P31 Crown-Implant Ratios of 6mm Length Implants

University of Minnesota

Hardeep (Bobby) Birdi, DMD ◆ John Schulte, DDS, MSD ◆ Alejandro Rodriguez-Kovacs, DDS ◆ Meghan Weed, RDH ◆ Sung-Kiang Chuang, DMD, MD

University of Minnesota School of Dentistry

Abstract

INTRODUCTION: Unfavorable crown-implant ratios have not yet been established. Still, excessive crown-implant ratios have been cited in the literature as being detrimental to long term implant success. The primary aim of this study was to determine the crown-implant ratios of single implant-supported fixed restorations on 6mm length implants in a clinical practice, and to evaluate the health of these implants via mesial and distal bone levels. Additionally, the relationship between crown-implant ratio and proximal bone levels was to be evaluated. **MATERIAL AND METHODS:** In this retrospective cohort study the cohort was composed of 314 patients possessing at least one single 6mm length plateau design implant supported fixed restoration which had been surgically placed between Feb 1997 and Dec 2005. A chart review was performed to acquire radiographs in which both the entire crown and implant were visible. The length of the crown and implant were measured directly from the radiographs using consistent magnification to calculate the crown-implant ratio. Also, the mesial and distal bone levels were measured using 3 times magnification and mathematically corrected for distortion. The last available radiograph was used to measure bone levels. Follow-up time was calculated from the day of implant placement, to the last available radiograph. Statistical analyses using analysis of variance mixed models were used. **RESULTS:** Data from 534 single implant supported fixed restorations were tabulated and included in the study. The mean (SD) follow-up time was 15.8 (19.2) months, with a range of 0.01 to 99.2 months. The mean crown length (SD) was 13.3 (2.7) mm, with a range of 2.4 to 21.7 mm. The mean (SD) crown-implant ratio was 1.97 (0.4) and ranged from 0.36 to 3.2. The average mesial and distal bone levels (SD) measured from the final radiographs were -0.2 (0.7) mm and -0.2 (0.9) mm respectively. There was no statistically significant relationship between increasing crown-implant ratios and decreasing mesial and distal crestal bone levels around the implant with p-values of 0.94 and 0.57 respectively. **CONCLUSIONS:** The results of this study suggest crown-implant ratios do not affect long term success of 6mm length implants. Also, there are no associations between crown-implant ratio and crestal bone levels.

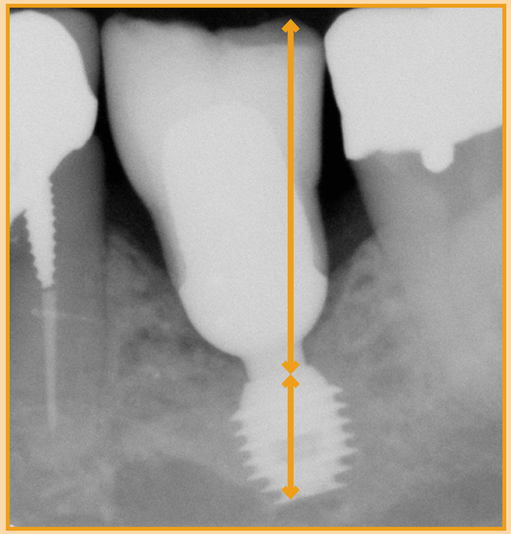
Background And Purpose

Historically, crown-root ratio is one of many factors used to evaluate the prognosis of a tooth. The concept that crown-implant ratios should not exceed the guidelines established for natural teeth has not been documented. The purpose of this study was to determine the crown-implant ratios of single implant-supported fixed restorations on 6mm length implants. The health of these implants was evaluated via mesial and distal bone levels. Also, the relationship between crown-implant ratio and proximal bone levels was to be evaluated.

Methods

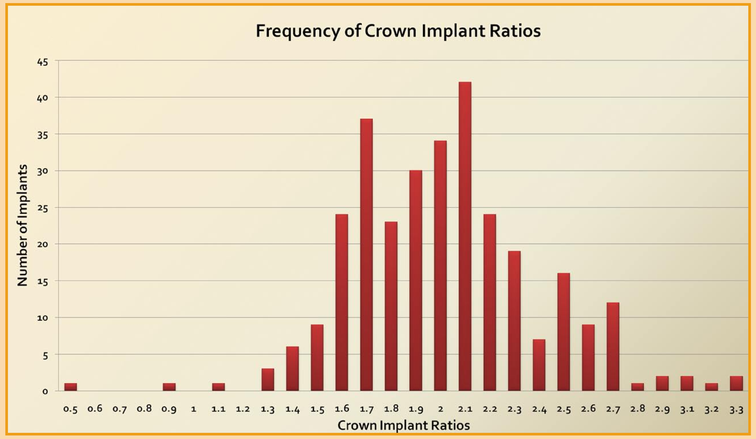
A chart review was performed to acquire radiographs in which both the entire crown and implant were visible. The length of the crown and implant were measured directly from the radiographs using consistent magnification to calculate the crown-implant ratio. Also, the mesial and distal bone levels were measured using 3 times magnification and mathematically corrected for distortion.

PATIENTS	IMPLANTS MEASURED	TIME SPAN OF IMPLANT PLACEMENT	IMPLANT LENGTH
314	534	Feb 1997 to Dec 2005	6mm



Results

Average Follow-Up Time (Months)	Average Radiographic Crown Length (mm)	Average Crown:Implant Ratio	Average Mesial Bone Loss (mm)	Average Distal Bone Loss (mm)
15.8	13.3	1.97 : 1	0.2	0.2



Statistical analyses using analysis of variance mixed models were used. There was no statistically significant relationship between increasing crown-implant ratios and decreasing mesial and distal crestal bone levels around the implant with p-values of 0.94 and 0.57 respectively.

Conclusions

The results of this study suggest crown-implant ratios do not affect long term success of 6mm length implants. Also, there are no associations between crown-implant ratio and crestal bone levels.