

LAYERED INJECTION MOULDING

A Pre-clinical Evaluation of a Clinical Possibility

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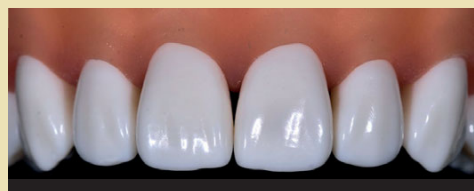
Introduction

The injection moulding technique allows the replication of life-like anatomy that is pre-determined by a lab-made wax-up that provides faster, more consistent results with minimal required adjustments.

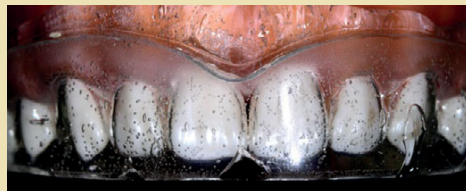
Objective

To evaluate a predictable technique that combines layering and injection moulding for easy, efficient and consistent polychromatic anterior restorations with uncompromised aesthetics.

Materials and Methods



Nissin 300 Series Standard Jaw
Model GNR300-UL



Clear stent
Exaclear Impression Material



Prepared diastemata

TRADITIONAL INJECTION MOLDING

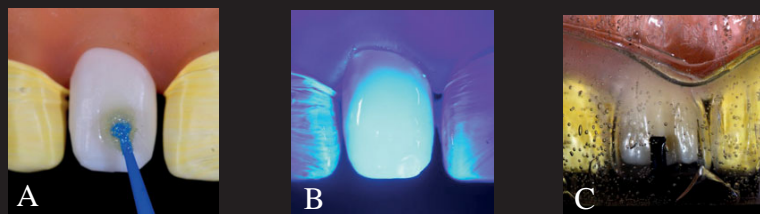


Figure 1. Bonding protocol was followed (A-B). Injectable composite (G-ænial Universal Flo shade A1) was injected into the Exaclear stent (C).

LAYERED INJECTION MOLDING

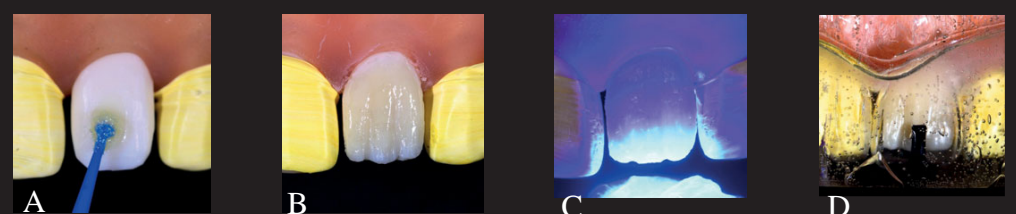


Figure 2. Bonding protocol was followed and composite layering was done using 3M packable composite. The anatomy of dentin was mimicked while leaving space at the edge for a dentin free zone (A-C). Injection molding was done using G-ænial Universal Flo shade A1 (D).

Less time consuming
More convenient

Monochromatic restorations
Absence of histological layers



Polychromatic life-like restorations
Control over anatomic features

Requires skill of the practitioner
Requires knowledge of specific materials

FDI CRITERIA USED FOR EVALUATION

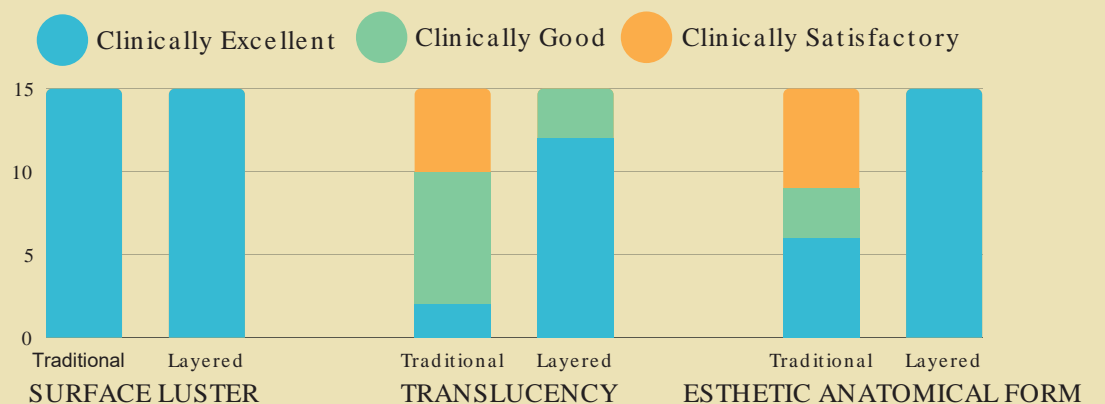
Hickel R, Peschke A, Tyas M, Mjör I, Bayne S, Peters M, Hiller KA, Randall R, Vanherle G, Heintze SD. FDI World Dental Federation: clinical criteria for the evaluation of direct and indirect restorations-update and clinical examples. Clin Oral Investig. 2010 Aug;14(4):349-66.

Results

- Both techniques were found to result in **similar surface luster** as this property is more dependent on finishing and polishing protocol and the material's composition.
- The **overall contour and anatomy of the restorations did not vary** as the same stent was used for the outermost layer.
- The teeth restored with layered injection moulding showed significantly more visible **internal anatomic characteristics** such as mamelons and lobes.
- Layered injection moulding technique had good colour match and a **clear difference in translucency** in comparison with traditional injection moulding.

Discussion & Conclusions

On evaluation, layered injection moulding technique was found to be more aesthetic as it was stratified and replicated natural internal anatomy and translucency much better than its counterpart.



Bibliography

- Dietschi D. Layering concepts in anterior composite restorations. J Adhes Dent. 2001 Spring;3(1):71-80.
- Terry DA, Powers JM, Blatz MB. The Injection Resin Technique: A Novel Concept for Developing Esthetic Restorations. QDT 2020:3-17