

Patients satisfaction after receiving prosthesis of some missing anterior elements among patients with missing posterior teeth: Making case for the concept of shortened dental arch

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ABSTRACT

Objectives: The study investigated the demography, reason(s) for seeking treatment and outcome of treatment of prosthodontic patients after receiving prosthesis of missing anterior elements among patients with missing posterior teeth.

Materials and Methods: A four-year prospective study involving interview and clinical examination of prosthetic patients. Patients were interviewed and examined at presentation and on the 7th and 28th and 72nd day post-insertion.

Results: There were 144 patients comprising 32(22.2%) males and 112(77.8%) females that met the inclusion criteria. The age range (mean) is 18-80 (44.4 ± 4.23) years. The most common and significant reason for replacement of missing teeth was aesthetics (58.3%, $p < 0.05$). Patient's reported treatment outcome reveals a 100% success following treatment of anterior edentulous spaces.

Conclusion: This study found that patients' are mostly concerned with replacement of anterior teeth and lends support the school of thought that SDA concept is a viable option in the management of edentulousness, since aesthetics rather than mastication is the most common indication for seeking to treat edentulousness.

Key words: Patients' satisfaction, Prosthesis, Anterior elements

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This article may be cited as: E D Odai, JO OmohUA Umanah. Patients Satisfaction after Receiving Prosthesis of Some Missing Anterior Elements among Patients with Missing Posterior Teeth: Making Case for the Concept of Shortened Dental Arch. Int J Cont Med Res. 2014;1(1):03-11

Introduction

The prime aim of dental care is to maintain a natural, healthy and functional set of dentition throughout life, including all the psycho-social and biological functions, such as self-esteem, aesthetics, speech, chewing, taste and oral comfort.^[1-4] The minimum number of teeth needed to satisfy functional demands has been the subject of several studies. However, since functional demands and consequently the number of teeth one needs vary from individual to individual, this minimum number cannot be defined exactly.^[5]

The shortened dental arch (SDA) may be defined as having an intact anterior region but a reduced number of occluding pairs of posterior teeth,^[6] and the concept is based on the considerations that it fits well with current criteria for a healthy occlusion, that SDA can meet the requirements of normal oral function, that molars are high-risk teeth for caries and periodontal diseases, and overcoming the limitation of traditional restorative view of a complete morphological repair.^[7]

The World Health Organization in 1992 stated that the retention throughout life, of a functional, aesthetic, natural dentition of not less than 20 teeth and not requiring recourse to prostheses should be the treatment goal for oral health.^[4] Furthermore, both dental and financial considerations strongly influence the treatment plan and, in fact, dental arches comprising the anterior and premolar regions

is shown to meet the requirements of a functional dentition.^[4,8] It follows that the replacement of missing molar teeth by cantilevers, resin-bonded fixed partial dentures, implant-supported prostheses, or distal extension removable partial dentures may amount to over-treatment for patients with shortened dental arches,^[9,10] a waste of resources and precious time, particularly in an environment with paucity of personnel, equipment and material. The SDA represents a frontier between what is healthy/comfortable and pathological/uncomfortable for most middle-aged and elderly people.

The aim of the study is to investigate the demography, reason(s) for seeking treatment and outcome of treatment of prosthodontic patients using the “Shortened Dental Arch Concept” option for distal extension saddles using patients’ reported outcome.

Materials and methods

Prospective study, involving all consecutive and consenting prosthetic patients in a dental clinic presenting for prosthodontics treatment and meeting inclusion criteria were recruited for the study over a four year period, from January 2006 to December 2009.

Inclusion criteria: Patients having Kennedy’s classes I and II saddles with modifications involving the anterior teeth only and who gave consent for recruitment into the study were included in the study.

Exclusion criteria: Patients having Kennedy’s classes III and IV saddles and those declining consent for recruitment were excluded from the study.

Patients meeting inclusion criteria were interviewed for demographic data and reasons for demanding prosthetic treatment. Findings from this interview and an intra-oral examination were recorded on a questionnaire. Information recorded included age, sex, educational status, occupation and reason(s) for demanding a prosthodontics treatment and missing teeth. Patients were further interviewed on the 7th, 28th and 72nd day post-insertion, to assess the patients’ reported outcome of treatment received as successful or unsuccessful.

Results of findings were presented as simple charts and frequency tables.

Ethical consideration includes approval from the hospital management committee, patients’ education enlightenment and informed consent.

