

UNIT NO. 6

HELPING THE SILVER GENERATION SMILE - PART 2

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ABSTRACT

Oral health is an integral component of general health and wellbeing. It is essential even in old age. This article describes the common medical conditions which can influence the oral health of the elderly. Xerostomia (dry mouth) may be the effect of medications. Reduced salivary flow not only increases the risk of dental caries. It also affects complete denture retention and is associated with increased periodontal disease, burning, or soreness of the oral mucosa. Periodontitis is one of the complications of diabetes mellitus. Furthermore, periodontitis may be a risk factor in the development of cardiovascular disease. The oral manifestations of the complications of radiotherapy to the head and neck region are directly related to the dose intensity. Cancer of the mouth and pharynx is among the top 10 most common cancers for both men and women. The initial signs of oral cancer commonly involves a non-healing ulcer with indurated, irregular edges, commonly on the tongue, lip and floor of mouth. Prior to cardiovascular surgery, it would be helpful to refer patients for dental evaluation and clearance, especially if the patients will be on warfarin or other anti-coagulants post-surgery. Removing all foci of dental infection before starting bisphosphonate therapy especially i/v bisphosphonate therapy will reduce the risk of osteonecrosis of the jaw.

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INTRODUCTION

The elderly may be plagued by various medical conditions and these can exert an influence on their oral health. It is useful for general medical practitioners to appreciate such influences and provide their elderly patients with the necessary advice to maintain good oral and general health.

COMMON MEDICAL CONDITIONS WITH ASSOCIATED DENTAL PROBLEMS

The following are common medical conditions with associated dental problems:

- Xerostomia (Dry Mouth).
- Diabetes Mellitus.

- Cardiovascular disease.
- Polypharmacy resulting in xerostomia.
- Radiation therapy in the head and neck region.
- Oral Cancer.
- Antibiotic prophylaxis for invasive dental treatments in
 - Cardiovascular conditions
 - Total Joint Replacements.
- Bisphosphonate therapy and Osteonecrosis.

Xerostomia (Dry Mouth)

Xerostomia was once considered an inevitable consequence of ageing, it is now known that saliva levels remain unchanged in healthy elderly individuals. Instead, the hyposalivation observed in many elders is often a side effect of certain diseases such as Sjorgrens' Syndrome, sarcoidosis, primary biliary cirrhosis and cystic fibrosis; multiple medications and radiation treatment. More than 400 drugs with any sympathomimetic or diuretic activity list xerostomia as a minor or major side effect. Many of such drugs including anticoagulants, antihypertensives, antihistamines, antipsychotics, antidepressants and anticholinergics cause xerostomia.

The General Functions of Saliva

Digestive Functions	Protective Functions
Assists the mastication of food	Provides comfort through lubrication
Forms a bolus and assist in swallowing of the bolus	Hydrates oral mucosa, gingiva and lips
Helps in taste perception	Inhibits adhesion and aggregation of bacteria; contains immunoglobulins
Helps in metabolism of starch	Provides buffering capacity
	Helps speech

Reduced salivary flow not only increases the risk of dental caries, it also affects complete denture retention and is associated with increased periodontal disease, burning, or soreness of the oral mucosa and difficulties in speaking, chewing and swallowing, all of which can adversely affect food selection and lower caloric intake.



Figure 1. A xerostomic patient exhibiting rampant root caries

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The influence of saliva on taste perception has been demonstrated in xerostomic patients who reported alterations in taste and food perception. These alterations can result in decreased interest in eating and resultant nutritional deficiencies or over-seasoning of food, usually with salt. Xerostomia can also lead to candidiasis with patients presenting with mucosal erythema, atrophy of the filiform papillae on the tongue and angular stomatitis (angular cheilitis) at the corners or commissures of the mouth.

Salivation may be promoted by using a stimulant such as chewing gums, diabetic sweets and cholinergic drugs (sialogogues), such as pilocarpine, bethanecol, cevimeline or anetholetrithione. Saliva substitutes are also recommended for patients with reduced or no salivary flow. The pH of unstimulated saliva is around 7.0 but rises rapidly to pH 8.0 and above when the flow rate increases. This increase in flow rate will help to remove food debris and degradation products. The high pH will help to neutralise acids in dental plaque and the high levels of calcium and phosphate will aid the remineralisation of any demineralised enamel.

Diabetes Mellitus

The American Diabetes Association has recognised periodontitis as one of the classic complications of diabetes mellitus (DM). There is a consensus in the literature that a bi-directional relationship exists between DM and periodontal disease – periodontal disease has an adverse effect on the severity of DM and the severity of DM has an adverse effect the severity of periodontitis. New evidence suggests that advanced periodontal disease may interfere with DM control and doctors should be informed about their patients' periodontal status. Good periodontal health decreases general systemic inflammatory markers, decreasing tissue resistance to insulin, hence improving glycemic control.

