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PREVALENCE OF ALVEOLOPLASTY IN COMPLETE DENTURE PATIENTS

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ABSTRACT

An alveoloplasty is a preprosthetic surgery that smoothen the jawbone. Usually this procedure was done after tooth extraction especially in complete denture patients. The main goal for this procedure is to provide better retention and stability for dental prosthesis. The aim of this study is to assess the prevalence of alveoloplasty procedure among complete denture patients. A total of 68000 case records of patients were evaluated between the period of January 2019 and December 2019. The study was conducted on patients between the ages of 30 to 80 years old. Case records which were complete and data regarding alveoloplasty treatment were included for the study. Incomplete case records were excluded. Convenient sampling method was used and photographic verification was done for cross verification of data. All the data was verified by a single trained examiner. Chi square test was done and the association between age and gender with alveoloplasty treatment were found to be statistically not significant. The present study showed that the prevalence for alveoloplasty treatment among complete dentures patients was at 6.03%. Population aged 50-59 years old most commonly underwent alveoloplasty. Within the

limit of our study, it could be concluded that prevalence of alveoloplasty among complete denture patients are low. Males had higher prevalence for alveoloplasty treatment compared to females patients. Complete denture patients aged 50-69 years had a higher predilection for alveoloplasty in comparison to others although it was statistically not associated.

Keywords: Alveoloplasty; Extraction; Incidence, Preprosthetic surgery, Incidence

INTRODUCTION

Factors such as comfort, function, and esthetics must be restored altogether while treating a completely edentulous patient **[1]**. Partial edentulism can be called when some teeth were lost **[2]** whereas complete denture referred to total loss of teeth. Edentulism could be associated with functional and sensory disturbances to the oral mucosa and salivary glands. Edentulous patients also are liable to reduce tissue formation that affects the protective function of oral mucosa **[3, 4]**. Edentulism is a debilitating and an irreversible condition and it can be described as the "final marker of disease burden for oral health," as it may compromise patients' quality of life. Based on the glossary of prosthodontic terms, a complete denture can be defined as a dental prostheses which replaces whole dentition and associated structures of the maxilla and mandible **[5]**. Complete dentures are essential in order to rehabilitate the stomatognathic by enhancing masticatory efficiency, phonetics and aesthetic appearance of the completely edentulous patients. It was reported that edentulism occurs in about one tenth to one fifth of the general population in about half of the population in ages over 65. According to WHO, it was reported that prevalence of edentulism among Canadian over the age of 65 was shown to be the highest (58%) followed by Finland (41%), 46% in the UK and 26% in the US. According to a study done by Stefanos, edentulism in individuals who are <50 years of age could be associated with depression. Dental caries can be considered as the main cause of edentulism in ages below 45 years, while periodontal diseases are considered as the main causative factor of edentulism in patients above the age of 45. Being a definitive condition, edentulism reflects a long steady state disability that is expected to carry its burden for the duration of the patients' life.

Alveoloplasty can be as simple as the compression of socket walls after closed extraction **[6]**. Another type of alveoloplasty is intraseptal alveoloplasty which includes removal of septal or interdental bone and results in the close approximation of labial

and lingual cortical plates and relieves the undercut. It can be performed at the time of tooth extraction. This technique helps in maintaining the alveolar ridge height but it can also result in the decreased width and thickness of the alveolar ridge. Intraseptal alveoloplasty and non-surgical extractions with properly squeezed sockets may lead to good and long term preservation of alveolar ridge height in comparison to the labial bone reduction which is usually done in secondary alveoloplasty **[7]**. Radical alveoloplasty is usually done in cases where severe undercuts are present and in pre radiation extraction **[8]**. Whole buccal or labial cortical plate is removed after extraction in order to reduce the chances of osteoradionecrosis post radiation based on this technique. Secondary alveoloplasty is a second surgical procedure that is carried out after the post extraction healing to eliminate the gross bony irregularities. Previously our team had conducted numerous studies which include in vitro studies **[9, 10]**, review **[11-17]**, survey **[18, 19]**, clinical trial [20][21], radiographic assessment studies, CAD CAM studies **[22]**. Now we are focussing on retrospective studies. The aim of this study is to assess the prevalence of alveoloplasty procedure among complete denture patients.

