

# Commonest location of traumatic ulcers in edentulous patients after denture insertion

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## ABSTRACT

**Aim:** To evaluate frequency of commonest location of traumatic oral ulcers after complete denture insertion and find out their association with age, gender and arch type.

**Study design:** Cross sectional observational study

**Place and duration:** Prosthodontic department of Islamic International Dental College, Riphah International University Islamabad, from 11th Feb.,2022 till 11th April 2022.

**Methodology:** A sample of 150 completely edentulous patients were clinically checked for traumatic ulcer development after insertion of complete denture. Frequently involved anatomical sites were noted in both arches. Denture surfaces were assessed to find out the frequently existing denture problems responsible for ulcers.

**Results:** Out of total 150 patients 37.3% with oral ulcers were males and 62.7 % were female. 61-70 years old age group reported with frequent ulcers 48.7%. Frequently observed oral ulcer site in maxilla was sulci 10.0% and in mandible was ridge 24.7%. Frequently observed denture problem responsible for ulcer formation was denture surface roughness 46.7%. Association with age, gender and arch type was significant;  $p < 0.05$ .

**Conclusion:** Frequent ulcers develop in mandibular arch as compared to maxilla and commonest sites of ulcer developments are the ridges and sulci. Old age and female predisposition have been seen in ulcer development.

**Keywords:** Complete dentures, Mandibular arch, Maxillary arch, oral ulcers, traumatic ulcers, post insertion complains

## INTRODUCTION

Edentulism is a condition that reflect a state when a patient loses all his teeth. This condition not only disturbs nutritional requirements of an individual but has negative affect on mental health and social wellbeing<sup>2</sup>. Despite preventive and curative dental treatment this condition is still challenging for dental professionals<sup>2,3</sup>. Edentulism prevalence shows variation in different parts of the world due to certain factors like education, life style, beliefs and attitude towards oral care<sup>4</sup>.

The treatment of edentulism condition is successfully done by removable complete denture that are cost effective and improve patient's life quality<sup>5</sup>. This prosthesis when delivered and installed needs special post insertion care. Post insertion period is crucial as dentures adjusted in oral cavity can result in ulcerative lesions, trauma, appearance of erythema<sup>6</sup>. All this happens because newly installed denture processing errors like over extension, irregular denture base, faulty occlusion like high spots<sup>6,7</sup>. Defects of denture bases frequently occurs while denture processing. Irregular denture bases with over extending margin, failure to create balanced occlusions or lack of denture relief over sharp bony areas are few common reasons for ulcers<sup>8</sup>.

Old age result is lack of nutrition, compromise tissue health, poor compliance of patient. This can future effect adaptation of dentures to base<sup>9</sup>. Mucosal thickness decreases with increasing age. Lack of cushion affect by mucosa and ongoing resorption result in prominence of sharp bony ridges<sup>9,10</sup>. All these greatly affect the supporting tissues underneath the dentures. Due to these reasons post operative visits should be carried out for assessing the denture acceptance by the patient and the tissue adaptation with the denture<sup>10,11</sup>.

Development of sore spots and traumatic ulcers reflect failure of tissue adaptation with the dentures thus rejection of prosthesis by the patient<sup>11</sup>. It has been documented that the

dissatisfaction with dentures and food avoidance is directly associated with oral health of an edentulous patient<sup>10,11</sup>. It is therefore important to locate frequently ulcerative sites in oral cavity, so that measures can be taken to timely locate and rectify the denture problems and thus improve the life quality of edentulous patients<sup>11</sup>.

Many studies in dental literature hypothesized the traumatic ulcers prevalence with respect to gender in various parts of the world<sup>8-10</sup>. The variables like age and gender could influence adaptation process of dentures to underlying tissues. In addition, the variation of traumatic ulcers has been significantly described according to race and ethnicity<sup>12</sup>. Very less literature is available on such topics in our region.

So, the purpose of the study was to evaluate the frequency of common location of traumatic ulcers after complete denture insertion and its association with age and gender.

## METHODOLOGY

A cross sectional study was carried out on 150 completely edentulous patients of both gender. Patient visited the prosthodontic department of Islamic International Dental College, Riphah International University Islamabad with post insertion complains of mucosal ulcers. Data was collected in 3 months i.e., from 11<sup>th</sup> February 2022 to 11<sup>th</sup> April 2022. Non-probability purposive sampling was used. Patients who visited for the first time within first month after complete denture insertion were selected. Patients with age ranged from 50 to 80 years were included in the study. All patients with complete dentures in both arches that were installed within past one month were selected. Dentures made up of poly-methyl methacrylate were included. Patients who had surgical interventions, resections of mandible/maxilla were excluded. All those with psychological or neurological problems were also excluded.

