

"Prevention Better Than Cure" In Prosthodontics - A Review

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ABSTRACT

The most effective prosthetic prophylaxis could be the prevention of causes leading to tooth extractions. Even the loss of a single tooth might cause dysfunction in the masticatory system. Besides the well-known consequences, like diminished masticatory, phonetic functions and esthetical problems we have to face the consequences related to morphological changes in the dentition leading to difficulties in prosthodontic treatment planning. So, the most important step in prosthodontic prophylaxis is the early replacement of the lost tooth. This review article gives an insight into various preventive prosthodontic measures given by different authors.

Keywords : Prevention; Over Dentures; Gnathological Principles; Traumatic Occlusal Forces.

I. INTRODUCTION

Prosthetic dentistry is one of the fundamental pillars of dentistry. The most effective prosthetic prophylaxis could be the prevention of causes leading to tooth extractions. As a dentist our main aim should be prevention, which not only includes prevention of caries and or periodontal disease but also prevention of residual alveolar bone loss after teeth are extracted. Modern treatment options improve the overall prognosis of the stomatognathic system and the quality of life of the affected patients significantly.¹ Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate future prosthodontic problems and over denture is an important part as the preventive treatment modality.² Preventive prosthodontics refers to prosthodontic practices that help prevention of the factors adversely affecting the orodento-facial tissues and structures including; the tooth supporting structures such as periodontium, alveolar bone, basal bone and surrounding musculo-skeletal structures like muscles of mastication, salivary glands and the tissues in the head and neck region.³

II. METHODS AND MATERIAL

Aims of Preventive Prosthodontics³

Knowledge application for patients education and motivation. Selecting evidenced based management option / prosthetic type and design to maintain

remaining teeth and their supporting tissues in healthy state. Prostheses for preventing, stabilizing and controlling the progression of specific dento-orofacial conditions. Special preventive prostheses for head and neck cancer (HNC) patients including preventive prostheses and radiation stents and carriers.

Goals Of Preventive Prosthodontics^{1,4}

1. To delay the residual ridge resorption,
2. Preservation of remaining structures,
- 3 Maintenance of surrounding structures .

Preventive Prosthodontics should be followed in complete denture fabrication as well as fabrication of partial dentures whether removable or fixed.

Important Considerations Ensuring Preventive Prosthodontics Prophylaxis³

- Assess the need for early prosthodontic replacement of lost tooth / teeth.
- Select treatment in consultation with patient and implement it judiciously.
- Design prostheses not interfering with normal orodental hygiene procedures.
- Act as team leader, guide colleagues & help prevention of future prosthodontic problems.
- Plan to preserve what already exists than replacing what is missing.

- Select appropriate materials and technology for the prosthesis.
- Follow basic gnathological principles in designing occlusal & other surfaces of crowns and pontics.
- Avoid / eliminate traumatic occlusal forces from prosthodontic rehabilitations.

III. RESULTS AND DISCUSSION

Preventive prosthodontics can be dealt under 3 levels¹

PRIMARY LEVEL	SECONDARY LEVEL	TERTIARY LEVEL
Mouth guards Radiation carriers	Occlusal interferences Bruxism TFO Plunger cusp Obstructive sleep apnoea	Immediate denture Over denture Provisional restoration Obturator Single complete denture Implants

For the sake of convenience they can be categorised as follows

REMOVABLE PROSTHODONTICS	FIXED PROSTHODONTICS	MISCELLANEOUS
1. Conventional dentures - diagnosis & treatment planning - Impression procedures - Arrangement of teeth/occlusal scheme 2. Immediate dentures 3. Over dentures 4. Soft liners 5. Costons syndrome 6. Kellys syndrome 7. RPD - Mouth preparation	- Provisional restorations - Resin bonded bridges - Implant supported over dentures	- Obstructive sleep apnoea - Radiation prosthesis - Splints - Nutrition

- Indirect retainers - Philosophy of design - Precision attachments 8. Maxillo facial prosthodontics - Obturators Feeding Palatal - Speech bulb - Palatal lift prosthesis		
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DISCUSSION:

Life expectancy has increased substantially since the beginning of 20th century. The growing population of elderly people has not only increased their medical needs but also the dental needs.¹ The loss of several teeth need not be an immediate threat to the function of whole dentition, but it can initiate serious problems related to oro-facial region and well being of the patient. In this perspective prosthetic dentistry is a valuable tool with high therapeutical and preventive character.⁵ Preventive prosthodontics includes the prevention of the factors which effect dental structures, supporting structures such as periodontium, alveolar bone, basal bone and surrounding musculo-skeletal structures like muscles of mastication, facial expression, TMJ, maxilla and surrounding cranium.⁶

As a rule of thumb every extra minute spent for clinical examination, reduces the time for further steps as well as eliminates the future prosthodontic problems. At the stage of diagnosis and treatment planning only, any pathologic finding, if present, should be diagnosed and the treatment for the same should be planned. The patient should be referred to the concerned doctor for the treatment of underlying pathology before the fabrication of complete denture as the pathology may alter the treatment results. It may alter the final outcome of the denture also. The various pathological findings may be either related to the underlying soft and hard tissues or may be some systematic disease. The treatment involves various Pre-prosthetic surgeries and Ridge extension procedures like frenectomy and vestibuloplasty. The availability of large edentulous area results in wide

dispersion of the occlusal forces and result in less amount of bone resorption. A program of preventive prosthetics must commence with rest registrations of ridge-vault areas. Impressions containing such registrations must be combined with occlusal working units so shaped and placed that the resultant flange inclinations will help seat the dentures during function.⁷

An immediate denture is a tooth appliance available for placement immediately after the final extraction so the patient's ability to eat and speak isn't unduly hampered (also helps preserve their facial appearance). In the mean time, the immediate denture will enable the patient to function in normal manner, as well as provide esthetic appearance.

