

Uses of Denture Base Reliner for Complete Dentures in Clinical Practice: A Study on Bangladeshi Dental Practitioners

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Abstract

Original Research Article

Background: Complete dentures are used for the rehabilitation of edentulous patients. When residual ridge resorption continue then dentures tend to become loose and unstable causing discomfort, chewing disability, and speech problems. Residual ridge resorption causes tooth loss. Denture relining is an economical means of improving a denture's stability and retention. The knowledge of understanding of the clinical indications and advantages of these materials is used for clinical success. This survey was to assess the effectively and practice in relining dentures to the specialized and general dental practitioners. **Methods:** This cross-sectional survey was conducted among 100 private dental practitioners in Dhaka city, Bangladesh, from May 1 to May 31, 2025 using a validated questionnaire. Data analysis was done using proportion test with SPSS EPI INFO software. **Results:** About 100 practitioners were all are not know the effects of relining and the procedure in their dental clinics, 50% of the practitioners were not know the correct relining step by step procedure and were not have the proper knowledge about the antimicrobial properties of the relining material. **Conclusion:** The CDE program and workshops helps to increase the appropriate knowledge about the relining materials which encharge within general dental practitioners. The relining procedure if included the undergraduate clinical curriculum as well as internship program then it will be effective.

Key words: Complete denture, antimicrobial property reliner, relining.

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INTRODUCTION

The biologic process is aging and it is a normal phenomenon. The aged people have various health problem all over the world. The increase in elderly population, problems associated with edentulism is also on a constant rise [1]. In Dhaka accounts for 6% of the population of Dhaka City, 10% of the district's population is over the age of 60 years. The more elderly population, the greater would be the need for social support for the elderly [2]. If the edentulism in elderly population, restoration and rehabilitation of the lost teeth with a dental prosthesis is the most common dental rehabilitation procedure. The socioeconomic status of the aged population restricts the use of implant-supported prosthesis in a developing country like Bangladesh. Conventional complete dentures are commonly used dental prostheses for the elderly [2].

The main thing of complete denture construction is to achieve denture bases that best fits the

underlying tissues. If the residual ridge resorption continue then dentures tend to become loose. As a result patients complains discomfort, chewing disability, difficulty in eating hard foods, and speech problems. The resilient liners improves denture base adaptation and prosthodontic patients are benefited [3]. Since their introduction in the 1950s, these viscoelastic compliant materials have undergone some development and improvement, being used to form all or part of the fit surface of a denture and help condition traumatized tissues providing an interim or permanent cushion-like effect [4,5].

Direct chairside relining and indirect laboratory technique are available for denture relining [6-8]. The direct chairside technique involves addition of self-cure soft relining material followed by soft-tissue molding to incorporate functional movements for correction of the fit of denture bases. Newer materials such as room temperature-vulcanizing silicone have been introduced with various antimicrobial and tissue conditioning

properties. An understanding of the clinical indications and limitations of these materials and procedures is crucial for clinical success. Therefore, the purpose of this survey was to study knowledge, attitude, and practice about relining procedure among dental practitioners. Based on the results, an action plan can be developed to increase awareness and updating of knowledge among dental practitioners in Dhaka so that more scientific-based standardized procedures can be undertaken for prosthodontic rehabilitation of completely edentulous patients.

METHODOLOGY & MATERIALS

This cross-sectional survey was conducted among 100 private dental practitioners in Dhaka city, Bangladesh, from May 1 to May 31, 2025. The study population included general dental practitioners, prosthodontists, and other dental specialists practicing in private clinics. Participants were selected based on convenience sampling. Of the respondents, 60% were male and 40% female. A validated, structured questionnaire consisting of 20 items was used to assess the knowledge, attitude, and clinical practices regarding denture base relining in complete denture cases. The questionnaire covered domains such as indications, techniques, materials, disinfection, and patient communication.

