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Errors in full denture casting

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Introduction

Casting full dentures represents nowadays an alternative to the classical manufacturing of full dentures by barothermopolymerisation, as well as to modern injection techniques. Acrylic autopolymerisable resins, suitable for casting, have a characteristic casting temperature below 65°C, being prepared in a firmness suitable for casting.

Material and Methods

The authors used the Vertex casting system, and the specific autopolymerisable acrylic resin Castapress (Vertex dental B.V., Zeist, Netherlands)- (fig. 1). The method includes the classical steps of the manufacturing technology for full dentures, to the final pattern step (fig. 2). A special flask and a reversible hydrocolloid or a silicone material are used in investing the final pattern (fig. 3). After the setting of the impression material, the flask is unwrapped, the model being removed together with the denture base pattern. The wax remains on artificial teeth are cleaned using the special Clean-Tray device (fig. 4). The teeth are repositioned in the already created investment (fig. 5). The acrylic resin is prepared and poured in the flask through the special orifice, until it is full. Afterwards the polymerisation of the denture is carried out, by immersing it in a special polymerisation pot, filled with water at 50±5°C, at a pressure of 2,5 barr, for 30 minutes. Finally, the denture is extracted from the investment, with minimal subsequent adjustments (fig 6.).



Fig. 1: The Castapress autopolymerisable casting acrylic resin, from Vertex



Fig. 2a: The final maxillar pattern



Fig. 2b: the final mandibular pattern, prepared for wrapping



Fig. 3a: The impression made of reversible hydrocolloid

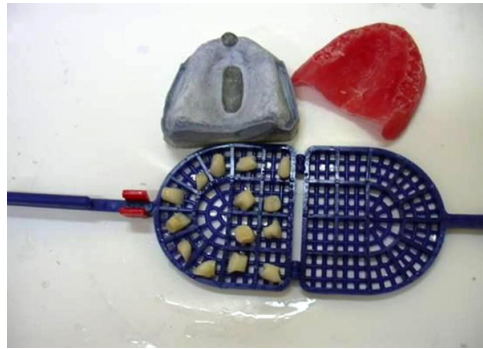


Fig. 3b: The impression made of silicone

Fig. 4: The mold, the denture's base pattern and the artificial teeth in the Clean-Tray device



Fig. 5: The teeth repositioned in the investment

Fig. 6: The unwrapped denture

Results

The deficiencies appear mostly when using reversible hydrocolloids (not detected when using a silicone material), because of the air bubbles which develop when pouring the material into the flask (fig. 7). If we try to eliminate these bubbles by pressing the flask, it may result in the melting of the wax pattern (fig.8).

The deficiencies may also develop due to the air incorporation when pouring the acrylic resin into the investment, and they appear as porosities on the mucosal surface of the denture (fig.9). In other cases the dentures appear incomplete, due to the short working time of the resin used and too early setting (fig.10).



Fig. 7: Bubbles in the reversible hydrocolloid

Fig. 8: Melting of the wax pattern



Fig. 9: Porosities on the mucosal surface of the denture Fig. 10: Lack of substance

Conclusions

The system has the following advantages: the reversible hydrocolloid may be reused, reduced polymerisation time, the wide chromatic range of the material (10 colours), minimal adjustments required. The disadvantages are: high cost of the system; in case of retentive fields, problems may occur when unwrapping; possible errors may also occur in teeth positioning. When using a new technology, one has to consider the advantages and disadvantages of the system. We pointed the possible errors which might occur when casting full dentures, using Vertex: porosities on the mucosal surface or lack of substance.

Literature

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ERRORS IN FULL DENTURE CASTING

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INTRODUCTION:

Casting full dentures represents nowadays an alternative to the classical manufacturing of full dentures by barothermopolymerisation, as well as to modern injection techniques. Acrylic autopolymerisable resins, suitable for casting, have a characteristic casting temperature below 65°C, being prepared in a firmness suitable for casting.

METHODS:

The authors used the Vertex casting system, and the specific autopolymerisable acrylic resin Castapress (Vertex dental B.V., Zeist, Netherlands) (fig. 1).



Fig. 1. The Castapress autopolymerisable casting acrylic resin, from Vertex

The method includes the classical steps of the manufacturing technology for full dentures, to the final pattern step (fig. 2).

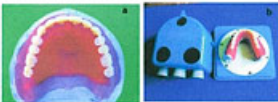


Fig. 2. a. The final maxillary pattern, b. the final mandibular pattern, prepared for wrapping

A special flask and a reversible hydrocolloid or a silicone material are used in investing the final pattern (fig. 3).



Fig. 3. The impression made of: a. reversible hydrocolloid, b. silicone

After the setting of the impression material, the flask is unwrapped, the model being removed together with the denture base pattern. The wax remains on artificial teeth are cleaned using the special Clean-Tray device (fig. 4).



Fig. 4. The mold, the denture's base pattern and the artificial teeth in the Clean-Tray device

The teeth are repositioned in the already created investment (fig. 5).



Fig. 5. The teeth repositioned in the investment

The acrylic resin is prepared and poured in the flask through the special orifice, until it is full. Afterwards the polymerisation of the denture is carried out, by immersing it in a special polymerisation pot, filled with water at 50±5°C, at a pressure of 2,5 barr, for 30 minutes. Finally, the denture is extracted from the investment, with minimal subsequent adjustments (fig 6.)



Fig. 6. The unwrapped denture

RESULTS

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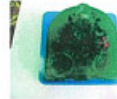


Fig. 7. Bubbles in the reversible hydrocolloid

If we try to eliminate these bubbles by pressing the flask, it may result in the melting of the wax pattern (fig.8).



Fig. 8. Melting of the wax pattern

The deficiencies may also develop due to the air incorporation when pouring the acrylic resin into the investment, and they appear as porosities on the mucosal surface of the denture (fig.9).



Fig. 9. Porosities on the mucosal surface of the denture

In other cases the dentures appear incomplete, due to the short working time of the resin used and too early setting (fig.10).



Fig. 10. Lack of substance

DISCUSSION & CONCLUSIONS:

The system has the following advantages: the reversible hydrocolloid may be reused, reduced polymerisation time, the wide chromatic range of the material (10 colours), minimal adjustments required. The disadvantages are: high cost of the system; in case of retentive fields, problems may occur when unwrapping; possible errors may also occur in teeth positioning. When using a new technology, one has to consider the advantages and disadvantages of the system. We pointed the possible errors which might occur when casting full dentures, using Vertex: porosities on the mucosal surface or lack of substance.