INCIDENCE OF DIRECT SINUS LIFT FOR IMPLANT PLACEMENT IN MAXILLARY POSTERIORS

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Abstract
Objective: The aim of this study is to evaluate the incidence of direct sinus lift in maxillary posterior region.
Materials and Methods: Study samples of 800 cases were obtained from the data of 86000 patients between March 2020 and March 2021. Statistical software used for analysis was the SPSS (statistical package for the social sciences) which is designed by IBM and the statistical tests used were frequency tables along with bar graphs to analyse and compare the obtained results. The obtained data was tabulated in excel systematically. Data was then entered in the SPSS analysis software and descriptive analysis and correlation statistics performed. The obtained results were tabulated and graphically represented.
Results: This study reveals that incidence of direct sinus lift was higher among the male population 57.5% when compared with female population 42.5%; Below 50 years (79.2%) of age patients undergone direct sinus lift during implant placement and Above 50 years of patients are 20.8%; Most of direct sinus lift occurred in the maxillary right molars 43.7%; 32.3% in maxillary left premolars; 9.1% in maxillary right premolars; 14.9% in maxillary left molars.
Conclusion: Further evaluation based on bigger sample size, multi location studies with details on the importance of direct sinus lift could be helpful. The findings of the study showed that direct sinus lift during implant placement is predominantly seen in the male population and the right maxillary molar has a higher incidence of direct sinus lift.
Keyword: Dental implants, Sinus lift, Maxillary posteriors, Bone.

INTRODUCTION

Implant prosthesis has become a useful and common treatment for the restoration of missing teeth. However, implant placement in the maxillary molar region requires further attention, because of potential bone quality and anatomical structure issues. In the maxillary molar area, the height of alveolar bone may be reduced due to acute or chronic periodontal disease, sinus pneumatization, or atrophy of the residual alveolar ridge after extraction[1]. Thus, implant placement in this area can be difficult or even impossible. Therefore, at the time of implant placement in the maxillary molar area, bone graft is performed using vertical alveolar bone graft, sinus lift, or onlay bone graft, of which sinus lift is simple and widely used[2]. Sinus lift is generally performed before or simultaneously with implant placement using the lateral window or crestal approach[3]. Dental implants have revolutionized oral rehabilitation in edentulous posterior maxilla with fixed prosthesis[4]. Posterior maxilla frequently presents with insufficient alveolar ridge with proximity to maxillary sinus[4].When teeth are extracted in the posterior maxilla, alveolar bone resorbs with inferior expansion of the sinus involving the residual ridge area. This process is known as pneumatization of the maxillary sinus. The pneumatized sinus with a thin wall is difficult to manage during implant placement lead to the development of a technique called "Sinus lift Procedure." This technique was proposed by Tatum in 1977. Boyne and James were the first to publish an article and described this technique in 1980[5]. Posterior atrophic maxilla with pneumatized sinus often challenges dental implant surgery. Sinus lift in order to augment the residual alveolar ridge height resulted in various sinus lift surgical techniques. Sinus augmentation in atrophic maxilla transforms the atrophic posterior maxilla to a favorable place for implant placement. Additional surgery of sinus lift during implant placement becomes a difficult decision for both dentist and patient[6]. Residual alveolar bone 5 mm or below are considered for direct sinus lift technique. Autogenous bone grafts are harvested by shaving the mandibular bone from the external oblique ridge area or parasymphysis region. A bone mill is used to grind the bone shaving into the fine particles. After adequate local anesthesia and preparation, a surgical incision is placed on the crest of residual bone at most appropriate area, with vertical releasing curvilinear incisions flaring into the vestibule. Full-thickness, subperiosteal labial, and palatal flaps are raised and reflected[7]. After elevation, the anterolateral wall of maxillary sinus is visualized. Care must be taken to identify and protect the infraorbital nerve, if encountered. The dimension of osteotomy is determined based on the clinical and radiographic examinations as well as the extent of edentulous span[8]. The lateral access antrostomy is opened by scoring the outline created by round bur. The antrostomy is prepared resembling the shape of the rectangle with rounded corners[9]. Once the lateral access window is delineated, continue rotary to remove bone

