Original Article

International Journal of Dental and Health Sciences
Volume 02,Issue 05

PREVALENCE OF PARTIAL DENTULISM AND REHABILITATION PROVIDED TO THE PATIENTS ATTENTING BAHRIA UNIVERSITY DENTAL HOSPITAL, KARACHI

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ABSTRACT:

The objective of the study was to figure out the prevalence of partial dentulism and various modes of rehabilitation provided to manage it. Secondly, to establish their association with both age and gender . The study was conducted in the Prosthodontics Department of Bahria University Medical and Dental College, Bahria University, Karachi. A retrospective study comprised of 1503 subjects, utilizing convenience sampling technique. Data was collected from patient record files from March 2012 to June 2015 to record age, gender, and kennedy's class modified by Applegate's rules in both the arches followed by the treatment prescribed. The collected information was analysed using SPSS version 17.0. Chi-square test was applied to evaluate significant findings. Out of the total 1503 patients,616(41.0%) were males and 887(59.0%) were females. Above 50 year age group was mainly affected by partial dentulism and Kennedy's class III without modification span was the most common pattern of partial dentulism in maxilla 569(37.9%) and in mandible 462(30.7%). Kennedy's class IV was the least encountered one with 43 (2.9%) in maxilla and 57(3.8%) in mandible. The maximally affected age group with Kennedy class III and class IV condition were 21-30 year and below 20 year respectively. Acrylic partial denture was the first choice of treatment for partial dentulism 1233(82.03%) while cast partial denture remained the rare one 12 (0.93%). Mostly females 747(49.70%) demanded acrylic removable prosthesis for managing their missing teeth. Hence the current study concludes the base line data to depict the prevalence of partial dentulism and frequently chosen treatment modality in context to our local population of Karachi and highlights the oral health care system and rationale behind prosthodontics.

Keywords: Kennedy's classification, Applegate's rule, Prosthodontics, Acrylic partial denture

INTRODUCTION:

Teeth are the fundamental components of the entire somatognathic system.[1] Loss of this key entity adversely affects appearance, mastication and speech efficiency.

Various modalities are available for the management of partial dentulism such as removable partial denture, fixed partial denture, resin bonded fixed prosthesis and implant retained

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prosthesis. A fixed partial prosthesis is a partial denture that is luted or otherwise securely retained to natural tooth, tooth roots, and/or dental implants abutment that furnish the primary support for the prostheses.[2] A removable partial or complete denture replaces some or all teeth and contiguous structures for edentulous or partially edentulous patients by artificial substitutes that are removable from the mouth.[2] The last restorative option, the dental implant, is a prosthetic device of alloplastic material implanted in the oral tissues beneath the mucosa and/or periosteal layer and on/or within the bone to provide retention and support for a fixed or removable prostheses.[2] Among them the removable partial dentures are considered as the all rounder prosthesis in our day to day management of missing teeth.

The objectives of prosthodontic treatment focus on elimination of oral diseases to the possible extent, preservation of the oral health and maintain relationship of the teeth with oral and perioral structures, restoration of oral functionsand finally esthetically pleasing effect.

Dental literature abounds with various proposed classification systems begining with Cummer's that is earliest on record till date.[1] Every classification system has it's own merits and demerits. None has been without critics and universal acceptance.[1] Latest on record is American classification of Prosthodontist (ACP) which is footing on oral diagnostic findings.

Perhaps the most popular and widely accepted classification is Kennedy-Applegate classification based on the relationship of edentulous area to the remaining natural teeth.[3,4] The appraise of the Kennedy Applegate classification system is judged on the qualities like simplicity, easy to remember, extremely comprehensive and very practical. It permits visualization of the partially edentulous span or RPD design . The main flaw is that it doesn't give any information regarding missing teeth and span of edentulous ridge.[5] The summarized form is as follows:

Class I – posterior, bilateral free-end saddles

Class II – posterior, unilateral free-end saddle

Class III – posterior, unilateral bounded saddle

Class IV – anterior bounded saddle

Hence the aim of this study was to find out the prevalence of partial dentulism in respect to Kennedy's classification after applying Applegate's rules, modes of rehabilitation provided to the patient to manage their missing teeth and to establish their relationship with age and gender respectively.

