

EVALUATION OF RETENTION AND RELEASE PERIOD IN LABIALLY INCLINED IMPLANT RETAINED MANDIBULAR OVERDENTURES WITH TITANUM-SILICONE SNAP ATTACHMENTS (COMPARATIVE IN-VITRO STUDY)

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INTRODUCTION

Complete denture wearers usually have difficulties concerning comfort and function while adapting to the new situation, therefore implants and attachments are used to provide support and retention for the prostheses to improve patient's quality of life. ⁽¹⁾ The objective was to evaluate retention and release period of two implants retained mandibular overdentures with different degrees of labial inclination 0 °, 17.5 ° and 35°, and different types of Titanium Silicon snap attachments before and after cyclic loading.

METHODOLOGY

This study was conducted on three Duplicate mandibular epoxy models with two dummy implants in the canine regions using the following degrees of labial inclination. Group A (control); 0 °, group B (study); 17.5°, and group C (study); 35°. Thirty six mandibular overdentures were constructed over the three models (twelve for each model), and connected to the models with Ti-Si snap attachments with retention Silicone 400 g/ 4 Newton (n=6) and 600 g/ 6 Newton (n=6). Retention and release period of all overdentures with different attachments concept was performed using universal testing machine before, after 540 cycles (6 months) and 1080 cycles (1 year) of insertion and removal on a chewing simulator with artificial saliva. Figure (1)

Then compared with control group.

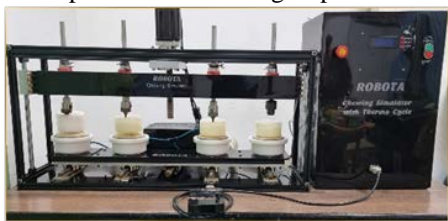


Figure (1): Robota Chewing Simulator

RESULTS AND DISCUSSION

In each group, repeated measures analysis showed a statistically significant change in the retention among the different cycle measurements. Pairwise comparisons revealed that the retention and release period were statistically significantly lower in the inclination 35 degrees group (p<.001) compared with the inclination zero degree group in both retention silicone types. These results were in agreement with Al-Ghafli et al. 2009, results showed that as the frequency of insertion and removal increased, the retention gradually reduced in each angulation group. Additionally, there were noticeable

variations in the retention levels at different implant angulations. ⁽²⁾



Figure (2): Cycling and measuring retention and release period

After performing cyclic loading, peak load and break load were used to calculate retention and release period, data were recorded using computer software (Bluehill Lite; Instron Instruments). (Figure 2) The retention results as in (table 1)

Table (1): Retention among the retention silicone 600g /6N in the studied subgroups

Retention (Silicon 600)	Inclination			Test of significance p value
	0 degree	17.5 degrees	35 degrees	
Baseline				
- Min. – Max.	25.03-25.83	17.38-18.82	15.76-16.49	$Z_{(KW)}=15.174$ $p=.001^*$
- Median	25.22	17.73	15.86	
- IQR	25.03-25.37	17.62-17.88	15.79-16.47	
Six months				
- Min. – Max.	22.93-23.81	15.26-16.14	13.42-15.13	$Z_{(KW)}=15.158$ $p=.001^*$
- Median	23.64	15.845	14.50	
- IQR	23.60-23.78	15.72-16.03	13.54-14.92	
Twelve months				
- Min. – Max.	22.78-24.04	13.51-15.09	10.38-11.64	$Z_{(KW)}=15.158$ $p=.001^*$
- Median	23.13	14.14	11.365	
- IQR	22.87-23.76	13.77-14.98	11.15-11.59	
Friedman Test of significance p value	$\chi^2_{(df=2)}=9.333$ $p=0.009^*$	$\chi^2_{(df=2)}=12.000$ $p=.002^*$	$\chi^2_{(df=2)}=12.000$ $p=.002^*$	

CONCLUSION

By using TiSi snap attachments in overdentures, the retention and release period decreases gradually as insertion and removal cycles increase. As labial angulation of the implants increases, retention and release period of attachments markedly decreases. Retention silicone resilient liners have a high success rate for short- and medium-term maintenance.

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