

General Systemic Evaluation of Prosthodontic Patients: A Literature Review

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Abstract

Any general systemic disability will question the denture success. Most people of the complete denture age group are likely to have contributing health causes to denture difficulties. Patient's general health status, host resistance and the systemic factors are the main determinants for the prognosis of the denture. This article reviews the available literatures about the various systemic diseases, their impact on the denture success and the possibility of modifying the host state for better tolerance of the denture.

Keywords:

Denture success, prosthodontic patients, systemic evaluation

Introduction

Evaluating the patient for proper diagnosis, prognosis and appropriate treatment plan is the first step in a denture treatment. A significant number of full denture patients are beset with significant impairment in general health.¹The preponderance of older patients seeking dentures demands a systematization of knowledge of their special reactions and needs. Competent treatment depends upon the careful evaluation of all available information, a definitive diagnosis and a realistic treatment plan that offers a favorable diagnosis.²Treating the patient for a denture health service is an extremely complex and challenging procedure that must be altered to meet the technical, anatomical, biological, psychological and instructional needs of the individual. Thus the success of the treatment depends not only on the oral tissues of the patient but also on his overall general health and attitudes

(De Van, 1951).

Some of the common conditions encountered in denture patients:

1. Conditions affecting the treatment methodology:

Any disorder that necessitates the use of the

antibiotic premedication, any use of steroids or anticoagulants and any previous allergic response to medication or dental materials should be evaluated before commencing any prosthodontic treatment.

2. Conditions affecting treatment plan:

Previous radiation therapy, hemorrhaging disorders, extremes of ages and terminal illness might alter or affect the treatment plan.

3. Systemic conditions with oral manifestations:

Periodontitis may be modified by diabetes, menopause, pregnancy or use of anticonvulsant drug. Certain drugs may generate side effects that may mimic temporomandibular disorders or duce salivary flow.

4. Possible risk factors to the dentist and auxiliary personnel:

Patients who are suspected or confirmed carriers of hepatitis-B, AIDS, Syphilis should be carefully treated to reduce the risk to the dentist and auxiliary personnel.

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Discussion

Diabetes Mellitus:

One of the most prevalent and common systemic condition amongst denture wearers is Diabetes Mellitus. It is a complicated metabolic disease characterized by hypo-function or lack of function of the beta cells of the islets of Langerhans in the pancreas, leading to high blood glucose levels and excretion of sugar in the urine.³ Problems associated in a diabetic patient can be periodontal breakdown, abscess formation, xerostomia leading to mucosal abrasion and ulceration, and progression of bone resorption over time.⁴ Some studies have shown an increased incidence of oral candidiasis.^{5, 6} Poorly controlled diabetic patients respond much less favorably, and short-term improvements in periodontal health are frequently followed by regression and by recurrence of disease.⁷ It is generally best to plan dental treatment to occur either before or after periods of peak insulin activity.⁸ The clinician should also be aware of the risk of a hypoglycemic attack. In case of a xerostomia, patient should be encouraged to sip water throughout the day, an ethanol free rinse containing aloe or lanoline, any water-soluble jelly or a saliva substitute containing carboxymethyl cellulose or mammalian mucin can also be given.

Prosthetic Modifications:

Mucostatic technique for the primary impression, wax spacer to cover complete tissue in special trays, use of rubber base material for border molding should be considered. Prosthetic factors such as broad area of tissue coverage, decrease buccolingual width of teeth, setting of the teeth above the ridge, using semi-anatomic or cusp-less teeth, avoidance of incline planes, centralizing the occlusal contacts to increase stability of dentures and providing adequate inter-occlusal distance should be considered. The patient is also instructed to frequently massage the oral tissues and come for frequent check ups as frequent relining can also necessitate the tolerance of the denture.

Cardiovascular disease:

Consult patient's physician. Uncontrolled hypertension should be treated until blood pressure has been lowered. Systolic blood pressure of 160

mm of Hg or more and diastolic blood pressure of 95 mm Hg or more should be considered as hypertension. Non-invasive prosthodontic treatments need not require any alteration in treatment plan however need for antibiotic prophylaxis to minimize the risk of bacterial endocarditis should be considered. Anxiety and pain control protocol should be administered. Use of vasoconstrictor in local anesthetics should be limited to 0.04 mg.⁹ Gingival retraction cord contains approximately 225.⁵ micro gram of racemic epinephrine per inch of cord. Epinephrine is readily absorbed through gingival epithelium that has been distributed by the dental procedure. About 64% to 94% of applied epinephrine is absorbed into the cardiovascular system.¹⁰ Use of epinephrine for gingival retraction, and its use is contraindicated in individuals with a history of cardiovascular disease.¹¹

Diseases of the bone and the joints:

Metabolism of the bone is influenced by the factors such as exercise, genes, hormones, nutrition etc. In osteoporosis there is an accelerated loss of trabecular bone type 1: postmenopausal form, type 2: senile or idiopathic form, can also develop as a consequence of hyperparathyroidism. Every possible measure to minimize rate of residual ridge resorption should be considered while fabricating denture. It has been suggested that the medical treatment of osteoporosis with estrogen supplements will help prevent tooth loss and will delay the atrophy of the mandible and maxillary ridge.¹² In Osteoarthritis; difficult to insert and clean dentures, temporomandibular disorders may be encountered.

Neuromuscular disorders:

Presence of paralysis, disorders of sensation, muscle tone, tremor or wasting, cerebral palsy, facial palsy, stroke, trigeminal neuralgia, multiple sclerosis, epilepsy and Parkinsonism affect various prosthodontic treatment plans. Abnormal facial movements; *Dystonia*: a group of uncommon disease characterized by abnormal movements associated with muscle spasm and are focal or generalized. *Dyskinesia*: abnormal movements of the tongue or facial muscles.

