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CASE REPORT

Prosthetically Driven Implants: How much a Reality?

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ABSTRACT

Implants are fast becoming an integral part of modern dentistry. It is the only treatment modality where additional abutments can be created for improving the esthetics and function. When diagnostic protocol involves both the surgeon and the prosthodontist, the biomechanical, technical and esthetic compromises are circumvented. 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.

Keywords: Implants, Surgical guides, Diagnostic wax up, Cement-retained prosthesis, Mechanical stresses.

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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 HL[1] outlined four categories of complications *viz* treatment plan related, anatomical, procedural and others.

Helvey GA[2] 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 51-year-old female patient reported to our outpatient Department of Prosthodontics, for restoration of missing teeth #31, 32, 41, 42. Implant fixtures were placed elsewhere about 5 months back with optimum osseointegration.

Orthopantogram 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 semiadjustible articulator. Two sets of mandibular impressions (abutment level) were made, one

Fig. 1: Preoperative OPG showing integrated fixtures in B, A and C regions

Fig. 2: Abutments placed in B, A and C region

Fig. 3A: Diagnostic wax up with three abutments

Fig. 3B: Diagnostic wax up with two abutments B and C only, note the improved lip profile

Fig. 4: Cover screws replaced in fixture in A region

Fig. 5: Final cement-retained prosthesis in place

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 (Figs 3A and 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. After obtaining the patients concent, the cover screw of the fixture placed in A region was placed back and the soft tissue was closed (Fig. 4). The

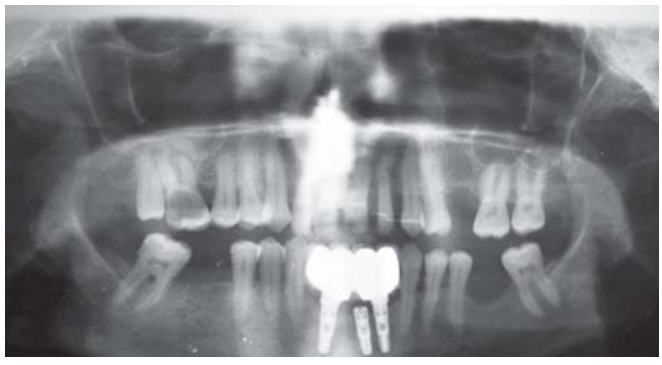

Fig. 6: Postoperative OPG with prosthesis cemented after 6 months

copings were tried and PFM fixed prosthesis (cement retained) replacing # 31, 32, 41 and 42 was cemented with zinc oxide noneugenol temporary cement. The patient was reviewed for a week and then the prosthesis was cemented with GIC type-1 cement (Figs 5 and 6). The patient was given the instructions regarding strict maintenance of oral hygine and was kept on regular recall for 6 months, during which no complaints were received.

DISCUSSION

Placing an implant in the wrong location is a frustrating, embarrassing and avoidable complication. 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 location.[3]

Misch Carl E,[4] 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:

1. No cantilever
2. No three adjacent pontics
3. Canine position
4. At least one implant in each edentulous segment of an arch.

In this particular case the guideline 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 augmentation.[5]

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 dimension.[6]

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.

REFERENCES

1. Misch K, Wang HL. Implant surgery complication Implant Dent 2008;17(2):159-68.
2. Helvey GA. Adjunct Associate Professor, Virginia, Parkel online learning center 2010 May, AEGIS Pub.
3. Meitner SW, Tallents RH. Surgical templates for prosthetically guided implant placement. J Prosthet Dent 2004;92:569-74.
4. Misch CE. Contemporary Implant Dentistry (3rd ed). Mosby (Elsevier) 2008:105-27,147-59.
5. Clelland NL, Gilat A. Effect of abutment angulation on stress transfer for an implant. J Prosthet Dent 1992;1:24-28.
6. Goodacre CJ, Bernal G. Clinical complications with implants and implant prostheses. J Prosthet Dent 2003;90:121-32.

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