Inclusion criteria were dental practitioners holding a recognized dental degree and currently practicing in private clinics in Dhaka city, with at least one year of clinical experience. Exclusion criteria included dental interns, practitioners not currently involved in removable prosthodontics, and those unwilling to participate. Data were collected anonymously, and all participants provided informed consent. Collected responses were coded and analyzed using IBM SPSS Statistics software, with descriptive statistics (frequencies and percentages) used to interpret the findings.

RESULTS

The survey was conducted using with 9 questions. This 9 item questionnaire included five knowledge-related questions [indication, technique, type of material, durability, and disinfection, [Table 2], six items on practice [clinical practice, material used, technique, recall, evaluation, and instructions to the patients, [Table 3], and five on attitude [Table 4], which were graded on a 5-point Likert scale (strongly agree, agree, don't know, disagree, and strongly disagree), reflecting the level of agreement of dentists' decision along the scale.

Data were imported to the IBM SPSS statistics software (IBM SPSS Inc., Chicago, IL, USA) to draw the means and percentage. The samples were also divided according to age group (25–35 years, 36–45 years, 46–

55 years, and more than 55 years) and according to years of clinical practice (1–10 years, 10–20 years, and more than 20 years) [Table 1].

Table 2 shows the Seventy one percent of dentists practicing in Dhaka region knew that relining is the procedure used to resurface the removable prosthesis whereas about 29% were not sure about the exact procedure of relining. On the other hand 52% felt that thorough examination of impression surface of the denture and also the soft tissue intraorally is necessary before relining whereas 32% felt that cleaning of the dentures with an ultrasonic cleaner to remove calculus and slimy layer before relining is needed. According to 39% of the dentists, 0.5 mm from tissue surface and 1 mm from border area should be scraped from the denture before relining the denture. About the use of a relining material, majorities think that soft reliner should be used for short term.

Table 3 shows the attitude of the dentist about relining procedure. Eighty-five percent of the dentists think that relining increases the retention and stability of the denture whereas 11% did not feel so and 4% were not sure about it. Thirty-eight percent of dentists surveyed thought relining might increase the vertical dimension of the dentures. One-fifth of surveyed dentist feels that soft reliner has adverse effects on the oral mucosa. 29% percent of practitioners did not know about the antimicrobial properties of reliner and the same percentage of practitioners disagreed with the use of antimicrobial relining material and majority of dentist thinks that disinfection is not necessary before relining procedure.

Table 4 shows practice of relining procedure. Forty percent of dentists do relining when there is poor adaptation of the denture to the ridge due to excessive resorption of the residual ridge.

Table 1: Characteristics of the study objects (n)

Variables	n(%)
Age group (years)	
25-35	20(20)
36-45	40(40)
46-55	25(25)
>55	15((15)
Gender	
Male	64(64)
Female	36(36)
Qualification	
General practitioner	70(70)
Prosthodontists	8(8)
Other specialists	22(22)
Years of clinical experience	
1-10	60(60)
11-20	25(25)
>20	15(15)

Table 2: Response to knowledge-based questions

Questions	n(%)			
	A	B	C	D
According to you the concept of relining is	5(5)	71(71)	24(24)	0
What kind of preparation you would perform before relining	8(8)	8(8)	46(46)	38(38)
How much thickness of denture base should be scraped out before relining	11(11)	34(34)	37(37)	18(18)
How long relining can be given	35(35)	9(9)	36(36)	20(20)
When should be the relining materials be replaced	16(16)	13(13)	13(13)	58(58)

Table 3: Dentist opinion in uses of relining:

