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The Prevalence of Denture Related Hyperplasia in Patients Attending Teaching Dental Center in Sulaimani City

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Abstract

Background and Objectives: One of the typical clinical findings among complete denture users is denture-related hyperplasia, characterized by bone resorption and flabby soft tissues beneath, classified into two types: inflammatory fibrous hyperplasia and inflammatory papillary hyperplasia. The goal of this study is to evaluate the prevalence and factors associated with denture hyperplasia among a group of complete denture wearers.

Methods: A cross-sectional observational study examined 146 complete denture wearers at Shorsh Teaching Dental Center in Sulaimani City between July 2022 and July 2023. A predesigned questionnaire was used, including: presence and types of hyperplasia and its relation to gender, age, type of the prosthesis, duration of wearing the denture, nocturnal denture wearing, history of fracture/repair or reline, professional who fabricated the prosthesis, denture cleaning method, and frequency of cleaning.

Results: The percentage of hyperplasia was 38.4% while inflammatory fibrous hyperplasia and inflammatory papillary hyperplasia types were 35.6% & 1.4% respectively. Hyperplasia was 38(67.9%) of night wearers compared to 21(23.3%) non-night wearers with a highly significant difference ($p<0.001$). Also; significant relation in history of fracture/repair or reline ($p=0.030$) and with regard to frequency of denture cleaning ($p=0.010$). No differences were observed in presence of hyperplasia across age groups ($p=0.215$), gender ($p=0.070$), type of prosthesis ($p=0.385$), duration of wearing dentures ($p=0.158$), professional who fabricated the prosthesis ($p=0.344$) and denture cleaning method ($p=0.379$).

Conclusions: The prevalence of denture hyperplasia was 38.4% which was the more common among night denture wearers.

Key words: Complete denture, Denture hyperplasia, Epulis fissuratum, Papillary hyperplasia.

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Introduction:

Oral mucosal lesions that occur as a result of acute or chronic irritations by factors associated with dentures are referred as denture-related mucosal lesions (DML).¹ One of the typical clinical findings of DML in complete denture users is denture hyperplasia, which is characterized by bone resorption and flabby soft tissues beneath.² Denture-induced fibrous hyperplasia (IFH“epulis fissured”) and inflammatory papillary hyperplasia (IPH) are two types of denture-related oral mucosal lesions that are more common in older individuals patients, because as people age, their oral mucosa becomes less resistant to local irritants.³ The word “epulis” is a general term that refers to the hyperplasia developed in the gingiva or in the alveolar mucosa. Denture granuloma, inflammatory fibrous hyperplasia, denture-induced fibrous hyperplasia, & denture-related hyperplasia are other names for epulis fissured.⁴ Long-term wearers of ill-fitting dentures run the risk of developing denture irritation hyperplasia, or epulis fissured. Chronic low-grade trauma, usually brought on by inadequate dentures or an overextended denture flange, causes such mucosal hyperplasia to grow gradually. The denture advances further into the vestibular mucosa as a result of the alveolar ridge's destruction, resulting in the formation of fibrous tissue that is inflammatory but typically asymptomatic folds that spread across the denture flange, with the denture's edge often sliding into the groove or cleft between the mucosal folds.⁵ It is generally asymptomatic but can sometimes be accompanied by severe inflammation and ulceration.⁶ Inflammatory papillary hyperplasia is uncommon oral lesion, and its cause is yet unknown. It is highly unusual for non-denture wearers to appear with it.⁷ Usually found in the facial aspect of the denture, one or more lesions of varying sizes are primarily located in the anterior parts of

the maxilla or mandible. The vestibule may have a single lesion or several minor ones throughout its length.⁸ Negative pressure between the tissue & an improperly fitted upper denture is typically what causes these lesions. But with time, the negative pressure results in an inflammatory papillary hyperplasia that forms its chamber without causing any pain.⁹ The mucosal irritation may be resolved by removing the denture or by doing a straightforward relining, depending on the extent of the lesion. However, in extensive cases such as vacuum chamber-related hyperplasia, the surgical approach is the standard treatment.¹⁰ Denture-induced oral mucosal lesions can cause exceptional discomfort to the patient that may interfere with stability, retention, & hinder frequent use of denture.¹¹ This research was conducted primarily to identify the prevalence of denture-related hyperplasia in patients attending Shorsh Teaching Dental Center in Sulaimani City. Furthermore, we aimed to determine any relationship between hyperplasia and the total duration of denture wearing throughout the day, the period of denture use, nocturnal denture wearing, and denture cleaning methods.