Results

A total of 190 (One hundred and ninety) patients presented for prosthodontic treatment. Forty-six did not meet the inclusion criteria. There were 144 patients comprising 32(22.2%) males and 112(77.8%) females giving a male to female ratio of 1:3.8 that met the inclusion criteria and were recruited. Their age ranged from 18 years old to 80 years with

a mean age of 44.4 ± 4.23 years. The distribution of patients by age categories, occupation, religion and educational status is as shown in Table 1.

Kennedy’s class I of the lower arch is the most common saddle distribution among the patients (Table 2).

The most common reasons for replacement of missing teeth were aesthetics (58.3%) and speech (13.2%, Table 3).

Table 4 shows that majority of the patients prefer to replace their anterior teeth compared to replacing their posterior teeth irrespective of the quadrants involved. An overview of types and number of teeth lost per quadrant is displayed on table 5.

The treatment outcome reveals all the patients were satisfied with their partial dentures at the third recall visit on 72nd day post insertion (Table 6).

Discussion

The concept of shortened dental arch (SDA) as a healthy alternative to prosthodontic replacement of missing molars, at least among older people was proposed due to reconsideration of what constitutes a minimal threshold of physical function.^[6, 11]

Characteristics	Frequency (%)
Age (Years)	
20 or less	5 (3.5)
21-30	14 (9.7)

31-40	35 (24.3)
41-50	46 (31.9)
51-60	31 (21.5)
61-70	10 (7.0)
70-80	3 (2.1)
Sex	
Male	32 (22.22)
Female	112 (77.78)
Religion	
Christianity	114 (79.2)
Islam	27 (18.7)
Others	3 (2.1)
Occupation	
Students	24 (16.7)
Teachers	38 (26.4)
Farmers	12 (8.3)
Business men/women	32 (22.2)
Bankers	5 (3.5)
Housewives	30 (20.8)
Others	3 (2.1)
Educational Status	
No formal	16 (11.1)
Primary	35 (24.3)
Secondary	52 (36.1)
Tertiary	41 (28.5)
Total	144 (100.0)

Table 1: Demographic characteristics of the respondents

Kennedy's Class	Number (%)
Class I (Upper)	15 (10.4)
Class II (Upper)	14 (9.7)
Class I (Lower)	64 (44.4)
Class II (Lower)	51 (35.4)
Total	144 (100.0)

Table 2: Distribution of saddle

Reasons	Number (%)	p-Value
Aesthetics alone	84 (58.3)	0.000
Speech	19 (13.2)	1.000
Biting alone	8 (5.6)	0.133
Chewing alone	7 (4.9)	0.065
Aesthetics and biting alone	11 (7.6)	0.812
Aesthetics, biting and chewing alone	9 (6.3)	0.258
Aesthetics, speech, biting and	5 (3.5)	0.013

chewing		
Others (Children's wish)	1 (0.6)	0.000
Total	144 (100.0)	----

Table 3: Reasons for Replacement of Missing Teeth

Variable	Kennedy's Class	Number (%)
Upper unilateral free end saddle (Right)	II	6 (4.2)
Upper unilateral free end saddle (Left)	II	8 (5.6)
Upper bilateral free end saddles	I	15 (10.4)
Lower unilateral free end saddle (left)	II	28 (19.4)
Lower unilateral free end saddle (Right)	II	23 (16.0)
Lower bilateral free end saddles	I	64 (44.4)

Table 4: Distribution of Free end Saddle not requiring replacement, existing in association with missing anterior teeth requiring replacement.

Description	Teeth Missing	Teeth Replaced	Percentage of Teeth Replaced
Upper Right Quadrant			
Anterior Teeth	58	58	100.0
Posterior Teeth	105	8	7.6
Upper Left Quadrant			
Anterior	62	62	100.0

Teeth			
Posterior Teeth	98	6	6.2
Lower Left Quadrant			
Anterior Teeth	25	25	100.0
Posterior Teeth	120	4	3.3
Lower Right Quadrant			
Anterior Teeth	30	30	100.0
Posterior Teeth	115	7	6.1
Total (Upper)			
Anterior Teeth	120	120	100.0
Posterior Teeth	203	14	6.9
Total (Lower)			
Anterior Teeth	55	55	100.0
Posterior Teeth	308	21	6.8
Total (Upper + Lower)			
Anterior Teeth	175	175	100.0
Posterior Teeth	511	35	6.9

