

The evaluation of flow property of alginate impression Material mixed with gargle solutions

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Abstract

The effects of antiseptic and gargle solutions mixed with the irreversible hydrocolloid alginate impression material to anti-bacterial activity and several properties had been elucidated. The flow property of the such impression has been not elucidated yet. The aim of the study was to evaluate the flow property of alginate impression mixed with gargle solution. Aroma Fine Plus alginate impression material was used and mixed with aquadest as control and Minosep, Betadine and Total Care gargle solutions. Ratio between alginate and each solutions were performed by following the producer's guidance as 8.4gr alginate and 20ml solution. The every alginate mixtures were made in triplicate (n=3). Measurement of flow capability was performed by using 0.5ml of alginate mix laid on glass plate covered with cellophane strip and loaded with 1kg metal for 1 minute. The major and minor diameters were measured by using digital caliper. Data were analyzed by using one way ANOVA ($\alpha= 0.05$). Aroma Fine mixed with aquadest showed the flow capability was about 26.18mm. Mixed with Minosep showed about 27.85mm, with Betadine 29.19mm and Total Care 27.11mm respectively. Statistically show a significant different flow capability between aquadest and Betadine mixed impression ($p=0.01$). Minosep and Total Care gargle solutions showed insignificant different with aquadest mixed impression ($p>0.05$). It can be concluded that the utilizing of Minosep and Total care gargle solution as solutions mixed with alginate impression material have no effect to flow property of the impression, except by using Betadine gargle solution.

Key words: Alginate impression material, flow, gargle solution.

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Introduction

Disinfection of impression is needed to be done to avoid the cross contamination between the patient and the operators. It is commonly to disinfect impression by using 1% sodium hypochlorite, 2% glutaraldehyde, chlorine compound, iodofor, glutaraldehyde or phenol disinfection agents. There are several methods of disinfection such as immersion or spray the disinfectant solution.^(1,2) These methods produce the dimensional changes on the irreversible hydrocolloid alginate impression.^(3,4,5)

The other method in disinfecting impression is by admixing disinfectant solution with irreversible hydrocolloid alginate impression material. Irreversible hydrocolloid impression material mixed with chlorhexidine exhibits varying degrees of antibacterial activity and can be used in disinfecting impression.^(6,7) By using this method also reveal that there is no significantly alter the properties of impression include the dimensional stability of set material.^(8,9)

Latterly the disinfection capacity of mouthwash solutions mixed with alginate impression was investigated. The 0.1% chlorhexidine contained Minosep gargle solution mixed with alginate impression materials show the insignificant difference disinfection capacity compare with the

impression immersed into the same gargle solution.⁽¹⁰⁾ Gargle solutions mixed with Aroma Fine Plus and Hygedent alginate impression materials increased the setting time and decreased the dimensional measurement of impression materials.⁽¹¹⁾ The aim of the study was to evaluate the flow property of irreversible hydrocolloid alginate impression mixed with gargle solution.

Materials and methods

Sample was made as mix of alginate with aquadest or Minosep, Betadine and Total Care gargle solutions. The alginate mix was laid on glass plate, covered with cellophane strip and loaded with 1kg metal for 1 minute.⁽¹²⁾ The major and minor diameters were measured by using digital caliper for three investigations each (n=3). Data were analyzed by using one way ANOVA ($\alpha=0.05$).

Results and discussion

Table 1 shows the impression materials and gargle solutions investigated.

Sample was made as mix of alginate with aquadest or Minosep, Betadine and Total Care gargle solutions. The alginate mix was laid on glass plate, covered with cellophane strip and loaded with 1kg metal for 1 minute.⁽¹²⁾ The major and minor diameters were

Table 1. Impression material and gargle solutions used

No.	Materials	Type	Product	Batch/Lot number
1	Impression mat.	Irreversible hydrocolloid alginate, regular set	Aroma Fine Plus	1701211
2	Gargle	Chlorhexidine Gluconate 0.1%	Minosep, Indonesia	88381
3	Gargle	Povidon Iodine 1%	Betadine, Indonesia	J817069
4	Gargle	Sodium Fluoride 0.1%wv	Total Care, Indonesia	48105111
5	Aquadest	H2O	Local, Indonesia	

Table 2. Flow capability of aroma fine plus alginate impression material mixed with gargles

Aroma fine plus imp. Material	Flow capability				
	Material mixed with	Aquadest (mm)	Minosep (mm)	Betadine (mm)	Total Care (mm)
Mean		26.18	27.85	29.19	27.11
Sd		1.49	0.26	1.51	0.26

measured by using digital caliper for three investigations each (n=3). Data were analyzed by using one way ANOVA ($\alpha= 0.05$)

Aroma Fine Plus impression material mixed with aquadest as control show flow activity as long as 26.18mm. Mixed with minosep, betadine and total care gargles show flow activity as long as 27.85mm, 29.19mm and 27.11mm, respectively.. Statistically minosep and total care gargles mixed with Aroma Fine Plus impression material show no significant different flow capability compare with aquadest mixed impression material. But Betadine mixed Aroma Fine Plus impression material show significant different flow capability than aquadest mixed impression material. Betadine mixed Aroma Fine Plus impression material show more longer flow capability than aquadest mixed impression material.

In this investigation it is revealed that Minosep and Total Care gargles mixed to Aroma Fine Plus impression material have no effect to the flow activity of impression. But on the other hand Betadine gargles show significant different in flow capacity compared to the control. Chlorhexidine Gluconate 0.1% contain Minosep gargle solutions mixed to irreversible alginate impression material have no effect to flow capability of impression material. This finding coincidence with Wang et al (2007) which show that mixing irreversible hydrocolloid impression material with chlorhexidine solution would not affect the flowability.⁽⁶⁾ Amalan et al (2013) concluded that mixing of irreversible hydrocolloid impression materials with disinfectant liquids may alter their properties depending on the type and concentration of the disinfectant.⁽⁹⁾ This study showed the gargle solutions mixed with the irreversible hydrocolloid impression material have different effect on flow capability property.

Conclusions

It can be concluded that gargle solutions having an affect on the flow property of impression material depend on the type of gargle solution used.

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