

# Restoring Function & Esthetics in a Trauma-HIT Patient : Clinical Report

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## Abstract

The Crown and Sleeve-coping removable telescopic partial denture utilizes the basic concept of an overdenture. While functioning as an overdenture it also serves the therapeutic role of a periodontal splint. It is the best treatment modality in patients with weakened periodontal situation where the main challenge of therapy is to salvage the remaining abutment teeth, the periodontal apparatus and the alveolar bone support. The Crown and Sleeve-coping prosthesis is used as a therapy rather than a mere replacement.

CAD/CAM based zirconia ceramics are popular contemporary ceramics with excellent physical properties, biocompatibility and superior esthetics.

**Key Words-** Crown and Sleeve coping, telescopic denture, CAD/CAM ceramics.

## Introduction

The Crown and Sleeve-coping prosthesis consists of three components: - the sleeve-copings, the secondary crowns and a frame work. The sleeve-copings are cemented individually to the abutment teeth. The secondary crowns are either solder connected or cast to the frame work to which the missing teeth and saddle segments are processed. The secondary crowns 'telescope' or cover the sleeve-copings and serve as removable retainers for the prosthesis. The frame work is a major connector to which the secondary crowns are solder connector or cast. Denture teeth can be attached to the frame work with processed acrylic resin or cemented to the pin receptacles with dental cement.

The zirconium oxide based ceramics are the most popular among the recent ceramics as they possess superior mechanical, biological and esthetic properties. They are based on high technology CAD/CAM techniques eliminating conventional laboratory procedures with their attendant complications and errors. This system produces more precise and life like dental restorations

## Case Report

A 20 years old male reported to the Department of Prosthodontics, Surendera Dental College and Research Institute who had met with an automobile accident a month back. In the accident he lost a few mandibular teeth and had fractured maxillary anterior teeth.

The patient had no other significant medical or dental history. A preliminary examination revealed the following:-

- Ellis Class IV fracture of 11, 12, 13, 21, 22, 23.
- Missing 32, 33, 34 and 36.
- Grade 2 mobility in 31, 41.
- Fractured restoration of 15.

## Treatment Plan

After a thorough diagnostic study, radiographic survey the following treatment was planned:-

- Post and core supported metal-free ceramic crowns for maxillary anterior

teeth. (11, 12, 13, 21, 22, 23)

- Crown and Sleeve-coping prosthesis for mandibular arch.
- Ceramo-metal crown for maxillary right second premolar.

## Clinical Procedure

- Maxillary anterior teeth were endodontically treated and prepared to receive post. Individual patterns were fabricated in blue inlay wax and cast in silver alloy. These post and cores were finished and cemented to the teeth.
- The maxillary anterior teeth were prepared to receive metal free Ceramic crowns and the maxillary right second premolar was prepared to receive ceramo-metal crown.
- The crowns were fabricated in zirconium oxide using CAD/CAM system. They were tried in patient's mouth, glazed then cemented with resin based cement.
- Mandibular central incisors and right first premolar were prepared to receive white metal sleeve-copings. Then provisional crowns were cemented to the prepared mandibular teeth.
- Sleeve-copings were cast, finished and cemented
- Impression for frame work was made in polyvinyl siloxane.
- The frame work and secondary crown-copings were cast in single unit. It was finished, polished and tried in patient's mouth.
- Then porcelain was fired to secondary crown copings
- The missing teeth were replaced by porcelain teeth. These teeth were attached to the frame work by processed acrylic resin
- The final prosthesis was finished and delivered to the patient. The prosthesis was evaluated for function, esthetics and phonetics.

## Discussion

For the restoration of fractured maxillary anterior teeth metal free zirconium based ceramics were used as they provided better esthetic compared to conventional ceramometal crowns. To enhance retention and resistance form in tooth preparation for ceramic crowns, post and cores were fabricated.

A Crown and Sleeve-coping prosthesis was chosen for the patient because of its good retentive and stabilizing properties, rigid splinting action, better stress distribution and less rigid coverage. Patient was not suitable for a mandibular fixed partial denture due to long. Edentulous space and weak primary abutments. Patient would not tolerate a conventional removable partial denture. Implants could not be used due to time and financial constraints.

Instead of fixed abutment crowns and a separate removable partial with various retainers, the crown and sleeve-coping prosthesis is a complete entity. A more physiologic linkage results between the tooth support and the soft tissue support of the

prosthesis thus eliminating mechanical retainers such as clasps, precision attachments and stress breakers with their attendant problems. The other advantages of this prosthesis are:

- It uses abutments with longer crowns exhibiting more frictional retention and greater stability, thus less movement of prosthesis occurs.
- It distributes forces between abutments and mucosa favorably and directs Occlusal forces along the long axis of teeth
- It provides cross arch splinting
- The vertical and centric jaw relations are better preserved with metal/ceramo-metal occlusal/incisal surfaces compared to acrylic denture teeth
- Labial and buccal flanges are absent around abutment teeth thus eliminating contour problems and gingival irritation
- If and when an abutment tooth is lost, it maybe added to the prosthesis with a simple chair side procedure
- By salvaging more teeth and using them as abutments, this prosthesis thereby preserves the alveolar bone and potential denture base tissue for a longer time

## Conclusion

Today's multidisciplinary approach to dental treatment results in the salvaging of a great number of teeth than in the past. Periodontics, endodontics and orthodontics have made possible the use of teeth as abutments for fixed and removable prosthesis that formerly would have been extracted.

By saving the crowns as well as the roots of abutment teeth, the resulting prosthesis replicates the functions of natural teeth. Since the crown and sleeve-coping prosthesis more closely resembles a fixed prosthesis, than a complete denture it improves masticatory efficiency and, in turn, provides the greater psychic satisfaction associated with the retention of natural teeth.

CAD/CAM zirconia system produced more consistent quality and superior marginal fit with life like appearances satisfying the most critical needs of the patients. Extensive studies also have confirmed high fractured resistance and good mechanical properties.

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