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Cast Partial Denture: A Preferred Choice of the Patient over Acrylic Partial and Flexible Denture- A Case Report

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ABSTRACT

An acrylic partial denture is a preferred choice of treatment for partially edentulous individuals because of the low cost and ease of fabrication. But there are lots of disadvantages for it because of its semi-porous nature, low strength, the thickness of the denture base etc. It also results in altered taste sensation, hampered speech and reduced heat perception by the patient. Cast partial denture is a treatment modality which has been proved through ages for treating partially edentulous individuals, but still not practised commonly mainly because of the economic viability and fabrication difficulty. In this case report, the patient is provided with a full acrylic denture, a flexible denture and a cast partial denture and the patient's perception towards the treatment is assessed.

Keywords— cast partial denture, partially edentulous, patient perception, removable prosthesis, comparison of prosthesis

1. INTRODUCTION

Teeth replacement techniques have evolved considerably over the years. Even though completely edentulous individuals have decreased comparatively, the number of partially edentulous individuals has increased, probably because of the worldwide ageing population and oral health-related prevention policies [11]. Prosthetic rehabilitation of the missing teeth includes various prosthetic options like Removable Partial Denture (RPD), a tooth supported fixed partial denture, and implant supported a partial denture or flexible denture. How well these prostheses restore and maintain the functions of natural teeth depends on a large extent on the number and location of the missing teeth [12].

Removable Partial Dentures (RPDs) are a simple method for replacing teeth for patients missing some or all of their natural teeth. From a professional perspective, potential benefits of partial dentures include: a) adjacent and opposing natural teeth are prevented from drifting; b) the burden of occlusal loading on remaining natural teeth is reduced; and, c) oral comfort and function are enhanced.

But the advantages that can be accomplished by the removable prosthesis for replacing the natural teeth are limited, such as non-invasive and low-cost partial dentures when made with the only acrylic, whereas cast partial denture has metallic framework along with metallic denture base or acrylic resin denture base. Full acrylic partial dentures have limitations such as an increase in thickness which will hamper the speech, decreased taste sensation, reduced tongue space, absence of heat perception by the patient, bulkiness and heaviness of the denture and are prone for fracture at the thinnest area. Whereas the metal bases have several advantages like accuracy, durability, resistance to distortion, inherent cleanliness, reduced weight, and bulk [12, 13]. The high cost of the cast partial denture is an important barrier in limiting its supply, leaving the patients with tissue supported all acrylic partial dentures for prosthetic rehabilitation. Eventually, these patient returns with complaints of denture loosening, movement of the denture during mastication, unnatural feeling and even degradation of the periodontal condition of the remaining teeth such as gingival recession and mobility. This case report describes the advantage of a cast partial denture over an acrylic partial denture and flexible partial denture as perceived by the patient.

2. CASE REPORT

A 46-year-old female patient reported to the Dept of Prosthodontics, JSS dental college and hospital with the chief complaint of missing teeth in the upper front and right back side. On clinical examination teeth missing were identified as 11, 24, 25,26,36,46 and root stump in relation to 12. The patient had poor tissue quality and bony undercuts intraorally. After thorough intraoral examination, she was presented with various treatment modalities for prosthetic rehabilitation. Patient resolved to go for a flexible

denture for replacing both the upper and lower missing teeth without the extraction of the root stump on 12. The patient was explained about the treatment consequences and informed consent was obtained. Upper and lower impression was made with irreversible hydrocolloid (Algitek, DPI) and poured with dental stone (Kalstone, Kalabhai). The flexible denture was fabricated and delivered to the patient. The patient was unhappy with the upper and lower denture because of its tight fit and because of the patient's poor tissue quality (Class II) and there were several sore spots intraorally during the subsequent recalls. The patient was unsatisfied with the prosthesis and requested for a refabrication of the same. At this stage, the patient was advised to extract the root stump and to go for a transitional partial denture till the complete healing of soft and hard tissue. The patient was recalled after 4 months post insertion of the acrylic RPD for the fabrication of a cast partial denture and enquired about the experience with the acrylic denture for which the satisfaction level was average due to inadequate retention, the bulkiness of the prosthesis, altered taste sensation and speaking difficulty.

Maxillary and mandibular impression was made using irreversible hydrocolloid (Algitek, DPI) and poured with dental stone (kalstone, Kalabhai). The casts were surveyed using a Ney surveyor (figure 3) to delineate soft tissue and hard tissue undercuts, to determine the path of insertion and removal of the CPD and to determine the position of direct & indirect retainer. CPD metal frame work designing was done on the working cast and transferred the same on to the teeth of the patient. Mouth preparation includes rest seat preparation on 17, 26 and 23. Depth orientation of the rest was done with round bur, margins were prepared with a straight fissure and the floor with an inverted cone bur. The indirect retainer was given on 13 and direct retainers included two circumferential clasps on 17 and 26 and an RPI system on 23.

