Survival Analysis of Dental Implants

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The purpose of this paper is to evaluate the clinical outcome of dental implants through a survival analysis of placed implants. A retrospective cohort study comprises 213 patients who received a total of 785 implants from May 2006 to April 2012 by a single surgeon. We adopt Kaplan-Meier method to analyze the survival pattern of the placed implants during this 6-year period. The method calculates the probability of an implant survival or failure after a given period of time. The estimated survival probability is called the product-limit estimate or sometimes the Kaplan-Meier estimate of the survival probability. The analyses include the influences of demographics and health status of patient, tooth position, implant brand, implant dimension, type of implant tooth, type of implant site, and pre-loading status. In this cohort, the first 24-month cumulative survival rate of all dental implants was 96.1% and the 60-month rate reduced to 94.4%. Therefore, the dental implant cumulative failure within 2 years after placement was only 3.9% that further implant failure probability for the next 3 years was trivial at 1.8%. Hence, this could institute a practical surveillance protocol for such a long-term dental rehabilitation.

Keywords: implant failure, censored time, cumulative survival rate, Kaplan-Meier method, hazard function, Cox proportional hazards regression model