

12-year follow-up study of silicoated resin-bonded fixed partial dentures

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Introduction

Resin-bonded fixed partial dentures (RBFDP) are a conservative approach for the replacement of missing teeth. Aim of the present study was to evaluate the clinical performance of silicoated RBFDP's, whose metal retainer surfaces were silicoated with the Silicoater (Kulzer Co ®., FRG) procedure.

Material and Methods

Patients and restorations:

Beginning 1986, 74 RBFDP's (64 anterior and 10 posterior) were delivered to 61 patients (Tab. 1). The clinical procedures were performed by one of the authors (L.P.). Tooth preparation consisted of occlusal rest seats, horizontal ledges, and vertical grooves (Fig. 1). All restorations were cast in non-precious alloys, 60 in a NiCr-alloy (Wiron88®, BEGO Co.) and 14 in a CoCr-alloy (Remanium CD®, Dentaureum Co.). All were veneered with ceramics (Vita VMK 68®, Vita Co.). The retainer surfaces were treated according to the manufacturer with the Silicoater procedure (sandblasting, silicoating, and silanizing).

After enamel etching with phosphoric acid gel the FPD's were seated with Microfill pontic (Kulzer company®), a bis-GMA light- and autocuring composite resin cement.

Patients were followed up at least once a year. RBFDP's loss or retainer loosening were considered as failure, and the survival rates calculated with the Kaplan-Meier method.

Count	Anterior	Posterior	
Maxillary	48	8	56
Mandibular	16	2	18
	64	10	74

Tab. 1

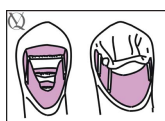


Fig. 1: Tooth preparation

Results

Drop-outs:

One patient could not be followed up at all. 29 (47.3 %) patients were rated as drop out, as they did not appear for recall for more than one year within the 12 year observation period.

Survival rate:

The maximum observation time of all restorations was 11 ½ years. Figure 2 shows the survival curve (Kaplan-Meier), which was calculable for 11 ½ years. The survival rate after 10 years was 76.4 % ± 12 % (95 % confidence interval). For the anterior bridges alone the calculated survival rate was 78 % ± 13 % after 10 years. 14 primary failures (18.9 % of all restorations), i.e. retention loss of one or more retainers, were observed after a mean function time of 4.1 years. 4 of the 14 RBFDP's were rebonded, thus a survival rate of 84.2 % ± 9 % (87.3 % ± 8.8 % for anterior bridges alone) of functioning restorations was calculated after 10 years (Fig. 3). One of the bridges failed after 30 months, was replaced with another, which again failed after 31 months. The 9 other failures were treated with conventional FPD's.

Clinical findings:

3 failures were associated with carious lesions of the abutment teeth. 3 veneer fractures occurred, however, the bonding of the RBFDP's was not affected.

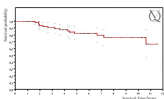


Fig. 2: Kaplan-Meier curve of primary failures

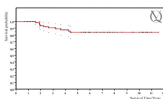


Fig. 3: Kaplan-Meier curve of functional survival

Discussion and Conclusions

Only few longitudinal clinical studies with an observation period of more than 10 years have been published. As in our study a major difficulty is the loss to follow-up during the final years, which is mainly due to the inability to contact patients. Creugers et al. found a significant difference between perforated anterior bridges with a survival rate of $49\% \pm 7\%$ and etched anterior bridges with a survival rate of $57\% \pm 7\%$ after 10.5 years (Creugers, N. H. et al. 1997). Williams et al. Reported of a 64% survival rate after 10 years (Williams, V. D. et al. 1989). A calculated survival rate of 60% after 10 years was published by Pröbster and Henrich (Pröbster, B. and Henrich, G. M. 1997). Our study showed an overall survival rate of $76.4\% \pm 12\%$ after 10 years. Considering the 95%-confidence interval, our results are comparable to the previously reported results of Creugers, Williams and Pröbster.

