Clinical Experience with a New Prosthetic Material for Implant Superstructures

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Background

Ceramic veneering of metallic or ceramic frameworks is considered the gold standard in aesthetic restorations in cases of definite complex restorations using implants. Depending on the framework design and material, and influences from manufacturing conditions, chipping can occur. The use of prefabricated composite veneers for cases involving full arch restoration produces an aesthetic outcome which is on a par with individual ceramic veneering. Is there an alternative for polymer based frameworks on polyetheretherketon (PEEK) resin? What is the long-term success in terms of plaque accumulation and discoloration?

Material and Method

During the last five years, 62 edentulous arches were treated with a reduced number of implants and tilted posterior implant placement. Twenty-six frameworks received an individual ceramic veneering (group A). Twenty-nine superstructures were manufactured by way of prefabricated composite veneer fixation with light polymerizing resin (group B). For 18 months, 7 frameworks were used with ceramic reinforced PEEK-framework (group C). The superstructures were re-evaluated after a loading period of between 12 and 48 months for group A and B and after a period of at least 6 months for group C.

Results

Out of the conventional 55 superstructures, 7 complications occurred, which required further dental or lab technician procedures (14.5%). On three superstructures in Group A, minor chipping of the surface (11.5%) occurred after 4, 7 and 11 months and for one superstructure a major chipping up to the framework (3.8%) occurred after 37 months. Three patients stated that the change from the temporary resin-based superstructure for immediate loading to the final superstructure did not fulfill the aesthetic demands. Two patients with restorations in the upper and lower jaw did not accept the undamped biting behavior of the opposing ceramic dentures, which led to a change in the prefabricated shades. In group B, one patient with former TMJ disorder lost three veneers due to actual functional problems caused by familiar changes after a 34 month loading period (3.4%). Two patients restarted heavy smoking of 30 and 40 cigarettes a day, which required extra oral refinishing after 29 and 42 months (6.8%). In group C, no early complication such as discoloration or loss of shades occurred.

Conclusions and Clinical Implications

The use of composite veneering material allows a high aesthetic acceptance with a reduced rate of complications in severe prosthetic problems. Patients with a reduced compliance receive a superstructure with a composite veneered framework which is easily and cost-effectively repairable. The use of the PEEK framework in combination with resin veneering showed no complications after an average loading period of 9 months.