

Assessment of Prevalence of Interproximal Open Contacts Between Single-Implant Restorations and Adjacent Teeth: An Observational Study

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ABSTRACT

Background: Interproximal contact loss (ICL) between fixed implant prostheses and adjacent teeth has been reported. Hence; the present study was conducted for assessing the prevalence of interproximal open contacts between single-implant restorations and adjacent teeth.

Materials & methods: A total of 30 patients who underwent prosthetic rehabilitation of missing maxillary anterior tooth with single implant were enrolled. Dental implants procedures were carried out in all the patients under the hands of skilled and experienced oral implantologists. Postoperative follow-up was done in all the patients at time period of 4 months and 5 years. Evaluation of interproximal contacts at follow-up was done using dental floss. Contact was considered open if floss passed without resistance from adjacent teeth. Visual confirmation was used for identification of interproximal contact loss (ICL) along with radiographic verification. All the results were recorded in Microsoft excel sheet.

Results: A total of 30 patients were analyzed. Interproximal open contacts were found to be present in 46.67 percent of the patients (14) patients. Interproximal open contacts on mesial side were found to be present in 30 percent of the patients while interproximal open contacts on distal side were found to be present in 23.33 percent of the patients.

Conclusion: The present study demonstrated a high prevalence of interproximal open contact among patients undergoing dental implants.

Keywords: Complete Denture Hygiene, Oral health, Oral hygiene practices.

INTRODUCTION

Interproximal contact loss (ICL) between fixed implant prostheses and adjacent teeth has been reported.¹⁻³ Several researchers have investigated the prevalence of ICL between implant prostheses and adjacent teeth. ICL between fixed implant prostheses and adjacent teeth is the absence of

interproximal contact between the implant prosthesis and adjacent teeth, where interproximal contacts were previously established by the clinician.⁴

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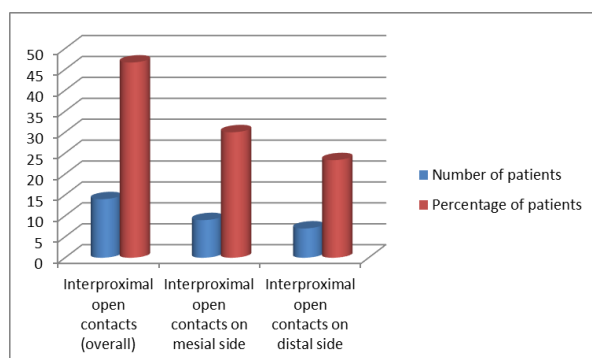
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A recent study reported that the proximal contact tightness between fixed implant prostheses and adjacent teeth significantly decreased at mesial and distal sites over time, particularly in the mesial. In the same study the authors showed that major changes occurred in the first 3-month period after crown delivery. Furthermore, ICL may create food impaction that may lead to periodontal defects, recurrent tooth decay, and peri-implant complications. Peri-implant structures are more susceptible to pathosis in comparison to natural teeth.^{3- 6} Hence; the present study was conducted for assessing the prevalence of interproximal open contacts between single-implant restorations and adjacent teeth.

Table 1: Prevalence of interproximal open contacts.

Parameter	Number of patients	Percentage of patients
Interproximal open contacts (overall)	14	46.67
Interproximal open contacts on mesial side	9	30
Interproximal open contacts on distal side	7	23.33

Graph 1: Prevalence of interproximal open contacts



MATERIALS & METHODS

The present study was conducted with the aim of assessing the prevalence of interproximal open contacts between single-implant restorations and adjacent teeth. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 30 patients who underwent prosthetic rehabilitation of missing maxillary anterior tooth with single implant were enrolled in the present study. Verification of

interproximal contacts was done using radiographs and dental floss at the time of insertion. Inclusion criteria for the present study included:

- Patients within the age group of 25 to 50 years,
- Patients with missing maxillary anterior tooth,
- Patients with negative history of any other systemic illness,
- Patients with negative history of any known drug allergy

Dental implants procedures were carried out in all the patients under the hands of skilled and experienced oral implantologists. Postoperative follow-up was done in all the patients at time period of 4 months and 5 years. Evaluation of interproximal contacts at follow-up was done using dental floss. Contact was considered open if floss passed without resistance from adjacent teeth. Visual confirmation was used for identification of interproximal contact loss (ICL) along with radiographic verification. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Univariate regression curve was used for assessing the level of significance.

