

## **In vitro evaluation of the effect of disto-labially inclined implant and Locator attachment on retention and longevity of implant-supported overdentures**

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### **Abstract**

**Background and Aim:** Several problems have been reported regarding the retention and longevity of the attachments of implant-supported overdentures. Few studies are available in this regard. This in-vitro experimental study evaluated the effect of disto-labial inclination of implant and attachment on retention and longevity of implant-supported overdentures.

**Materials and Methods:** In this experimental study, 40 specimens in 8 groups were evaluated. Four mandibular edentulous models and related dentures were identically fabricated. Two implant analogues (Dentium, South Korea) were placed in each model. Analogues were placed at disto-labial inclinations of 5, 10 and 15 degrees. In the control group, analogues were placed parallel and at 90 degrees angle to the edentulous ridge.

Locator abutment (Dentium, South Korea) with red retainer was placed on each implant analogue. Each specimen was loaded by 3000 insertion and removal and 2000 thermal cycles. The retention of each specimen was measured after each 500 cycles with UTM (SANTAM, STM20). Data were analyzed by Repeated Measure ANOVA and TUKEY tests.

**Result:** The maximum initial retention before thermo-cycling was found in specimens with 5 degrees of inclination ( $36.4 \pm 1.51$  N). After thermo-cycling, the maximum retention was found in specimens with 15 degrees of inclination ( $30.7 \pm 1.11$  N). The minimum retention was recorded in the group with 10 degrees of inclination in both conditions ( $17.18 \pm 0.92$  N). No significant difference was found between 5 and 15 degrees inclinations according to Repeated Measure ANOVA and TUKEY tests. But the retention in these inclinations was significantly higher than 0 (control) and 10 degrees inclinations. ( $P < 0.001$ )

**Conclusion:** Inclination of implant and attachment has a positive effect on the retention and longevity of overdenture in a way that by increasing the inclination to 15 degrees, the retention increases but wear-down rate and retention loss also increase simultaneously.

**Keywords:** *dental prosthesis, implant-supported, implant inclination, attachment, denture retention, longevity*