

## Identification of intra oral complaint zones in denture wearers

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### ABSTRACT

**Objective:** To identify the most common complaint areas in patients wearing complete dentures and evaluate the relationship of denture discomfort with systemic diseases.

**Study Design:** Descriptive cross sectional study.

**Place and Duration:** Department of Prosthodontics, Altamash Institute of Dental Medicine, Karachi, from 1<sup>st</sup> June 2018 to 30<sup>th</sup> November 2019.

**Methodology:** Both male and female patients with edentate upper/lower or both arches, rehabilitated with conventional complete dentures were included in the study. At the follow up visit, clinical evaluation of patient's oral cavity was carried out. The frequency of the post insertion complaints at particular intraoral areas was noted along with demographics and systemic disease in a self-structured validated questionnaire.

**Results:** In maxilla (N=551), the most common complaint areas were the labial vestibule and labial frenum with pain (30.9%) and ulceration (4.9%) being the most common complaints. In mandible (N=551), anterior ridge crest was the most common complaint with pain (18.7%) and ulceration (6.5%). A significance difference ( $p < 0.001$ ) was found in relationship of pain with systematic disease. A significant relationship was also found between gender and complaint areas.

**Conclusion:** Pain and ulceration were the most prevalent complaints reported by new complete denture wearers. Moreover, the labial frenum and vestibule in maxilla and anterior alveolar ridge crest in the mandible were the most common intraoral complaint zones identified in this study.

**Keywords:** Adaptation, Complete Denture, Oral health, Prosthodontics, Postoperative, Rehabilitation

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### INTRODUCTION

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Prosthetic rehabilitation of edentulous patient with conventional complete denture can be rewarding as well as, not infrequently, a frustrating experience<sup>1</sup>, as the oral tissues are not in harmony with the well fitted, new complete denture and require time for adjustment<sup>2</sup>. The dental clinician should know that removable dental prostheses insertion is not the final patient-clinician meeting, patient's visit continues long after the installation of the denture. As there are various technical and clinical complexities involved in complete denture treatment, patients generally experience an adjustment phase which is necessary to monitor the patient's response to the treatment, proper adaptation of the dentures to the soft tissues and optimal occlusion<sup>3-5</sup>

During the follow-up care of complete denture, the patients can come up with minor complaints such as, pain/discomfort, chewing difficulties, aesthetic problem, speech problem and loose denture<sup>6</sup>. These post insertion complete denture complaints may arise due to various factors such as denture base defects, including thick and over extended denture flanges, frenal impingement, premature occlusal contacts, denture irregularities, porosities or tissue undercut<sup>2-4</sup>.

These problems if not addressed adequately can cause changes in eating and social behavior of an individual, which further can

lead to deterioration of self-confidence. Therefore, these common complaints should be evaluated and addressed properly to achieve a good clinical outcome<sup>7</sup>. Furthermore, the follow-up and management of post-op complaints facilitates long-term efficiency<sup>6</sup>. Very few studies have been conducted worldwide to assess the complaints associated with acrylic dentures<sup>8,9</sup>. In addition, as there is a potential for problems to arise after the insertion of complete denture that can be transient or serious leading to intolerance to denture<sup>10</sup>. It is for this reason that the emphasis was laid on locating the areas of most common mucosal injuries which can lead to improvement achieving the patient's comfort during the immediate post-operative period. In addition, this study will add to the existing literature and will aid in dental education and training as it shall improve awareness of a dental clinician about common post insertion complaints and the most common zones. Therefore the study was conducted to identify the most common complaint area in patients wearing complete dentures and evaluate the relationship of denture discomfort with systemic diseases.

### METHODOLOGY

This descriptive cross-sectional study was carried out at Department of Prosthodontics, Altamash Institute of Dental Medicine, Karachi, from 1<sup>st</sup> June 2018 to 30<sup>th</sup> November 2019. Non-probability convenience sampling technique was used to recruit 551 participants. Additionally, as a protocol an informed and written consent was sought out from the participants at the interview stage.

Both male and female patients in the age range of 40 - 80 years opting for complete denture as a treatment option for their edentulous states were included. Those patients opting implant supported over dentures for replacement of their missing teeth were excluded.

The data from participants was recorded in a well-structured questionnaire. The internal consistency of the questionnaire was assessed with Cronbach's alpha ( $\alpha = 0.73$ ). The questionnaire consisted of two sections. The first section included the demographic detail of the participants. In the second section, medical and dental history of the patient was addressed along with a list of anatomical intraoral maxillary and mandibular landmarks for the participant to choose the specific areas giving trouble to them.

