Scholars Journal of Dental Sciences
Abbreviated Key Title: Sch J Dent Sci
ISSN 2394-4951 (Print) | ISSN 2394-496X (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Prosthetic Management of Malpositioned Implant in RPD Case Report

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DOI: 10.36347/sjds.2024.v11i03.002 | **Received:** 12.03.2024 | **Accepted:** 20.04.2024 | **Published:** 08.05.2024

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Abstract **Case Report**

Removable dentures in classe I KENNEDY APPLEGATE remain an essential prosthetic challenge as support is required from the teeth, the mucosa, and the underlying residual ridges. Dental implants can improve denture retention, stability, and support in distal extension removable partial denture. However, a malpositioned implant can complicate tooth/implant-supported condition. This case report describe a 66-year-old female patient treated with maxillary implant -supported removable partial denture (RPD). Both the implants were placed in first premolar site. However, the implant on the left side presented severe facial inclination. We suggest that the discharge of the prosthetic edge with using a laboratory non retentive nylon Patrice's on the Intaglio of metal housing locator attachment can solve the problem of denture insertion.

Keywords*:* Malpositioned Implants, Removable Partial Denture, Locator.

INTRODUCTION

One of the most common complications in implantology is an error in placing the implant in vestibular position [1]. Such a situation may be encountered especially in low density maxilla or immediate dental implant placement to optimize the primary stability of the implant by seeking a palatal anchorage. This danger" zones for positioning of dental implants can lead to functional and aesthetic compromise namely the loss of peri-implant soft tissue volume and recession of the peri-implant mucosa and papillae, and may also complicate successful prosthodontic rehabilitation [2]. Apart from site factors, in almost every case, these iatrogenic complications occurred because of an error in judgment by the clinician [3].

Here, in this case, several challenges were encountered while dealing with a vestibular position implant under RPD in term of insertion, connexion of matrice axial attachment and esthetic dilemma. Subsequently, this case report provides a management option for such cases.

CASE REPORT: A 66-year-old housewife with balanced diabetes, who consulted for functional and esthetic rehabilitation.

Clinical Examination

Exo-oral examination revealed bilateral cheek sagging, a long face, equality of facial levels and hyperdivergent profil. Fig 1

The intraoral examination showed: acceptable oral hygiene with presence in the maxillary of a bilateral free-end edentulism and attrition facets in the anterior teeth, the mandibular arch is practically toothed, only the absence of the 36 the right posterior sector was noted, the right posterior sector was restored by a hermetic metal ceramic bridge with abutment teeth 45 and 47. Fig 2,3,4

The examination of the osteo-mucosal surfaces revealed edentulous ridges partially resorbed covered by adherent fibromucosa. Occlusal examination showed maintained DVO. Fig 3,4

Radiographic Examination

Radiographic examination revealed a crown to root ratio (RC/RR), equal to 1 on the maxillary and mandibular anterior teeth with the exception of 46 which RC/RR> 1 also a dysplasia was noticed near to the mesial root 46. In the absence of infectious complications, the course of action is abstention and monitoring. Fig 5

Tomographic Evaluation

A cone beam computerized tomography was indicated in order to select implant sites primary after evaluating the anatomical structures that affect the

implant placement which in this case maxilla sinus, than to asses bone availability by measuring the ridge heights and widths digitally of predetermined implant sites in the maxillary. Referring to the coronal sections from 80 until 85 in the right posterior side, and left coronal slices from 92 to 95, an available bone height was between 11 and 13 mm yet the width of the crest was 7 mm. Fig 6

Treatment

Pre-prosthetic study, removable partial prosthesis was proposed to the patient, who nevertheless wishes to avoid the visibility of metal clasp. Fig 7

For financial reasons which hinder a fixed implant prostheses, a design supported by a combination of two anterior implants and the remaining teeth was accepted by the patient. For low jaw, 36 will be replaced ulteriorly with implant.

To provide stable occlusion, two 4.1 diameter implant with 10 mm in length (ref Mode®4.110) were placed distal to 13 and 23. Fig 8

The prosthetic rehabilitation consisted of a cast metal RPD stabilized by a locator attachment. This proposal has the advantage of avoiding any intervention on the anterior teeth and guarantees effective retention without altering aesthetics.

Instead of the healing abutments, Locator Attachments were used during the initial delivery phase. Fig 9

Prosthetic Achievement

Prosthetic construction begins after 3 months of healing. The dental supporting surfaces are then prepared.

A complete impression of the preparations and the implants' emergence using transfers made with individual trays (made on models from the primary impression) and a medium-viscosity polysulfide Permlastic®. Fig 10

After casting, the metal copings with attachments are validated on the model using silicone keys and then in the mouth. Fig 11

It should be noted that the creation of a corono-cingulate bar is not possible, given the incisor-canine relationships on the cervical third of the palatal side of maxillary anterior crowns and the presence of an interincisal diastema.