MATERIALS AND METHODS

Study design:

The present study was a retrospective study done in a university setting at a private dental college. A total of 68000 case records of patients were evaluated and it was found that 514 patients matched our criteria and were included in the present study. The advantages for this study setting is it can provide easy accessibility to data and provide a population with similar ethnicity. The inclusion criteria would be all complete denture patients and with a history of alveoloplasty treatments meanwhile the exclusion criteria would be the incomplete case sheets and other history.

Data collection:

Data was imported in the time period of June 2019 to March 2020. The study was conducted on all complete denture patients which were between the ages of 30 to 80 years old. The age group was split into three categories which are 30-49 years old, 50-69 years old and 70 years and above. Convenient sampling method was used and photographic verification was done for cross verification of data. All the data was verified by a single trained examiner. Ethical approval for this study was obtained from the institutional ethical committee: (SDC/SIHEC/2020/DIASDATA/0619-0320). Data regarding age, gender, presence or absence of alveoloplasty procedures were

performed and the data was tabulated in Microsoft Excel. The imported data was analysed using SPSS software (IBM SPSS Statistics, Version 24.0, Amonk, NY: IBM Corp)

Statistical analysis:

Descriptive statistics were used for data summarization. Chi square test was done to test the association between gender of complete denture patients and alveoloplasty treatment; age groups of complete denture patients and alveoloplasty treatment. Independent variables were gender and age and the dependent variable was the alveoloplasty treatment. The level for a statistical significance was set at a p value<0.05.

RESULTS AND DISCUSSION

Teeth plays an important role in facial appearances, speech as well as mastication of food. There is little evidence regarding the negative effect of being completely edentulous based on Oral Health **[23]**. Furthemore, it could also bring negative effects towards oral function, social behavior, and day to day activities **[24]**. Total loss of teeth for a long period of time particularly can give drastic negative effects towards their confidence level. In the present study, the total sample size studied was 68000 case records of patients from January 2019 to March 2020 and among which 514 of them were complete denture patients. Among the 514, 265 of them were female and 249 were male patients. In the 514 complete denture patients, 31 of them had alveoloplasty treatment while 483 did not undergo alveoloplasty treatment.

Figure 3 revealed the distribution of alveoloplasty treatment based on age. The most commonest age group from the sample size population that undergone alveoloplasty were patients at the age of 50-69 years old with percentage of 5.54% followed by patients at the age of 70 years and above and the least commonest age group of patients that underwent alveoloplasty procedures were patients that came from the age group of 30-49 years old 2(0.48%). Chi square analysis was performed to find out the association between age of the complete denture patients and whether they had alveoloplasty treatment or not. The p value was found to be statistically not significant with p value of 0.655 which was more than 0.05. Complete denture patients aged 50-69 years had a higher predilection for alveoloplasty in comparison to others although it was statistically not associated. This is similar to finding from Hermes *et al* **[25]**. The study regarding oral and maxillofacial surgery was conducted in

Germany encompassing 600 patients of maxillofacial surgery cases and 800 patients of surgery and general dentistry as controls. They utilized the STAI scale and found out that higher scores in the case group with statistical difference found with young age populations.

In the present study, it can be concluded that the overall prevalence for alveoloplasty is low with a value percentage of 6.03%. This value could be contributed due to the various reasons such as patients denied for alveoloplasty because of high anxiety levels. A study which was done by **[26]** found fear or pain, cost of treatment, needles as specific stressors associated with surgical anxiety, role of previous treatment experience as major factors for them to deny or stop them from undergoing alveoloplasty before proceeding to denture prosthesis **(Figure 4)**. Limitations of this study is that due to small sample size included. Since it was a retrospective study, there was also possible for manual errors during data collection or data analysis. Furthermore, it was only based on a single institutional. Further studies to be performed with huge sample size and confirmation from few examiners were required to avoid manual error during data collection or data analysis. In addition, it should also cover multiple cities and centres.

