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RESEARCH ARTICLE

IMPLANT SUPPORTED PROSTHESIS WITHOUT PROSTHETIC CONSIDERATION-WASTE OF TIME AND MONEY

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ABSTRACT

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Modern dentistry has changed tremendously with implant therapy. It is the only treatment modality where additional abutments can be created for improving the esthetics and function. For successful implant therapy, making a proper treatment plan considering with surgical and prosthetic part in mind is key to success. Often dentists tend to create a treatment plan overlooking the basic principles of prosthetic part. Careful planning, evaluation of all the diagnostic aids, mock wax up and using a surgical guide helps to accurately locate the implant fixture regarding the depth and angulation which is critical to the esthetic and biomechanical success of the prosthesis. The clinical case depicted here is an illustration of how difficult it becomes to restore the case when the fixtures are placed in incorrect location and/or angulation.

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INTRODUCTION

Implant prosthodontics is a viable treatment option today with a predictable success rate owing to the huge strides made in the materials science and technology, since the days of Linkow and Branemark. Implants is the only option in prosthodontics in which additional abutments can be created for enhancing function, esthetics, prosthetic longevity and an improvement in the overall quality of life. However in implants too, complications are encountered. McDermott et al, 2003, reported 13.9% frequency of complications, of these the prosthetic complications were 2.7% Misch K. and Wang H. L outlined four categories of complications viz. treatment plan related, anatomical, procedural and others. Helvey stated that a number of factors are involved in achieving a successful outcome for an implant supported prosthesis. In these, a major factor is the placement of implant fixture in a buccolingual, mesiodistal and apicocoronal dimension. The esthetics and functions of the final restoration are strongly affected by the placement of the implant fixture. Even a small change in implant position can create a lot of problem for the restoring prosthodontist.

A clinical case is being reported here, in which the restoration design had to be customized according the implant fixtures placed.

Case report

A fifty one year old female patient reported to our clinic, for restoration of missing teeth #31,32,41,42. Implant fixtures were placed elsewhere about 5 months back with optimum osseointegration. Orthopantomogram revealed that the three fixtures were placed in B, A and C sites (Fig 1). Stage two surgery and cement retained prosthesis was planned. However after the cover screws were uncovered and abutments were placed, the problem of optimally restoring the case was realized. The implant placed in A region was found to be exactly in the midline and out of the desired archform (Fig 2). The maxillary cast was mounted with a face bow record on a semi-adjustable articulator. Two sets of mandibular impressions (abutment level) were made, one of which having only two abutments i.e. B and C regions and another one having all the three abutments i.e. B, A and C regions. Two different sets of wax up were done and tried in the patient (Fig 3 a and 3 b) The wax up with only two terminal abutments had better esthetics, including lip fullness and matching of midline as compared to the other one with three abutments.

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(FIGURE 1) PRE OPERATIVE OPG SHOWING INTEGRATED FIXTURES IN B, A, C REGION



(FIGURE 2) ABUTMENTS PLACED IN B, A, C REGIONS



(FIGURE 3 A) DIAGNOSTIC WAXUP WITH THE ABUTMENTS

After obtaining the patients consent, the cover screw of the fixture placed in A region was placed back and the soft tissue was closed (Fig 4). The copings were tried and PFM fixed prosthesis (cement retained) replacing # 31, 32, 41 and 42 was cemented with zinc oxide non-eugenol temporary cement. The patient was reviewed for a week and then the prosthesis was cemented with GIC type-1 cement (Fig 5 and 6).



(FIGURE 3 B) DIAGNOSTIC WAXUP WITH TWO ABUTMENTS B and C ONLY. NOTE THE IMPROVED LIP PROFILE

The patient was given the instructions regarding strict maintenance of oral hygiene and was kept on regular recall for 6 month, during which no complaints were received.

DISCUSSION

Placing in implant in the wrong location is a frustrating, embarrassing and avoidable complication.



(FIGURE 4) COVER SCREW REPLACED IN FIXTURE IN A REGION



(FIGURE 5) FINAL CEMENT RETAINED PROSTHESIS IN PLACE



(FIGURE 6) POST OPERATIVE OPG WITH PROSTHESIS CEMENTED AFTER SIX MONTHS

The interocclusal distance, interdental distance, ridge height and ridge width estimation guides the operator whether implants are indicated in the first place. The spatial orientation should be in line with the occlusal plane and centered according to the opposing occlusion to prevent cross bites or additional stress on the prosthesis. If more than one implant is to be placed, a diagnostic wax up should be used to determined the correct implant location³. Misch Carl, compared the dental arch to an open pentagon viz. the two premolar and molar sites, two canine sites, central and lateral incisors representing the five sides. He proposed that implants be placed in accordance to the following guidelines-

- No cantilever
- No three adjacent pontics
- Canine position
- At least one implant in each edentulous segment of an arch.

In this particular case the guide line regarding cantilever omission was followed. Also all three implants were placed in the anterior segment i.e. one side of the pentagon. However, the central implant was placed incorrectly. This implant was exactly in the midline and also placed labially to the desired arch form.

Rosenfeld and Mecall, proposed a protocol to help clinicians place implants precisely. By using a diagnostic wax up, the correct alignment of the replacing tooth can be finalized. Barium coated templates help clinicians to determine the exact implant alignment and multiplanner reformatted CT will determine the need for hard/soft tissue augmentation⁵. Misch Carl E. outlined the excessive stress to be primary factor in mechanical complications like crestal bone loss, implant fracture ,screw loosening, occlusal material fracture, prosthesis fracture or attachment wear and fracture. Any increase in the load arm will increase the moment load on the implant. Using a surgical template helps to accurately determine the position of the implant and prepare the osteotomy site in both buccolingual and mesiodistal dimension⁶. In this case the operators decided to omit using the centrally placed implant as an abutment, for sake of better esthetics and to reduce the mechanical stresses on the prosthesis and implants. The patient was duly informed and was a party to the decision. Since all implants were osseointegrated the centrally placed implant was left inside the bone.

Summary and conclusion

Implant complications are relatively common and should be addressed immediately. Time spent in planning stages, for example, evaluating the casts, radiographs, diagnostic wax up and surgical guides, goes a long way to reduce the surgical and prosthetic complications.

Implants is a multidisciplinary field and enlisting the help of a prosthodontist in planning stages will help to avoid later frustrations. The case portrayed here, seems to demonstrate the importance of the implant being prosthetically driven for ensuring a good prognosis.

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