Ethical letter was obtained from ethical review committee of the same dental college. After taking informed consent patients' demographic data and history taking completed. Chief complaint of

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pain noted and intra-oral examination was done to find out the commonest location of oral ulcers. Erythematous ulcers and red areas located. Anatomical areas of higher traumatic injuries were noted in both arches. Dentures were clinically evaluated to find out the commonest cause of trauma due to dentures i.e., denture base irregularities, occlusal imperfections, over-extended dentures and lack of denture relief. To locate ulcers the jaws anatomical sites were divided.

**Data analysis:** Data was entered and statistically analyzed by SPSS version 20. Frequency and percentages were calculated with respect to age, gender, sites of ulcers, arch involved and denture defects. Age and gender stratification with respect to oral ulcer sites was done. Chi square test was used to find out the association.

## RESULTS

Out of total 150 patients 56(37.3%) were males and 94(62.7%) were females. Minimum age of the patients were 50 years and maximum age was 80 years. The mean age was 67.87±SD 6.875. Maximum ulcers were found in 61-70 years of age 73(48.7%) followed by 71-80 years 54(36%) and least were in 50 to 61 years old patients 23(15.3%). Association of age with development of ulcers was found significant;  $p < 0.05$ .

Most frequently observed denture problem was denture base roughness 70(46.7%) followed by over extended denture flanges 33(22%). Lack of denture relief was found in 24(16%) patients whereas 23(15.3%) had traumatic ulcers due to occlusal imperfection.

Ridge was frequently observed traumatic ulcers site in mandibular arch 37(24.7%) followed by reteromylohyoid area 26(17.3%). In maxillary arch frequent ulcers were found in maxillary sulci 15(10%) and tuberosity area 13(8.7%) (Table I).

Table I: Frequently observed traumatic injury sites (n=150)

Ulcer sites	Frequency(n)	Percentage%
Mandibular Ridge	37	24.7
Labial/buccal sulci	25	16.7
Reteromylohyoid area	26	17.3
Labial/lingual freni	18	12.0
Maxillary ridge	13	8.7
Maxillary sulcus	15	10.0
Maxillary Frenum	3	2.0
Tuberosity	13	8.7

Table II: Association of gender with site of traumatic ulcers (n=150).

Ulcer sites	Male	Female
Mandibular Ridge	7(12.5)	30(31.9)
Labial/ buccal sulci	4(7.1)	21(22.3)
Reteromylohyoid area	15(26.8)	11(11.7)
Labial/lingual freni	10(17.9)	8(8.5)
Maxillary ridge	3(5.4)	10(10.6)
Maxillary sulcus	11(19.6)	4(4.3)
Maxillary frenum	0(0.0)	3(3.2)
Tuberosity	6(10.7)	7(7.4)
Total	56(100.0)	94(100.0)

P value 0.000

Table III: Association of ulcers with arch type (n =150).

Ulcer sites	Arch type	
	Mandibular arch (%)	Maxillary arch (%)
Mandibular Ridge	36(34.0)	0(0.0)
Labial/ buccal sulci	25(23.0)	0(0.0)
Reteromylohyoid area	26(24.5)	0(0.0)
Labial/lingual freni	18(17.0)	0(0.0)
Maxillary ridge	1(0.9)	12(27.3)
Maxillary sulcus	0(0.0)	15(34.1)
Maxillary frenum	0(0.0)	4(9.1)
Tuberosity	0(0.0)	13(29.5)
Total	106(100.0)	44(100.0)
P value	0.00	

Significant association of gender with traumatic sites was seen.  $P < 0.05$ . In males maximum ulcer formation was found in reteromylohyoid area 15(26.8%) followed by maxillary sulci 11(19.6%). In females frequently seen ulcer sites were mandibular ridge 30(31.9%) followed by mandibular labial sulci 21(22.3%) (Table II).

Association of traumatic ulcer development with respect to arch showed significant results.  $P < 0.05$ . Mandibular arch was frequently found to have traumatic ulcers 106(70.7%) as compared to maxilla 44(29.3%) (Table III).

## DISCUSSION

Traumatic injuries due to defective denture commonly occur in complete denture post insertion period. Well-functioning complete denture provision is quite a challenge<sup>13</sup>. Authors believe that faulty denture fabrication and its structural defects are prime reasons that a patient rejects using the prosthesis and traumatic ulcer formation occurs<sup>14</sup>. Laurina and Sobolleva<sup>15</sup> stated that complaints of trauma under the dentures are generated whenever the denture fabrication is not up to the mark. The present study was aimed to evaluate the frequently involved sites of traumatic ulcers and find out their age and gender association.