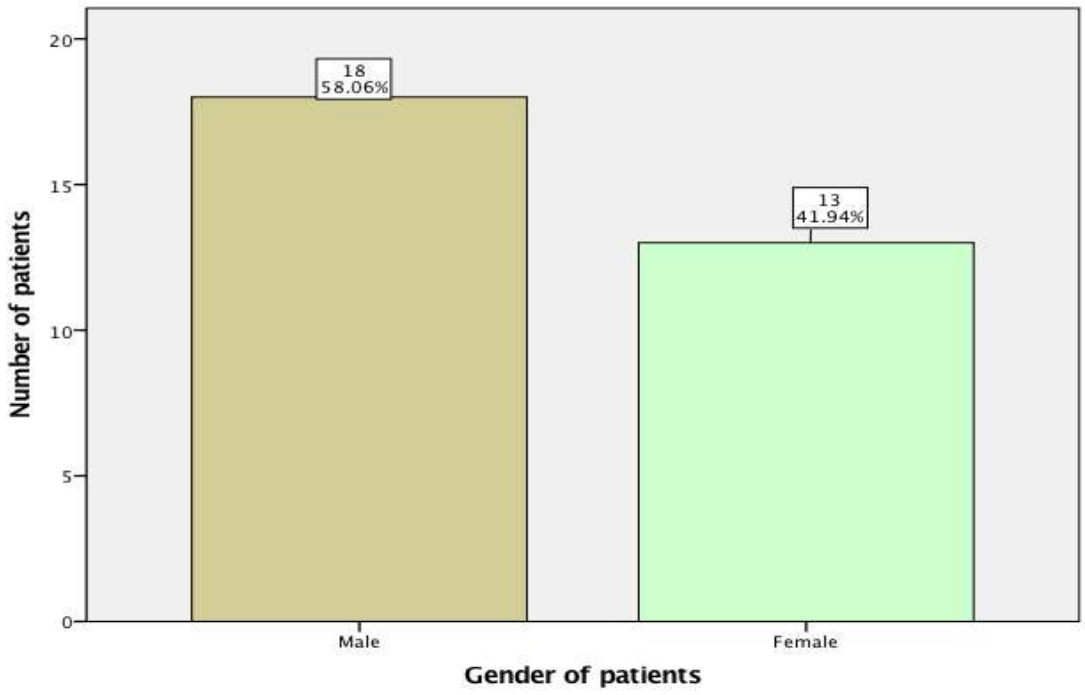

Figure 1: Bar graph represents frequency distribution of alveoloplasty among gender of patients. X axis represents gender of the patients and Y axis represents the number of complete denture patients underwent alveoloplasty treatment. It can be seen that males(58.06%) had higher prevalence for alveoloplasty than females(41.94%).

