

Dental laboratory procedures

REMOVABLE PARTIAL DENTURES

Rudd · Morrow · Eissmann

VOLUME THREE

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DENTAL LABORATORY PROCEDURES

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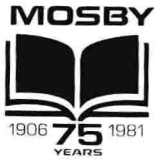
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DENTAL LABORATORY PROCEDURES
REMOVABLE PARTIAL DENTURES

To
those who inspired us along the way

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PREFACE

As in most prosthodontic procedures, the fabrication of high-quality, professionally acceptable restorations depends on the knowledge and skill of a dental team. The dentist, dental assistant, and laboratory technician working in harmony with precision and concern are each responsible for the patient's dental happiness. To fully understand the restorative process, each member of the team must be aware of the procedures involved. Many overlap, and in this volume we have tried to describe the complete laboratory procedure for fabricating removable partial dentures. It was our concern to provide dental professionals with precise technical guidelines, using ample illustrations to explain procedures.

This book represents the accumulation of knowledge over many years from many different people and sources. From the beginning, our goal has been to make this book simple, yet detailed, and to write it in a step-by-step format that was easy to follow. We have wanted it to be a text that would benefit those who have knowledge by stimulating a few

new ideas. We have hoped that those who lack experience could refer to it when in question about a procedure and arrive at a solution.

Francis Bacon, in *Essays*, wrote, "Some books are to be tasted, others to be swallowed, and some few to be chewed and digested." If our ideas are digested and help make your job easier, then our goal has been reached.

We are indebted to our contributors who have been outstanding in assembling knowledge in their fields. We acknowledge with thanks the support we received from Mrs. Wanita Morrow who was responsible for typing our scribbled notes. To thank everyone connected with making this book a reality would take more space than is available. You know who you are, but more important, we know who you are; for your effort, contribution, and dedication, we thank you.

**Kenneth D. Rudd
Robert M. Morrow
Harold F. Eissmann**

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CHAPTER 1

CARE OF IMPRESSIONS AND MAKING CASTS

KENNETH D. RUDD and ROBERT M. MORROW

agar A gelatinous colloidal extract of a red alga used as a gelling agent and principal effective ingredient in reversible hydrocolloid impression materials.

alginate A salt of alginic acid, such as sodium alginate, which, when mixed with water in accurate proportions, forms an irreversible hydrocolloid gel used for making impressions.

aqueous impression materials Both agar and alginate material are included in this category because they contain, or are mixed with, large amounts of water. Agar is about 85% water, and alginate is about 70% water when it is mixed.

elastomeric impression materials A rubberlike impression material. The four types are polysulfide, silicone, polyether, and polysiloxane.

hydrocolloid A name applied to either alginate or agar impression materials because they yield a gel when mixed with water.

irreversible hydrocolloid (alginate) A hydrocolloid whose physical condition is changed by a chemical action that is not reversible.

partial denture impression An impression of part or all of a partially edentulous arch made for the purpose of designing or constructing a partial denture.

preliminary impression An impression made for the purpose of diagnosis or the construction of a tray for making a final impression.

reversible hydrocolloid (agar-agar type) A hydrocolloid whose physical condition is changed by temperature. The material is made fluid by heat and becomes an elastic solid on cooling.

The most frequently used material for making impressions for diagnostic casts and removable partial dentures is alginate irreversible hydrocolloid. Alginate is easy to use, requires no special equipment, and when proper procedures are followed

can produce an acceptable cast (Rudd et al., 1970). Reversible hydrocolloid (agar) is also used to make impressions for removable partial dentures. Reversible hydrocolloid requires special equipment for liquefying, tempering, and storage and water-cooled trays and hoses; as a result, it is not used as frequently as alginate. Polysulfide, silicone, polyether, and polysiloxane impression materials may also be used for removable partial denture impressions, although their most common use is for fixed partial dentures and quadrant inlay and crown impressions. They are also used as secondary or wash materials for making complete denture impressions. In this chapter, methods for pouring casts in alginate irreversible hydrocolloid, agar reversible hydrocolloid, and elastomeric impressions will be described. See pp. 28 to 78 in *Dental Laboratory Procedures: Fixed Partial Dentures* for the methods used in making impressions and casts from hydrocolloid and elastomeric materials for fixed restorations.

REQUISITES FOR CASTS

All casts for removable partial dentures should exhibit the following qualities:

1. All surfaces to be contacted by the prosthesis should be accurate and free of voids or nodules. Removal of nodules resulting from voids or bubbles in the impression is essential, but hand carving in critical areas is, of course, not acceptable.

2. The surface of the cast should be hard, dense,

and free of any grinding sludge left by the cast trimmer.

3. The cast extensions should include all of the area available for denture support, for example, 3 to 4 mm beyond the hamular notches on the maxillary cast and 3 to 4 mm beyond the retromolar pad on the mandibular cast.