MATERIALS AND METHODS:

The retrospective study design in which 1503 dental records of the patients from March 2012 to june 2015 attending

Prosthodontic OPD at Bahria University Medical and Dental college, Bahria University Dental Hospital Karachi were undertaken. The sample size was selected utilizing convenience sampling technique. The inclusion criteria encompassed subjects from both the genders, permanent dentition, partially dentulous arch (either upper/ lower or both) with age above 15 years. Incomplete files which lacked required details, edentulous arch ,patients who requested for obturators, mouth guard and palatal feeding plates for cleft lip and palate, physically /mentally handicapped, patients who have lost third molars, etiology behind partial dentulism were excluded from the study. The collected data was compiled on specialized proforma which composed of demographic details, Applegate's modified form of kennedy's classification encoded various types of partial dentulism in context to the arch and rehabilitation provided to encounter the given condition . The anonymity and confidentiality of the employed dental charts used for the study were preserved. Statistical package for social sciences version 17.0 was utilized to statistically analyze the data. Chi-square test was employed to determine the level of significance. The statistical significance was set at $p < 0.05$. Data is represented in the form of tables and figures in the present study.

RESULTS:

The sample comprised of total 1503 dental records with 887 female (59.0%) and 616 (41.0%) male records .

Regarding age evaluation of the results showed that the most affected age group was above 50 years which represented partial dentulism in both the arches. In correspondence to the arch, isolated maxillary 369(24.55%) and mandibular 440(29.27%) cases were observed while in 694(46.17%) various partially dentulous configurations were noted in both the arches which were highly significant findings.(p=0.00)(Table 1).

Further analysis of the results showed that Kennedy's class III without modification span, maxillary 569(37.9%) and mandibular 462(30.7%),was most frequently tabulated pattern of partial dentulism while Kennedy's class IV being the rare finding of the present study in context to both the arches with 43(2.9%) in maxilla and 57(3.8%) in mandible. The frame of reference in maxilla and mandible, the utmost affected age group from Kennedy's class III was 21-30 and below 20 years respectively. The results were highly significant.(p=0.00)(figure 1,2).

On the subject of prosthetic rehabilitation, the results inspection highlighted that the acrylic partial denture was the first line of treatment 1233(82.03%) provided to 747 female(49.70%) and 486 male(32.33%) patients followed by fixed partial dentures 256(17.03%) while cast partial denture, that is, 12(0.93%) was rarely

opted treatment for partial dentulism which were statistically significant findings. (p=0.01)(table 2).

DISCUSSION:

Acknowledgement to the prevalence and pattern of partial dentulism assist clinician to understand the needs of oral rehabilitation and materials to be used. Therefore, regarding this concern the objectives of the study focus on analyzing the local community of Karachi for the prevalence of partial dentulism and modes of rehabilitation to treat it.

The present study shows the partial dentulism is more prevalant in females. Our study is harmonious to the researches did by Naeem S, [6] Ali R et al,[7] Lana A,[8] Clarkson JJ et al,[9]Axell T et al.[10]but contradictory outcomes were discovered from Muneeb et al,[11]Thomas et al,[12]Hassan Naveed et al.[13] work.Studies in Libya [14] and Bangladesh [15] are also in contrast to our results. They commented that males have higher incidence of partial dentulism as compared to females. Greater partial dentulism in females may be due to more toothloss in association to additional interventional dental procedures to enhance their appearance.[7] Higher frequency in our study might also be due to the fact that more females reported to the department of Prosthodontics reflecting their concern to esthetics. However, a study in Karachi provides no relationship between gender and partial dentulism.[16]

There is a positive co-relation between partial dentulism and aging.[17] Our results are closely identical to Naeem S,[6]Askari J et al,[16]Although etiology behind the scenario is beyond the scope of our research, frequent periodontal problems in adults [18] might be a contributing factor in the present study. A study in United Arab Emirates [12] also revealed that majority Pakistanis have had extractions mainly due to periodontitis. In the community like ours, negligence of oral hygiene, less concern about the oral needs as well as other systemic disorders especially in the elderly age group may lead to tooth mortality and hence partial dentulism. However, our analysis is dissimilar to local [7,11,19] and global [12] studies where the average age group of 25-35 is more frequently found.

