

## A Multidisciplinary Approach to Full Mouth Rehabilitation and Solving the Dilemma of Wriggling Dentures- A Case Report

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### Abstract:

A successful management of full mouth rehabilitation demands a multi-disciplinary approach for its long lasting success. The present case report is intended to give an insight into the use of multiple treatment modalities to achieve a balanced, efficient and biomechanically successful prosthodontic treatment with acceptable aesthetics. Treatment of a maxillary and mandibular bilateral distal free end edentulous arch along with upper and lower anterior teeth requires plenty of contemporary and conventional prosthodontic treatment modalities. Management of distal extension situation provides complexity of biomechanical problems due to the three dimensional movements of the distal extension denture. A distal most implant can convert a distal extension RPD from a tooth and tissue supported prosthesis to a tooth and implant supported prosthesis which provides a definite stop thus enhancing the retention and stability of the prosthesis, eliminating the problems often associated with a tooth and tissue supported distal extension RPD.

**Key Words:** Cast partial dentures, implant, PFM, post & core

### Introduction

Creating a beautiful smile with desirable functional efficiency for a patient is extremely rewarding for any clinicians for which a proper balance between realistic and unrealistic expectation of the patient and biomechanically variable prosthodontic treatment has to be given or rendered.<sup>1</sup>

Clinical reports proved that successful mouth rehabilitation demands a multidisciplinary approach for its long lasting success.<sup>2</sup> In the past well documented longitudinal reports have proved that a full mouth rehabilitation with implants in partially edentulous patient serving as abutment has helped in limiting the movement of removable partial denture which otherwise could exert damaging forces on supporting structures.<sup>3</sup> The limitation with implant therapy is mostly encountered in maxillary arch because of anatomical limitations, where in use of extra coronal precision attachment, limits the movement of cast partial denture, improves retention and support.<sup>4</sup> Crown lengthening procedure is often done in correlation with other fixed prosthodontic treatment to improve the prosthetic forecast of the tooth. if a tooth because of its relative lack of solid tooth structure requires post and core, thus the endodontic treatment to allow a ferule effect in respect to that tooth, sufficient vertical height of tooth structure, that will be grasped by the crown, is necessary to allow ferule effect, which reduces the incidence of fracture of tooth.<sup>5</sup>

### Case Report

A 50 year old female patient reported to the Department of Prosthodontics, Navodaya Dental College, and Raichur with a complaint of difficulty in eating and poor appearance of existing upper and lower front fixed dental restoration (Figure 1). A brief medical history was recorded and it was confirmed that the patient was not



Figure 1: Preoperative.

under any medical supervision.

After clinical examination and definitive radiological examination a comprehensive treatment plan was formulated. The same was explained to the patient in detail along with duration of the treatment and anticipated outcome of the treatment. After a thorough oral prophylactic procedure, diagnostic impressions were made and casts obtained diagnostic mounting was done on a semi adjustable articulator at an established vertical height.



**Figure 2:** Crown Lengthening Post and Core, Tooth Preparation.



**Figure 3:** Temporisation.



**Figure 4:** Opgafter Implant Placement.

Periodontally compromised 16, 35 were surgically extracted. The remaining upper and lower teeth were endodontically treated. After due observation to facilitate the crown retention a crown lengthening procedure was carried out for all endodontically treated teeth and they were prepared to receive threaded metal post of desired

length and crown build up was done with resin based core build up material (Figure 2).<sup>1</sup> The appropriate shade was selected and biomechanical preparation of the teeth was done. The final impression in relation to upper and lower arches was made with addition silicone elastomeric impression material followed by temporisation (Figure 3). The upper posterior bilateral edentulous space was restored with a distal extension cast partial denture retained by precision attachments. Open horse shoe major



**Figure 5:** Ball Abutments in Lower Molar Region.



**Figure 6:** Upper Cpd.



**Figure 7:** Nylon Housings in Upper Cpd.

connector was designed for the maxillary arch keeping in mind the patient's complaint of gag reflex. The two extra coronal precision attachments were placed bilaterally distal to the second premolars (Figure 6 and 7). The lower posterior bilateral edentulous space was restored with an implant retained distal extension cast partial denture, a



**Figure 8:** Nylon Housing in Lower Cpd.



**Figure 9:** Lower Cpd.

conventional two phase implant therapy was carried out (Figure 9). Two implants of sizes 4mmx10mm were placed in mandibular second molar region under local anesthesia (Figure 4). The type of major connector designed was lingual plate. Rests and seats were incorporated on the fixed partial denture. An interim prosthesis was fabricated in relation to the mandibular arch once the implant placement was done. After twelve weeks patient was once again and two ball abutments were screwed on to the implants (Figure 5) and the corresponding female counter part (Figure 8) was incorporated into the cast partial denture. The patient was scheduled for a follow up after two weeks and it was noted that the patient was satisfied with the comfort, aesthetics, biting efficiency and with the prosthesis, (Figure 10).

