



CASE STUDY

NOVEL DIE PIN CHEEK PLUMPER ATTACHMENT- AN INNOVATION TO ENHANCE FACIAL ESTHETICS IN COMPLETELY EDENTULOUS PATIENTS

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ABSTRACT

Aim: This article describes the noninvasive treatment alternative to enhance the appearance by detachable cheek plumpers used with the conventional complete dentures, using different attachments (push buttons and double die pins).

Background: In the era of increasing demand for esthetics, the role of complete denture is not limited to the functional efficacy. So much attention is given to the lip fullness for the complete denture patients. Similarly slumped tissues in the cheeks should also be an area of concern and be included in the treatment planning.

Case Description: Two patients with slumped cheeks sought a denture with esthetic rehabilitation. For first patient, cheek plumper was attached to denture with a push button and for the other, die pin attachments were used.

Conclusion: In some cases teeth and the denture base satisfactorily restores the anatomical contour of the soft tissues but in severely slumped cheeks some additional bulk on the denture is necessary.

Clinical Significance: Sunken cheeks can add years to the person's age. Sag or collapse of the patient's features can negatively impact the self-confidence, social interactions and personal relationships of the patient. Surgical corrections for this disfigurement are not readily acceptable to all the patients because of the cost, discomfort, and certain systemic limitations.

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INTRODUCTION

Reconstruction of the normal anatomy is the goal of any esthetic or restorative treatment. Prosthodontics no longer confines to mere replacement of missing teeth. Along with the replacement of missing teeth, comes the various challenges of restoration of the masticatory function, speech and providing the support to the lips and cheeks as well. If the lips and cheeks are unsupported, muscles become weak and do not function properly which leads to wrinkling of skin and sagging of lips and cheeks that can add years to a person's age and hence have a detrimental psychological effect on the patient professional and social life. (Bains and Elia, 1994) The volume of the buccal fat pad may change physiologically or pathologically throughout a person's life. The exemplary image of an elderly individual usually includes empty mouth and exaggerated nose along with sunken cheeks. (Zwetchkenbaum and Shay, 1997) For the cases in which the dentures are insufficient in providing

the pleasing esthetics, certain other measures need to be taken to enhance the slumped cheeks. Cheek plumper is a commonly used prosthesis to enhance the support of sunken cheeks providing better esthetics.

Case descriptions

The article gives a report of two cases treated at JSS Dental College and Hospital, A Constituent College of Jagadguru Sri Shivarathreeswara University, Mysuru, Karnataka. Attachments used are push-buttons and double die pins respectively.

Case 1

A 44 year old male patient reported to the Department of Prosthodontics in with the chief complaint of missing teeth and sought replacement due to unaesthetic appearance (Figure 1). His teeth were extracted over a period of three years due to mobility. He was edentulous since two years. On examination one of the major finding was poor esthetics, unsupported oral

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musculature and slumped cheeks. The patient needed complete dentures with some form of cheek support. Based on patient's needs a treatment plan was formulated. It was decided to give patient upper and lower complete dentures with detachable cheek plumpers for the maxillary denture. At the try-in stage, cheek plumper was made in wax as separate portions on the buccal surface of the complete trial denture. They were superficially attached to the buccal surfaces on the right and left side and tried in the mouth to determine the amount of desired cheek support appropriate for comfort. A thin layer of Vaseline was applied on buccal flange of maxillary trial denture over which wax was adapted from premolar to molar region. The change in the appearance with and without wax-up cheek plumper was evident and was readily accepted. They were designed according to the available space intraorally necessary to enhance the appearance and thickness which did not interfere with functional movement. The plumpers and dentures were separately acrylized in conventional way. The finished and polished dentures were tried in the mouth. Press buttons were used as a mode of attachment of cheek plumpers to the maxillary complete denture (Figure 2). Female part of the press button was attached on the buccal surface of the denture and the male portion, were oriented to the attached female portion and attached to the inner surface of the cheek plumper, with self cure resin. The change is esthetics was readily accepted by the patient (Figure 3)

Case 2

A 30 year old female patient with Parkinsons disease, conscious of her appearance with a history of missing maxillary teeth reported for complete denture prosthesis (Figure 4). The Patient had lost her teeth over a period of 2 years due to mobility and decay. She had been edentulous since 1 year. Extraoral examination revealed evident sunken cheeks. On intraoral examination, completely edentulous maxillary arch was noted. The maxillary ridge was firm but had reduced in size due to resorption. The mandibular teeth were malposed, tipped, and supraerupted, hence, the occlusion was far from harmonious and balanced. As the patient lost her teeth at such a young age, her main concern was esthetics. The patient and her father in particular complained about her sunken cheeks, making her appear much older, contrary to her actual age. The psychological stress due to embarrassing appearance prevented the patient from attending social gatherings, resulting in an isolated life. Keeping patient's demand in mind a proper diagnosis and Treatment plan was prepared. Some amount of discrepancy was noted on the occlusal plane. The mandibular teeth which caused interferences were modified grinding them on the cast till good intercuspation and acceptable occlusion of the denture was achieved. During the maxillary denture try in appointment, cheek plumpers were made as a separate portion in wax. These distobuccal flange of the trial dentures were

Case I



Figure 1. Pre op



Figure 2. Push button attachment on denture



Figure 3. Post op

Case II



Figure 4. Pre op



Figure 5. One end of the plumper on which stem of the pin has to be attached filled with autopolymerizing resin, and oriented