In relation to our study, partial dentulism shows its widespread prominence in mandible as well as in maxilla. This is familiar to Khalil A et al,[1] Ali R [7] and Muneeb A et al [11] research work in Karachi and Peshawar respectively. With respect to our analysis, the second highest rating recorded in mandible. This is similar to Naveed H et al,[13] Cahen PM et al [20] and unlike to Thomas S et al,[12] Arigbede AO et al, [21] Baqain ZH et al. [22] High frequency in both the arches might be due to the compromised dental awareness due to the poor literacy rate leading to oral diseases and multiple saddle areas.[23] Usually patients don't visit their dentist unless have annoying symptoms or pain.[24] Till to date, there is

no research work to explore the reasons behind the scenario.

Regarding the pattern of partial dentulism in context to both the arches, Kennedy's class III without any modification span is more persistent finding while Kennedy's class IV is the occasionally observed one. This is consistent with other studies like Muneeb A et al,[11] Khan AU et al,[23] Sadig WM et al,[25] and Idowu AT et al.[26] A five year survey on prevalence and pattern of partial dentulism in Saudi Arabian sample population [27] also reflects the findings of our current work. However Khalil A et al,[1] Enoki et al,[29] Curtis et al, [30] Keyf [31] showed contrast outcomes to our investigation. Another study did by E. E. Ehikhamenor et al, [28] in 2010, determined frequency of different types of removable partial dentures state that Kennedy's class III(57.3%) has high recurrence rate whereas Kennedy's class I and II(0.9%) is rarely encountered pattern. This might be due to the early eruption of molars which are more prone to decay followed by more extractions because of esthetic insignificance which lead to class III. The traumatic injuries of anterior teeth especially the upper ones, localized periodontics, untreated orthodontic extractions and regional variations are the possible etiologies behind Kennedy's class III partial dentulism. Our study also reveals that Kennedy class III and class IV is more influential in the age group of 21-30 year and below 20 year respectively. The findings are in close match with Muneeb A et al,[11] where Kennedy class III is more dominant in the age group of 25-30 year and also with Thomas S et al [12] investigation on causes and pattern of tooth mortality who explore that most Pakistanis have had molar extractions belong to the twenties age group. This is attributed to the lack of dental awareness in younger age group [7] and low socio economic status [7] which restrict them from utilizing conservative approaches other than extraction of teeth which may lead to Kennedy's class III scenario.

In correspondence to our research outcomes, acrylic partial dentures are the most frequently prescribed prosthesis followed by fixed partial dentures while cast partial dentures are rarely opted treatment modality regarding partial dentulism. This is in agreement with survey conducted in Bahrain private dental set up where 89% patients entertained with transitional acrylic RPD.[32] Similarly survey of 1800 patients in dental hospital of Chennai [33] and Athens [34] highlight equivalent findings to ours current work. They stated that the highest delivery rate of acrylic removable partial denture to manage tooth mortality. Cost effectiveness, simple fabrication, reversible procedure, limited visits as compared to other prosthetic modalities may the dependent factors of its high frequency rate. Regarding our venue of the current study which still has not implant provision together with low socioeconomic status may be the significant factors in promoting acrylic partial dentures. Jepson N J A et al also

support the above stated fact.[35] Private clinical setup might give different results.

Our study enquires into the basic information regarding partial dentulism and the provided treatment modalities lacking etiological factors behind the context in the regional community of Pakistan. The limited dental awareness and poor socioeconomic status of our population may be attributed to highly encountered partial dentulism in the present study. There is a need to review the prescribed treatment approaches in private clinical setup or community level.

CONCLUSION:

The current study provides an apparent outlook form of partial dentulism in relation to our local community of Karachi. To sum up, Kennedy's class III in both the arches with age group of 31-40 of female gender dominates while acrylic partial denture is the preferable treatment choice. It also highlights the status of oral health care system as well as the rationale behind the prosthodontics.

RECOMMENDATIONS:

From this day forth, etiology behind partial dentulism must be addressed and should focus on preventive measures and the necessary educational aids required to create awareness in the community regarding maintenance of oral health.

Secondly, there should be an investigation to find out the factors behind the increasing demand of acrylic removable partial dentures and also compare it with private and community setups.

