# DENTAL IMPLANT CRITERIA BEFORE AND AFTER PLACEMENT WITH PANORAMIC RADIOGRAPHY

## (KRITERIA DENTAL IMPLAN SEBELUM DAN SESUDAH PENEMPATAN DENGAN GAMBARAN RADIOGRAFI PANORAMIK)

**Barunawaty Yunus**

Department of Radiology
Faculty of Dentisrty, University of Hasanuddin
Jl. Kandea No.5, Makassar.

**Abstract**

The increasing demand towards dental implant in society with intermediate until high socio-economic status has forced implant practitioners to be more professional to work. This study aimed to find the differences between dental implant placement location before and after the dental implant examination by using the panoramic radiography. This research was a "Quasi Experimental" design with "Pre-Post Test". This study was conducted in the RSGMP FKG UNHAS with the subject of treatment by the number of 30 samples, included both male and female, aged 20-50 years, losing 1-2 dental units, had no systemic diseases, no proximal caries , minimum jawbone was 5 mm in width and 9 mm in height. Data was analyzed with SPSS Program version 12 for Windows. The results showed that there were significant differences in the disposition of dental implant before and after panoramic radiography examination. As conclusion, before the installation of dental panoramic implants radiographycally, all samples had good criteria, after installation of the implants 56.7% had good criteria, 16.7% moderate and 26.7% bad criteria. Based on gender, male had higher percentage for good dental implants placement compared to female. Female had higher percentage of dental implant shifted to mesial and on the other hand, male had higher percentage of dental implant shifted to distal.

**Key words:** dental implant, panoramic radiography, alveolar bone.

## INTRODUCTION

Tooth loss treatment can be done in various ways. In line with the development of dental technology, treatment of tooth loss which is more popular today is dental implant treatment. This treatment is one of the alternative treatments of tooth loss that can overcome various limitation problems of conventional artificial tooth.[1]

Implants have been used extensively to replace the missing tooth elements, and this shows one of the important advances in oral rehabilitation. However, rigorous evaluation of the quality and quantity of remaining bone and the location of an accurate anatomical structure needs to be done to ensure the success of dental implant treatment.[2]

Various devices of modern diagnostic radiographic imaging have been used for dental implant treatment, but in Makassar, availability of these tools do not exist, therefore panoramic radiography is still the main examination of the jaw bone that will receive dental implants.

Many dental implant practitioners in Jakarta only use panoramic radiography as a guide of jaw bone evaluation, based on the recommendation of the implant manufacturers. Radiographic survey of the dental implant treatment results on 18 dental implant practitioners in Jakarta, 44.44% used pericapical radiography, 94.44% panoramic radiography, and only 38.89% used periapical and panoramic radiography. From 109 cases of implant treatment of the survey results, it obtained 22 cases (22.18%) suffered from bone damage to more than 50%.[3]

There are various types of radiographic imaging technique for preoperative plan and dental implant placement evaluation. Although the three dimensional dental implant pointer systems have been available, only some dentists are using it. Appropriate radiography equipments, cost and radiation exposure play an important role. Preferably, the target of the radiography examination is to obtain much information about the jawbone with the possibility of minimal radiation and cost. All types of imaging techniques have their own advantages and disadvan-

Edisi Cetak Dentika Dental Journal, Juli 2010 (ISSN: 1693-671X)

tages, and combination of different methods of image can be used to optimize the diagnostic results. In fact, survey showed only about 63.6% using panoramic radiography for dental implant needs.[4]

Based on the facts above, it is required an effort to improve the diagnostic radiography analysis information in quality and quantity of jaw bone in dental implant treatment although only using panoramic radiography equipment that is available.

This study aimed to find criteria for dental implant placement that was planned prior to and after installation of dental implants with panoramic radiography.

## MATERIALS AND METHODS

In obtaining a good placement criteria of dental implant for installation of dental implants, researcher used panoramic radiography before and after installation of dental implants. The research is quasi-experimental approach with pre-post test design.

Research was conducted on population that meets criteria specified sample, who are male and female sex as many as 30 samples with age between 20-50 years old, had lost 1-2 teeth, no systemic disease, and no caries on the proximal and root abnormalities in neighboring teeth, no periodontal disease, jaw bone had a width of at least 5 mm and height of at least 9 mm. Sample was taken from patients who came to private dentist clinic and panoramic pictures taken on the Radiology Laboratory of Faculty of Dentistry, University of Hasanuddin.

Jawbone condition was known by taking impression and after on the upper and lower jaw. Panoramic radiography was performed before and after the installation of the implant. The results of panoramic radiography were analyzed to determine the size of dental implants to be used, then the installation on the local dental implants edentulous jawbone was done. After the installation of dental implants, panoramic radiographs was resumed to be analyzed again to see the location of the planned implant placement before and after installation of dental implants. Data obtained were analyzed with program of SPSS for Windows version 12.

## RESULTS

Samples that carried out panoramic radiography before the installment of dental implants 100% had good criteria for dental implant placement. After the installment of dental implants 56.7% had good criteria for dental implant placement, 16.7% had moderate criteria and 26.7% had bad criteria for dental implant placement (Table 1).

Table 1. The frequency of dental implant placement criteria before and after installation of dental implants with panoramic radiography examination.

| Dental Implant Placement | Before Implant | | After Implant | |
|---|---|---|---|---|
| Criteria | N | % | N | % |
| Good | 30 | 100 | 17 | 56.7 |
| Moderate | 0 | 0 | 5 | 16.7 |
| Bad | 0 | 0 | 8 | 26.7 |
| Total | 30 | 100 | 30 | 100 |

Males who had implants 73.4% had good criteria for dental implant placement, 6.6% moderate criteria, and 20% bad criteria. Females, 40% had good criteria, 26.7% moderate criteria and 33.3% bad criteria for dental implant placement (Tabel 2).