4. The peripheral roll should be complete and approximately 3 to 4 mm deep.

5. Side walls of the cast should be vertical and may be tapered slightly outward but should not be undercut.

6. The base of the cast should be not less than 15 mm thick at the thinnest place, and the lingual region of mandibular casts should be trimmed flat and smooth. The lingual peripheral roll, however, should not be removed. The cast should show no indications of having been wet, washed, or brushed in tap water.

ALGINATE IRREVERSIBLE HYDROCOLLOID IMPRESSIONS

The impression should be examined critically before pouring to determine that the alginate has not pulled loose from the tray (Fig. 1-1). The impression should also be checked for voids in critical areas, metal tray show through, and any indication that the impression has been allowed to set too long before sending it to the laboratory (Fig. 1-2). It is more economical for everyone concerned to obtain another impression at this point rather than accept a questionable impression and perhaps remake a framework later.



Fig. 1-1. **A,** Examining impression critically. **B,** Alginate impression material has pulled away from tray. It cannot be repositioned accurately, and new impression should be obtained.

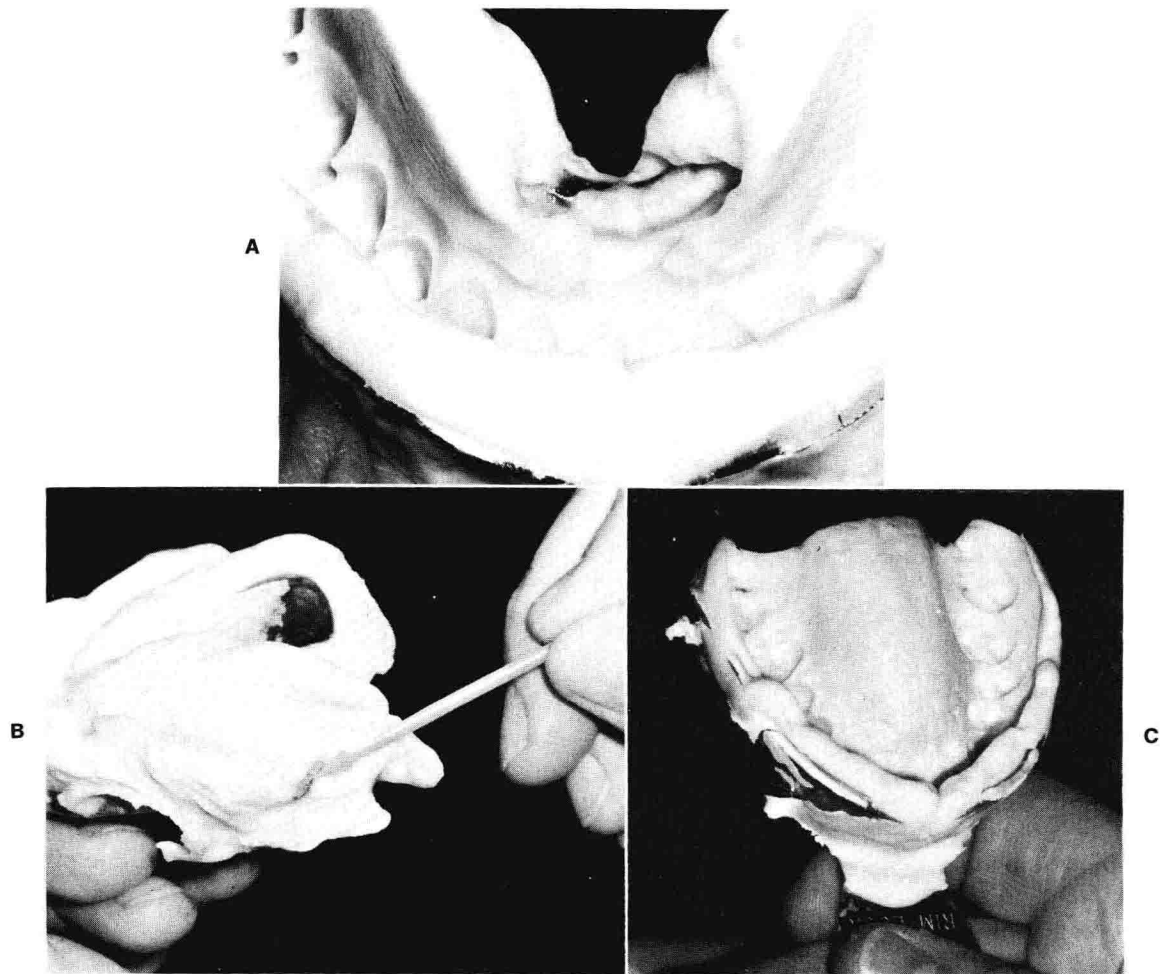


Fig. 1-2. **A,** Impression has void in critical area and should be remade. **B,** Metal tray shows through due to faulty positioning of tray when making impression. Resultant cast will be inaccurate. **C,** Too much time has elapsed between making and pouring impression. Note shrinkage as result of drying. Pour alginate impression within 15 minutes.