To take into account the difference in depressibility of the support structure of the implant - stabilized RPD, we have chosen the stress breakers concept. Fig 12

Subsequently, the metallic stellite will be poured onto the casting before being refined and smoothed then validating in mouth. Fig 13,14

After this step, two occlusion models are fabricated on the working models developed after the treatment of the impression, allowing the registration of the jaw relationship in centric relation and vertical dimension of the occlusion. Fig 15

Later, a tooth mounting on wax is made. Fig 16

After the clinical, esthetic and functional tests and validation of the mounting wax, a key was made with a putty elastomeric to take the reference of the ideal profiles of the prosthetic extrados and anterior teeth. This key allows visualization of the prosthetic space available to incorporate the assembly of the complementary retention system without interfering with the ideal profile and lingual anterior teeth. Implant in site 23 remains in the prosthetic corridor but has a vestibuled position. Fig 17

The removable prosthesis is placed in the mouth. During this step, the intrados of the maxillary prosthesis is recessed in front of the attachments. To assess complete insertion of denture excessive resin recess of the left prosthethic edge must be done that lead unfortunately to exposure of the left the metal housing. Fig 18,19

After that the occlusion is checked and balanced then a restoration impression was made with medium viscosity silicone in occlusion then an over-impression with alginate was taking for relining. Fig 20

In laboratory, a discharge with the plaster next to the case then the prosthetic edge can be relined with auto-polymerizing resin. Fig 21

The spacers are in place and the female parts of the attachments (retaining sheaths in metal housings) are integrated into the prosthetic intrados using chemical curing resin under occlusal. Fig 22

In order to optimize the aesthetic, clasps were grinded to the shoulders' and relined with resin Fig 23,24,25

Fig. 1: Patient Front View

Fig. 2: Initial clinical situation

Fig. 3: Right view

Fig. 4: Left view

Fig. 5: Panoramic Radiography

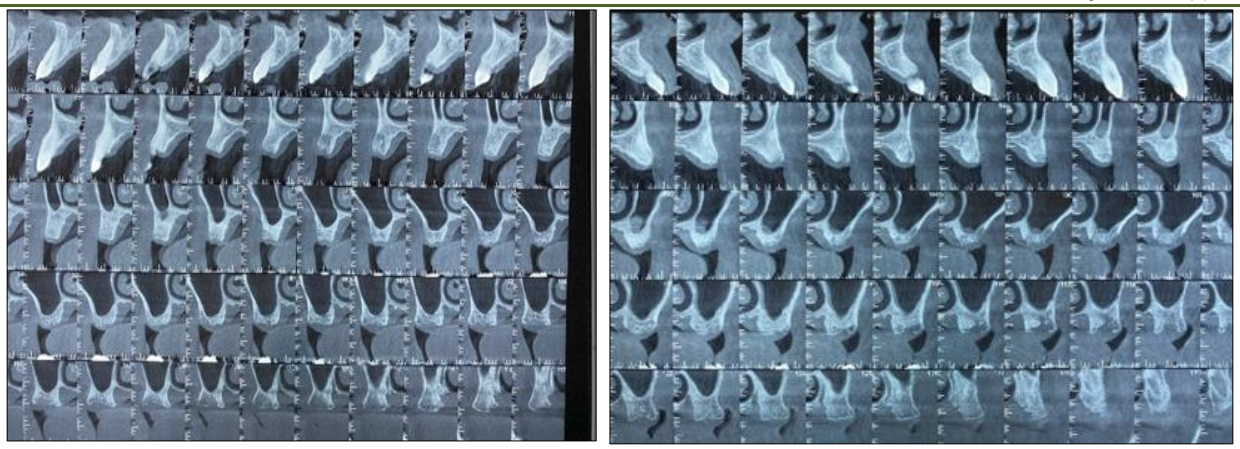

Fig. 6: Cone beam computerized tomography

Fig. 7: Pre-prosthetic study

Fig. 8: Placement of 2 implants MODE® (4.1 Ø L 10) site 14 and 24

Fig. 9: Placement of Locator® healing abutments and tightening to 20 N/cm

Fig. 10: Impression of preparations, implants' position and surfaces of bone and mucosa

Fig. 11: Evaluation of the available vertical prosthetic space using silicone key

Fig. 12: The prosthetic project materialized by a pattern of the metal frame

Fig. 13: The saddles must be at a distance from the emergence of the implants to provide space dedicated to the connexon of the boxes

