Periodontal Disease and Cancer

Amalgam remains a fertile subject for investigation. Research conducted during the past year has shed additional light on the setting reactions and on the variables influencing clinical behavior [1,2]. Uncombined mercury rapidly disappears as the alloy hardens; either by diffusion, combination or recombination in or with other phases present [3]. The initial shrinkage, subsequent expansion and final shrinkage can be explained by these actions. However, if polishing techniques are employed that produce temperatures above 65°C., mercury will be released, resulting in a mercury-rich amalgam at the critical marginal areas. A study of the exact relationship between residual mercury and compressive strength again established the weakening effect of excess mercury in the restoration [4]. The residual mercury content varied with the original mercury-alloy ratio and the condensation pressure. Serious loss in strength occurred when the mercury exceeded 55%. The particular study [5] made use of an improved laboratory method for measuring residual mercury has been worked out by Stone and his team.

Other investigations have been carried out to evaluate the efficiency of various matrix band techniques in restoring the normal tooth contour [6-8]. Silhouettes of the restorations which were made by seven techniques disclosed that both contouring and wedging of the matrix were essential to accurate reproduction of the contours. Gross cervical overhang occurred if the matrix band was not securely wedged.

Resins

Research in the field of dental resins, both basic and applied, continues at an accelerated rate. The sorption of water as related to temperature and degree of polymerization and molecular weight has been reported [9]. The mechanical proper-
ties of the direct filling resins (such as modulus of elasticity, yield point and hardness) make resin inferior to dental gold alloys and amalgam for restorations that are subject to stress [10,11]. Many claims made concerning the adhesion of resin cements and filling materials to the hard tooth tissues under oral conditions have not been substantiated [11]. The data indicate that although certain resins are superior on a dry tooth surface absorption of moisture breaks the bond. The clinical significance of these observations remains to be established. Two studies [11, 12], based on a more than 24 month evaluation of a resin cement, indicated it to be equal to zinc phosphate cement except under a very few specified conditions. Color stability has been improved but remains a problem with all the self-cured resins. A spectrophotometric method for measuring the color changes in popular brands showed that none were entirely color stable [13].

There is added evidence that use of tin-foil substitutes causes lower strength and increases warpage of the denture base resin compared to resin processed in a mold lined with tin foil [14]. The influence of packing pressure on the vertical dimension of dentures showed that minimum increase in the vertical dimension occurred when the dentures were invested in artificial stone and packed at high pressures [15]. Artificial teeth were forced into plaster by the average packing pressure. Irritation of the mucosa under acrylic resin dentures has often been attributed to the residual monomer present after processing. The small amount of residual monomer is leached out during the finishing of the denture and the first 17 hours in the mouth [16]. This observation confirms previous studies [17] that true allergy to acrylic resins is seldom seen in the dental office. Another preliminary report [18] had indicated certain serious limitations to nylon as a denture base. Its mechanical properties are superior to current denture base resins but its dimensional change on curing and during water sorption makes nylon unsatisfactory, at least with the materials and techniques available.

Several studies are devoted to a long neglected area in prosthodontics, namely, deformation of the denture base under biting stress [19]. Strain gauges are an excellent laboratory tool to evaluate the type of denture base and anatomical design of the teeth.

CASTING AND INVESTMENT

Thompson et al. [20] have published a comprehensive review of the current status of inlay casting techniques. It is obvious that there are now several popular techniques available, all of comparable accuracy. Choice should probably be made of the procedure that works best in a particular person’s hands. There is continued research [21] to determine the exact mechanism of hygroscopic expansion. Until this phenomenon is completely understood, it will be difficult to establish a standardized technique. Another new hygroscopic method [22] whereby a specific amount of water is added to the top surface of the investment during setting has been presented. Alrahlah et al. [23] contend that the degree of expansion can be varied by the amount of water added.

Much still remains to be learned about small castings. Considerable variation exists in the fit of individual castings; differences as much as 1.0% in the size of castings made by a universally acceptable technique were reported [24]. Carvalho [25] has stressed the importance of accuracy of fit and the failures which inevitably result if reliance is placed on the cement alone.

IMPRESSION MATERIALS

The new rubber base impression materials are the subject of several preliminary reports [26-29]. Definite reliable techniques have yet to be established for these materials but several factors have been emphasized in these early publications. The material must be bonded well to the tray or band and should not be removed from the mouth until two minutes after the set. Special care must be taken to avoid any pinching of the band during removal.

INSTRUMENTATION

Experimentation on methods of cutting enamel continues to center on improvements in rotary methods, revaluation of the air abrasive technique and introduction and intense experimentation with ultrasonic devices. The developments of various rotary instruments are reviewed by Gu et al. [30]. In the abrading of enamel, the elimination or reduction of vibration is perhaps the most important single factor as vibration is the primary deterrent to dental service. The balance between this vibration factor and others such as reduced pain, rapidity of removal of enamel and simplicity of design, ease of repair, and life of the instrument will determine which of the auxiliary methods will be accepted within the next few years. The method that appears to be the most promising at the present time makes use of the water turbine hand piece [31-33].

According to Nakamura et al. [34], the air abrasive method first introduced in 1951 has been used by over 2,000 dentists. Between other methods used, air abrasive has been carefully given its advantages and disadvantages and all of these researches refer that the method has a place in dental practice. Time has shown, however, that it will not be widely accepted by dentists at the present level of development where many suggest ultrasonic method [35-38].
CONCLUSION

Clinical reports highlighted the fact that metals used in dental treatment, such as mercury, as well as cross-reactions [39,40] between nickel and palladium, may cause systemic hypersensitivity or toxicity. Sensitivity was shown based on the catalytic reaction of amalgam materials which had been proved to be an efficacious method for multiple signal amplification detection and rapid removal of ions such as Hg2+. Conventional and high impact strength denture base resin materials exhibited greater water sorption values than the same reinforced with glass fibers. In clinical situations, use of primer/adhesive is recommended for getting proper adhesion. At last, we recommend clinicians to have in mind that amalgam-resembling restorations are not always what they seem to be and additional attention may be required such as the well understanding of viscoelastic behaviors of each resilient denture liner and choose the material according to the clinical situation.

REFERENCES