using paint brush stroke with copious irrigation until bluish hue is observed. Bluish hue indicates close approximation to the sinus membrane. Gentle tapping of the bone helps to separate the bone to create window[10]. A buccal bone window in the exposed wall of maxillary sinus is done using a postage stamp method. The bony wall is gently manipulated with sinus membrane elevation without damaging Schneiderian membrane. The previously obtained graft material is then placed and packed. The implant can be placed on the same sitting with the help of a stent for appropriate faciolingual and mesiodistal positioning. The drills are used in a standard reduction gear handpiece along with a physiodispenser, enabling copious saline irrigation to prevent the excessive heat generation. The drills are used at the speed of 800–1000 rpm. After sequential drilling with reference to implant size, the implants are placed into the prepared site using a torque wrench.Our team has extensive knowledge and research experience that has translate into high quality publications. The aim of this study is to evaluate the incidence of direct sinus lift in the maxillary posterior region

MATERIALS AND METHODS

Study setting

This study was carried out in a university setting which consists of subjects predominantly South Indian population. Advantages of the study include available data and similar ethnicity. Disadvantages of this study is the fact that it is a unicentre study and the geographic locations trends are not assessed. Approval of the study is by the ethical board of Saveetha university. Number of people involves 3 reviewers. A Guide, Researcher and a reviewing expert.

Sampling

This is a retrospective study in which the samples were considered from the time period of March 2020 to march 2021. Case sheets reviewed for the research include patients who underwent direct sinus lift during implant placement. Cross verification of the required samples was done by the reviewing expert. Measures were taken to minimize the sampling bias. These are inclusion of only clear and readily available data followed by simple random sampling. Both internal and external validation was also obtained to carry out the study.

Data collection / Tabulation

Data required for this study was procured by reviewing the patient records of about 86000 patients visiting the dental college. The samples were collected from March 2020 to March 2021. Dental Information Archiving Software is the database system used in college to record all the details of the patient, which includes their demographic data, photographs, diagnosis and treatment reports The required data i.e, patients who undergone direct sinus lift were collected and entered in a methodical manner in an excel sheet for the tabulation of data and further statistical analysis data was validated by 1-2 external reviewers and all the non specific, unclear or incomplete data were excluded from the study.

Analytics

Statistical software used for analysis is the SPSS(statistical package for the social sciences) which is designed by IBM and the statistical test used were frequency tables along with bar graphs to analyse and compare the obtained results. Independent variables include ethnicity. Dependent variables include Gender, Direct sinus lift, age

RESULTS AND DISCUSSION

Out of total sample size (725 cases),Results from the study reveals that incidence of direct sinus lift was higher among the male population 57.5% when compared with female population 42.5%[Figure 1]; Below 50 years(79.2%) of age patients undergone direct sinus lift during implant placement and Above 50 years of patients are 20.8%[Figure 2]; Most of direct sinus lift occurred in the maxillary right molars 43.7%; 32.3% in maxillary left premolars; 9.1% in maxillary right premolars; 14.9% in maxillary left molars.[Figure 3]. Further assessment of age with the incidence of direct sinus lift revealed that Below 50 years of age patients underwent direct sinus lift in maxillary right molars 32.9%.The correlation between the age and the incidence of direct sinus lift revealed that Pearson Chi-Square Value-0.426;p>0.05. Hence statistically not significant[Figure 4]. An assessment of gender with the incidence of direct sinus lift revealed that most of the male population underwent direct sinus lift in the maxillary right molars. The correlation between the gender and incidence of direct sinus lift revealed that Pearson Chi-Square Value-0.307;p>0.05. Hence statistically not significant[Figure 5]. Similar findings were observed by Kent and Block (1989)who evaluated the direct sinus lift during dental implant placement and observed that there was higher incidence in right maxillary molars. Wiltfang et al. observed that sinus lift surgery during implant placement is predominantly seen in male population. Our study correlates to their study in having male predominance. However,there were a few limitations encountered in this study. This study contained some data that were unclear of certain reporting parameters such data were not considered. Another limitation was the geographic limitation i.e.,assessment of predominantly South Indian population. Further this study is an unicentered study. Future research should focus on panel data to better understand the incidence of direct sinus lift for implant placement. The scope of this study is the incidence of the direct sinus lift for implant placement in maxillary posteriors.