#### **Discussion**

This article will discuss a multidisciplinary full mouth reconstruction case involving crown lengthening procedure, post and core restorations, crowns, splinted crowns, bridges, cast partial dentures, precision attachments and implant supported removable partial denture prosthesis. By the end of the article, the reader



**Figure 10:** Post Operative.

should be well aware of the restorative outcome of the treatment both functionally and aesthetically.

The removable partial denture option remains an essential prosthetic consideration in many oral conditions, The distal extension removable denture presents a number of design and maintenance challenges.<sup>6</sup> Distal extension removable partial dentures are complex because of the teeth and mucous support, requiring better load distribution for both tissues to avoid vertical, horizontal and torsional forces that may have adverse effects.<sup>7</sup> A functional and physiologically comfortable prosthesis can be achieved by limiting the movement of distal end of removable partial denture by supporting it with an implant, which has been well documented in the literature. For better load distributions in distal extension measures like the use of functional reline impressions,<sup>8</sup> design considerations like RPI systems are recommended. The use of distal implants to support and retain removable partial dentures has been reported in the literature, to minimize dislodgement, improve aesthetics and mastication, leading to satisfaction of the patient, also because the process is cost-effective. Cobalt-chromium (Co-Cr) alloy is the material of choice to construct removable partial denture frameworks because of its low cost, corrosion resistance, high micro hardness, modulus of elasticity and low density.<sup>9</sup> Several studies have reviewed stress distribution of distal extension removable partial denture associated with implants in different positions of alveolar residual ridge varying implant dimensions and attachment systems. Nevertheless, the retention of conventional and implant associated removable partial dentures, which is important to minimize dislodgement, resulting in improved mastication and patient satisfaction was not evaluated yet. The null hypothesis was that the association of an implant in residual alveolar ridge with

removable partial dentures improves retention and stress distribution. The main objective of placing implant in the posterior region is to stabilize the removable partial denture and provide additional retention, reduce the residual ridge resorption. A tooth and tissue supported prosthesis could be changed to implant supported prosthesis.<sup>10</sup> Posterior occlusion in tissue supported distal extension is unstable but with implant supported at distal region, a stable bilateral occlusal contact is established. Keltjens et al.<sup>11</sup> also stated that the fitting of implants under the distal extension of the base of the removable partial dentures results in better occlusal stability. Two clinical cases were reported combining the use of implants with removable partial dentures providing occlusal stability and comfort to the patient. Planning of the oral rehabilitation of partially edentulate arches with free ends, it is noted that, compared with the other treatment options the removable partial dentures supported and retained by distal implants, provides adequate retention, stability and support which provides comfort, allowing the patient to perform the functions of the stomatognathic system. It is also found that, when compared with the denture fixed on top of implants, the removable partial denture and implant combination is less expensive, with a shorter treatment time and there is the possibility of fitting shorter implants, since there will be no lever arm in the crown portion.<sup>12</sup> Kuzmanovic and colleagues treated a 66-year-old partially edentulous patient with an implant-supported RPD. In this patient, the mandibular premolars and molars were missing on both sides, and the anterior teeth were worn. They placed bilateral single molar implants to eliminate displacement of the distal extensions, a common problem with conventional RPDs. At the 2-year recall appointment, no prosthodontic maintenance was needed, except for simple activation of the gold matrices of the mandibular RPD to re-establish retention on the patrices.<sup>13</sup> Brudvik reported that when the implants are connected with other attachments, including conventional clasping on the other teeth (or precision crowns), lateral stability and retention could be enhanced. Extracoronal attachments such as an O-ring should be utilized when a single implant abutment is used on an RPD.<sup>14</sup>

### Conclusion

Benefits of implant supported RPD have been well documented, this clinical case demonstrates fabrication of a cast partial denture with an implant as anchorage in the

distal extension. The goal of restoring the partially edentulous patient with cast partial denture is to improve the masticatory function, establish stable posterior occlusion with established vertical dimension.

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