Cardiovascular Disease

Periodontitis may be a risk factor in the development of cardiovascular disease. The role of inflammation in atherosclerotic events has emerged as an integrative cardiovascular disease factor. Periodontitis is a chronic inflammatory disease which increases the incidence of atherosclerotic events. Moderate to severe periodontitis increase the level of systemic inflammation as measured by hsCRP, chemokines, cytokines and other inflammatory biomarkers. Treatment of moderate to severe periodontitis decreases the level of these systemic inflammatory markers. Also, gram negative bacteria common in periodontal pockets have been found in atheroma. Indirectly, periodontitis and cardiovascular diseases share many common risk factors such as smoking, high serum LDL, and diabetes mellitus. Patients with cardiovascular diseases should have a dental evaluation to screen for periodontitis and vice versa. (Friedwald et al, 2009)².

Radiation Therapy

The oral manifestations of the complications of radiotherapy to the head and neck region are directly related to the dose intensity. The acute reaction is usually mucositis which usually heals completely within 3 weeks after the end of treatment. Longer term complications include xerostomia and osteoradionecrosis (ORN), potentially the most serious. Modern techniques and the use of mucosa-sparing blocks have significantly reduced the risk. The mandible is more prone to ORN as it is compact bone with higher density and poorer vascularity compared to the maxilla.

The initiating factor for ORN is often trauma, such as tooth extraction, or oral infection, or ulceration from dental prostheses. Predisposing factors for ORN include high radiation dose, immunodeficiency and malnutrition. The clinical presentation of ORN is exposed bone of bony sequestrum in an irradiated mouth, with or without external sinuses, pain and pathological fracture.

Treatment involves long-term antibiotics, usually tetracycline and local cleansing. Hyperbaric oxygen is also helpful to increase bone perfusion. Salivary changes are quantitative as well as qualitative (lowering of pH; lowering of buffering capacity; changes in the electrolytes).

Management Of Oral Complications Of Radiotherapy

Complication	Management
Mucositis	Prophylaxis: Amifostine 200mg/m ² /day; Bethamethasone mouthwash 4x daily from the day before radiotherapy, throughout the course
Osteomyelitis	Warm saline or benzydamine or aqueous chlorhexidine chlorhexidine mouthwashes
Xerostomia	Saliva substitutes or artificial saliva e.g., methycellulose or mucin Frequent ice cubes or sips of water Sialogogues e.g., pilocarpine or cevimeline
Osteoradionecrosis	Perform atraumatic extractions under antibiotic cover, with primary wound closure Plan pre-radiotherapy extractions or extractions within 3 months of radiotherapy
Loss of taste	Consider zinc sulphate
Trismus	Jaw-opening exercises 3x daily
Ulcers	Aqueous chlorhexidine or benzydamine mouthwashes 4x daily
Candidiasis	Nystatin suspension 100,000IU/ml mouthwash 4x daily Fluconazole if immunocompromised
Caries	Daily topical fluoride application
Dentine hypersensitivity	Fluoride applications/mouthwash
Periodontal disease	Oral hygiene Aqueous chlorhexidine mouthwash

Oral Cancer

Cancer of the mouth and pharynx is among the top 10 most common cancers for both men and women worldwide. More than 90% of oral cancer is oral squamous cell carcinoma (OSCC) and is seen predominantly in the elderly and in males. By far the most important dietary influence of oral cancer is alcohol. The evidence is extensive and consistent. It is very likely that there are synergistic interactions between alcohol consumption and tobacco (smoking and smokeless) use. Individuals with high exposure to both alcohol and tobacco have a relative risk of 15.6 compared with those who neither smoke nor drink alcohol. However, individual genetic predisposition and impaired ability to metabolise certain carcinogens (aromatic amines in particular) and/or repair DNA damages by mutagens have also been cited as possible aetiological factors. (Scully, 2004)¹.

In Singapore and South Asia, betel nut chewing together with slaked lime, areca nut, spices and tobacco (by the Indians mainly) have been associated with increased risk of developing OSCC, particularly when it is initiated early in life and is used frequently and for prolonged periods. However, with patient education and better awareness, this is gradually reducing with time.

It is important to recognise some precancerous lesions which can progress to OSCC. These precancerous lesions include erythroplakia (the most likely lesion to progress to severe dysplasia or carcinoma); leukoplakia; lichen planus; submucous fibrosis; discoid lupus erythematosus; chronic candidiasis and human papilloma virus etc.

Initial signs of oral cancer commonly involve a non-healing ulcer with indurated, irregular edges, commonly on the tongue, lip and floor of mouth. A high index of suspicion should be aroused, especially if a solitary lesion is present for more than 3 weeks and if it is ulcerated and unaccompanied with pain or discomfort. Other possible forms of pre-cancer clinical presentations include:

- Granular ulcer with fissuring or raised exophytic margins.
- Red lesion (erythroplakia).
- White lesion (leukoplakia).
- A mixture of red and white lesion.
- Non healing extraction socket.
- Cervical lymph node enlargement or fixation.

