

Modified Processing Technique for Acrylic Resin Denture Base

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Abstract

Modified flasking technique for acrylic resin denture base at sandy stage. The uniform denture base plate wax pattern was made on the stone casts with a thickness of 3 mm. For the flow of acrylic on ridge, the necks of teeth were slight grinded from palatal or lingual surfaces toward buccal surface to allow more space. The volume of the definitive casts must be reduced as much as possible before flaked in the lower part of the traditional flasks and fill with dental plaster (class II) covering the buccal, labial, incisal and occlusal surfaces of the teeth to give more support and prevent teeth migration. After curing cycle, the denture bases are carefully deflaked, the excess trimmed and polished the surfaces of the denture. Dentures processed with this procedure provides good retention and esthetic, more hygienic and comfortable for the patient than those processed with the conventional method. Giving more support and prevent teeth migration, comfortable for patient, good esthetic, give fine details of the mold and decreasing of time required for processing and finishing the cured prostheses.

Introduction:

Dentistry as a branch of science, has witnessed a continuous evolution search for a new materials and techniques to improve the quality of treatment service. The material type used for denture bases fabrication have an effect on dimension during processing of the denture bases and other factors related to clinical uses. The practice of dentistry, in particular prosthetic dentistry is at an interface delicately balancing technology and science on one side and patient oriented

service on the other ⁽¹⁾. The acrylic resins are a major breakthrough in the annals of advanced dentistry. Their acceptance and recognition in prosthodontic prosthesis are usually incredible as they are found to be high esthetic, easy manipulated in both the clinic and the laboratory ⁽²⁾. Acrylic resin has been used in dentistry since 1946, commonly as a material of denture base and mostly consist of polymethacrylate (PMMA), and methyl methacrylate (MMA) ⁽³⁾. Owing to their acceptable

physiological and chemical properties in addition to ease of handling, better esthetic and cheap costs. The resins have been considered as a perfect materials to be used in the oral environment and have been widely indicated⁽⁴⁾.

Polymethyl methacrylate and methyl methacrylate are the most common materials used for processing of complete and removable partial dentures. Although their popularity and satisfy esthetic demand are not ideal in fulfilling the mechanical properties of such prosthesis⁽⁵⁾. The indication of pour-type (fluid) resins are markedly increased over the past decade for the denture bases fabrication. The dimensional change that occurs during polymerization shrinkage is the critical factor in the stability and retention of the complete prosthesis⁽⁶⁾. This change may be partial compensate by water absorption,⁽⁷⁾ the resilience of gingival mucosa⁽⁸⁾ and the film of saliva formed between the soft supporting tissue and the denture base^(9, 10). Despite relatively best fitting dentures is produced with easy manipulation with a cheap cost, the current denture base materials, in every aspect, are not ideal. In 1943, Skinner and Cooper⁽¹¹⁾ find that, at least, two unavoidable changes of denture dimension that are active in all acrylic denture like processing shrinkage, and subsequently expansion, that occur after immersion in the water. One of the successful prosthesis of the clinical criteria is the adequate adaptation of the denture bearing area. Investing materials and processing technique were developed, like direct and trial pack procedures, wet and dry curing cycle, pour and injection processing. Although little researches have been conducted on the evaluate the dental stone type that used for the cast fabrication⁽¹²⁾. Masticatory problems of edentulous like denture looseness and diminished chewing efficient should been demonstrated by many authors.

The consequence of edentulous include speaking disability and eating, low of social contact and inability of residual ridge, and the overlying tissue to withstand forces of mastication⁽¹³⁾.

Materials and Methods:

After making primary and final impressions for maxilla and mandible, poured with class III dental stone (Hi-Japanese stone) using W/P ratio of (33 ml to 100 g). The vertical dimension and centric relation determined by measurement of the distance between two tattoos on the tips of nose and chine. The uniform denture bases plate from wax pattern were made on all master casts with thickness of 3 mm. Teeth neck was grinded from the palatal or lingual toward buccal side to allow more space for the flow of acrylic. The volume of the definitive casts was reduced as much as possible Fig. (1) for reduce height of casts to compatible with flask flanges height, the cast was flaked in the bottom part of the traditional flasks and filled by dental plaster (class II) with covering the buccal, labial, incisal and occlusal surfaces of denture teeth to give more support and prevent teeth migration Fig. (2). The plaster was painted with a petroleum jelly as a separating medium in the lower part of the flask after setting. The upper part of the flask was placed over the lower part, and filled by plaster. One hour later, the flask was placed in a boiling water to soften the base plate wax. After parts of flask were separated, removed the molten wax and cleaned the stone cast with boiling water with liquid detergent Fig. (3). Separating medium was used as a mould separator Fig. (4). When the flask parts have cooled, PMMA (Classico Dental Products, Sao Paulo, SP, Brazil) was used with a L/P ratio of 1:3 (by volume) according to the instructions of manufacturer for flask pressing. The prepared liquid mixture was packed immediately after mixing according to the conventional packing methods. The flasks were placed in a traditional metallic clamps Fig. (5) after final pressing was performed using a hydraulic press with load of 1.250 kg for five minutes Fig. (6). The flasks were a immersed in water, after transferred to a flask carrier, according to the postpressing times and cured by using short curing cycle 90 min. at 74 °C followed by 30 min. at 100 °C. The flasks were removed after the curing cycle, and

