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Objectives:

The aim of this study was to compare the two types of mixing methods with and without disinfection on the compressive strength, recovery from deformation and particule characteristics of two types of irreversible hydrocolloid materials.

Materials and Methods:

A total of 88 standardized samples were prepared both by hand and device mixing (Algimax Dancer DM21) according to ANSI/ADA specification no.18 using Orthoprint-fast setting (Zhermack) and CA37-regular setting (Cavex) irreversible hydrocolloids.

Half of the samples were subjected to 2% sodium hypochloride disinfection. Recovery from deformation and compressive strength tests were conducted using universal testing machine (cross-head speed : 0.5 mm/min) according to ANSI/ADA specification no.18. Additionally, particule characteristics of the prepared samples were examined under light microscope (Nikon Eclipse ME600) and the scanned images were analyzed using Lucia G software.

Results:

The fast setting irreversible hydrocolloid material showed recovery from deformation results which can not be in accordance with the ANSI/ADA specifications (93.557 %) and neither the mixing method nor the disinfection procedure affected the results. On the other hand, the results of the regular setting material were in the acceptable range (95.043 %) . Statistical analysis (Student t-test) showed favourable results for device mixing , though disinfection was not effective. In the compressive strength test regular setting material had lower values than the fast setting one. The viewed surfaces of the fast setting material consisted of 30% air entrapment in both of the mixing methods while in the regular setting material there were more air entrapment in the hand mixing method than the device (38% and 27% respectively). The pores were seemed to be filled with the disinfectant on the surface, forming a layer.

Conclusion:

Device mixing of the regular setting irreversible hydrocolloids showed better mechanical results.