In the present study majority of female patients 62.7% were reported with development of ulcers in post insertion period. Their dominance was found over males i.e., 37.3% Khezran<sup>16</sup> and co-workers in contrast reported 56.4% male dominance over female 43.6%. Likewise, more male to female ratio i.e., 1.6:4.0 was reported by Pervez<sup>17</sup> and co-workers i.e.; 72.5% males and 27.4% females with post-insertion complaints. Our study results are consistent with the results stated by Ahmed<sup>18</sup> and co-workers who reported 63% females and 37% males with traumatic ulcers. Female patient dominance could be explained by the fact that they seek dental treatment more often than men<sup>19</sup>. Furthermore, they are more sensitive to perceive pain as they are found to have thin bio-type of oral mucosa due to osteoporosis and hormonal changes. Slight over extension of denture base can compress thin mucosa and results in traumatic ulcers<sup>13</sup>.

Maximum ulcer development under the dentures were seen in older age group i.e., 61-70 years of age, where 48.7% patients reported ulcer formation. Second highest group with ulcer development was oldest group with age ranged from 71-80 years i.e.; 36% whereas only 15.3% patients in 50-60 years age group developed ulcers. This difference of ulcer development within different age groups was found significant. Similar findings can be seen in the study of Ahmed<sup>18</sup> and co-workers however the association with age was insignificant. Similarly, Ahmed<sup>18</sup>, Khezran<sup>16</sup> and Pervez<sup>17</sup> reported insignificant gender and age difference in their respective studies. Old age group reported more traumatic ulcers and the reason could be due to the fact that poor health of oral mucosal tissue, muscle weakness and reduced strength plus compromised systemic health all leads to poor denture tolerance, easy ulcer formations and thus more complaints<sup>20,21</sup>.

Many dentures related factors could be responsible for trauma under the dentures.<sup>21</sup> Denture base roughness was found to be the most frequent cause of ulcers development. It accounts for 46.7% in denture related factors responsible for trauma. Over extended denture flanges were observed as the second most frequent finding responsible for ulcer development i.e., 22%. Lack of relief under the dentures was observed in 16% dentures, whereas occlusal imperfection accounts for 15.3%. These findings bear a striking similarity with already established studies carried out by Khezran<sup>16</sup>, Koul<sup>22</sup> and Ahmed<sup>18</sup>. 33.6% discomfort under the dentures was reported by Khezran<sup>16</sup> and co-workers. Similarly, Ettinger<sup>20</sup> and Verma<sup>23</sup> concluded the denture base irregularities to be the prime reason of denture retention failure. Occlusal errors about 3.6% were responsible for pain and discomfort in study done by Khezran<sup>16</sup> and coworkers. Jabeen<sup>24</sup> and co-workers marked occlusal errors of a denture as a prime reason of pain and dis-

comfort. Occlusion disturbs during denture processing as inherent polymerization shrinkage of acrylic disturbs the planned occlusal contacts<sup>24</sup>.

Trauma sites most commonly found in our patients were ridges i.e.; 24.7% followed by retro-mylohyoid area 17.3% in mandible. In maxilla sulci 10% and tuberosity area 8.7% were the sites that frequently developed ulcers under the dentures. Significant association between gender and trauma sites was recorded. Male patients frequently developed ulcers in retromylohyoid area 26.8%, where as in females 31.9% ulcers formed on mandibular ridges. Kiviovics<sup>25</sup> in concordance with the results of the current study stated that highest injuries found in denture border areas i.e., 48.6%. Few other associated studies stated the same results<sup>18,23</sup>. We reported mandibular arch to be the frequently traumatized arch 70.7% as compare to maxilla 29.3%. The significance association of arch type with ulcer formation was seen. The reason could be explained by the fact that mandibular arch has thin bio-type of mucosal tissue and more bony spicules formation resulting in poor adaptation of dentures. Slight overextension or occlusal irregularity can easily harm<sup>22,25</sup>.

Poor denture fabrication or processing denture defects greatly results in discomfort and traumatic ulcer formation<sup>25,26</sup>. Dental practitioners should focus on commonest and frequently arising complaints and their rectification in logical manner as a poorly adjusted prosthesis will result in compromised psychological, physical and functional wellbeing of an edentulous patient.

## CONCLUSION

Frequent ulcers develop in mandibular arch as compared to maxilla and commonest sites of ulcer developments are the ridges and sulci. Old age and female predisposition have been seen in ulcer development.

**Authors contribution:** **MAGC:** Data collection/Manuscript drafting, **SHAR:** Conceived idea/ methodology, **AZ:** Statistical analysis, **RA:** Manuscript writing, **SMR:** Literature review, **FA:** Manuscript final reading, **KQ:** Research supervisor/designed research

**Conflict of interest:** None to declare

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