RESULTS

In the present study, a total of 30 patients were analyzed. Interproximal open contacts were found to be present in 46.67 percent of the patients (14) patients. Interproximal open contacts on mesial side were found to be present in 30 percent of the patients while interproximal open contacts on distal side were found to be present in 23.33 percent of the patients.

DISCUSSION

Dental implants are a successful means of replacing missing teeth but are not without complications, with both biological and technical complications reported. Teeth suspended by the periodontal ligament can move in relation to force vectors related to the cusp angle and root tip, tooth wear, and other factors; in addition, the underlying alveolar bone structure itself can move. This can lead to relative malpositioning of an osseointegrated dental implant, which is in effect an ankylosed medical device.^{7, 8} Loss of interproximal

contact between fixed implant prostheses and adjacent teeth has been previously reported. Resultant open contacts create food impaction, which may lead to periodontal defects and recurrent tooth decay. To prevent tooth decay and implant-tooth periodontal sequelae, a new proximal contact may have to be established between the implant prosthesis and adjacent tooth.^{8,9} Hence; the present study was conducted for assessing the prevalence of interproximal open contacts between single-implant restorations and adjacent teeth.

In the present study, a total of 30 patients were analyzed. Interproximal open contacts were found to be present in 46.67 percent of the patients (14) patients. Interproximal open contacts on mesial side were found to be present in 30 percent of the patients while interproximal open contacts on distal side were found to be present in 23.33 percent of the patients. Varthis S et al presented the prevalence and contributing factors of interproximal contact loss (ICL) between implant restorations and adjacent teeth. The authors explored the dental literature on PubMed on ICL between implants and adjacent teeth, interproximal contacts, open contacts, teeth migration causes, facial bone formation, and facial bone changes. ICL between fixed implant prostheses and adjacent teeth has been reported. A literature search revealed 7 studies showing a high prevalence of ICL between implant prostheses and adjacent teeth. The literature indicates that this ICL is greater in the mesial aspect in comparison with the distal. As identified by the literature review, ICL in the maxilla ranged between 18% and 66% versus 37% to 54% in the mandible. ICL might occur as early as 3 months after prosthetic treatment. The literature review documented possible tooth migration causes, crown-related causes, and bone formation/growth-related causes of ICL. ICL is a common multifactorial implant complication. The clinical condition will dictate if the implant crown needs to be modified/replaced or the natural tooth needs to be restored to reestablish interproximal contact between an implant prosthesis and adjacent tooth.⁹

In another study conducted by Varthis S et al determined the prevalence of interproximal open contacts between singleimplant prostheses and adjacent teeth, as well as to provide guidelines to prevent interproximal contact loss (ICL). One

hundred twenty-eight patients (174 single-implant restorations) from Columbia University College of Dental Medicine and a private faculty clinic with a single-implant restoration in the posterior or anterior region were selected to participate in their study. The period of evaluation after implant restoration insertion was between 3 months and 11 years. Participants were seen at random intervals to identify ICL. Interproximal contacts were evaluated with 0.07-mm-thickness dental floss and visual confirmation. Contact was considered open if floss passed without resistance from adjacent teeth. The results of their study revealed a significant percentage of ICL, 52.8%, between single-implant restorations and adjacent teeth; 78.2% were identified on the mesial surfaces and 21.8% on the distal surfaces. ICL was noted in 57.9% of the maxillary implant restorations and 49% of the mandibular implant restorations. Eight implant restorations in women demonstrated mesial and distal openings. Among the patients with ICL, a significant percentage, 40%, were aware of the presence of ICL and food impaction. In this study, 52.8% of implant restorations demonstrated ICL. This result dictates that ICL should be included as a prosthetic implant complication.¹⁰

CONCLUSION

The present study demonstrated a high prevalence of interproximal open contact among patients undergoing dental implants. However; further studies are recommended.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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