After complete history and examination of the patient, new set of complete denture/s were fabricated. The initial post-op problems were addressed at the insertion appointment. The patient was recalled after 1 week and clinically examined in detail by two qualified dentists having minimum BDS qualification. Patients were asked about the areas giving trouble to them. The subjective complaints (pain, swelling) in the particular area as told by the patient and confirmed by the clinician with examination (ulceration, swelling) were noted in the questionnaire. The confusion and ambiguity arose during data collection was sought out with discussion and by consensus with a third author (specialist/ consultant).

**Data Analysis:** The IBM SPSS statistics for windows, version 25.0 (Armonk, NY: IBM Corp) was used for statistical analysis. Descriptive statistics were carried out for qualitative (gender, denture hygiene practices, denture complaint areas, systematic disease, and arch location) and quantitative (Age) variables. For qualitative variables like (gender, denture hygiene practices, denture complaint areas, systematic disease, and arch location), frequency and percentages were calculated. For Quantitative variable like age, means  $\pm$  SD was calculated. Spearman correlation test was used to assess the relationship of dependant (denture complaint areas) and independent (gender and systematic diseases) variables. A p-value of  $<0.05$  was considered as statistically significant.

### RESULTS

In our study, out of 551 patients, 299 (54.3%) were males and 252 (45.7%) were females. Majority of the patients belonged to the age group 51-75 years (52.8%). Regarding co-morbid illnesses majority of our participants had diabetes mellitus 231(41.9%) and hypertension 282(51.2%). In addition, majority 455(82.6%) practiced oral and denture hygiene while none of them reported any parafunctional habits.

The most common complaint area identified in maxilla was labial vestibule and labial frenum, with pain 170(30.9%) being the most common complaint followed by ulceration 27(4.9%). Besides, 95(17.2%) participants also complained of pain in the left buccal vestibule and frenum and 83 (15.1%) with pain in anterior crest of ridge. Additionally, a significant difference ( $p=0.000$ ) in relationship of pain and ulceration complaints with systematic disease in maxilla was also found, as described in (Table I)

**Table – I: Relationship of maxillary post insertion complaints with systematic health of participants (N=551).**

Anatomical area	Complaint	n%	Systematic health	P-Value	Correlation
Labial Vestibule and Frenum	Pain	170 (30.9%)	Allergies Comorbid illness and Drug use history	0	0.264
	Ulceration	27 (4.9%)			
Buccal Vestibule and Frenum Right Side	Pain	45 (8.2%)		0	0
Buccal Vestibule and Frenum Left Side	Pain	95 (17.2%)		0	0
Anterior Ridge Crest	Pain	83 (15.1%)		0	0.406
	Ulceration	21 (3.8%)			
Middle Of Ridge Crest	Pain	42 (7.6%)		0	0
Posterior Ridge Crest	Pain	63 (11.4%)		0	0
	Ulceration	21 (3.8%)			

On the contrary, in mandible anterior ridge crest was most common complaint area with pain in 103(18.7%) and ulceration in 36(6.5%), followed by buccal vestibule and frenum of right side with pain in 84(15.2%), ulceration in 48(8.7%) and buccal

vestibule and frenum of left side with pain in 75(13.6%) and ulceration in 42(7.6%). Moreover, 41 (7.4%) patients complained of pain in lingual frenum area and whereas 35(6.4%) complained about pain only on mylohyoid ridge. Additionally, there was a significance difference (p= 0.000) in relationship of pain and ulceration with systematic disease in mandible, as shown in (Table II)

**Table – II: Relationship of mandibular post insertion complaints with systematic health of participants (N=551).**

Anatomical area	Complaint	n%	Systematic health	p-value	Correlation
Labial Vestibule and Frenum	Pain	27 (4.9%)	Comorbid illness, Drug use history and Allergies	0	-0.738
	Ulceration	68 (12.3%)			
Buccal Vestibule and Frenum Right Side	Pain	84 (15.2%)		0	-0.659
	Ulceration	48 (8.7%)			
Buccal Vestibule and Frenum Left Side	Pain	75 (13.6%)		0	0.625
	Ulceration	42 (7.6%)			
Anterior Ridge Crest	Pain	103 (18.7%)		0.019	-0.198
	Ulceration	36 (6.5%)			
Middle of Ridge Crest	Pain	21 (3.8%)		0	0
Posterior Ridge Crest	Pain	21 (3.8%)		0	0
Alveolingual Sulcus	Pain	14 (2.5%)		0	1
	Ulceration	21 (3.8%)			
Lingual Frenum	Pain	41 (7.4%)		0	0
Buccal Shelf	Pain	21 (3.8%)		0	0
Mylohyoid Ridge	Pain	35 (6.4%)	0	0	

Furthermore, it was observed that the most common complaint areas in males were right mandibular buccal vestibule and frenum 84(15.24%). Although, maxillary labial vestibule and frenum was identified as the most common complaint areas in females 104(18.87%). Additionally, a significant relationship between gender and complaint area was also found as presented in (Table III).