Figure 1: Bar graph showing the distribution of gender with the incidence of direct sinus lift during implant placement across the sample size. x axis represents the gender and the y axis represents the percentage of participants. Incidence of direct sinus lift during implant placement is higher in the male population 57.5% and the female population is 42.4%. This reveals that the direct sinus lift is predominantly observed in the male population.

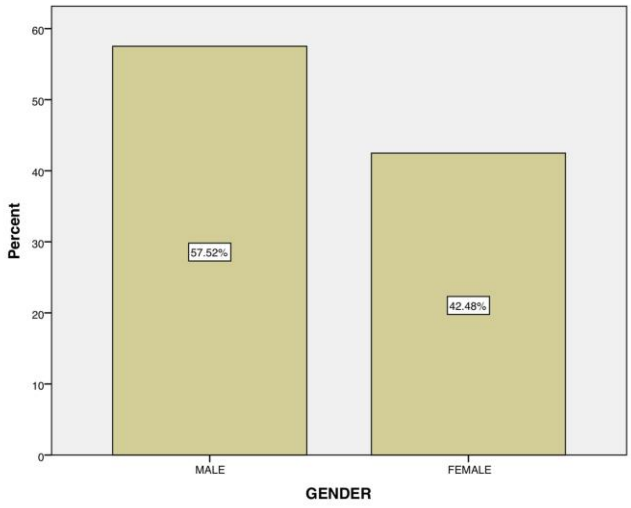

Figure 1

Figure 2:Bar graph showing the distribution of age with the incidence of direct sinus lift during implant placement across the sample size. x axis represents the age and the y axis represents the percentage of participants. Incidence of direct sinus lift during implant placement is higher in below 50 years of patients 79.1% and above 50 years of age is 20.8%. This reveals that the direct sinus lift is predominantly observed in the below 50 years of age patients.

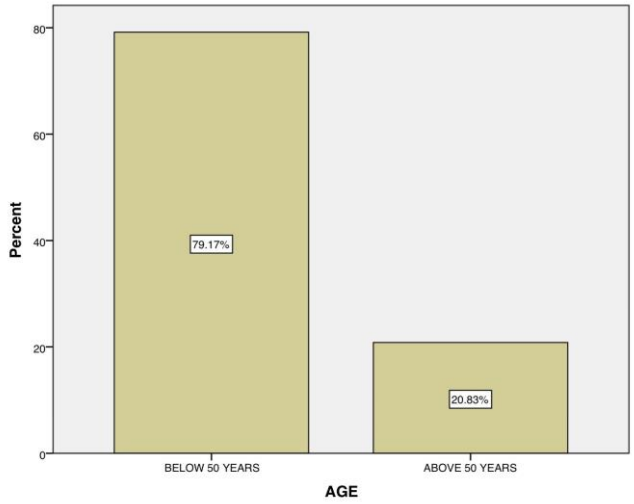

Figure 2

Figure 3:Bar graph showing the distribution of gender with the incidence of direct sinus lift during implant placement across the sample size. x axis represents the gender and the y axis represents the percentage of participants. Incidence of direct sinus lift during implant placement is higher in the maxillary right molars 57.5%, in maxillary left premolars is 32.8%, in maxillary right premolars is 9.1% and in maxillary left molars is 14.9%. This reveals that the direct sinus lift is predominantly observed in the maxillary right molars.