bench cooling at room temperature. The denture bases were carefully deflasked without the stone casts fracture, the excess of resin was trimmed and polished the denture surfaces Fig. (7). Dentures were fixed onto their corresponding casts placed on the ridge crest of the stone cast. Selective grinding of the dentures teeth were done on an articulator before insertion it inside the patients mouth for checking the mandibular movements. Retention, support, stability and dentures extension checked carefully inside of the patient mouth in addition to the appearance and face profile of the patient.

Results:

The dentures polymerized with this procedure were free of porosity or flash and easily trimming and polishing. The unpolished internal surfaces, as with the polished surfaces, were smooth, easily cleaning, and not conducive of secretions to retention and impaction. These results have lead to conclude that these dentures processed with modified flasking procedure are high hygienic, it is comfortable for patient (thin and light weight) provides a good retention and esthetic (not bulky) than those processed with the conventional method. Fast pouring of fluid acrylic resin material will enhance the acrylic flow easily into the mold to produce a fine details. In addition, decreasing of processing time, easy and simple procedures of flasking, deflasking and time decreasing that required for finished and polished the cured prosthesis.

Discussion:

Fast pouring of fluid acrylic resin material will enhance the acrylic flow easily into the mold to produce a fine details. In addition, decreasing of processing time, easy and simple procedures of flasking, deflasking and time decreasing which required for finished and polished the cured prosthesis. Further research into the magnitude of their effect on reproduction of details and mechanical properties of the fluid resin should be invaluable in established guidelines for the material

using ⁽¹⁴⁾. Advantages of fluid resins include, decreasing of processing time, easy and simple procedures of flasking, deflasking and time decreasing that required for finished and polished the cured prosthesis ⁽¹⁵⁾. However, the anatomical regions for the maxillary and mandibular arches are different, denture bases showed same patterns of adaptation. May be, these occurrences are due to the true that, maxillary arch showed better retention of anterior region and another 'posterior palatal seal' with bad retention, while the anterior region of mandibular arch showed better retention and bad retentions of posterior with free ends. So, when the denture base was considered as a whole, it would similar patterns of adaptation in each part of denture bases ⁽¹⁶⁾. The tested study, which displacement of teeth should be adversely affected by method of the flask closure and post pressing time association, was in accepted part. Measurements have been taken carefully to overcome inaccuracy of dentures, like base distortion and artificial teeth displacement. These factors are responsible for loss of the denture stability and retention, and increase the displacement of teeth causing difficult of the adjustment procedure of occlusion. Clinically, these changes in dimension would also modify the planned vertical occlusion dimension, and cause mucosal trauma and bone loss ⁽¹⁷⁾. This evidence is also approved by ⁽¹⁸⁾ as he said that absence of porosities were found in the conventional resin in uniform thin denture base which explain the risk of porosities in a thick (more than 3mm thickness) specimens and this finding in agreement with others (references).

Conclusions:

- Give more support and prevent teeth migration affected by the flask closure method or processing.
- It is comfortable for patient (thin and light weight).
- Provides a good retention and esthetic (not bulky) than those processed with the

- conventional method.
- Fast pouring of fluid acrylic resin material will enhance the acrylic flow easily into the mold to produce a fine details.
- Decreasing of processing time, easy and simple procedures of flasking, deflasking and time decreasing that required for finished and polished the cured prosthesis.



Fig. (1): Reduce the volume of the cast teeth with dental plaster



Fig. (2): Covering surfaces of denture



Fig. (3): Waximation



Fig. (4): Application of separating medium press by brush



Fig. (5): The flasks placed in clamps



Fig. (6): Hydraulic

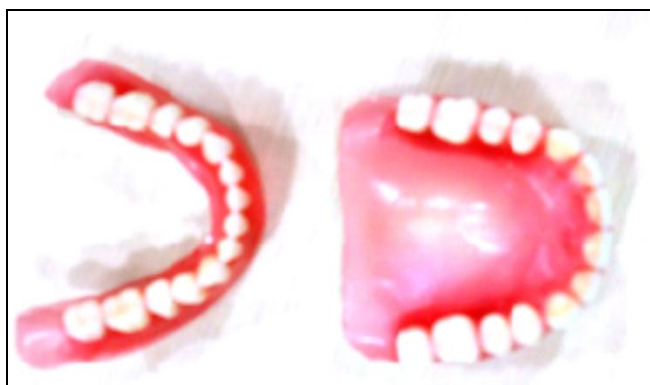


Fig. (7): Finishing denture

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