Figure 6. Plumpers attached to denture



Figure 7. Post op

coated with a thin layer of petroleum jelly to facilitate the removal of the plumper for processing. These plumpers were located at between the second premolar and first molar regions of the maxillary denture flange. The amount of desired cheek support, function and aesthetics was checked during the try in stage. The maxillary denture and the cheek plumpers were fabricated with heat-cure acrylic resin separately. After finishing and polishing, slots were made in the buccal surface of the denture for sleeves and the attachment surfaces of the plumpers were also trimmed to make space for the die pins. Trimming away of the denture and plumpers also reduced the weight of the dentures which compensated for the added weight of the die pins. Double die pins were placed on the plumpers and the sleeves for the pins were placed in the denture base. The angulations and locations of the die pins and their sleeves were evaluated so that there be no discrepancy and the double die pins could easily seat into their respective sleeves. After conforming the location sleeves were sealed with autopolymerizing resin on the denture base. Holes of the sleeves were blocked with wax to prevent the flow of the acrylic resin into the sleeves. Autopolymerizing resin was allowed to set properly. The die pins were inserted into the sleeves, then little acrylic resin in dough stage was carefully kept on the little shaft of the pins and covered by the plumper (Figure 5). The resin was not allowed to flow beyond the shaft of the die pins for proper insertion and removal of the pins from the sleeves. After the resin had set, the plumper could easily be removed. Trimming, polishing of the irregular surfaces was done and the prosthesis was delivered (Figure 6). Patient was instructed on the use of plumpers and dentures were delivered after evaluating them for fit and aesthetics (Figure 7). On the recall of 48 hours patient did not possess any problems with speech or mastication.

DISCUSSION

Loss of teeth, a part of normal aging can be restored along with few modifications to enhance the lifestyle and dental care of the elderly. With increasing age, treatment modalities become increasingly challenging. In addition to positioning of teeth for lip support, excellent denture esthetics can be achieved by providing additional support to the slumped tissues. Cheek plumpers are basically for supporting and plumping the cheek to provide a youthful appearance. It is especially useful in young patients who have lost all their teeth and part of the maxillary bone as a result of a traumatic injury. However, it can also be used in patients who have an unusually excessive slumping of the cheeks as a result of teeth loss. (Larzen *et al.*, 1976; Lazzari, 1955; Keni *et al.*, 2012) To overcome the disadvantages of conventional cheek plumper, detachable

cheek plumpers are now in use that have advantages of reduction in weight, easily insertion & removal, prevent muscle fatigue, cleaning and allow patient to wear only denture without cheek plumper. Magnetic retention for hollow cheek patients is advantageous due to its small compact size and strong attractive forces; however, over a period of time the magnets used intraorally require replacement once every 6 months due to lack of long-term durability in oral conditions. (Riley *et al.*, 1999) Also, magnets are expensive. Customized abutments are laborious, lengthy and costly procedures. So a feasible treatment option needs to be introduced. Plastic blocks (lego) might not be stable in the diverse environment of the oral cavity.

This article has described 2 simple, effective and noninvasive treatment alternatives to improve facial appearance in a patient with hollow cheeks. The alternative options such as push buttons and die pin were tried to improve the patient's facial appearance. The die pin retained cheek plumper prosthesis successfully restored the contour of the cheek, improved the esthetics and psychological well being of the patient. Double die pin retained detachable cheek plumper simplifies the procedure and helps the patient to attach or detach the cheek plumpers as per their convenience. A lost smile and enthusiasm for life was thus restored.

Advantages of press button retained cheek plumpers (Rupal J. Shah *et al.*, 2014)

- Small & light weight
- Snug fit
- Inexpensive

Disadvantages of press button retained cheek plumpers (Rupal J. Shah *et al.*, 2014)

- Poor corrosion resistance
- Food lodgments
- If only one button is used to attach the plumper, rotation of the plumpers can occur while function. Therefore two push buttons in each plumper are preferred for better stability.

Advantages of Die pin retained cheek plumpers

- Precise fit
- No rotation or movement while function or insertion/removal of prosthesis
- Good strength

- Corrosion not reported
- Can be used in patients with compromised dexterity.

Conclusion

This case report describes a simple, effective and non-invasive treatment alternative to enhance the facial esthetics of patients with sunken cheeks by a cheek plumper attached on a pre-existing denture by different means (push buttons & double die pins) for patients having excessively slumped cheeks. An effort was made to improve patient's appearance by providing better support to the cheeks. Both these methods were effective with good patient compliance. Due to early corrosion of the buttons the longevity of the buttons is questionable. The use of die pins in the present case report demonstrates a paradigm shift from the conventional methods. This prosthesis provides excellent esthetics and stability during various functional movements & boost the self esteem of the patient by improving their appearances. This innovative approach aids in achieving overall well being of the patient.

Clinical significance

Cheek plumpers or cheek lifting appliances have been used previously for the purpose of improving aesthetics and psychological profile in patients. (Larzen et al., 1976; Lazzari, 1955) The construction of single piece prosthesis may cause the discomfort for the patient. To overcome this flaw a detachable plumper prosthesis can be used; where plumper can be detached easily and conveniently from the complete denture. Magnets, soft liners, wires, and customized attachments have been used for fabrication of detachable cheek plumpers but

they all have disadvantages that prevent their regular uses. The attachments should be cost effective, long acting and should resist rotation or movement of plumpers while function. Keeping these considerations in mind push buttons and die pins were used to attach the cheek plumpers with the denture in the given 2 case reports.

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