Clinical evaluation of the performance and safety of a new dentine substitute, Biodentine, in the restoration of posterior teeth — a prospective study

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Abstract

Objectives

A multicentric randomized, 3-year prospective study was conducted to determine for how long Biodentine, a new biocompatible dentine substitute, can remain as a posterior restoration.

Materials and methods

First, Biodentine was compared to the composite Z100®, to evaluate whether and for how long it could be used as a posterior restoration according to selected United States Public Health Service (USPHS)' criteria (mean ± SD). Second, when abrasion occurred, Biodentine was evaluated as a dentine substitute combined with Z100®.

Results

A total of 397 cases were included. This interim analysis was conducted on 212 cases that were seen for the1-year recall. On the day of restoration placement, both materials obtained good scores for material handling, anatomic form (0.12±0.33), marginal adaptation (0.01±0.10) and interproximal contact (0.11±0.39). During the followup, both materials scored well in surface roughness (≤1) without secondary decay and post-operative pain. Biodentine kept acceptable surface properties regarding anatomic form score (≤1), marginal adaptation score (≤2) and interproximal contact score (≤1) for up to 6 months after placement.

Resistance to marginal discoloration was superior with Biodentine compared to Z100®. When Biodentine was retained as a dentine substitute after pulp vitality control, it was covered systematically with the composite Z100®. This procedure yielded restorations that were clinically sound and symptom free.

Conclusions

Biodentine is able to restore posterior teeth for up to 6 months. When subsequently covered with Z100®, it is a convenient, efficient and well tolerated dentine substitute. Clinical relevance Biodentine as a dentine substitute can be used under a composite for posterior restorations.