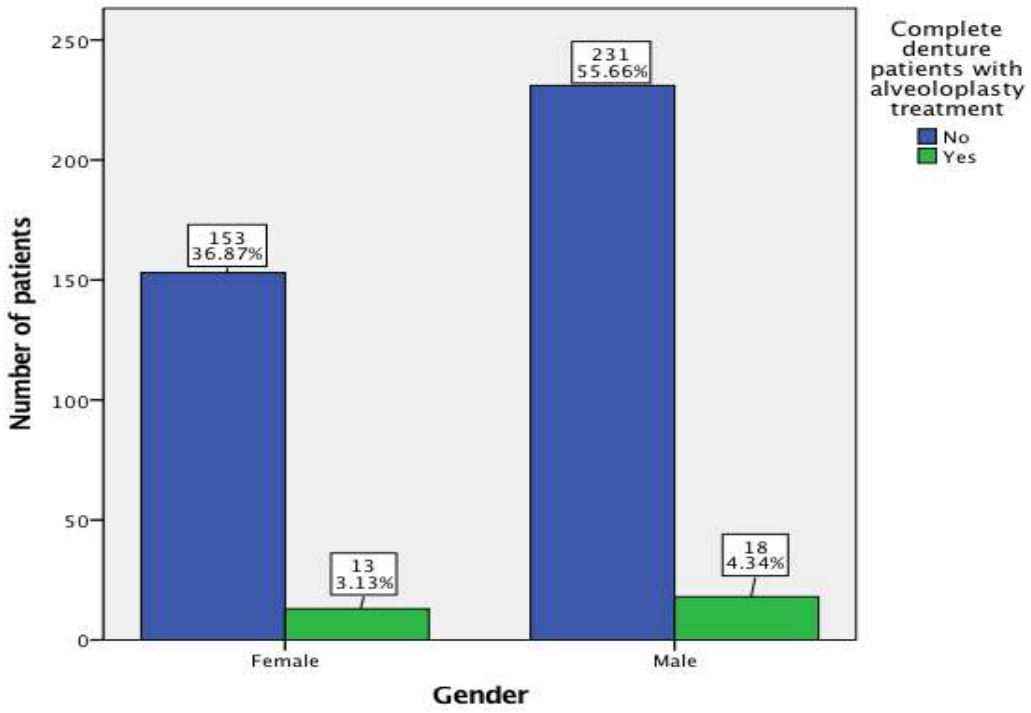

Figure 2: Bar graph represents the association of gender with absence(blue) and presence (green) of alveoloplasty treatment . X axis represents gender of the patients and Y axis represents the number of complete denture patients underwent alveoloplasty treatment. Chi square test was done and the p value was found to be statistically not significant with p value =0.618, p>0.05. Both genders showed lower percentages for alveoloplasty. Hence, statistically not significant.