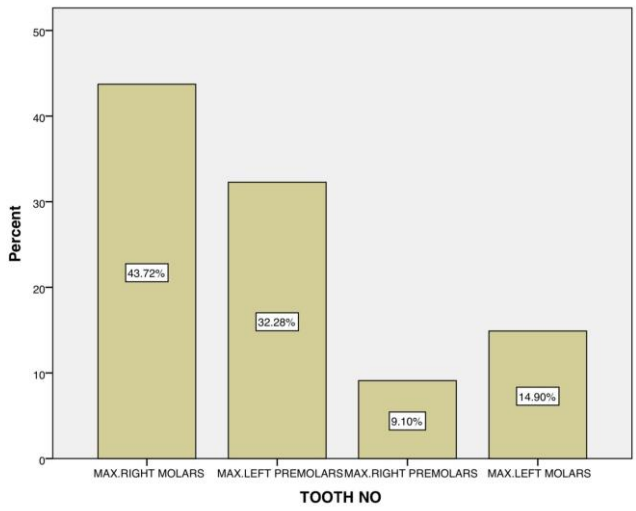

Figure 3

Figure 4:Bar graph depicting the age and the incidence of direct sinus lift. X axis represents the age and Y axis represents the tooth region. Blue colour denotes maxillary right molars and green colour denotes maxillary left premolars and yellow colour denotes maxillary right premolars and purple colour denotes maxillary left molars.

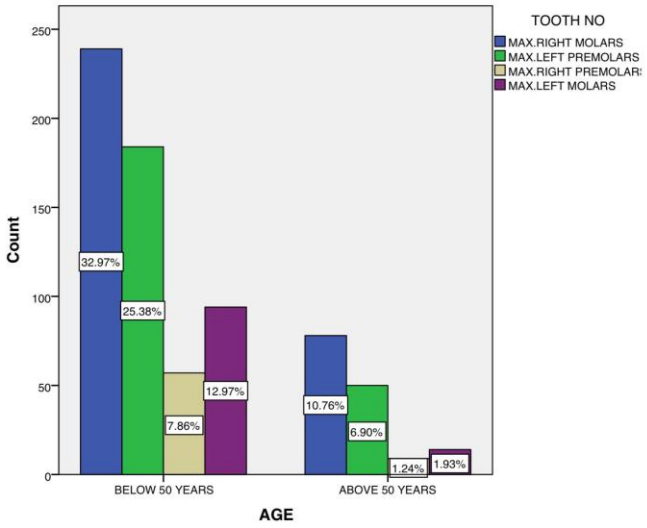

Figure 4

Figure 5:Bar graph depicting the gender and the incidence of direct sinus lift. X axis represents the gender and Y axis represents the tooth no. Blue colour denotes maxillary right molars and green colour denotes maxillary left premolars and yellow colour denotes maxillary right premolars and purple colour denotes maxillary left molars.

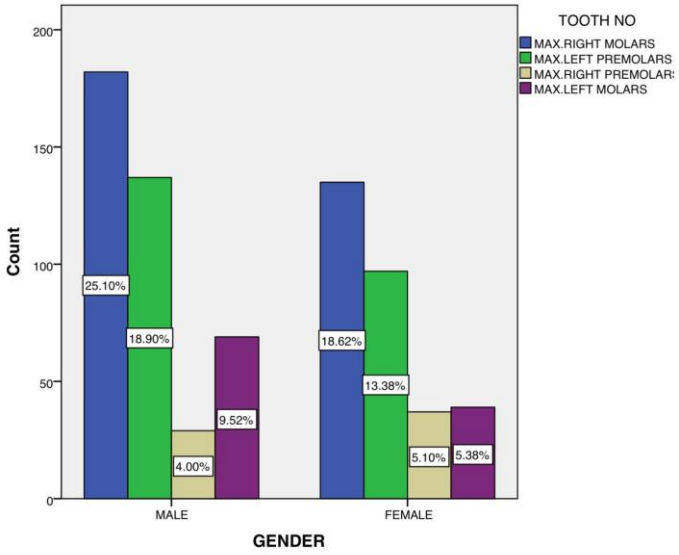

Figure 5

CONCLUSION

Further evaluation based on bigger sample size, multi location studies with details on the importance of direct sinus lift could be helpful. The findings of the study showed that direct sinus lift during implant placement is predominantly seen in the male population and the right maxillary molar has a higher incidence of direct sinus lift.

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Conflicts of Interest:
There are no conflicts of interest.

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