Clinical study with short implants: relation among insertion torque, osseointegration and bone loss

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Background and Aim

The use of short implants has gained popularity in the last years, since they have demonstrated high long-term survival and success rates. Adequate primary stability and osseointegration are of extreme importance for long-term success of implant therapies. The aim of this study was to assess the relationship between insertion torque, premature osseointegration failure and bone loss in patients with short morse taper implants after a 1-year follow-up.

Methods and Materials

20 morse taper 4 and 5mm in diameter and 5 and 6mm in length dental implants were installed in 11 patients. During placement, insertion torques were recorded using a torque wrench. Implants were left submerged. After 6 months, during second-stage surgeries, signs of osseointegration failures were evaluated, provisional crowns delivered and x-rays taken. 1-year after loading, control x-rays were taken. Bone levels were measured in x-rays from the implant platform to marginal bone using ImageJ 1.52d analysis software. Loading and follow-up x-rays were compared to assess the amount of bone loss. Data collected was analyzed using shapiro-wilk normality test, t-tests and Pearson correlation in the SPSS software. Significance was declared at $p < 0.05$.

Results

The mean follow-up time after implant placement was 18.75 ± 7 months. Three implants were excluded (15%), two due to mechanical and one due to biological failures. Mean values for mesial bone measurements at loading (0.95 ± 0.74) and at control x-rays (0.88 ± 0.83), and for distal bone levels at loading (1.12 ± 0.92) and at control x-rays (1.08 ± 0.91) were used to calculate the amount of bone loss in mesial (0.146) and distal sites (0.326), respectively. Correlation values between insertion torque, mesial ($r = -0.240$) and distal bone loss ($r = 0.127$) were calculated, as well as for insertion torque and osseointegration ($r = 0.291$).

Figure 1. Radiographic analyse of bone measurments at baseline and follow-up.

	Baseline	Follow-up	Sig.
Mesial	0.95 ± 0.74	0.88 ± 0.83	0.146
Distal	1.12 ± 0.92	1.08 ± 0.91	0.326

Tabel 1. Bone measurments at different times.

Conclusion

No relation between insertion torque and bone loss nor insertion torque and osseointegration was found, meaning that initial torque has no direct influence on the amount of bone loss and does not predict osseointegration failures. This study demonstrated success of short implants in.

Refrences

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