Table 5: Replacement of Missing Teeth by Numbers and Types Per Quadrants

Days/Criteria	Satisfactory	Unsatisfactory	Total
7th Day Post-Insertion			
Aesthetics	144	0	144
Function	139	5	144
Comfort	136	8	144
28th Day Post-Insertion			
Aesthetics	144	0	144
Function	143	1	144
Comfort	140	4	144

72nd Day Post-Insertion			
Aesthetics	144	0	144
Function	144	0	144
Comfort	144	0	144

Table 6: Patient-Reported Treatment Outcomes on 7th day, 28th and 72nd day Recall Visits

It was prompted by an increased awareness of the propensity to seek and tolerate treatment, as well as to benefit from it.^[6, 11,12,13,14] This concept agrees with WHO goal for oral health which is retention of a healthy, natural, functioning dentition comprising not less than 20 teeth (e.g. all anterior teeth and premolars) and not requiring prosthesis^[5, 6].

SDA is a strategy that aims to preserve adequate oral function by focusing dental resources on the anterior and premolar teeth and to avoid complex restorative treatment in the molar area^[15, 16]. This will be ideal in situations where dental services are limited or unaffordable like in our environment. Its main characteristics are functional repair, a problem oriented approach in which it is considered sufficient to restore or replace only the strategic part of the dental arch.^[7]

The non-replacement of permanent molars has been reported to have side effects such as: increased rates of temporomandibular disorders, tooth migration, supraeruption, insufficient chewing efficiency and performance, and compromised aesthetics.^[14,17,18,19,20] It was however, reported

that SDA with between 3 and 5 missing occlusal unit have temporomandibular joint changes within acceptable levels.^[21] However Witter et al in a 6 year follow up study of patients with missing permanent molars reveal that SDA can provide sufficient occlusal stability and oral comfort in terms of chewing and aesthetics, and sufficient mandibular function to prevent sign and symptoms of mandibular dysfunction. The study also shows that oral function was not improved by using free end RPD.^[8]

Females presented more than males for management of edentulous spaces, this is similar to earlier reports.^[22,23] Females have been shown to have more dental fears^[24] and they tend to be more meticulous about their general health.^[25] Most of the patients are between the fourth and sixth decades of life, this is expected because there is increased risk of missing molars in this age categories due to caries and periodontal diseases when compared to premolars and anterior teeth.^[26, 27]

Kennedy classes I and II edentulous space of the lower arch was the most common presentation in our patients. This can be explained by the fact that the lower molars have occlusal surfaces with fissures; this aided by gravity enhances the pooling and entrapment of debris necessary for cariogenicity. However, Taiwo and Omokhodion found a greater retention of teeth

in the lower arch among elderly individuals in Nigerian communities.^[28]

The commonest reason why our patients want to replace their missing teeth was due to esthetics reasons. This finding is statistically significant, $p < 0.05$ (Table 3). Similar observations were noted in previous studies done in Africa and developed countries.^[29, 30]^[31] Most of our patients were concerned about their facial appearance irrespective of the location or quadrant of the edentulous space. Patients have been shown to seek treatment for problems they believe to be serious and are likely to be treated successfully.^[32] They accept treatment that will benefit their self-image and social interaction than they are of treatment that enhances their physical function.^[29,30] Aesthetics, speech, biting and chewing combined or influences of a relation, such as a child contribute minimal reasons for seeking prosthodontics care. This finding is statistically significant, $p < 0.05$ and would be of a great importance to a clinician formulating a treatment plan and to educators training dental healthcare providers.

Moreover, absent molars are considered to have less impact on oral functions and quality of life than absent anterior teeth.^[1, 29, 30]

Descriptive population studies indicate that posterior tooth spaces are well tolerated by patients, and most only seek some form of replacement when anterior teeth are missing.^[33] Most fabricated free end RPD are

not worn by patient with missing permanent molar teeth, and this has been attributed to the discrepancy between dentist assessed need and patient treatment demand.^[9, 10, 27, 33]

All our patients show satisfaction with the concept of SDA by the seventy-second day (third visit post insertion) of using their anterior RPDs. They were satisfied with their aesthetic appearance and oral function.

Conclusion

The attitude of our patients to loss of anterior elements and the concept of SDA confirm numerous studies that advocate the concept as a treatment option. It is therefore advisable to embrace this evidence base treatment option than the traditional approach of restoring/replacing all lost molars in Kennedy Class I and Kennedy class II. This study is however limited in design, being an observational study. A well designed comparative clinical study is advised to appropriately validate the findings from this study.

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