Abstract:

The use of metal clasps on anterior teeth may cause esthetic problems. Recently, acetal resins have been used as an alternative tooth-colored denture clasp material to improve esthetics. The therapeutic use of thermoplastic materials has increased drastically in the late decade. This new procedure, during which a fully polymerized basic material is softened by heat (without chemical changes) and injected afterwards, has opened up a new chapter in making dentures. The excellent tissue-friendly and mechanical characteristics of these basic materials can only be made to last by an exactly executed and reproducible technology. The Valplast clasp blends with the surrounding tissue and virtually disappears. Valplast partials are smooth and comfortable against the tongue. This case report describes the treatment for this situation, the rationale for the design and use of valplast flexible denture flanges in the maxillary and mandibular posterior buccal vestibule, and the laboratory procedure for incorporation of flexible denture flanges.

Key words: Thermoplastic resin, Valplast RPD, Injection system

INTRODUCTION

Restoration of esthetics is an important factor to consider in the fabrication of a removable partial denture (RPD). Several types of polymers and metal alloys have been used in RPD construction. Frequently, RPD clasps made from the same alloy as the metal framework. The most common alloys used for clasps are cobalt-chromium (Co-Cr) alloy and gold and titanium alloys, although these may be unesthetic. Thermoplastic materials for dental prostheses, Valplast and Flexiplast, were first introduced to dentistry in the 1950s. Both materials were similar grades of Polyamides (nylon plastics). Since their introduction, there has been a continued interest in thermoplastic dental materials. It is reported to have a sufficiently high resilience and modulus of elasticity to allow its use in the manufacture of retentive clasps, connectors, and support elements for RPDs. Valplast is a pressure-injected, flexible denture base resin that is ideal for partial dentures and unilateral restorations. This material generally replaces the metal, and the pink acrylic denture material used to build the framework for standard removable partial dentures.

Flexible Partials blend in well with the natural appearance of your gums, making the partial virtually invisible. The plastic has almost a chameleon effect, it is so strong that the partial can be made very thin and also picks up the characteristics of the underlying tissue. Valplast introduced a flexible semi-translucent thermoplastic resin to create flexible tissue-born partial dentures. While the material was not strong
enough to allow for conventional tooth born rest seat, the flexibility added to patient comfort in wearing the appliances.3

CASE REPORT
A healthy 58-year-old man being seen and referred for fabrication of dentures for multiple upper and lower missing teeth. Examination of the patient revealed 7 remaining maxillary teeth and 8 remaining mandibular teeth (Fig. 1,2). As the maxillary and mandibular teeth were periodontally sound and caries free, they were retained. The planned treatment was placement of a maxillary and a mandibular interim flexible removable partial denture (RPD). With the aim of maximizing the border seal to ensure retention, the decision was made to incorporate flexible flanges in the undercut region using resilient Valplast material to allow optimal height (extension) and thickness (width) of the denture flange. The denture flange was designed to fill the entire available vestibular space. Preliminary impressions were made in alginate, the model poured promptly. A custom bite and try-in was done for both maxillary and mandibular free-end saddle cases. Salient features of the denture were evaluated at the trial placement appointment. Valplast uses the RetentoGrip tissuebearing technique for retention. No tooth or tissue preparation is needed. After designing the case on the master model, placing all necessary relief and blocking in wax, sprue was attached as straight as possible. After investing and washing out, the teeth were prepared for mechanical retention (Fig. 6). The Valplast resin was injected into a closed flask. After the case is deflasked, it is finished and fit on the master model, polished, and packed in water. The hot water treatment permits a very smooth initial insertion and a good adaptation with the natural tissues in the mouth. If the patient senses any discomfort because of tightness of a clasp, the clasp may be loosened slightly by immersing that area of the partial in hot water and bending the clasp outward. Like any removable prosthesis, the patient was instructed to utilize good hygienic practices to maintain the appearance and cleanliness of the Valplast restoration (Fig. 3,4,5).

DISCUSSION
Thermoplastic resins have been used in dentistry for over 50 years. During that time the applications have continued to grow, and the interest in these materials of both the profession and the public has increased. The materials have superior properties and characteristics and provide excellent esthetic and biocompatible treatment options. With the development of new properties, elastomers and copolymer alloys, there are certain to be additional new applications for thermoplastic resins in the future, to help patients with damaged or missing teeth.

Retentive clasp arms must be capable of flexing and returning to their original form and should retain an RPD satisfactorily. The tooth should not be unduly stressed or permanently distorted during service and should provide esthetic results.6 The clinical experience of loss of retention of the RPD after the prosthesis is worn for some time raises the question of whether constant deflection of the clasp during insertion and removal of the denture fatigues the clasp.2 The rationale for using flexible flanges and clasp was to aid retention by ensuring seal around the entire border of the denture. The clinical and laboratory steps used in the treatment of the patient were described.

REFERENCES
Fig. 1 Pre-Op Maxillary View

Fig. 2 Pre-Op Mandibular View

Fig. 3 Post-Op Maxillary View

Fig. 4 Post-Op Mandibular View

Fig. 5 Right Buccal View

Fig. 6 Sprue Attachment and Deflasking