0,096	-0,072	-0,197	-0,027	-0,077	-0,005
2 weeks	-0,152	-0,131	-0,288	-0,341	-0,091	-0,152
6 months	-0,139	-0,160	-0,083	-0,010	-0,080	-0,104

Normosil Adición Putty Fast (Normon©) → Lowest dimensional stability

Impregum Penta Soft (3M ESPE™) → Highest dimensional stability

CONCLUSIONS

The null hypothesis is rejected.

The gypsum casts shows dimensional changes of the impression materials after autoclaving.

The dimensional changes are below the maximum allowed by ADA Specification nº19 (1977) and ISO 4823:2000, therefore the steam autoclave sterilization should be considered a valuable disinfection procedure.

MATERIAL AND METHODS

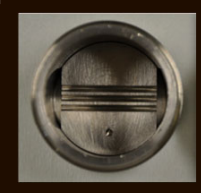
Impregum™ Penta™ Soft Polyether (3M ESPE™)

Aquasil Ultra Monophase (Dentsply®)

Normosil Adición Putty Fast (Normon©)

Pentamix 2 (3M ESPE™)

Metallic matrix side view



Metallic matrix top view

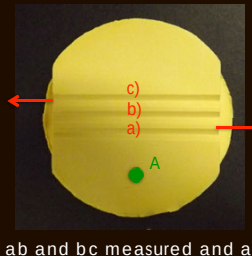
A group - 5 samples

B group - 5 samples

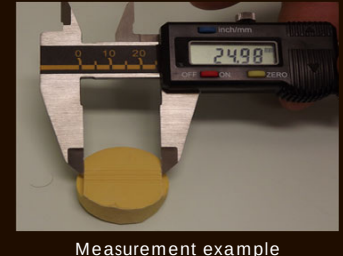
Chemical disinfection with 5.25% sodium hypochlorite - 10 min.

Chemical disinfection with 5.25% sodium hypochlorite - 10 min. + Steam autoclave sterilisation at 134ºC - 25 min.

Gypsum casts



a, b, c, ab and bc measured and averaged



Measurement example

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