SHORT COMMUNICATION

Do Flexible Removable Partial Dentures Neglect Conventional Acrylic Rigid Dentures?

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ABSTRACT

Introduction: **This article aimed to review the fabrication of flexible removable partial dentures in lieu of conventional acrylic rigid removable partial dentures in Iraq.**

Materials and Methods: **The Iraqi Dental Association listed the numbers of 75 dental laboratories in its telephone directory. All dental laboratories listed were contacted and invited to participate in this study. Written information received from dental technicians for the fabrication of flexible and rigid removable partial dentures was examined for evidence.**

Results: **Of the 75 dental laboratories listed, 51 (68%) had the facilities to fabricate flexible removable partial dentures in their office.**

Conclusion: **The fabrication rate of flexible removable partial dentures was higher than that of conventional acrylic rigid removable partial dentures in Iraq.**

KEY WORDS

flexible dentures, conventional acrylic denture, dental laboratories

INTRODUCTION

Removable partial dentures (RPDs) became popular with the introduction of acrylic polymer materials and chrome-cobalt alloys in the dental field. Most patients choose RPDs due to their low cost and psychological factors. In 1937, Dr. Walter Wright introduced and utilized polymethylmethacrylate (PMMA) as a denture base material. Since then, PMMA has become the main polymer material used in the field. In addition to PMMA, metal cast is used to fabricate the denture base and restore defects. Unfortunately, PMMA has several issues that need to be addressed, including insertion in deep undercut regions, weak and brittle structure, and allergy of soft tissue to PMMA monomer[1,2)]. The main issue with rigid RPDs is the metal clasp; this aesthetic problem is undesirable for patients who then avoid and neglect their use[3-5)]. In the past, most patients demonstrated low interest in aesthetic outcomes of conventional removable dentures. However, numerous patients are presently challenging the aesthetic aspect of prostheses. In the 1950s, thermoplastic resin materials became available in the market and were used to fabricate partial and complete removable dentures[6-10)]. Thermoplastic removable dentures have been used as flexible dentures, clasp-free metal-free dentures, and non-metal clasp dentures[4)]. Recently, flexible dentures have become common among patients. Dentures made from these materials should exhibit more advantages than conventional acrylic rigid dentures. Thermoplastic resin materials are flexible, easily engage the area of the alveolar ridges for better retention, and show easy path of insertion in the mouth. Moreover, they are resistant to plastic deformation and breakage, and the denture base can be thinner than in acrylic rigid dentures. Such materials do not induce an allergic response and are semi-transparent, thereby providing good aesthetics. These materials reflect the color of the mucosa, and the lack of metal clasps makes the dentures practically invisible in the mouth[11)]. This study aimed to review the fabrication of flexible RPDs in lieu of conventional acrylic rigid RPDs in Iraq. We hypothesized that dental clinicians in Iraq provided more flexible RPDs to dental laboratories than rigid RPDs. Incidence data of flexible dentures were documented in a survey of 75 dental laboratories in Iraq.

MATERIALS AND METHODS

In 2015, the Iraqi Dental Association/ Baghdad was contacted, and it provided us with a list of 75 dental laboratories in its telephone directory. All dental laboratories listed were invited to contribute in this study and asked about their equipment to fabricate flexible dentures. Respondents were also asked to forward new cases regarding the fabrication of flexible dentures they received from clinicians. No similar study has been previously carried out in Iraq, and this research aimed to provide baseline data in this area. Consequently, data collected were analyzed by a quantitative rather than a qualitative method.

Table 1. Principal reasons of the laboratories that participated in the study.

Reason	n	%
Noncontactable	3	4
No response	5	7
No flexible denture facilities	16	21
With flexible denture facilities	51	68
Total	75	100

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RESULTS

Of the 75 dental laboratories listed, three (4%) were noncontactable, and five (6%) did not respond to participate in this study. Sixteen (21%) of the remaining laboratories did not have the facilities to fabricate flexible dentures in their office and concentrated on fixed prostheses, leaving 51 (68%) laboratories contributing to this study (Table 1). The remaining laboratories had the facilities to fabricate flexible dentures in their office.

DISCUSSION

This study explored the attitudes and information about flexible RPDs among dentists in Iraq. The manufacturing cycle of a flexible and rigid partial denture needs a clinician and dental laboratory to fabricate it in accordance with certain recommendations. The most popular material used for the fabrication of conventional rigid acrylic dentures has been PMMA. However, this material is far from perfect. In spite of the extensive progress and research made in the fields of dental materials, training, and techniques, we cannot avoid breakage, foul smell, and allergy to PMMA[12-14]. The present study involved 51 laboratories (Table 1). Some technicians reported several disadvantages of conventional rigid acrylic dentures and referred to an irritation factor, claiming that conventional acrylic fabrication is unhygienic and time consuming. In addition, these laboratories were found to prefer the fabrication of flexible dentures because of the advantages of materials used. Such materials commonly replace the metal and PMMA denture base material used to fabricate the framework for conventional RPDs. They are almost strong and aesthetically acceptable because of their similarity in color to gingival tissues, thin structure, and ability to form the denture base and body of clasps. They also have high wear, fatigue, and solvent resistance; no porosity; and no biological and stain material buildup[15-18]. In general, the respondents preferred flexible dentures in place of acrylic rigid dentures, and this finding was in agreement with the results of Pun *et al*.[19]