Patient & method:

A total of 146 complete denture wearers were included in this cross-sectional observational study. Gender distribution, the percentage of those with ill-fitting dentures that induced hyperplasia, and the location of the lesions were evaluated. The study duration was one year from July 2022- July 2023 carried out at Shorsh Teaching Dental Center in Sulaimani City. A predesigned questionnaire is used for each patient, including; gender, age, type of the worn prosthesis, duration of wearing denture, nocturnal denture wearing, denture cleaning method, frequency of cleaning, any history of fracture or relining or repair for prosthesis, medical history, dental history, drug history & the presence of any other mucosal lesion. The questionnaire was





created and designed by the two researchers. Patients of both sexes and various age groups were included. They were examined using sterilized patient examination kits under the dental chair light. The oral mucosa of denture wearers and their denture surfaces were inspected to check for stability, retention, flange extension, tooth contact in centric relation, vertical dimension, and arrangement of teeth. Finally, the location of the lesions was determined. Written patients' consent was taken from the patient after full explanation of the procedures & the aim of the research at time of interview for data collection. Confidentiality was ensured by not including the participant's names in the data form. Inclusion criteria were patients having complete upper and/or lower dentures, attending the Shorsh Dental Center, regardless of age or gender. Exclusion criteria were patients with recently constructed complete denture (less than 6 month), partial dentures wearers, psychological (mental disorder) & patient with immediate denture. The study was approved by the ethical committee of Sulaimani University (Issue No.: 22/113, Date: 9/6/2022) and the Kurdistan Higher Council of Medical Specialists (Issue No.: 1391, Date: 14/8/2022). The data was collected & coded. The collected data was reviewed & analyzed using the Statistical Package for Social sciences (SPSS version 23). Descriptive statistics such as frequency & percentage were calculated. For categorical variable chi -square were used with a 95% confidence interval to determine significant associations between categorical dependent & independent variables. The p value was considered significant if it was ≤ 0.05 .

Result:

A total of 146 complete denture wearers' patients from both genders were included in this study. Out of all the participants, 56 were

diagnosed as denture related hyperplasia as shown in Figure (1).

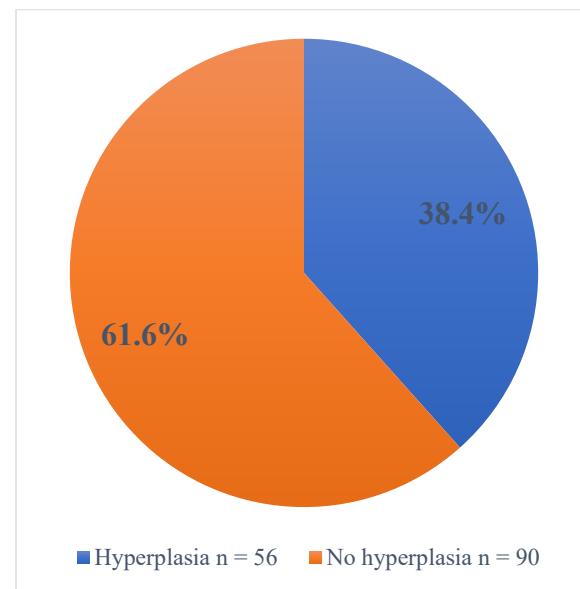


Figure (1): The prevalence of denture related hyperplasia.

The majority of participants (38.4%) were elderly with age range between 66-75 years, followed by 56-65 years (32.2%). Sex representation reveals that males constitute a slightly higher proportion of the sample, with 79 individuals making up 54.1% of the studied population as illustrated in Table (1).

Table (1): Age & sex distribution of the participants

	Frequency	Percent
Age group		
45 – 55	24	16.4
56 – 65	47	32.2
66 – 75	56	38.4
76 – 85	17	11.6
86 – 95	2	1.4
Total	146	100.0
Sex		
Male	79	54.1
Female	67	45.9
Total	146	100.0





There was no statistically significant difference in the presence of hyperplasia across age groups ($p=0.215$), gender ($p=0.070$), type of prosthesis worn ($p=0.385$), period of denture wearing ($p=0.158$), & the professional who fabricated the prosthesis ($p=0.344$). However, the frequency of denture cleaning after each meal showed a significantly more hyperplasia ($p=0.010$), compared to whom clean only

once at night [44(78.6%) vs. 52 (57.8%)]. A highly significant difference was found in nocturnal denture wear ($p<0.001$), with 38 (67.9%) of night wearers showing hyperplasia compared to 21 (23.3%) who do not wear their dentures during night. Similarly, a history of fracture, repair or reline indicated a significant correlation with the presence of hyperplasia ($p=0.030$) as demonstrated in Table (2).