An incisional biopsy is invariably required for histological confirmation and staging of the tumour. OSCC is now treated largely by surgery and/or radiotherapy to control the primary tumour and metastases in the draining cervical lymph nodes.

The most common oral cancer is carcinoma of the lower lip and it has a far better prognosis than intraoral cancers. The most common intraoral site is the postero-lateral border/ventrum of the tongue and which may or may not involve the floor of the mouth.



Figure 2. Lateral border of tongue is most common intra-oral site for squamous cell carcinoma

Antibiotic Prophylaxis Guidelines

The at-risk patients who may benefit from prophylactic antibiotic coverage include immunocompromised patients, those with end-stage organ (kidney, liver) disease, those with certain cardiovascular manifestations and those with prosthetic joint replacements.

The American Heart Association 2007 guidelines (AHA,2007)³ state that at-risk patients requiring antibiotic prophylaxis before invasive dental treatment include those with:

- prosthetic cardiac valves;
- history of endocarditis and
- congenital heart disease (unrepaired/within 6 months of repair/with residual side effects).

In the past, this list included surgically constructed systemic-pulmonary shunts; rheumatic and other acquired valvular pathology; hypertrophic cardiomyopathy as well as mitral valve prolapsed with insufficiency.

The American Dental Association and American Academy of Orthopaedic Surgeons in 2003 (ADA and AAOS, 2004)⁴ stated that antibiotic prophylaxis is not indicated for dental patients with pins, plates or screws. It, however, recommended that patients about to have total joint arthroplasty should be in good dental health prior to surgery as the risk of bacteremia increases in a mouth with ongoing inflammation. It will be advisable to refer such patients for dental evaluation for proper oral hygiene counselling prior to surgery.

Patients at potential risk of experiencing hematogenous total joint infection include:

- All patients during first two years following joint replacement.
- Immunocompromised/immunosuppressed patients (e.g. rheumatoid arthritis, systemic lupus erythematosus or drug/radiation induced immunosuppression).
- Patients with co-morbidities (e.g. previous prosthetic joint infections, insulin-dependent diabetes, HIV, malignancy).

The potential benefit of antibiotic prophylaxis must however be weighed against the known risks of antibiotic toxicity, allergy and microbial resistance. Although there seems to be a lack of agreement amongst clinicians on the indications for antibiotic prophylaxis from the practical standpoint, there appears to be a consensus that it should be provided for at-risk patients undergoing oral surgery, periodontal treatment, and implant placement. Prior to cardiovascular surgeries, it may be helpful to refer patients for a dental evaluation and clearance, especially if the patients will be on warfarin or other anti-coagulants post-surgery.

It will be useful for general medical practitioners to inform elderly patients and provide them with a note for their dental surgeon indicate the need for antibiotic prophylaxis prior to invasive dental procedures. This note can then be passed to their dental practitioner for their follow-up.

Bisphosphonates and Osteonecrosis of the Jaws

Bisphosphonates are used commonly to treat osteoporosis, Paget disease of the bone, multiple myeloma and breast cancer. Though not common, a difficult to treat side effect of bisphosphonates is osteonecrosis of the jaw bone after dental surgery or infection. This is especially so for IV bisphosphonates. Preventive strategies include removing of all foci of dental infection before starting bisphosphonate therapy. It would be beneficial for patients about to start on bisphosphonates to be referred to the dental clinic for dental evaluation and clearance prior to commencement of the bisphosphonates therapy. (Woo et al, 2006)⁵.



Figure 3. Osteonecrosis of the jaw can have severe effects on the alveolar bone

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LEARNING POINTS

- **Medical conditions which can influence the oral health of the elderly.**
- **Xerostomia (dry mouth) may be the effect of medications. Reduced salivary flow not only increases the risk of dental caries it also affects complete denture retention and is associated with increased periodontal disease, burning, or soreness of the oral mucosa.**
- **Periodontitis is one of the complications of diabetes mellitus. Furthermore, periodontitis may be a risk factor in the development of cardiovascular disease.**
- **The oral manifestations of the complications of radiotherapy to the head and neck region are directly related to the dose intensity.**
- **Cancer of the mouth and pharynx is among the top 10 most common cancers for both men and women. The initial signs of oral cancer commonly involves a non-healing ulcer with indurated, irregular edges, commonly on the tongue, lip and floor of mouth.**
- **Prior to cardiovascular surgery, it would be helpful to refer patients for dental evaluation and clearance, especially if the patients will be on warfarin or other anti-coagulants post-surgery.**
- **Removing all foci of dental infection before starting bisphosphonate therapy especially i/v bisphosphonate therapy will reduce the risk of osteonecrosis of the jaw.**