Table 5. Dentist opinion in uses of relining.					
Questions		n(%) of respondents (n=100)			
		Strongly disagree	Disagree	Don't know	Agree
Relining improves the stability and retention of denture.	7(7)	12(12)	5(5)	59(59)	17(17)
Relining increses the vertical dimension	14(14)	40(40)	0	8(8)	38(38)
Soft reliner is harmful to the oral mucosa	6(6)	45(45)	29(29)	17(17)	3(3)
Disinfection should be done before relining	5(5)	19(19)	46(46)	25(25)	5(5)
Reliner with antimicrobial property should be used	7(7)	10(10)	12(12)	61(61)	10(10)
Relining the denture improves patient satisfaction	7	10	12	57	14

Table 4: Response regarding practice of relining procedure

Questions	n(%) of respondents (n=100)			
	A	B	C	D
Do you treat complete or partially edentulous patients	100(100)	00		
In your practice, what are the clinical conditions require relining	6(6)	7(7)	29(29)	58(58)
Whice technique do you prefer for relining	25(25)	53(53)	22(22)	
How many of your patients require relining	6(6)	33(33)	53(53)	8(8)
Which brand of reliner you use	28(28)	23(23)	25(25)	24(24)

DISCUSSION

In this study, the response of dentists on the basis of knowledge regarding relining of complete dentures was surveyed. It was noted that about 30% were not sure about the exact procedure of relining. Regarding response to a question about the preparation before relining procedure, 57% felt that thorough examination of impression surface of the denture and also the soft tissue intraorally is necessary before relining whereas 38% felt that cleaning of the dentures with ultrasonic cleaner to remove calculus and slimy layer before relining procedure was needed. About 33% of practitioners did not know about the antimicrobial properties of reliner and same percentage of practitioners disagreed with the use of antimicrobial relining material and majority of dentists thought that disinfection is not necessary before relining procedure. One-fourth of surveyed dentists felt that soft reliners have adverse effects on the oral mucosa. It showed that practitioners were not updated with newer materials available. It has been shown that rougher surfaces enhance the adhesion of microorganisms onto resilient lining materials and may allow fungal growth [9,10]. The microorganisms from the plaque on the denture surface may expose patients and dental personnel to infection [11]. In addition, denture plaque containing *C. albicans* could cause denture-induced stomatitis [12]. Brushing alone with a soft toothbrush and plain water does not clean the

denture effectively, so use of denture cleansers is mandatory. As toothpaste causes denture roughness with time, its use is not advised for relined dentures. Although preserving the surface integrity of tissue conditioners may play an important role in reducing the adhesion of fungal and other microorganisms on dentures, other solutions have been suggested; these include integrating antimicrobial components such as silver zeolite into the tissue conditioner powder [13,14]. Schneid demonstrated that a sustained release delivery system that incorporated 4 antifungal agents (chlorhexidine, clotrimazole, fluconazole, and nystatin) into a tissue conditioner (Lynal) significantly inhibited *Candida albicans* although the hardness of the tissue conditioner increased [8]. It is possible that antimicrobial compounds could be combined with surface-coated tissue conditioners although the surface coating may prevent their release.

Chemical cleansers can be used for significant removal of accumulated denture plaque, but adequate soaking time or recommended temperature is needed for proper action [15]. The use of antimicrobial agent prolongs the clinical longevity of resilient materials and reduces plaque accumulation [16]. This combination may be a logical therapy in the treatment of denture stomatitis because of several factors: (1) reducing the trauma caused by the internal surface of removable dentures, (2) eliminating contact of the contaminated surface with the oral tissues and consequently

interrupting the cycle of reinfection, and (3) action of antimicrobial agents incorporated into the material on the infected tissues [12,16]. In the general dental practitioners, the responses show a negative attitude toward the procedure of relining and the correct ways to control change in vertical dimension, and maintaining health of soft tissues was not known. It might also suggest that the indications and evidence-based case selection were not very clear.

