# "EFFICACY OF ANTIBACTERIAL SEALING GEL AND O-RING TO PREVENT MICRO LEAKAGE AT THE IMPLANT ABUTMENT INTERFACE – A COMPARATIVE INVITRO STUDY"

By

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# ABSTRACT

**Background and Objectives** - Premature loss of dental implants is due, apart from mechanical factors, to germ-related inflammation. Gaps and hollow spaces within the implant system, for example the gap between implant and abutment in the two-part implant system, may provide a bacterial reservoir causing or maintaining inflammation. It has been postulated that a potential microscopic gap of 55-104 microns exists at the implant abutment interface. Oral micro-organisms have a diameter of less than 10 microns and can easily pass through this micro gap. This misfit may lead to micro leakage of fluids and bacteria which may cause loss of marginal bone and may finally lead to periimplantitis. O-ring an addition poly siloxane and GapSeal an antibacterial sealing gel was used at the implant abutment interface in order to seal this micro gap. The present study was performed to evaluate the efficacy of these sealing agents to prevent the micro gap at the implant abutment interface.

**METHOD**- A total of 45 identical implant systems of ADIN company were taken and divided into 3 groups with 15 implants in each group. The group labeled U was the group with unsealed implants; the group O was with implants sealed with an O-ring, the group G were implants sealed with GapSeal gel. The implants were gamma sterilized. All the 3 groups were placed in sterile brain heart infusion broth tubes and inoculated with enterococcus for 5 days. The implants were removed from the tubes, dried aseptically and placed in 2% sodium hypochlorite solution for 30 minutes and washed with sterile saline for 5 minutes. They were then dried aseptically and put in sterile brain heart infusion broth tubes. This broth was poured in sterile Petri dishes

and mixed with liquid BHI Agar at 50 degree centigrade. This plate was allowed to cool and the colonies formed on each plate were counted using a digital colony counter after 48 hours. The data thus obtained was subjected to statistical analysis by Kruskal-Wallis ANOVA test and Mann-Whitney U-test.

**RESULTS**- It was observed that all the 3 groups showed microbial growth, however the growth was more in the unsealed groups as compared to the sealed groups. It was also observed that the G group showed least amount of growth as compared to the O group and the U group. Statistical comparison of the 3 groups was done by Kruskal-Wallis ANNOVA test which showed statistical significance with p value of 0.0444.

**CONCLUSION**- Within the limitations of the study it was concluded that though microbial growth is seen in all the 3 groups, the growth is significantly reduced when sealants like O ring and GapSeal were used. Thus, the data taken together suggests that antibacterial sealing gel and O-rings help in decreasing the microbial growth and can be used as a supportive measure to prevent the micro-leakage at the implant abutment interface.

**KEYWORDS**- Implant- abutment interface, Micro gap, O-ring, GapSeal.