4 Dental laboratory procedures: removable partial dentures

Care of the impression

PROCEDURE

1. Examine the impression to determine its acceptability.
2. With a sharp knife, trim excess alginate ex-

tending beyond the back of the tray. Cut toward the tray to negate the possibility of pulling the alginate loose from the tray. Alginate extensions should not touch the bench top when resting on it, or the impression may be distorted (Fig. 1-3).

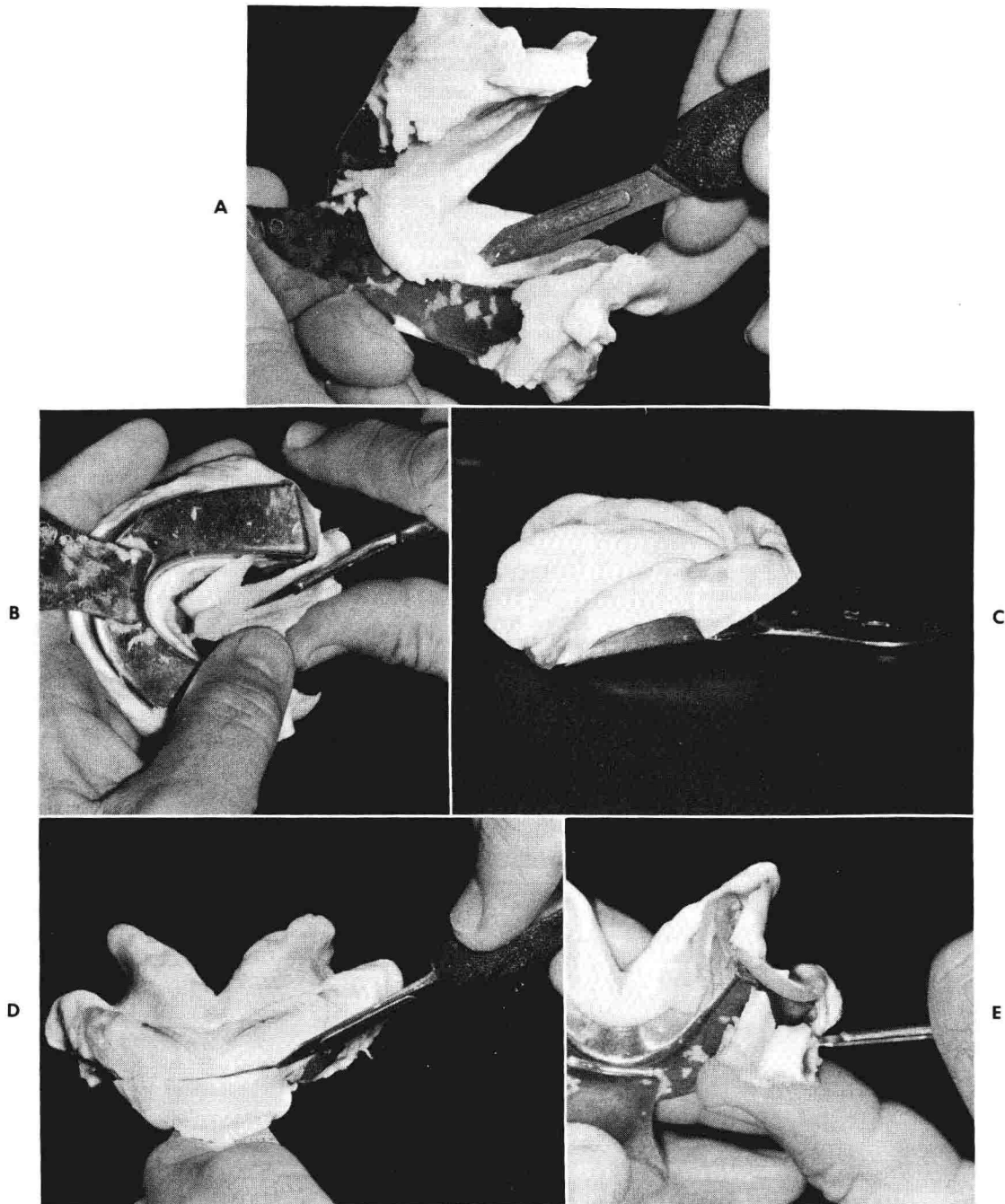


Fig. 1-3. A, Alginate extends beyond tray and will be distorted if placed on bench top. B, Alginate is trimmed with sharp No. 25 blade. Take care to not remove needed portions of impression. C, Trimmed impression will not be distorted if placed on bench top. D, Remove alginate extending onto sides. E, Alginate on top of tray is cut away.