CONCLUSION

This survey on the fabrication of flexible dentures indicated differences between flexible and acrylic rigid dentures. Years in practice of the clinician and dental laboratories were related to the selection of these dentures, whereas comfort, aesthetics, and price were the main causes for deciding the use of flexible dentures among patients.

REFERENCES

1) Atulya Sharma, Shashidhara H.S. 2014. A Review: Flexible Removable Partial Dentures Journal of Dental and Medical Sciences.13 (12), 2279-0861.
2) Salah K A, Zaihan A, Adam H, Fazal R. (2014). Comparison of Microbial Adherence to Polymethylmethacrylate for Maxillo-Facial Prostheses World Applied Sciences Journal, 31 (12), 2115-2119.
3) Hill EE, Rubel B, Smith JB. Flexible removable partial dentures: a basic overview. Gen Dent. 2014 Mar-Apr; 62(2): 32-6.
4) Fueki K, Ohkubo C, Yatabe M, Arakawa I, Arita M, Ino S *et al*. Clinical application of removable partial dentures using thermoplastic resin-part I: definition and indication of non-metal clasp dentures. J Prosthodont Res. 2014 Jan; 58(1): 3-10.
5) Salah K A, Zaihan A, Adam H, Fazal R. (2016). Comparison of Microbial Adherence to Cobalt-Chromium for Maxillo-Facial Prostheses International Medical Journal, 23(3), 230-232.
6) Ardelean L, Bortun C, Motoc M. Metal-free removable partial dentures made of a thermoplastic acetal resin and two polyamide resins. Materiale Plastice. 2007; 44: 345-8.
7) Negrutiu M, Sinescu C, Romanu M, Pop D, Lakatos S. Thermoplastics resins for flexible framework removable partial dentures. Timisoara Medical J 2005; 55: 295-9.
8) Singh K, Aeran H, Kumar N, Gupta N. Flexible thermoplastic denture base materials for aesthetical removable partial denture framework. J Clin Diagn Res. 2013 Oct; 7(10): 2372-3.
9) Kalaskar R, Kalaskar A. Functional esthetic rehabilitation of a 7-year-female patient with hereditary ectodermal dysplasia using flexible denture. Indian J Dermatol Venereol Leprol. 2013 Nov-Dec; 79(6): 826-7.
10) Tannamala PK, Pulagam M, Pottem SR, Karnam S. Flexible resins in the rehabilitation of maxillectomy patient. Indian J Dent Res. 2012 Jan-Feb; 23(1): 97-100.
11) Parvizi A, Lindquist T, Schneider R, Williamson D, Boyer D, Dawson DV. Comparison of the dimensional accuracy of injection molded denture base material to that of conventional pressure pack acrylic resin. J Prosthodont. 2004 Jun; 13(2): 83-9.
12) Anusavice KJ. 10th ed. Philadelphia: WB Saunders; 1996. Phillips Science of Dental Materials; p. 238.
13) Nafij B J, Taweewatchaikul Y, Theerathavaj S, Mohammad K A. (2013). A New Technique to Correct the Iris Shading of Ocular Prosthesis International Medical Journal, 20(5), 621-622.
14) Nafij B J, Amornvit P, Srithavaj T, Mohammad K A. (2013). Management of a Maxillectomy Patient by Definitive Obturator International Medical Journal 20(4), 460-461.
15) Stafford GD, Huggett R, MacGregor AR, Graham J. The Use of Nylon as Denture Base Material. J Dent.1986; 14: 18-22.
16) Dhiman RK Col, Roy Chowdhury SK. Midline Fracture in Single Complete Acrylic vs Flexible Dentures. MJAFI. 2009; 65: 141-5
17) Lili H, Nik H, Azidah A K, Norhayati M N, S. Siti Amrah, Intan I, Shaiful Bahari I., Juhara H, Kamarul I. (2013). Safety of Honey in Postmenopausal Women. International Medical Journal, 20(1), 25-28.
18) Enezei H H. and Alam M K. (2015). Survival Analsis for Use ofTow Types of Antibiotics in the Remedy of Mandibular Third Molar Deep Abscess. International Medical Journal, 22(5), 430-432.
19) Pun DK, Waliszewski MP, Waliszewski KJ, Berzins D. Survey of partial removable dental prosthesis (partial RDP) types in a distinct patient population. J Prosthet Dent. 2011 Jul; 106(1): 48-56.