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A retrospective study of the duration with provisional crowns and experience of dentists in relation to loss of pulp vitality.

Göran Nilsson, Stefan Ellner, Liselott Lindh, Christel Larsson

Introduction: 5 year survival rate for both single and multiple units have been reported to be as high as 90-95 %. Second most common biological complication in fixed prosthodontics is loss of pulp vitality and necrosis, which in many cases leads to loss of reconstruction. Reason for loss of pulp vitality is debated.

Aim: The objective of this retrospective study was to investigate if the duration with provisional crowns or the experience of the dentist could be correlated to loss of pulp vitality.

Methods: We performed a retrospective analysis of 15 879 teeth being crowned in Kalmar County Public Dental healthcare between 2005 and 2012. Team responsible for the treatments consisted of 174 dentists. 250 crowns were randomly selected from failure and control group (122 patients with failed crowns and 120 patients in control group). Patient records were reviewed through July 2018 (6-13 yrs. post-installation). Clinical factors (material, type of crown, type of support, choice of cement, number of cantilevers, if tooth were distal bridge support, provisional replacement, number of days with provisional, complications with provisional replacement, post prosthodontic symptoms after 2 weeks and 12 months) were recorded. Loss of pulp vitality was defined as tooth either being endodontically treated or extracted during the follow up period. Mann-Whitney U Test was first used followed by multiple logistic regression if group difference had a significance level, $p < 0.10$. The skills of dental professionals was defined by the number of treatments (<10 , 10-25, 26-99, 100-200 and >200) and coupled to failure rate using ANOVA. Failure rate was transformed to the double logarithm ($\ln(\ln(x))$, where in this the natural logarithm) in order to obtain a normal distribution.

Results: 1 136 of 15 879 crowns failed during the observation period leading to a failure rate of 7,2 % up to 13 yrs. Failure rate in the dentist group varied between 0 % to 100 % failures. As concerns dentists with >9 treatments, there were no statistical differences in failure rate between dentists who did few compared to those who performed larger numbers of crowns, which could indicate that technical skill has little to do with endodontic complications after crown therapies. Clinical factors were analyzed in control vs. failure group with multivariate logistic regression. The only significant factor for loss of pulp vitality was number of days with provisional replacement, with a p value of 0,002.

Conclusions: The result of the present study suggest that the number of performed crowns of individual dentists did not affect the failure rate and that extended time with provisional crown could be a contributing factor to late complications such as loss of pulp vitality