3. Suspend the tray by its handle if excess alginate cannot be trimmed (Fig. 1-4). While mixing and setting the stone, place the handle of the tray in a holder to eliminate the need to rest the tray on the bench.

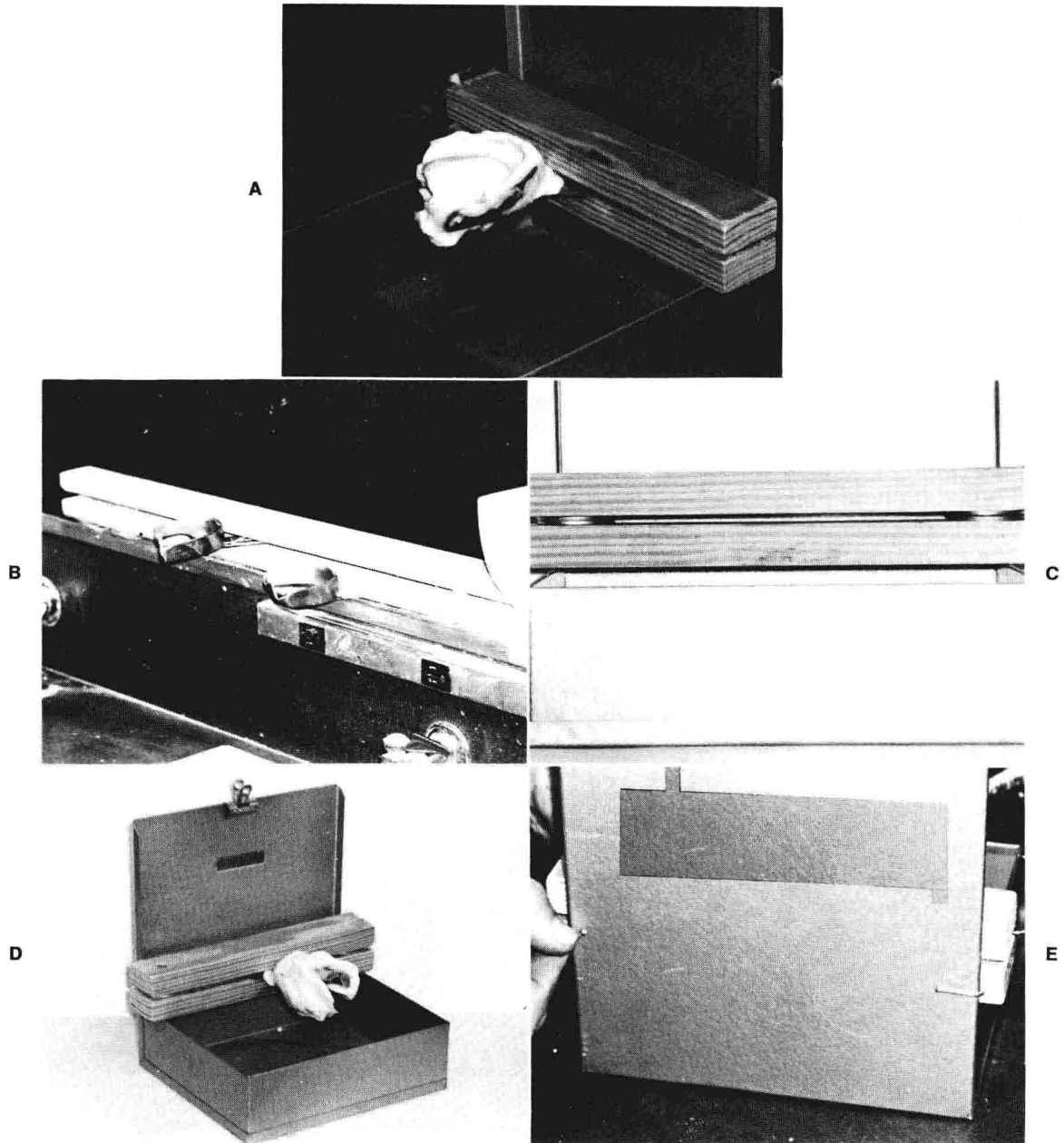


Fig. 1-4. **A**, Tray is suspended in tray holder to prevent distortion of alginate. **B**, Bench holder is made by placing suitable spacers between two 1 × 2-inch (2.5 × 5-cm) boards and attaching it to back of bench. In this case, thicker spacer was placed in top slot for water-cooled trays. Slot between bottom board and bench is narrower and will accommodate standard trays. **C**, Smaller tray holder for case pan is made by attaching two 1 × 2-inch (2.5 × 5-cm) boards together. **D**, Tray in position in small tray holder. **E**, Bent nails secure holder to case pan and permit easy removal.