

# The Use of a Micronized Barium in an Obturator Construction

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The use of a temporary speech aid appliance has been described by Blakeley (1, 2, 3) in conjunction with an obturator reduction program. This philosophy aims at providing an improved palato-pharyngeal sphincter to complement a subsequent pharyngoplasty. Often, adjustments are needed in an obturator reduction program with lateral jaw or cephalometric radiographs necessary to relate the obturator to anatomical landmarks. Fletcher (4) and co-workers coated the obturator with a radiopaque material prior to radiographs. Others (5) wrapped the obturator bulb with a piece of tin foil before radiographs were obtained. Weiss (6) has described the use of a micronized barium in a cineradiography and radiographic evaluation of children with articulatory defects.

The purpose of this report is to describe the use of a micronized barium\* incorporated into self-curing acrylic resin. Chemically pure barium sulfate is inert, insoluble in water, and radiopaque (7). Micronized barium, when combined with a radiolucent self-curing acrylic resin, transforms the acrylic resin into a radiopaque material.

## OUTLINE FOR THE FABRICATION OF THE BULB PORTION OF A SPEECH AID APPLIANCE

- I. Radiographs
  - A. Cephalometric radiographs (rest and phonation)
    1. Prior to obturator construction.
    2. Complete obturation as determined by the speech pathologist (with and without speech aid appliance).
    3. Upon completion of the obturator reduction program (with and without appliance).
- II. Bulb Construction
  - A. Impression technique
    1. A small bulb on the speech aid appliance has been worn for a short period of time to allow the patient to adjust to the oral stimulus of the appliance. (Figure 1.)
    2. An anatomical impression of the pharyngeal area is completed using a soft line resilient acrylic resin which has been added to the small bulb of the obturator appliance. (Figure 2.)
  - B. Obturator Construction
    1. An impression of the pharyngeal bulb is obtained.
      - a. An irreversible hydro colloid material (alginate) is mixed and placed on a glass slab.

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\* Micropaque, Demancy and Coltd, Ltd., Ware-horts, England.

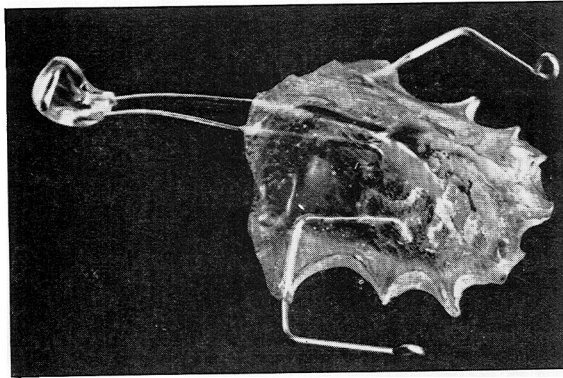


Figure 1. Speech aid appliance prior to bulb enlargement.



Figure 2. Soft line resilient acrylic resin used for bulb impression.



Figure 3. An impression of the bulb in an irreversible hydro colloid material.

- b. The impression of the pharyngeal area is inverted on the glass slab into the alginate material. (Figure 3.)
2. Bulb construction.
  - a. When the alginate material has set, the impression of the pharyngeal portion is removed and the soft line resilient material is peeled off and discarded. (Figure 4.) The prosthetic appliance is re-inserted in the impression.
  - b. A mixture of three parts self-curing resin powder to one part micronized barium is used. (Figure 5.)
  - c. The powder mixture is shaken well.
  - d. Into the alginate impression of the bulb portion of the obturator, the liquid portion of the self-curing acrylic resin is added to the powder of the acrylic resin: micronized barium mixture. (Figure 6.)
  - e. Insert the filled impression into a pressure cooker. (Figure 7.) Hot water at 110 degrees is used. The impression and bulb is then processed for ten minutes at 30 p.s.i. air pressure.
  - f. Remove the bulb from the alginate impression, polish, and clean.

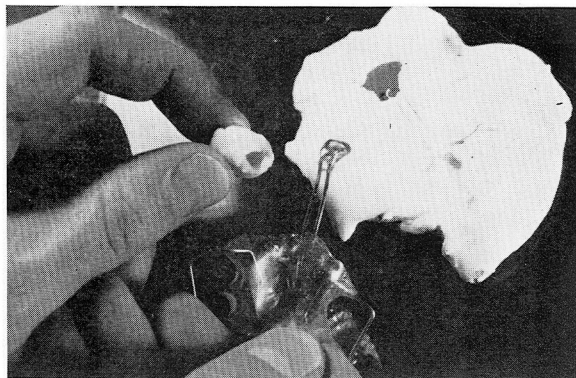


Figure 4. The appliance removed from the impression and the discarded portion of the resin impression.

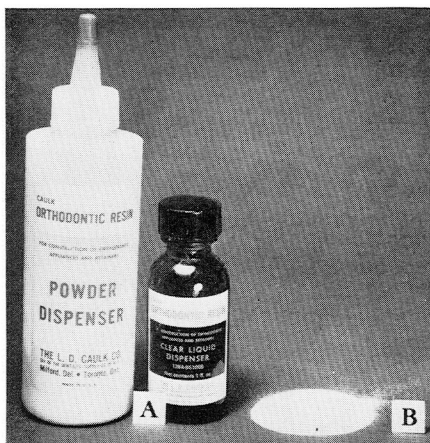


Figure 5. Self-curing acrylic resin (A) and micronized barium sulfate (B). The powders of (A) and (B) are measured by volume and mixed in a ratio of 3:1.