Over denture therapy envisages essentially a preventive prosthodontic concept since it attempts to conserve the few remaining natural teeth and prevent ridge resorption. There is documented literature available on tooth supported over dentures as one of the means for preventive prosthodontics.⁸ Garg S et al.,⁹ and Garg R and his colleagues⁸ mentioned that tooth supported denture can come under preventive prosthodontics. According to Mohsin AHB et al.,¹⁰ the combination of tooth supported BPS over denture and flexible removable partial denture can also be regarded as preventive prosthodontic care. The presence of a healthy periodontal ligament maintains alveolar ridge morphology. The main objective if this is to distribute stress concentration between retained abutment teeth and denture supporting tissues. Most researchers recognised that over dentures helps reduce the impact of some of the complete denture wearing consequences: residual ridge resorption, loss of occlusal stability, undermined esthetics and compromised masticatory function.

Welker WA and his colleagues¹¹ mentioned that the mucosal coverage of roots come under preventive prosthodontics. Farmer JB¹² discussed factors that contribute to the fracture and failure of the single maxillary denture. Recognition of these factors and their prevention or correction will result in a single maxillary denture that is physiologically and functionally accepted for the patient for an extended period without chronic denture failure.

Arora et al¹³ reported over denture with attachments as a boon to preventive prosthodontics. The use of attachments can redirect occlusal forces away from weak supporting abutments and on to soft tissue, or redirect occlusal forces toward stronger abutments and away from soft tissues. They act as shock absorbers and stress redirectors as well as provide good retention.

Obturator is a prosthesis used to close a congenital or acquired tissue opening primarily of the hard palate and contiguous alveolar tissues. Three types of speech appliances can be used to assist with speech production: A palatal obturator, a palatal lift, and a speech bulb obturator. The palatal obturator is used to close the defects of the hard palate or velum. The palatal lift is used for velopharyngeal (VP) incompetence, and the speech bulb obturator is used for VP insufficiency.¹⁴

After the tooth preparation is done for fixed prosthesis, provisional restoration is advocated to prevent the events like pulpal inflammation, mesial migration, supra eruption and arch integrity, protection of tooth preparation margins (partial veneer crown) and protection of periodontium.¹⁵

Resin bonded or resin retained bridges (RBBs/RRBs) are minimally invasive fixed prostheses which rely on composite resin cements for retention. From a clinician's perspective, the main advantage of RBBs is that, in comparison to conventional bridge preparations, they are conservative of tooth structure. By using a RBB it is possible to provide a fixed replacement for missing teeth which is essentially reversible and does not compromise the abutment tooth.¹⁶

Preventive dentistry is mainly concerned with caries and periodontal disease and little, or no attention is paid to the prevention of alveolar bone loss. Preventive implantology is concerned with the preservation of the alveolar ridge of the (edentulous) jaw. After tooth extraction, the atrophy of edentulous lower jaws can be prevented or delayed by using implants supporting an over denture or a fixed mandibular prosthesis. Studies have shown that mandibular ridge shows a slower resorption pattern when it is loaded by implants supported prosthesis rather than a conventional mucosa supported dentures.¹⁷

The role of dentistry in sleep disorders is becoming more significant, especially in co-managing patients with simple snoring and mild to moderate obstructive sleep apnoea. It is characterized by cessation of airflow through upper airway while diaphragm movement continues. It can cause due to enlarges tonsils, enlarged soft palate, large tongue and retrognathism. This can be taken care by fabrication of prosthetic mandibular advancement appliances like soft palate lifters, tongue retainers, mandibular repositioners, snore guards etc., and surgery to remove portions of the soft palate and uvula.¹⁸

The Maxillofacial Prosthodontists can help in the care of radiation therapy patients beyond the routine dental prophylaxis. Various intraoral prostheses can be fabricated easily and with expertise for each individual patient to help meet difficult problems of delivering high dose radiation therapy to the oral cavity and the paranasal sinus areas. Radiation prosthesis can be classified into three groups: They are: positioning stent, shielding stent, radiation carriers incorporated with radio isotopes.¹⁹

If occlusal interferences are present, the patient tries himself to equilibrate the occlusion and thus develop the habit of clenching or grinding of teeth. Bruxism leads to attrition, mobility, muscle hypertrophy, occlusal facets, alveolar bone loss and TMJ disorders. Symptoms include muscle soreness, fatigue of masticatory muscle early in morning, hypermobility, hypercementosis, cusp fractures, pulpitis break in lamina dura, furcation involvement. Treatment of bruxism involves controlling the psychological stress, occlusal correction, coronoplasty and occlusal splints or intraoral orthoses.²⁰ The mouth guards are indicated to prevent the dental and dentofacial injuries in contact sports. The mouth guards with moderate resiliency absorb the forces, protect the teeth, TMJ and prevent the contact of teeth and thus prevents ankylosis.²¹

Improper nutrition leads to dehydration, cheilosis, xerostomia in older individuals. The modified food pyramid has been advocated according to food act 1994 which includes 8 glasses of water at the bottom line.²²

IV. CONCLUSION

Prevention is an obligation of dentistry as well as critical patient responsibility. Though prosthodontics is a specialised field in replacement of missing teeth and hard and soft tissues, the preventive aspect of prosthodontics cannot be ignored. Different problems can be solved and prevented by systematically executing a preventive prosthodontic practice.

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