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A Survey on Radiographic Prescription Practices in Dental Implant Assessment.

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Abstract
Background-Dental implant use has been increased exponentially over the last decade to support the removable and fixed partial denture prosthesis. Radiographic imaging plays an vital role in the placement of implant and to check the survival of implant.
Aim*-A survey was conducted on the radiographic prescription practice among the dentist for dental implant assessment.*
Materials and Methods*-100 dentist were interviewed using 11 questions questionnaire related to imaging modalities for both pre-operative and post-operative, particularly related to cost, availability, precision of measurement ,broad coverage of facial bone, enhancement of surgical efficiency during implant surgery , approximate location of vital structure near implant placement site, prescription of bone mapping for implant placement, and any significance difference in dimension when Cone-Beam Computed Tomography (CBCT) compared with ridge mapping. The dentist included in the survey were specialized in Prosthodontics, Oral & maxillofacial surgery and Periodontics with a clinical experience of less than 5 years, 5-10 years and more than 10 years . Data collected through survey was analyzed by statistical package of social science (SPSS version 20 ; Chicago Inc., USA)*
Result*- It was observed that the majority of surveyed 74% dentist prescribe the combination of Orthopantomography (OPG), Cone-Beam Computed Tomography (CBCT), Intra-Oral Periapical Radiography (IOPAR) . The main reasons given for prescription was precision of measurement, affect surgical efficiency during placement, availability, facial coverage, cost.*
Conclusion- The conducted survey showed that the precision of measurement had been emphasized to avoid complication during implant placement by avoiding iatrogenic default.
Key words*- Dental implant, Orthopantomography (OPG), Cone-Beam Computed Tomography (CBCT), Intra-Oral Periapical Radiography (IOPAR) , American Academy of Oral and Maxillofacial Radiology (AAOMR)*

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I. Introduction

Now a days the osseointegrated implant is most widely accepted treatment for rehabilitation of edentulous space.[1,2] The implant supports the fixed partial denture and removable partial denture.The type of imaging technique plays an vital role in achieving the essential information with the best dimensional accuracy.[3]Dental implants successful placement depends on treatment planning enhance for a dentist it is important to be able to place an implant with a high degree of precision and accuracy in the oral cavity.[4]The criteria for the assessment of dental implant success assessment is marginal bone loss.[5,6] Many type of radiographic modalities have used in the treatment planning of dental implant such as intraoral periapical radiography (IOPAR), orthopantomography (OPG), occlusal radiography, conventional tomography, computed tomography (CT), and cone-beam CT (CBCT) and the dentist should identify the best modality according to clinical suitation .[7,8,9,10,11,12]The American Academy of Oral and Maxillofacial Radiology (AAOMR) in 2000 published a positional paper on the role of imaging modality on dental implant planning.[13] The recommendation by American Academy of Oral and Maxillofacial Radiology (AAOMR) for the assessment of all dental implant sites was that cross-sectional imaging was used and currently imaging method of choice is Cone-Beam Computed Tomography (CBCT) at present to gain this information related to diagnosis.[13]

The type of modality for imaging depends upon phase integration-[14,15]

Phase 1- Pre-prosthetic implant imaging

In this phase diagnosis and treatment planning for the dental implant. Patient's edentulous site, soft tissue, bone mineralization, bone type, bone available in edentulous area, number of implant is required are evaluated in this phase. Any soft and hard tissue pathology should be detected in this phase.

Phase 2- Intra-operative implant imaging-

Following things are evaluated in this phase-

at the time of surgery implant surgical site, during surgery position and angulations of the implant assessment, relation between implant and adjacent teeth, temporary prosthesis loading.

Phase 3-

Maintaince of implant and prosthesis, healing around implant, osseointegration .

II. Materials And Methods

100 dentists were interviewed randomly by using a 11 questions questionnaire which enquired about dental radiographic prescription method by dentist in pre-operative and post-operative assessment in their implantology practice. The dentist who are specialized in Oral and Maxillofacial surgery Prosthodontics and periodontics. The questionnaire enquired about the cost, precision of measurement, availability of modalities broad coverage of facial bone, affect on surgical efficiency during implant placement, approximately finding the location of vital structure near implant placement site, prescription of bone mapping , any significant difference in bone dimension by Cone-Beam Computed Tomography (CBCT) and ridge mapping. Data collected through survey was analyzed by statistical package of social science (SPSS version 20 ; Chicago Inc., USA).

III. Result

The results are exhibited in figure 1 & 2 and table 1.