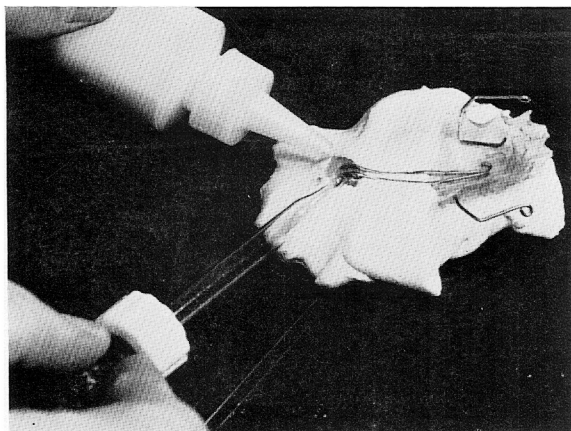


Figure 6. Adding liquid to powder in bulb portion of impression.

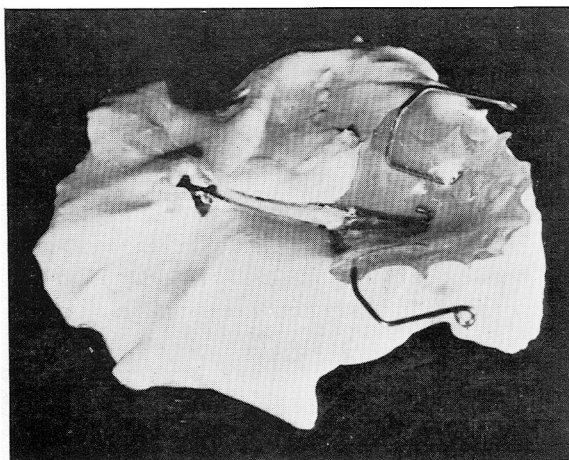


Figure 7. Filled impression prior to insertion in pressure cooker.

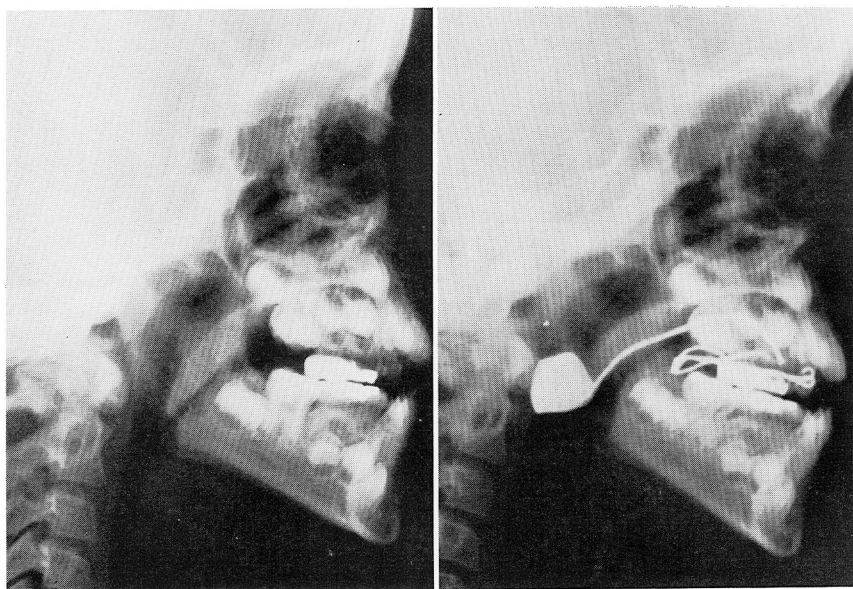


Figure 8 (left). Lateral radiograph of child with palatal incompetence prior to obturation.

Figure 9 (right). Child in Figure 8 with bulb in position. The bulb is of acrylic resin: barium mixture.

### Discussion

With the incorporation of a radiopaque material into the self-curing resin material, radiographs can be taken to demonstrate obturator position in the patient whether at rest or during phonation.

Figure 8 shows a lateral view of a patient who was referred for obturator

construction at the Special Services Clinic, Crippled Children's Division, University of Oregon Medical School. The child has palatal paralysis or incompetence. Figure 9 demonstrates the temporary speech aid appliance position upon completion of obturation as determined by the speech pathologist. The child is presently participating in the obturator reduction program.

The advantages of using a self-curing resin micronized barium mixture are (1) that the barium sulfate modifies a radiolucent material, acrylic resin, to make it radiopaque; (2) the bulb can be modified, either altered in shape or enlarged, utilizing the acrylic resin:micronized barium composite; and (3) if one is engaged in an evaluation of an obturator reduction program, the radiopaque obturator allows for a comparison of data from longitudinal radiographs for a series of children or the progress of each individual child.

### Summary

Micronized barium sulfate when incorporated in a self-curing acrylic resin transforms a radiolucent material into radiopaque substance. The data for each child and/or a group of patients enrolled in an obturator reduction program can be collected and evaluated in a longitudinal manner.

### References

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