REFERENCES:

1. Khalil A, Hussain U, Iqbal R, Ali W. Pattern of partial edentulism among patients reporting to department of Prosthodontics, Khyber college of dentistry, Peshawar. JKCD June 2013;3(2):42-45.
2. The glossary of Prosthodontics terms.The academy of Prosthodontics..The journal of Prosthetic dentistry.July 2005;94(1):10-91.
3. Bhandari A J, Bhandari A J. A simplified classification system for partially edentulous patients. International journal of medical research and health sciences. 2014;3(2):436-440.
4. Stewart s Clinical Removable Partial Prosthodontics. 2nded ; 2003:14-157.
5. Nicholas J.A. Jepson: Removable PartialDenture. Quintensence Essentials.2004: 25.
6. Naeem S. Pattern of toothloss in maxillary arch; a study conducted

at Lahore Medical &dental college.Pakistan Oral &dent. Jr.2003; 23:181-184.

7. Ali R, Rehman R, Noreen N. Pattern of tooth loss in patients reporting to Khyber college of dentistry, Peshawar. JKCD.2012; 3(1).
8. Lana A. Shinawi**.** Partial edentulism: a five year survey on the prevalence and pattern of tooth loss in a sample of patients attending King AbdulAziz University - Faculty of Dentistry. *Life SciJ.*2012; 9(4) :2665 – 2671.
9. Clarkson JJ, O'Mullane DM. Edentulousness in the united kingdom and Ireland. Community Dent Oral Epidemiol. 1983 Oct;11(5):317-20.
10. Axell T, Owall B. Prevalence of removable dentures and edentulism in adult Swedish population. Swed Dent j. 1997;3:129-37.
11. Muneeb A, Khan B A, Jamil B. Causes and pattern of partial edentulism/exodontia and its association with age and gender: semi rural population, Baqai dental college, Karachi, Pakistan. International dental journal of student's research.2012;1(3).
12. Thomas*S, Al-Maqdassy S E. Causes and Pattern of Tooth Mortality among Adult PatientsinaTeachingDentalHospital.Ibnosina.JournalofMedicineandBiomedicalSciences.2010;2(4):160-167.
13. Naveed H, Aziz MS, Hassan A, Khan W, Azad AA.Patterns of partial edentulism among armed forces personnel reporting at armed forces institute of dentistry pakistan.Pakistan oral & dental. J..2011; 31(1).
14. Hassan AK. Reasons for tooth extraction among patients in Sebha, Libyan Arab Jamahiriya: a pilot study.East Mediterr Health J. 2000 Jan;6(1):176-8.
15. AkhterR, HassanNM, AidaJ, ZamanKU, Morita M:Risk indicators for toothloss due to caries and periodontal disease in recipients of free dental treatment in an adult population in Bangladesh. Oral Health Prev Dent. 2008;6(3):199-20.
16. Askari J et al,Pattern of tooth loss in maxillary arch:a study conducted
    At Ishratulebad institute of oral health sciences DUHS, Karachi. JPDA .2009;18(1).
17. Meskin LH, Brown LJ, Brunelle JA, Warren GB. Patterns of tooth loss and accumulated prosthetic treatment potential in U.S. employed adults and seniors, 1985-86. Gerodontics. 1988 Jun;4(3):126-35.
18. Fall WT. toothloss in 100 treated patients with periodontal disease. j. periodontal.1981;53:427-429.
19. Afridi SH, RehmanB,Din QU. Causes of tooth extraction in oral surgery:an analysis of 400

patients reporting to Khyber college of dentistry. JPDA. 2010: 19(2).