It is concluded, that silicoated resin-bonded fixed partial dentures are a viable treatment means with an acceptable success expectancy.

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Poster Faksimile:

12-year Follow-up Study of Silicoated Resin-bonded Fixed Partial Dentures.

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Introduction

Resin-bonded fixed partial dentures (RFPDs) are a conservative approach for the replacement of missing teeth. Aim of the present study was to evaluate the clinical performance of silicoated RFPDs. Silicoated resinous surfaces were silicoated with the Siluxite (Kulzer Co., FRG) procedure.

Materials and Methods

Patients and restorations:
Beginning 1986, 74 RFPDs (34 anterior and 40 posterior) were delivered to 41 patients (Tab. 1). The clinical procedures were performed by one of the authors (C. P.). Teeth preparation consisted of occlusal end cuts, horizontal bridges, and vertical grooves (Fig. 1). All restorations were cast in non-precious alloys, 60 in a Ni-Cr alloy (Dentaur, DGGG-Co) and 14 in a Co-Cr alloy (Bismetium CUP, Dentaurum Co.). All were cemented with cement (Niss VMD 60, Vion Co.). The silicate surfaces were treated according to the manufacturer with the Siluxite procedure (conditioning, silicoating, and finishing). After dental etching with phosphoric acid gel the PPD's were sealed with Microfil prosth (Kulzer company) a bis-GMA light- and autopolymerizing composite resin cement. Patients were followed up at least once a year. RFPD's loss or retention (loosening) were considered as failure, and the survival rates calculated with the Kaplan-Meier method.

Case	Anterior	Posterior	%
Maxillary	48	9	56
Mandibular	15	2	18
Total	63	11	74

Results

Drop-outs:
One patient could not be followed up at all. 29 (41.5%) patients were not in the study, so they did not appear for recall for more than one year within the 12-year observation period.

Survival rate:
The maximum observation time of all restorations was 11.5 years. Figure 2 shows the survival curve (Kaplan-Meier), which was calculated for 11.5 years. The survival rates after 10 years were $76.4\% \pm 12\%$ (95% confidence interval). For the anterior bridges alone the calculated survival rate was $78\% \pm 13\%$ after 10 years. 14 primary failures (18.9% of all restorations), i.e. retention loss of one or more restorations, were observed after a mean duration time of 4.1 years. 8 of the 14 RFPD's were retouched, thus a survival rate of $84.7\% \pm 9\%$ (95% CI: 8.8%) for anterior bridges alone of functioning prosthodontics was calculated after 10 years (Fig. 3). One of the bridges failed after 30 months, was replaced with another, which again failed after 31 months. The other failures were treated with conventional PPD's.

Clinical findings:
3 failures were associated with carious lesions of the abutment teeth. 7 repair failures occurred, however, the bonding of the RFPD's was not affected.

Discussion

Only few longitudinal clinical studies with an observation period of more than 10 years have been published. As in our study a major difficulty is the loss to follow-up during the final years, which is mainly due to the inability to contact patients. Creugers et al. found a significant difference between perforated anterior bridges with a survival rate of $49\% \pm 7\%$ and etched anterior bridges with a survival rate of $57\% \pm 7\%$ after 10.5 years (Creugers, N. H. et al. 1997). Williams et al. Reported of a 64% survival rate after 10 years (Williams, V. D. et al. 1989). A calculated survival rate of 60% after 10 years was published by Pröbster and Henrich (Pröbster, B. and Henrich, G. M. 1997). Our study showed an overall survival rate of $76.4\% \pm 12\%$ after 10 years. Considering the 95%-confidence interval, our results are comparable to the previously reported results of Creugers, Williams and Henrich.

It is concluded, that silicoated resin-bonded fixed partial dentures are a viable treatment means with an acceptable success expectancy.

References

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Fig. 2. Kaplan-Meier curve of primary failures

Fig. 3. Kaplan-Meier curve of functional survival