Table 2. The frequency of dental implant placement criteria based on gender with panoramic radiography examination.

| Dental Implant Placement | Male | | Female | |
|---|---|---|---|---|
| Criteria | N | % | N | % |
| Good | 11 | 73.4 | 6 | 40 |
| Moderate | 1 | 6.6 | 4 | 26.7 |
| Bad | 3 | 20 | 5 | 33.3 |
| Total | 15 | 100 | 15 | 100 |

After installation of dental implants 46.7% had shifted to mesial, 36.7% shifted to distal, and 16.7% were normal or not shifted.

Table 3. The frequency of dental implant placement that shifted with panoramic radiography examination.

| Dental Implant Shifted | Frequency | % |
|---|---|---|
| Mesial | 14 | 46.7 |
| Distal | 11 | 36.6 |
| Normal | 5 | 16.7 |
| Total | 30 | 100 |

Table 4. The frequency of dental implant placement that shifted based on gender.

| Dental Implant Shifted | Male | | Female | |
|---|---|---|---|---|
| | N | % | N | % |
| Mesial | 6 | 40 | 8 | 53.3 |
| Distal | 7 | 46.7 | 4 | 26.7 |
| Normal | 2 | 13.3 | 3 | 20 |
| Total | 15 | 100 | 15 | 100 |

A total of 40% males had dental implant placement shifted to mesial, 46.7% to distal, and 13.3% were normal or not shifted. Females had 53.3% dental implant placement criteria that shifted to mesial, 26.7% to distal, and 20% were normal or not shifted (Table 4).

## DISCUSSION

Before installation of dental implants, dental implant placement location that has been planned examined by panoramic radiography had good criteria of dental implant placement in all samples, whereas after the installation of the implants, it had three criteria for placement of dental implant which is good, moderate, and bad. The expertise and the selection of optimal dimensions of the installation of dental implants became attention since the appointment of research showed failure rate directly related to the length and diameter of dental implants. Hint of dental implant placement should be considered in the treatment plan that is not appropriate from dental implants also causes lack of precision in dental implant installation. In the survey that had been done found that there are approximately 63.6% dentists use only the panoramic radiography for dental implant treatment needs.[4]

Males had good criteria more than female, moderate criteria of dental implant placement was more common in female as well as the bad criteria of dental implant placement compared with male. This is because in some cases, installation of dental implants female is approaching anatomical maxillary sinus location, so that the installation is tilted slightly to the mesial direction so that the maxillary sinus has no injuries.

Differential diagnosis and treatment plan are an important element of preoperative stage of dental implant treatment to be successful. Radiography examination is an indispensable part of dental implant treatment plan to assess the morphological characteristics and location of anatomical structures such as maxillary sinus, mandible canal, mentale foramen for dental implant placement.[4,5]

The percentage of dental implant placement which shifted to mesial was higher than distal, and the percentage for dental implant placement which was shifted to distal was higher than normal/not shifted on the installation of dental implants with panoramic radiography examination. This is because implant operator tends to give more stress to the mesial or to the front direction, due to the narrow field of view of the posterior teeth area. The existence of structural abnormalities such as undercat, lack of field of view can influence the placement or angularity of dental implant installation.

The percentage of dental implant placement which was shifted to mesial was higher in female than male. The percentage of dental implant placement shifted to distal was higher in male than female. Further, the percentage of dental implant placement which was normal or not shifted was higher in female compared with male. This is because in some cases male has molar tooth inclination on adjacent teeth that is slightly crooked or leant to the mesial, made the tool position difficult to enter correctly in the normal inclination. Direction of dental implant placement should be considered as only the inclination. Inclination which is not correct from the installation of dental implants may affect the accuracy of placement for installation of dental implants.

It was concluded that before the installation of dental implant, panoramic radiographycally all samples had good criteria, after installation of the implants 56.7% had good criteria, 16.7% moderate and 26.7% bad criteria. Based on gender, male had higher percentage for good dental implant placement compared to female. Female had higher percentage of dental implant shifted to mesial and on the other hand, male had higher percentage of dental implant shifted to distal.

## References

1. Elsubehi ES, Attard N, Zarb GA. Implant prosthodontics for edentulous patients: currents and future directions. In: Zarb GA, Bolender CL, eds. Prosthodontic treatment for edentulous patiens complete dentures and implant-supported protheses. 12th ed. St Louis: CV Mosby Co, 2004: 528-38.
2. Dantas JA, Fhilo AM, Campos PSF. Computed tomography for dental implants: The influence of the gantry angle and mandibular positioning on the bone height and width. Dentomaxillofacial radiology 2005; 34: 2.
3. Priaminiarti M. Prosedur operasional baku pemeriksaan radiografik pada perawatan implan gigi. Jakarta: Departemen Radiologi Kedokteran Gigi Universitas Indonesia, 2008: 1-2.
4. Anil S, Al-Ghamdi HS. Method of gauging dental radiographs during treatment planning for dental impalnts. T J Contemporary Dent Pract 2007; 8(6): 1-3.
5. White SC, Pharaoh MJ. Oral radiology principles and interpretation. 5th ed. St Louis: CV Mosby Co, 2004: 71-209.