20. Cahen PM, Frank RM, Turlot JC. A survey of the reasons for dental extractions in France. J Dent Res. 1985 Aug; 64(8):1087-93.
21. Arigbede A O, Taiwo J O.Pattern of Demand for Removable Acrylic Partial Denture (RPD) in the city of Port Harcourt, Nigeria. The Nigerian Health Journal.2011;11(2).
22. Baqain ZH, Khraisat A, Sawair F, Ghanam S, Shaini FJ, Rajab LD.Dental extraction for patients presenting at oral surgery student clinic. CompendContinEduc Dent. 2007 Mar;28(3):146-50; quiz 151-2.
23. Khan AU, Ghani F. Factors influencing the type of prosthetic restoration for partially dentate adults. Jpmi. 2010; 24(1): 3-21.
24. K .O. Savage and P. O. Ayanbadejo. Pattern of Exodontia Treatment Need Adults Attending The Lagos University Teaching Hospital Dental Clinic. Nig. Ot J. Hosp. Med. April-June.2005; Vol. 15(2).
25. Sadig WM, Idowu AT. Removable partial denture design. A study of selected population in Saudi Arabia. J Cont Dent Prac 2002;3:1-11.
26. Idowu AT, Al- Shamrani SM. Pattern of tooth loss in a selected population at King Saud University College of Dentistry. The Saudi Dental journal . 1995;7(3):135-140.
27. Lana A. Shinawi**.** Partial edentulism: a five year survey on the prevalence and pattern of tooth loss in a sample of patients attending King AbdulAziz University - Faculty of Dentistry. *Life SciJ.*2012; 9(4) :2665 – 2671.
28. E. E. Ehikhamenor, H. O. Oboro*, O. I. Onuora, A. U. Umanah, N. M. Chukwumah and I. A. Aivboraye. Types of removable prostheses requested by patients who were presented to the University of Benin Teaching Hospital Dental Clinic. Journal of Dentistry and Oral Hygiene. 2010; 2(2): 15-18.
29. Enoki K, Ibeke k, Hazeyama T, Ishida K, Matsuda K.I, Maeda Y. Incidence of partial denture usage and Kennedy classification.JPD.1992;67(5):664-7.
30. Curtis DA, Curtis TA, Wagnild GW, Finzen FC. Incidence of various Classes of removable partial dentures. J Prosthet Dent. 1992;67:664–67.

31. Keyf F. Frequency of the various Classes of removable partial dentures and selection of major connectors and direct/indirect retainers. Turk J med sci. 2001:445–49.
32. Graham R, Mihaylov S, Jepson N, Allen P.F, Bond S. Determining 'need' for a removable partial denture: a qualitative study of factors that influence dentist provision and patient use.BDJ.2006;200(3):11.
33. Prabhu KR, Prabhu R, Rai R, Ilango T, Easwaran MA, Shakir I A. The Quality of Oral Rehabilitation in the Partially Edentulous South Indian Population: A Cross Sectional Study. Journal of Clinical and Diagnostic Research. 2011 (Suppl-2), 5(7): 1478-1480.
34. Pun DK, Waliszewski MP, Waliszewski KJ, Berzins D. Survey of partial removable dental prosthesis types in a distinct patient population. JPD 2011;106:48-56.
35. Jepson N J A, Thomason J M, Steele J G. The influence of denture design on patient acceptance of partial dentures. BDJ 1995; 178: 296-300.

TABLES& FIGURES:

PARTIAL DENTULISM		Age										Total	
		below 20		21-30		31-40		41-50		above 50			
		n	%	n	%	n	%	n	%	n	%	n	%
	maxilla	20	1.33	67	4.45	110	7.31	89	5.92	83	5.52	369	24.55
	mandible	10	0.66	67	4.45	134	8.91	109	7.25	120	7.98	440	29.27
	combination	04	0.26	56	3.72	203	13.50	174	11.57	257	17.09	694	46.17
	Total	33	2.19	190	12.64	447	29.74	372	24.75	460	30.60	1503	100

Table 1: "Frequency and percentage of arch wise partial dentulism in various age groups."