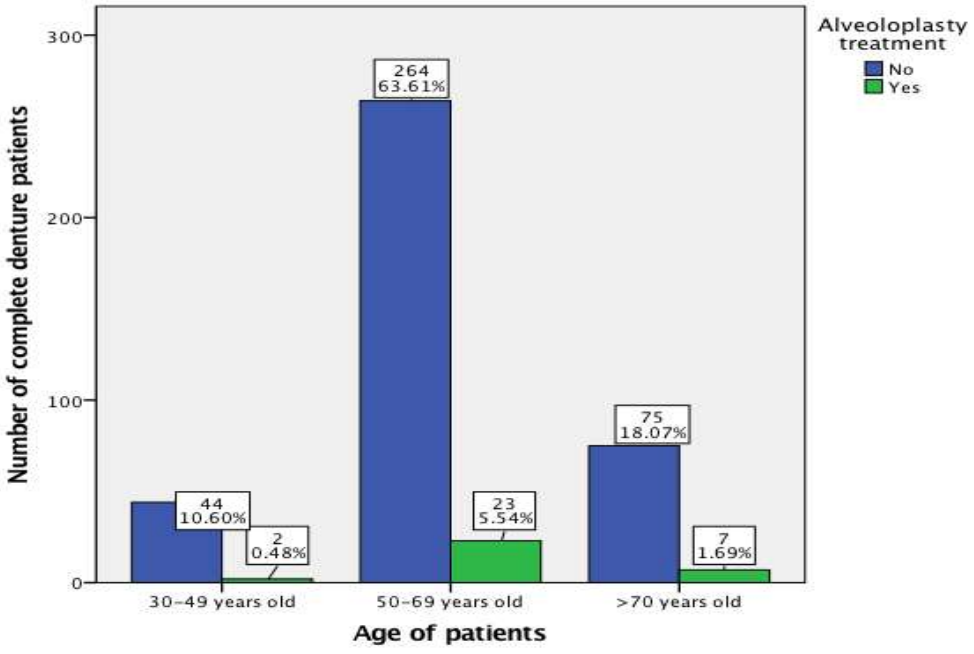

Figure 3 : Bar graph represents the association of age with absence (blue) and presence (green) of alveoloplasty treatment. X axis represents age of patients and Y axis represents number of complete denture patients undergoing alveoloplasty. Chi square test was done and association was found to be statistically not significant with p value= 0.655 (>0.05). Patients aged 50-69 years had a higher prevalence for alveoloplasty compared to other groups.

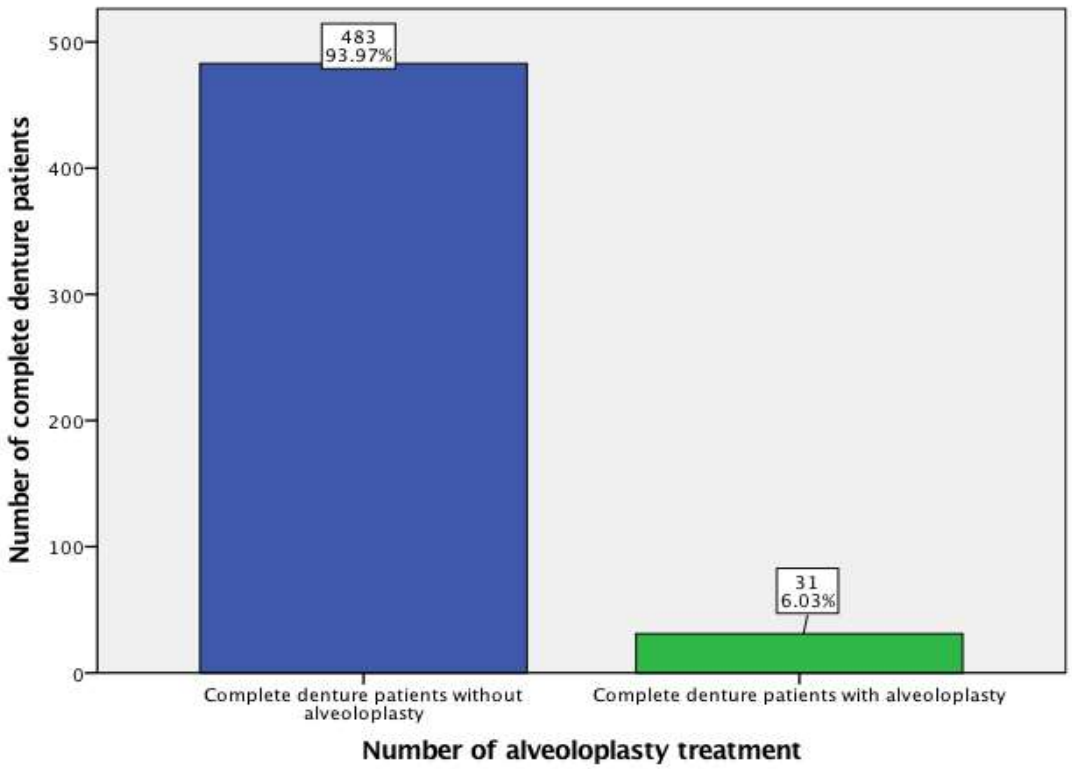

Figure 4: Bar graph shows the frequency distribution of alveoloplasty treatment among complete denture patients. Alveoloplasty in complete denture patients(green) was 6.03% which is quite low compared to complete denture patients without alveoloplasty(blue).

CONCLUSION

Within the limit of our study, it could be concluded that the prevalence of alveoloplasty among complete denture patients is low which was 6.03%. Males had higher prevalence for alveoloplasty treatment compared to females patients. Complete denture patients aged 50-69 years had a higher predilection for alveoloplasty in comparison to others although it was statistically not associated

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