The conducted study showed that around 74% of the practitioner prescribed the combination of IOPA, Cone-Beam Computed Tomography (CBCT) and OPG, 14% of the practitioner prescribed the combination of Cone-Beam Computed Tomography (CBCT) and OPG ,10% of the practitioner prescribed Cone-Beam Computed Tomography (CBCT) and 2% practitioner prescribed intraoral periapical radiography (IOPA) . When the main reason enquired related to the reason of prescribing certain modalities was modalities their precision of measurement (100%),affect the surgical efficiency during implant surgery (96%),availability (90%) , broad facial coverage (80%), cost related (70%),prescription of ridge mapping for implant placement(38%). From the study it was also observed that combination of Cone-Beam Computed Tomography (CBCT) and OPG approximately find the location of vital structure near implant placement site and significant difference in bone dimension by Cone-Beam Computed Tomography (CBCT) and ridge mapping. Intraoral peri-apical radiography (IOPA) followed by Cone-Beam Computed Tomography (CBCT) and OPG are frequently prescribed radiographic modalities prescribed post operatively.

Table 1-

QUESTIONS	**YEAR OF PRACTICING**			**p VALUE**
	Less than 5 Years	**5-10 years**	**More than 10 years**	
Q1. The radiographic modalities prescribed by you for dental implant?				
1.IOPA	2	0	0	
2.OPG	nil	nil	nil	
3. IOPA & OPG	nil	nil	nil	**0.018(S)**
4. CBCT	2	4	4	
5.IOPA & CBCT & OPG	48	18	8	
6. CBCT & OPG	10	0	4	
Q2. Is prescription of radiographic modalities cost related?				
1. Yes	46	18	12	**0.768**
2. No	16	4	4	
Q3. Did prescription of radiographic modalities depend on their precision of measurement?				
1. Yes	62	22	16	**Not applicable**
2. No	nil	Nil	Nil	
Q4. Did prescription of radiographic				

modalities depend on their availability? 1. Yes 2. No	52 10	22 0	16 0	**0.033(S)**
Q5. Did prescription of radiographic modalities depend on the broad coverage of the facial bone? 1. Yes 2. No	52 10	18 4	10 6	**0.158**
Q6. Did radiographic modalities affect your surgical efficiency during implant placement? 1. Yes 2. No	58 4	22 0	16 0	**0.279**
Q7. According to you which radiographic modalities approximately find the location of vital structure near implant placement site? 1. CBCT & OPG 2. OPG 3. IOPA& OPG 4. CBCT & OPG &IOPA	50 nil 8 4	14 nil 8 0	0 nil 0 16	**0.001 (HS)**
Q8. Did you prescribed ridge mapping for implant placement? 1. Yes 2. No	20 42	6 16	12 4	**0.004(HS)**
Q9. Is there is any significant difference in bone dimension by CBCT and Ridge mapping? 1. Yes 2. No	30 30	6 16	8 4	**0.001(HS)**
Q10. Which radiographic modalities you prescribed for post- operative assessment? 1. IOPA 2. CBCT & IOPA 3. CBCT&OPG 4. CBCT &OPG &IOPA	28 0 22 12	6 8 4 4	8 4 0 4	**0.001(HS)**

Figure 1- The distribution of various modalities in implant assessment.

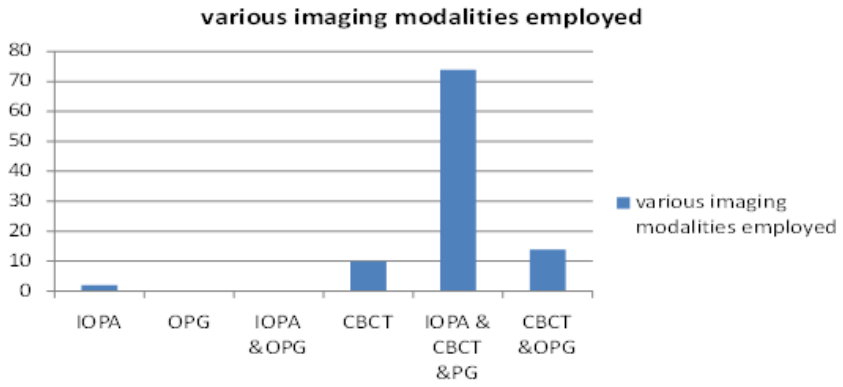
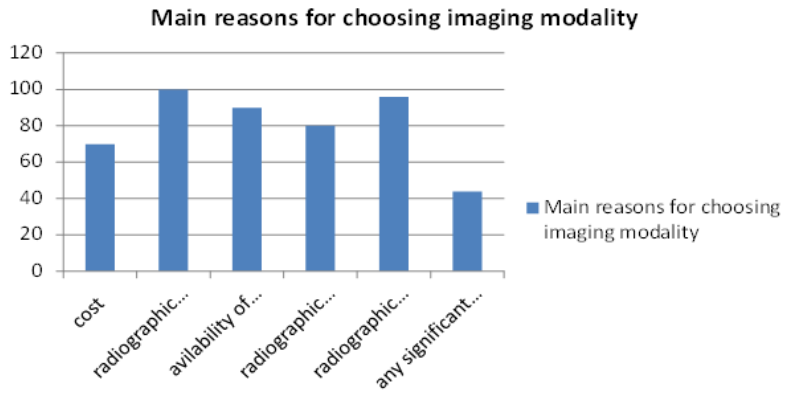