**DISCUSSION**

In this study the most common complaint area identified in maxilla was labial vestibule and labial frenum, with pain (30.9%) being the most common complaint followed by ulceration (4.9%). According to literature, denture-induced traumatic mucosal ulcerations are inevitably one of the most common problems that occur following the insertion of a new denture<sup>11</sup>.

**Table – III: Gender based comparison of denture complaint areas (N=551)**

Anatomical area	Complaint	Male	Female	P-value
Labial vestibule and frenum maxilla	Pain	66 (11.97%)	104 (18.87%)	0.001
	Swelling	0	0	
	Ulceration	27 (4.9%)	0	
	Others	0	0	
Buccal vestibule and frenum right side	Pain	18 (3.26%)	27 (4.9%)	0.001
	Swelling	0	0	
	Ulceration	0	0	
	Others	0	0	
Buccal vestibule and frenum left side	Pain	14 (2.54%)	81 (14.7%)	0.001
	Swelling	0	0	
	Ulceration	0	0	
	Others	0	0	
Anterior ridge crest	Pain	41 (7.44%)	42 (7.62%)	0
	Swelling	0	0	
	Ulceration	21 (3.81%)	0	
	Others	0	0	
Middle of ridge crest	Pain	21 (3.81%)	21 (3.81%)	0
	Swelling	0	0	
	Ulceration	0	0	
	Others	0	0	
Posterior ridge crest	Pain	42 (7.62%)	21 (3.81%)	0.001
	Swelling	0	0	
	Ulceration	21 (3.81%)	0	
	Others	0	0	
Mandibular labial vestibule and frenum	Pain	27 (4.9%)	0	0
	Swelling	0	0	
	Ulceration	14 (2.54%)	54 (9.8%)	
	Others	0	0	
Right mandibular buccal vestibule and frenum	Pain	84 (15.24%)	84 (15.24%)	0
	Swelling	0	0	
	Ulceration	48 (8.71%)	48 (8.71%)	
	Others	0	0	
Left mandibular buccal frenum and vestibule	Pain	0	75	0
	Swelling	0	0	
	Ulceration	21 (3.81%)	21 (3.81%)	
	Others	0	0	
Anterior mandibular ridge crest	Pain	68 (12.34%)	35 (6.35%)	0.006
	Swelling	0	0	
	Ulceration	14 (2.54%)	22 (3.99%)	
	Others	0	0	
Middle mandibular ridge crest	Pain	21 (3.81%)	0	0
	Swelling	0	0	
	Ulceration	0	0	
	Others	0	0	
Posterior mandibular ridge crest	Pain	21 (3.81%)	0	0
	Swelling	0	0	
	Ulceration	0	0	
	Others	0	0	
Alveolingual sulcus	Pain	0	14 (2.54%)	0
	Swelling	0	21 (3.81%)	
	Ulceration	0	0	
	Others	0	0	
Lingual frenum	Pain	0	27 (4.90%)	0
	Swelling	0	0	
	Ulceration	0	0	
	Others	0	0	
Buccal shelf	Pain	0	21 (3.81%)	0
	Swelling	0	0	
	Ulceration	0	0	
	Others	0	0	
Mylohyoid ridge	Pain	0	35 (6.35%)	0
	Swelling	0	0	
	Ulceration	0	0	
	Others	0	0	

Same results were found by Jainet et al, where in the maxillary arch, most common area of pain ulcerations was labial frenum<sup>2</sup>. This could be due to improper deepening and widening of the labial notch of maxillary denture at the time of denture insertion. Furthermore, pain in buccal vestibule and frenum of left side (17.2%) without any symptom of swelling and ulceration was the second most complaint common area in the current study. Similar results were found in the study by Yaqoob et al, in which complaints in the maxillary denture bearing area appeared most commonly on the facial seal area of the denture base, i.e. in the vestibule between labial and buccal frenum and the vestibular sulcus, between the buccal frenum and maxillary tuberosity<sup>11</sup>. The trauma due to insertion and removal of the unyielding denture causes mucosal irritation. Other complaint area was the crest of the ridge (ant-mid-post) whereas least complaints were found on mid crest of the ridge (7.6%). Deora et al explained that pain or area of ulceration on the crest of the ridge, usually occurs as a result of occlusal prematurity which can be located using articulating paper and corrected accordingly<sup>12</sup>.