Table (2): Presence of hyperplasia in relation to various studied parameters

Parameters		Hyperplasia (n=56)	No Hyperplasia (n=90)	Total	
Age group	45 – 55	7(12.5)	17(18.9)	24(16.4)	0.215
	56 – 65	22(39.3)	25(27.8)	47(32.2)	
	66 – 75	18(32.1)	38(42.2)	56(38.4)	
	76 – 85	9(16.1)	8(8.9)	17(11.6)	
	86 – 95	0(0.0)	2(2.2)	2(1.4)	
Gender	Male	25(44.6)	54(60.0)	79(54.1)	0.070
	Female	31(55.4)	36(40.0)	67(45.9)	
Type of Prosthesis Worn	Both	52(92.9)	87(96.7)	139(95.2)	0.385
	Lower	1(1.8)	0(0.0)	1(0.7)	
	Upper	3(5.4)	3(3.3)	6(4.1)	
Period of Wearing Dentures	Less than a year	3(5.4)	1(1.1)	4(2.7)	0.158
	More than a year	53(94.6)	89(98.9)	142(97.3)	
Nocturnal Denture wear	Yes	38(67.9)	21(23.3)	59(40.4)	<0.001
	No	18(32.1)	69(76.7)	87(59.6)	
Any History of Fracture/Repair or Reline	No	45(80.4)	84(93.3)	129(88.4)	0.030
	Yes	11(19.6)	6(6.7)	17 (11.6)	
The Prosthesis Fabricated By	Dentist	33(58.9)	60(66.7)	93(63.7)	0.344
	Technician	23(41.1)	30(33.3)	53(36.3)	
Denture Cleaning Method	Brushing	22(39.3)	44(48.9)	66(45.2)	0.379
	Denture Cleaning tablets	5(8.9)	10(11.1)	15(10.3)	
	Soap & Water	29(51.8)	36(40.0)	65(44.5)	
Frequency of Denture Cleaning	After each meal	44(78.6)	52(57.8)	96(65.8)	0.010
	Once at night	12(21.4)	38(42.2)	50(34.2)	





Regarding the types of hyperplasia among the total 146 complete denture wearers; 90(61.6%) patients had no hyperplasia, 52 (35.6%) had IFH, 2 (1.4%) had IPH and 2 (1.4%) had both IFH and IPH as shown in Figure (2). Analysis of the types of hyperplasia among the 56 patients with dentures induced hyperplasia showed that 52 (92.9%) of the cases had inflammatory fibrous hyperplasia (IFH), 2 (3.6%) had inflammatory papillary hyperplasia (IPH), & 2 (3.6%) had both IFH & IPH as illustrates in Figure (3).

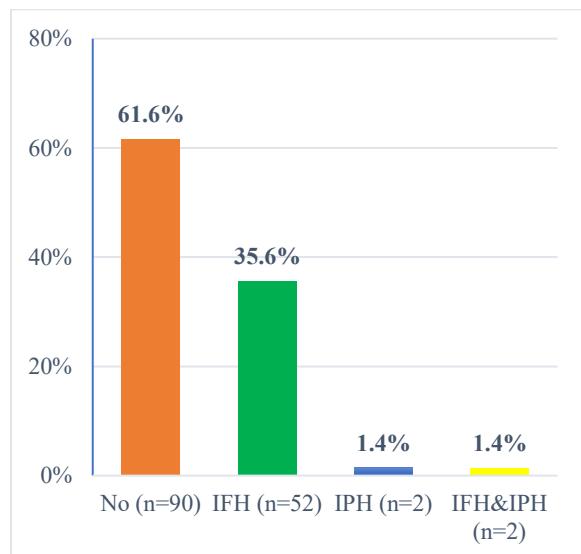


Figure (2): Frequency (%) & types of hyperplasia among complete denture wearer (n=146)

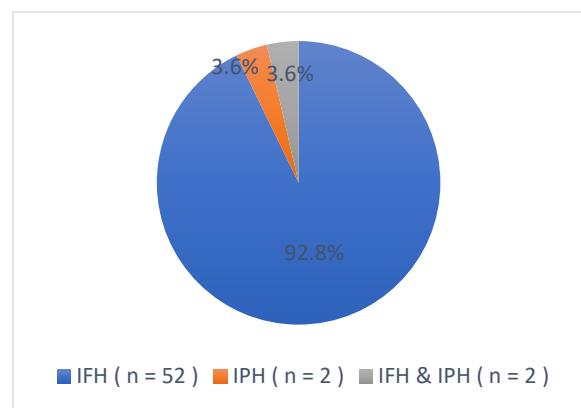


Figure (3): Frequency of the Hyperplasia types (n=56)

Discussion:

In our society, complete dentures are still widely used, particularly among the elderly edentulous patients. Although it is an excellent form of oral rehabilitation, improper use can cause several mucosal problems.¹² This study was a cross-sectional observational study that determined the prevalence of hyperplasia among 146 consecutive edentulous complete denture wearers who visit Shorsh Teaching Dental Center. The rate observed in this study was (38.4%) which was closely similar to Zwiri study who reported 40%, while Azeem et al and Patil et al reported lower rate(14.3% and 7.2% respectively).^{13,14,15} In this study that included all age groups, hyperplasia was higher among the middle-aged (56-65) patients in this study sample, which is close to Mubarak et a study who observed oral lesions in (41.9%) of their patients in the same age group.¹⁶ Despite, male predominance in our sample, still the percentage of female diagnosed with hyperplasia was higher with a marginally suggestive significance (p-value 0.07). This difference may stem from hormonal and pathophysiological factors making females vulnerable to have more dental diseases than males. A finding that was in harmony with Naderi et al and Atashrazm et al studies.^{3,4} Additionally, the high prevalence of IPH within females can be attributed by Gual-Vaqués et al to the fact that females live longer than men, so more women wear dentures (and for longer periods) than men.⁷ This study reported Period of denture wearing was not significantly leads to denture hyperplasia that is in disagreement with Bozdemir et al that stated using dentures for ≥ 20 years exhibited more denture hyperplasia.¹⁷ This study documented a significant relation between hyperplasia and nocturnal denture wear. This result is in agreement with other studies.^{18, 14} This relation might be explained by the long-term





traumatic effect on the tissues from dentures occurring as the result of the use of dentures at night.¹⁷ However, Ogunrinde reported insignificant relation with wearing dentures at night and development of DML.¹⁹ In this study, there was a significant relation between the history of fracture/reline or repair of denture and the formation of hyperplasia. The latter is in agreement with results demonstrated by Mohammadi et al's study that stated; the denture users who were reluctant to replace or repair their dentures, used their dentures for longer durations.²⁰ Regarding denture cleaning methods, this study noted denture cleansing by either brushing or soap and water had insignificant results on denture hyperplasia. A new significant finding in this study was the correlation of the frequency of denture cleaning (3 times/day) with hyperplasia, compared to less frequent cleaning (1 time/day) ($p=0.01$). Taheri et al also agreed with this finding on DML but did not specifically mention hyperplasia.²¹ This finding, which has not been emphasized enough in other studies, requires further investigation to understand the pathophysiological mechanisms behind it, particularly whether it is related to the materials used for cleaning and denture prosthetic components. The majority of participants were IFH type (35.6%) which was the most common type, as mentioned by several studies.²²⁻²⁴ Irritation in the older population tends to tolerated rather than treated, causing deterioration into a chronic, progressive, painless flabby tissue. Denture wearers may seek for medical consultation only when they complain of poor retention or compromised stability.^{19, 25, 24} Furthermore, inadequate oral hygiene, continuous denture usage, smoking, age-related alterations, & systemic conditions may also contribute.¹⁹ However, Atashrazm et al found lower rate (16.4%) in Iranian elderly complete denture wearers.⁴ Conversely, the prevalence of IPH

in our study was (1.4%) despite the relatively good sample size, it was quite lower than other studies were papillary hyperplasia was (7.4%).^{19, 27, 28} They attributed it to ill-fit dentures for long periods of use & frequency of denture cleaning. Canger et al concluded that the most significant risk factor for IPH is wearing ill-fitting dentures for more than 10 years. Kossioni noted that the frequency of denture cleaning was significantly related to IPH. Really the pathogenesis of IPH is still unclear.^{25, 28} The following have been recommended as potential etiological factors: ill-fitting dentures, day and night denture use, poor oral hygiene, sensitivity to denture liners, tobacco, age related changes and some systemic conditions.^{29,30} Limitations of the study were; collection of the sample was from one center, the cross-sectional design that lack follow up to see the future progression of the lesions and recall bias particularly by elderly patients.

Conclusion:

The prevalence of denture hyperplasia was 38.4%. Among complete denture wearers, the most common diagnostic type of oral mucosal lesion was denture induced fibrous hyperplasia. Furthermore, denture hyperplasia had a statistically significant relation with night wearing of dentures and frequency of denture cleaning. However, further studies are needed in this aspect on a larger population for better understanding.

Conflict of Interest:

The authors declare no conflict of interests related to the publication of this work.

Acknowledgments:

The authors wish to thank sincerely; the public health specialist Khalid Anwar Hamaghareeb for his statistical work, the participated patients for their cooperation and all the staffs of Shorsh teaching dental center.





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