A definitive cast made of die stone (kalrock, Kalabhai) was made and surveyed. Refractory casts were made and the wax pattern was fabricated on it. The frame work was cast and evaluated intraorally and adjusted wherever needed. Maxillomandibular relation was established (figure 6); acrylic teeth were arranged (figure 7), and try in was done. Being satisfied with the esthetic and functional requirements, the denture was processed in heat cure acrylic resin. Intraorally it was checked for passivity and high points. After finishing and polishing (figure 8), the denture was inserted (figure 8) and post insertion instructions were given. The patient was not experiencing any difficulty at the time of insertion. The patient was summoned 2 days later for review and asked about her experience with the new prosthesis.

The patient was satisfied with the esthetics, retention and thickness of the denture. Absence of palatal coverage for the CPD helps her to taste her food properly compared to the acrylic denture and her voice also became clear because of the absence of palatal coverage in CPD. She experience increased stability and retention of CPD compared to the acrylic partial denture.

3. DISCUSSION

Use of Cast Partial Denture (CPD) has been proved to be an effective method to replace missing teeth. The use of CPD not only will increase the stability and retention of the prosthesis but also enhance the patient's confidence. In this present case report, the patient had undergone prosthetic rehabilitation with a flexible denture, full acrylic partial denture and CPD of which the patient expressed the most satisfaction with the cast partial denture. The use of CPD not only enhanced the patient's confidence but also improved her speech, taste sensation and heat perception. Even with the advent of newer techniques, the conventional method of replacing missing teeth in partially edentulous individuals is advantageous for the patients when properly diagnosed and executed. Mahilan et al have described the use of a bar connecting the natural teeth with attachment studs which will facilitate the insertion of a fixed removable prosthesis^[1] but in this case, it could not be applied because the patient did not want any unnecessary tooth reduction for taking support. Sheriff et al reported a similar case where the author has used a single strap as a maxillary major connector in Kennedy's class 3 mode 1^[2]. But in this case, double palatal strap has been given to enhance making use of the quadrilateral design and L beam effect. Ali Afzal Khan et al reported an increase in esthetics and masticatory efficiency following treatment with CPD to replace missing teeth in a partially edentulous individual^[3].

Gad M M suggested that circle configuration ("L-beam" effect) would improve the connector rigidity because the straps are in 2 different planes and therefore it favors usage for the most maxillary partially edentulous situation. This was confirmed by studies, in which the A-P palatal strap had the highest rigidity and also showed the least deformation^[4]. Shresta S et al used Round-Rest, Distal Depression Clasp (RRDD Clasp) in Kennedy's class 3 case where esthetics is of high demand. The RRDD clasp assembly is technically demanding for both the clinician as well as the lab technician. A thorough understanding of the clasp functions and a good mouth preparation are mandatory on the clinician's part, while a meticulous work is required by the lab technician^[5]. In the current scenario, the patient has a moderate smile line so I bar doesn't compromise the aesthetics.

Vivienne reported that acrylic denture could be used over CPD when socioeconomic status is taken into consideration and when the proper maintenance of the acrylic denture is maintained. She insists on the harmonious design of the acrylic framework to cope for the increased rate of fracture and proper maintenance for the increase in plaque accumulation due to its porous nature^[6]. Allen and Finbarr indicate their belief that cobalt-chromium based dentures have a longer prognosis than acrylic dentures. Patients' attitudes are considered influential in the success of RPD provision, and their influence on appearance is considered the most important factor influencing success. The most important factors influencing failure are: the patient not requesting a denture, RPD restoring unbounded saddles and lower RPDs.

Rajul et al suggested the use of clasp-type removable partial dentures whenever practical because of their lower cost, ease of fabrication and maintenance, and the predictability of results^[8]. Suwal et al stated that with adequate maintenance of oral and denture hygiene at a regular interval, cast partial denture provides better results in terms of retention, stability, masticatory efficiency, comfort and periodontal health of abutment. So it can be concluded to serve as a better prosthesis functionally and biologically^[9]. Implants for replacing the missing teeth were not acceptable for the patient because of the surgical protocol and FPD was not considered because of inadequate support from the abutment teeth.

Krall and others investigated to state that the presence of removable partial denture is important for nutritional intake and the replacement of missing teeth could help people maintain a healthy diet ^[10].

4. CONCLUSION

CPD is an effective method of replacing missing teeth in partially edentulous individuals when the condition is properly diagnosed and hard and soft tissue contours are delineated. It would provide sufficient esthetics with the patient desire along with improvement in retention, function, speech, taste sensation and heat perception.

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