Additionally in our study, in mandible, anterior ridge crest was most common complaint area with pain (18.7%) and ulceration (6.5%), followed by buccal vestibule and frenum of right (15.2%) and left side (13.6%) respectively. Whereas in a study by Sadr et al, retromylohyoid region is mentioned as the most frequent injured area in mandible<sup>4</sup>. Singh et al explained irritation on the anterior lingual and lateral slope of mandibular ridge is caused when centric relation and centric occlusion do not coincide and also due to defective occlusal contact<sup>13</sup>. Moreover, according to Kivoviks et al<sup>3</sup> dentists tend to extend flanges as much as possible to overcome the retention problem and that is why the highest frequency of injuries were seen in borders and flanges in the retro-mylohyoid area (48.6%), the buccal sulcus adjacent to the buccal shelf (9.8%), and the retromolar pad (9.5%). By applying a pressure indicating paste and detection of overextended borders/flanges at delivery or post-insertion stages, mucosal injuries can be avoided and patient satisfaction can be achieved.

Moreover, in our study, a significant difference ( $p=0.000$ ) in relationship of pain and ulceration complaints with systematic disease in maxilla and mandible was found. Majority (51%) had high blood pressure, whereas 41% confirmed diagnosis of diabetes mellitus. This corresponds to a study by Cordova et al, in which 54.8 % patients had high blood pressure and 23.81% had diabetes mellitus<sup>14</sup>. He further elaborated that an elevated glucose level in the blood engenders an influence in the oral cavity that causes hypo salivation and increases the infection vulnerability along with healing difficulty. Due to the alteration of the healing process, higher prevalence of injuries of the oral mucosa are expected after installation of dentures in diabetic patients. Our results are in conflict with the study of Ogunrinde et al, who reported no significance difference in relation to patient's medical condition and pain. This is possibly because patient with medical condition had no oral affection<sup>15,16</sup>. Whereas Barbe et al<sup>17</sup> reported in agreement to our study that many elderly patients who take medication for several disease can cause xerostomia which further causes deleterious effects

and affect the patient's ability to tolerate the denture. Conditions including diabetes mellitus and neuromuscular disease may make successful wearing of denture difficult<sup>15</sup>. Lack of lubrication between the denture mucosa interfaces can produce denture sores and ulceration as well<sup>1</sup>.

Furthermore, in the current study we found significant relation between gender and complaint areas, where the most common complaint area in males was right mandibular buccal vestibule and frenum (15.24%) whereas in females it was maxillary labial vestibule and frenum, (18.87%). Similar results were found by Kivovics, who reported that denture-induced irritations were detected in a higher ratio in the mandible especially in male denture wearers. Men had a higher ratio of lesions at the region of the maxillary vestibular sulcus between the labial and buccal frenum and at the mandibular vestibular sulcus of the buccal shelf<sup>3</sup>. Whereas contrary to present study, Sadr et al specify no significant difference between males and females in the number of mucosal injuries evaluated in the maxilla and mandible<sup>4</sup>. However prosthesis adjustment depends on a numerous factors such as quality and quantity of residual ridge, condition of the mucosa covering the residual ridge, patient capacity to adapt the denture, relationship between the arches and the clinical and laboratory skills<sup>11</sup>. Even with precise attention paid during the fabrication of complete dentures, post insertion complication can arise and soft-tissue behavior shows variability during impression-making procedures and the dimensional changes involved in processing of denture. Therefore, emphasis should be laid upon development of skill in the clinical steps, for example, careful designing of the denture, improved impression technique with adequate border molding, good occlusal records, and careful denture trial and insertion followed by scheduled post insertion visit. In addition, it is very important that proper instructions and counseling should be given to each and every patient to minimize their struggle for adaptation with the removable dentures<sup>19,20</sup>.

## CONCLUSION

Pain and ulceration are the most prevalent complaints reported by new complete denture wearers. Moreover, the labial frenum and vestibule in maxilla and anterior alveolar ridge crest in the mandible were the most common intraoral complaint zones identified in this study.

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## AUTHOR'S CONTRIBUTION

**Irfan AB:** Conceived idea, Designed methodology, Literature review

**Abbasi MS:** Literature review, Manuscript writing

**Ahmed N:** Statistical analysis, Data interpretation, Critical Review

**Masood S:** Manuscript Writing

**Shaikh J:** Literature review, Final review

**Fatwani H:** Manuscript writing

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