According to previous study by Kuncha *et al.*, in 2014, on tensile bond strength of soft liners to the denture base resin with different surface preparation, sandpapering the surface of the heat-polymerized denture base as well as preparing holes on the surface of the denture base increased the bond strength of the soft liner due to increase in the surface area and mechanical interlocking [17]. According to 37% of the dentists in the present survey, relief should be provided over 0.5 mm from the tissue surface and 1 mm from the border area of the denture before relining. However, according to an institution-based survey done by Nassif and Jumbelic *et al.*, in 1984, about 57 dental institutions all over United States of America placed 1 mm of relief in the tissue side and 1–2 mm of border relief before the relining procedure [18]. Clinical studies indicate that the lining layer must be of sufficient bulk (a thickness of 2 mm is recommended) to be clinically efficient [19-21]. Babu *et al.*, in 2017 conducted a prospective randomized clinical study on the effect of denture soft liner on mandibular ridge resorption in complete denture wearers after 6 and 12 months of denture insertion and concluded that the use of soft denture liner significantly reduces the residual ridge resorption in complete denture wearers as compared to conventional denture wearers (without denture liner) over a period of 1 year [14]. Bajaj *et al.*, in 2009 said that the soft liner accommodates ridge irregularities and changes such as excessive resorption, minimal keratinized ridge epithelium, and thin lamina propria and described a procedure to fabricate a metal-based denture relined with soft liner that is comfortable for the patient and is easy to adjust [9]. These liners may be classified as provisional or definitive, room temperature and heat temperature vulcanized depending on the procedure of vulcanization [22-24]. They are also divided into four groups according to chemical structure: plasticized acrylic resins either chemical or heat polymerized, vinyl resins, polyurethane, polyphosphazene and silicone rubbers [25].

Clinical experience indicates almost universal tissue tolerance of soft liners and acceptable patient reactions [26-28]. However, currently, the materials have to be considered as temporary expedients because of problems during clinical use including loss of resilience, water sorption, support of bacteria, color change, and loss of adhesion between the liner and denture base resin requiring replacement at short intervals, which is time-consuming and costly for both the dentist and patient.

About the duration of use of a relining material, majority of practitioners think that soft reliner should be used for short term. [17,18] Gardner and Parr in 1988 evaluated methods of enhancing the useful lifespan of tissue conditioners, including preservation of surface integrity and viscoelasticity [5].

This study shows practice of relining procedure. 70% percent of dentists do relining when there is poor adaptation of the denture to the ridge due to excessive resorption of the residual ridge. Response to the question regarding the technique followed by the dentists for relining showed that 55% of the dentists surveyed preferred indirect method of relining whereas maximum number of prosthodontists surveyed chose direct or indirect technique depending on the cases.

Limitations of the study

This study has some limitations was that the sample population was restricted to Dhaka district and if we include more dental surgeon then other dental surgeon may be benefited their clinical practice.

CONCLUSION

Proper knowledge of advanced relining materials and their antimicrobial properties is very important for dental practitioners. The improper procedure causes failure of the relined complete dentures. The proper scientific approach relined complete dentures, a systematic scientific approach toward the procedure of relining is necessary, especially in patients of lower economic status, in a developing country like Bangladesh, who may not be able to afford new dentures. Clinical experience indicates almost universal tissue tolerance of soft liners and acceptable patient reaction. However, currently, the materials have to be considered as temporary expedients because none of the advocated permanent liners have a life expectancy comparable to that of the resin denture base. Improved strength, permanent resiliency, improved adhesion to the denture bases, the ability to inhibit growth of microorganisms, and chemical stability continue to be the main focus of ongoing research. These attempts include surface coatings of liners with sealants such as fluorinated copolymers and integration with antifungal components. Good resilient denture liners have higher elasticity during mastication the functional and nonfunctional forces and relieve the pain. In the oral environment the material must be durable. Acrylic resin which shows higher levels of cushioning effect may best meet the requirements for the resilient denture liners. However, in case of durability, the silicone would be better. Material selection is influenced not only by the properties available but also by the particular clinical situation. The most appropriate testing environment is intraoral; consequently, clinical studies should be performed on the materials tested.

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Conflicts of interest

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