

Managing screw loosening in single-unit implant restorations: a retrospective study

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INTRODUCTION

Screw loosening or fracture is a common complication with implant-supported restorations and occurs when occlusal forces exceed the screw's axial preload. There is insufficient evidence regarding the optimal management method for screw loosening: retightening the existing screw versus replacing the loose screw with a new one. The purpose of this study was to determine whether screw replacement or screw retightening is equally effective in addressing screw loosening for single-unit implant-supported restorations.

OBJECTIVE

- To evaluate the effectiveness of screw retightening versus screw replacement in managing screw loosening in single-unit implant-supported restorations.
- To compare the frequency of subsequent screw loosening or complications following the first screw loosening incident after retightening or replacing the screw.

METHODOLOGY

Patients who had a single-unit implant-supported restoration completed at the predoctoral clinic were identified. A word search was performed to identify patients who experienced screw loosening after the delivery of their restoration. Data collected included implant manufacturer, initial torque, method of addressing the loose screw, and subsequent screw loosening events or other complications following the first screw loosening incident. The data were analyzed using statistical analysis software (SPSS v29).

RESULTS /FINDINGS

Sixty-one patients (33 males, 28 females) with 76 implants (32 Straumann, 32 Zimmer, 7 Nobel, 2 Astra, 2 unspecified) were included in the study. Fixed opposing dentition was present in 95.08% of cases, and the correct initial torque was used in 50.82% of cases. Screw retightening and replacement were performed equally to address screw loosening (n=38 or 50% for each method). No difference was observed in the outcomes of the two methods ($\chi^2=.271$, $p = .602$).

CONCLUSION

Both replacement of the screw and retightening of the existing screw (assuming no damage to the screw) appear to be valid approaches for the management of screw loosening. Inadequate preload or improper torque can lead to screw loosening and/or fracture during the initial post-treatment event. Cyclic loading may contribute to subsequent events experienced by patients.

ANALYSIS

The data showed a decreasing trend in the time intervals between screw loosening or fracture events for a single implant restoration. Initially, there was a long period between the first two events (SL0 and SL1) of 1032 days, followed by progressively shorter intervals, with 858 days between SL1 and SL2, and 620 days between SL2 and SL3. The shortest intervals occurred between the final events, with only 77 days between SL4 and SL5, and just 24 days between SL5 and SL6. This suggests that the frequency of screw issues increases as time goes on, potentially indicating cumulative stress or wear on the implant over time.

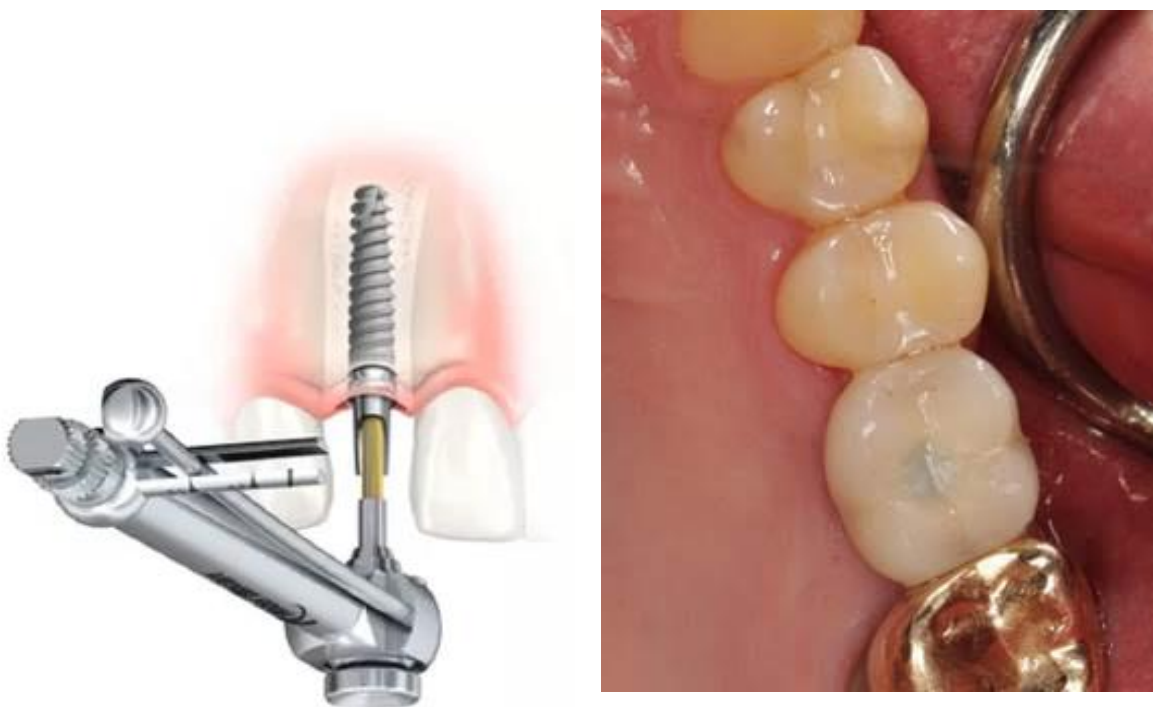


Figure 1. A single implant screw requires a specific torque to avoid dislodgment. For example, a Straumann implant requires a 35NCm torque on final crown while Astra EV requires 20NCm. These variations combined with patient compliance can affect the outcome.

Graph 1. Average Duration (Days) Between Screw Loosening Events

