Porcelain laminate veneers — what is the best way to prepare the tooth?

Tooth preparation techniques for porcelain laminate veneers *by P. A. Brunton, A. Aminian, and N. H. F. Wilson*
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Objective
The purpose of this study was to determine the effect that two guides to tooth preparation had on an operator's ability to appropriately and consistently prepare teeth for porcelain laminate veneers.

Study design
In-vitro study

Materials and methods
Thirty typodont central incisor teeth were randomly allocated into three groups and a general dental practitioner was asked to prepare the teeth for porcelain laminate veneers. Group A were prepared freehand while Group B and C were prepared with the assistance of a silicone index and depth preparation bur respectively. Images of the prepared teeth were used to calculate the mean labial depth of preparation and incisal reduction of teeth in each group.

Results
The mean labial reduction for Groups A, B and C was 0.37 mm (SD 0.13), 0.62 mm (SD 0.17) and 0.61 mm (SD 0.15) and the mean incisal reduction for Groups A, B and C was 1.0 mm (SD 0.28), 1.0 mm (SD 0.38) and 1.03 mm (SD 0.26) respectively.

Conclusion
It is suggested that consideration be given to the use of a silicone index or depth gauge bur when teeth are prepared for porcelain laminate veneers.

In Brief
- Under preparation of teeth for porcelain laminate veneers is relatively common. The placement of laminate veneers on underprepared teeth, can lead to periodontal problems and/or poor aesthetics.
- Assessing adequate labial reduction when preparing teeth for porcelain laminate veneers can be difficult for practitioners.
- The use of a depth gauge bur or silicone index will help practitioners to appropriately prepare teeth for porcelain laminate veneers.

Comment

The advantages of using porcelain laminate veneers to improve the appearance of unsightly teeth would appear obvious. The maintenance of substantial amounts of tooth structure including the palatal guidance and a reduced insult to the pulp would suggest that this is often the treatment of choice. However, there are currently fewer porcelain laminate veneers being prescribed in England and Wales.

Veneers, however, have their own specific difficulties. Following cementation a common perception of patients is that their restored teeth are too prominent. This problem, and that of an underlying discolouration shining through the veneer may account for dentists' dissatisfaction with the treatment. As with most laboratory fabricated restorations any underpreparation will produce a compromised result and a greater preparation depth will produce a more robust and aesthetically satisfactory restoration. However, this turns a treatment that could be considered reversible into one that is definitely (though minimally) invasive.

Most dentists in the UK prepare labial veneers using a freehand approach and many do not use local anaesthetic or a temporary veneer. It can be presumed that these teeth are then 'underprepared' (at least as far as the dental laboratory is concerned). To evenly remove 0.5 mm, and gain a more satisfactory restoration, the authors have used image analysis to investigate the use of depth orientation burs or a silicone index compared to freehand reduction.

Freehand reduction reduces the labial aspect by (approximately) 0.4 mm compared with 0.6 mm for the two other techniques. Both the guided methods will therefore tend to allow a more satisfactory appearance. The authors recognise the potential difficulties that may then result from exposure of cervical dentine and recommend routine use of a dentine bonding agent in the cementation of the final veneer.

On balance the authors recommend the use of a silicone index rather than depth orientation burs noting that, in addition to gaining a better guide to uniform tooth reduction, the index can be used to fabricate a temporary veneer. However, the use of a temporary veneer is made more of a necessity by the removal of more tooth structure and the temptation to place a dentine bonding agent over sensitive dentine should be resisted to avoid interfering with cementation of the final veneer.

A silicone index or specific depth-limiting bur adds to the cost involved but only a small amount of silicone is required and can often be 'stolen' from that dispensed for the working impression.

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