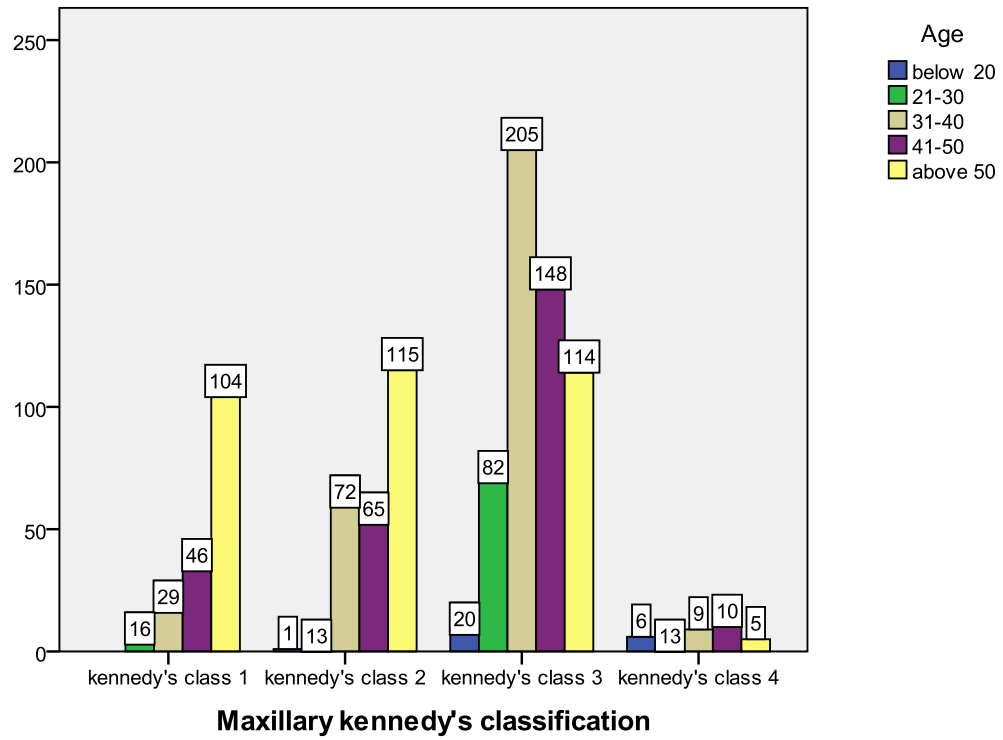

Figure 1: "Frequency of various patterns of maxillary Kennedy's classification in different age groups."

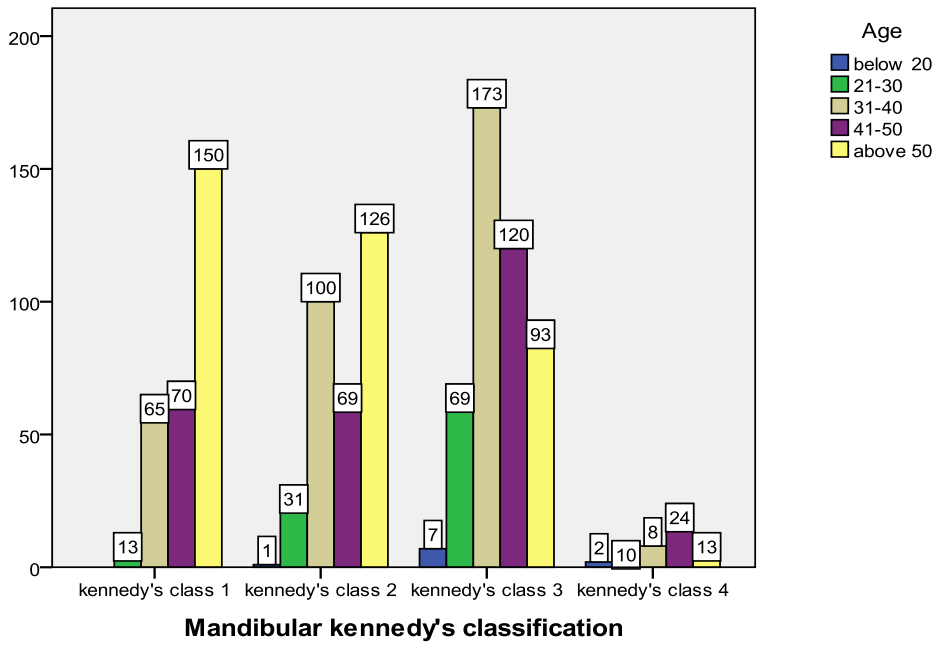

Figure 2: "Frequency of various patterns of Mandibular Kennedy's classification"in different age group."

TREATMENT MODALITY		GENDER				Total	
		Male		Female			
		n	%	n	%	n	%
	RPD	486	32.33	747	49.70	1233	82.03
	FPD	123	8.18	133	8.84	256	17.03
	Cast partial denture	8	0.53	6	0.39	14	0.93
	Total	616	40.98	885	58.88	1503	100

Table 2: “Frequency and percentage of provided Treatment Modalities with respect to gender.”