Muscle tone:

determines stability of the denture. House's

classification; *Class 1*: normal tension, tone and placement of the muscle of mastication and facial expression, no degeneration. *Class 2*: normal muscle function but slightly decreased muscle tone. *Class 3*: decreased muscle tone and function; it is usually accompanied with ill-fitting dentures, decreased vertical dimension, decreased biting force, wrinkles in the cheeks and drooping of commissures.

Parkinsonism:

Due to dysphagia and an altered gag reflex, special precautions must be taken to avoid the aspiration of water or materials used during dental procedures. Mandibular tremor results in masticatory difficulties, especially in those with removable appliances.¹³ In patients who suffer with hypersialorrhea, maintaining a dry field in procedures can be difficult.¹⁴ An electric toothbrush can help patients with impaired manual dexterity and other motor disabilities maintain oral hygiene. Endosseous dentoalveolar implants for partially or completely edentulous adults have achieved remarkable success in the past several decades and can be included in the treatment plan of most older persons.^{15,16,17}

Speech: based on the ability of the patient to articulate and co-ordinate it.

Type 1: Normal, patient who are capable of producing an articulated speech with their existing dentures and can easily accommodate to new dentures.

Type 2: Patient, who has impaired articulation or coordination of speech with their existing dentures, requires special attention during anterior teeth arrangement.

Diseases of Skin and Oral tissue:

Pemphigus; treatment becomes necessary before making the dentures, constant use of prosthesis should be discouraged for these patients. Many lesions are attributed to local trauma, denture-irritation, accidental biting, and sharp dental restorative surfaces. Ill-fitting dentures can induce a hyperplastic reaction, leading to the formation of an epulis fissuratum or traumatic hyperkeratosis. Repair of an ill-fitting denture, removal of an epulis fissuratum, and palliative topical medications may be necessary. Nutritional

and hematological deficiencies that are common in older adults can predispose to recurrent ulcers.¹⁸ Presence of removable partial denture are an independent risk factor for developing root surface caries in older adults.¹⁹ The use of fluoride containing dentifrices and rinses can aid in the remineralization of existing decay and in the prevention of new carious lesions.^{20, 21}

Asthma:

Stress reduction protocol. Avoid dental materials that may aggravate or precipitate the attack. Acrylic appliances should be cured prior to insertion and usually a material without methyl methacrylate is preferred. Steroid prophylaxis to the patients who are on long term systemic corticosteroid may be considered. Appointments should preferably be arranged for late morning or later in the day.

Drugs:

Drugs such as anticholinergics, anorectics, antihypertensive, and antihistamines can lead to xerostomia. Patients undergoing irradiation or with Sjogren's syndrome should be managed by salivary stimulation through 5-10 mg of pilocarpine three times a day. Prolonged presence of xerostomia is conducive to greater carious activity and is therefore extremely hostile to the margins of cast metal or ceramic restorations. For denture wearers, denture adhesives and artificial saliva may aid in the retention of the prostheses.

Renal diseases:

Renal osteodystrophy; bone demineralization, loss of trabeculation, total or partial loss of lamina dura, giant cell lesions, metastatic calcifications, tooth mobility are few symptoms presented in geriatric patients. Evaluate for hyper or hypotension. Allow patient to walk or stand tently during long procedures.

Malignancies:

A waiting period; from the radiation therapy to the beginning of the denture construction is advisable in malignancy cases. The tissues having a bronze color and loss of tonicity are not suitable for denture support. Frequent examination of tissue for radionecrosis, comprehensive dental management before, during and after treatment is essential to prevent complications. Importantly,

older edentulous individuals are four times less likely to see a dentist than are dentate individuals,²² and should therefore be targeted for regular annual examinations for head and neck cancer.^{23,24} Patients who have undergone surgery and radiotherapy for oral cancers have been reported to have 5 years survival rates of 90% for oral implants.²⁵

Infectious diseases:

Viral, fungal and bacterial infection should be considered. The most frequent oral fungal infection in older adults is caused by *Candida albicans*.²⁶ The loss of vertical dimension as well as drooling of saliva, creates a moist environment in the labial commissures that also favors yeast infection. In tuberculosis; lesions can occur in soft tissues, supporting bone, tooth extraction sites, tongue and floor of the mouth. In HIV, there is a high susceptibility to dentally induced infections. A neutrophil count of less than 500-750 cells/cu mm requires antibiotic prophylaxis. In all cases proper infection control protocol must be followed.

Allergic reactions

Sign and Symptoms: Oral contact stomatitis, metallic taste, dryness and burning mouth, jaw pain, tiredness, toothache, oral lichen planus. Systemic symptoms: Chronic fatigue syndrome, vertigo, sleep disturbances, headache, depression. It may be best to avoid metal alloys containing transition such as nickel, chromium, cobalt, platinum, or palladium for sensitive patients. Titanium: because of its excellent corrosion resistance and biocompatibility may be an ideal alternative to precious alloys for patient, who require prosthesis and are allergic to other metals.

Summary

The treatment for each individual patient has many similarities but the treatment for each patient must be appropriately altered to meet the specific needs of the individual. Some problems can be eliminated, some can be minimized, and some problems the dentist and the patient must contend with. Intelligent effective treatment will meet the specific needs of the individual patient. However for the total tolerance and the well being of the patient, identifying the needs, modifying the treatment procedure and giving

proper instruction to the patient will improve the overall tolerance of the prostheses.

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