Fig. 14: Try-in of the maxillary frame

Fig. 15: Bite registration

Fig. 16: Denture wax try-in

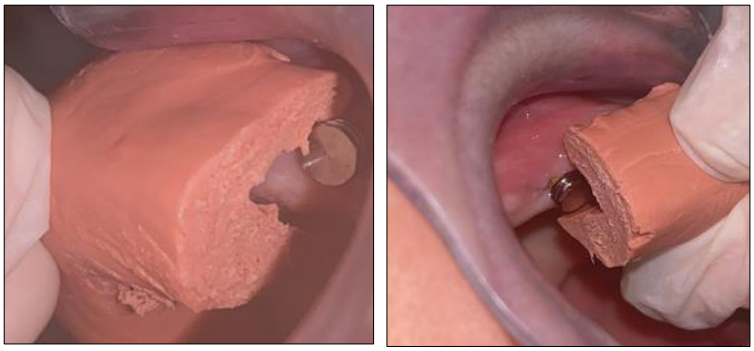

Fig. 17: Vestibuled position of Implant in site 23, central position of implant in site 13

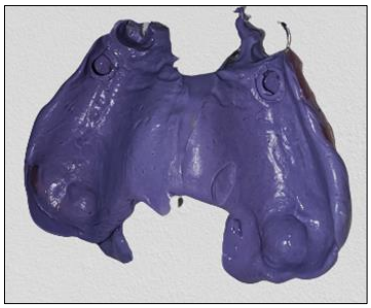

Fig. 18: Emptying interior surface base: use of a light silicone to specify areas that interfere with the Locator®'s box

Fig. 19: Exposure of the left the metal housing after excessive resin recess

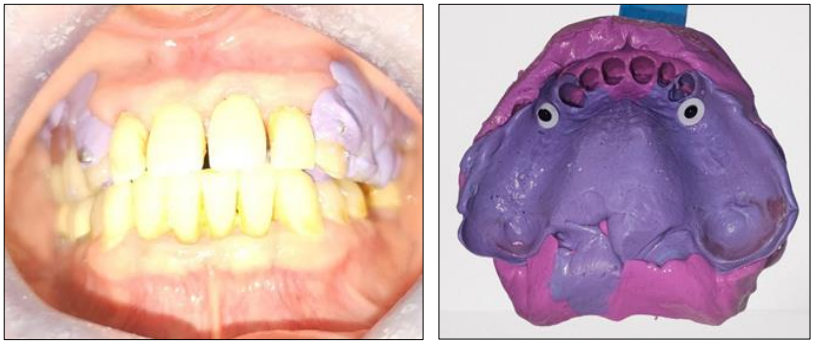

Fig. 20: Restoration impression with medium viscosity silicone in occlusion then over-impression with alginate for relining

Fig. 21: Discharge with the plaster next to the case then casting the impression

Fig. 22: Relining the prosthetic edge with auto-polymerizing resin

Fig. 23: Connexon of the Patrice (black retention sheath) to the removable prosthesis under occlusion

Fig. 24: Removal of clasps

Fig. 25: Improved aesthetic appearance after grinding the clasp's shoulder and relining with resin

DISCUSSION

This present case report shows the importance of correct implant position under implant -stabilized RPD to avoid problems related to the lack of insertion, esthetic and retention problems. The standard Locator may be a solution to manage an implant disparallelism up to 40°. Unfortunately, in this report, this attachement interfered with the margin of denture preventing the insertion.

In literature, several options were proposed to solve such incorrect implant placement.

A recent cylindric attatchement named Locator R-Tx brings significant new features especially on an aesthetic level due to his pink color. It allows an angulation up to 60° between two implants thanks to his dual engaging geometry of the Abutment. A dual retentive surfaces on the exterior of the patrice with a coronanl central cavity enhances vertical and rotational movement. This geometry allows the patient to more easily align and properly seat the overdenture [4].

Qin Yue, DDS and col. suggested a prefabricated angulated abutments system (Novaloc) and polyetheretherketone (PEEK) inserts to thwart divergent implants under removable prothesis.

This anguled attachement is available for major implant systems. This overdenture needs indirect laboratory processing and authorize one path insertion [5].

Another alternative to manage angulated implants is the directional rings placed in inclined 7.5º in all directions ball attachment type SPHERO FLEX® or SPHERO BLOCK s by Rhein83 in case of straight ball abutment.

This nylon opened sleeves give the retentive caps the best possible parallel position and achieve a passive fit for the final prosthesis. This solution prevent the premature wear of the caps and additional trauma to the implant. The resilience can also be controlled due to the assortment of available retentive caps.

The directional ring is chosen on the basis of the position of the implant. When the implants are parallel, the 0º ring is used. For implants that have greater divergence, a 7° or 14° ring can be used. The directional ring must be placed onto the hex of the attachment with the flat side down. In order to assure a correctly aligned retentive caps inside of the final prosthesis, retentive cap must be placed onto the sphere and the DIRECTIONAL RING must be rotated until the cap is parallel with the other caps and are in the same horizontal plane [6].

CONCLUSION

This will involve thinking from a clinical case presented, of different solutions to passive fitting a denture under mispositioned implant.

Otherwise when divergence implants are too extreme the removal of the implant is required.

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