figure 2-Distribution of the reason of modalities for the assessment of implants



IV. Discussion

The survey was conducted with the objective to determine the radiographic prescription used by dental practitioner for dental implant assessment.

The conducted study showed that 74 % dentist prescribed combination of Orthopantomography (OPG), Cone-Beam Computed Tomography (CBCT), Intra-Oral Periapical Radiography (IOPAR) in pre-operavtive assessment . The similar finding was observed by the Mahdi Alnahwi et al[16]. The main reason for prescribing the combination of radiographic modalities was prescision of measuremnet and similar finding was observed by CE Sakakura et al[17].

The majority of dentist prescribed Intra-oral periapical radiograph for post-operative assessment of osseointegrated implant and similar finding was observed by Mahdi Alnahwi[16]. The conducted study showed that the many dentist are not aware the guidelines recommended by the AAOMR and does not follow. Similar finding was observed by Mahdi Alnahwi et al (11), CE Sakakura et al[17]

The conducted study showed that majority of dentist does not used bone mapping in assessment of bone dimension in implant placement. There is no significant difference in the dimension of bone when ridge mapping is compared to CBCT. The similar finding was showen by the study conducted by Chuge et al. [18]

V. Conclusion

With the advancement in the radiographic modalities,the presciption for dental implant has been shifted towards increase precision measurement to locate vital structure near the implant site and improve the surgical efficiency.

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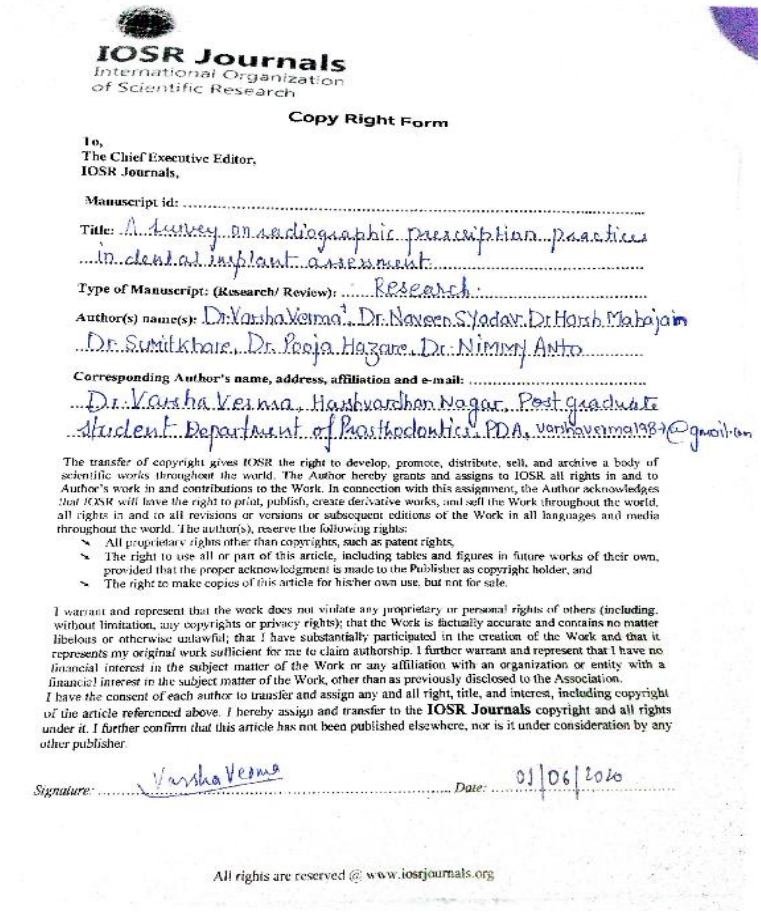
CONFLICT OF INTEREST - nil



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