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Dental problems in diabetes

Add a dentist to the diabetes team

This article uses a case based approach to review the two most common causes of dental problems in people with diabetes – caries and periodontal disease – and highlights the importance of adding a dentist to the diabetes team.

■ **A healthy tooth in a healthy gum and healthy mouth is fairly secure. The roots are firmly embedded in bone and the gum firmly encases the tooth, leaving only the resistant enamel exposed to any debris and bacteria that saliva has not flushed away.**

Dental problems are more common in people with diabetes and can affect diabetes management.^{1,2} Diabetes is associated with poor dental health for a number of reasons:

- diabetes is most common from age 40 years,³ when vascular disease is starting to affect the fine vessels supplying the tooth
- diabetes greatly accelerates vascular disease in the teeth as well as in the rest of the body
- saliva washes the teeth clear of debris and bacteria, but age and diabetes affect the autonomic nervous system and hyperglycaemia glycosuria causes dehydration.⁴ Both reduce salivary flow. The resulting dry mouth and teeth are uncomfortable (particularly for people with dentures), but also predispose patients to caries and periodontal disease
- hyperglycaemia affects immune function and the inflammatory response, setting the scene for caries, periodontal disease and the problems associated with progressive dental and periodontal destruction and infection.⁵

Caries

We tend to think of caries as a nuisance rather than a problem. Patients may not seek attention until they experience the pain associated with advanced caries, as bacteria break through the enamel into the easily eroded dentine and through to the pulp and the alveolar bone surrounding the roots. From there, bacteria can access the tissues of the mouth and pharynx causing dental

abscesses, sinusitis or deep tissue infection. These problems don't respond to medical treatment and require root canal treatment, tooth extraction and sometimes urgent surgical drainage of pus.

Major factors that cause caries include:

- anatomy
 - maligned teeth may make it difficult to keep the exposed tooth surface clean
- fluoride exposure
 - older people and immigrants may not have had exposure to enamel strengthening fluoride during their youth

Figure 1. Diabetes and the dental cascade

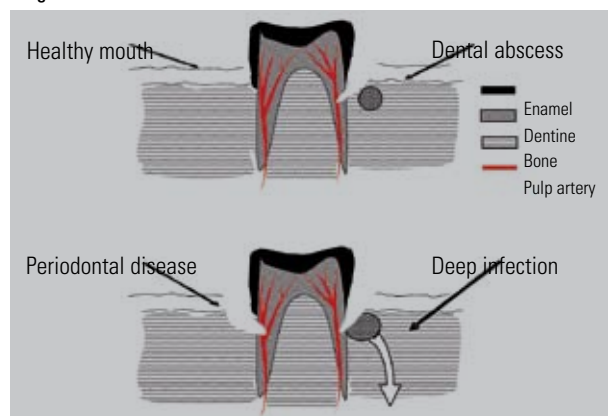
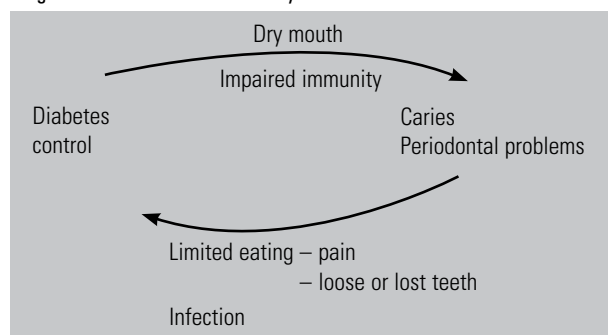


Figure 2. Diabetes and dentistry – 'double trouble'



Case study 1

Mary seems embarrassed as she explains that her dentist told her to see you. On her last visit, the dentist found two molars that 'had to come out', one already filled tooth that required capping and three other teeth with advanced caries. Mary's dentist told her that diabetes was probably causing 'galloping tooth decay' and warned her to 'fix her diabetes or start thinking about dentures'.

You feel some sympathy for Mary, but also some frustration. You have been trying to work with her to improve her diabetic control for years. She is now 52 years of age and has had type 2 diabetes for 8 years. Her glycated haemoglobin is consistently higher than 10%.

People with diabetes may be predisposed to caries by the autonomic neuropathy that reduces salivary flow and/or by adhering to a high carbohydrate diet (but not with the recommended low glycaemic index [GI] carbohydrate).

Some of the complications of diabetes may require medications that themselves reduce salivary flow, eg. diuretics for hypertension or cardiac failure, tricyclic depressants for painful peripheral neuropathy.

Mary may need to listen to her dentist, take her diabetes seriously and 'control' it. Otherwise she may finish up with dentures (which introduce the problem of reduced salivary flow) or without a smile.

Unfortunate though her encounter with the dentist was, this may be Mary's opportunity to improve her diabetes control, protect her teeth and reduce the risk of other diabetes complications.

Case study 2

Tony is a taxi driver who has type 2 diabetes with inadequate glycemic control.

'Everyone tells me my breath smells,' he says. 'I have tried nose sprays, gargles and mouth washes and nothing helps. To me, I don't have a problem, I can't smell anything bad. Is it me and can I fix it?'

Tony's breath does smell and when he opens his mouth you can see the problem is periodontal disease (*Figure 3*). Deep tissue infection is the cause of Tony's bad breath and is compromising his teeth.

Apart from the social and employment problem Tony may face because of his bad breath, his periodontal disease may affect his diabetes control.

Bad breath may not be enough to prompt Tony to seek and adhere to dental and medical advice, but his poor diabetes control and his need to renew his licence may be.

- salivary flow
 - diseases and medication can reduce salivary flow allowing bacteria, bacterial plaque and caries to progress rapidly
- diet
 - frequent consumption of sugar drinks or carbohydrate foods which coat and stick to the teeth provide the acid carbohydrates that convert cariogenic bacteria
- oral hygiene
 - complete dental care includes flossing, 'picking' and brushing. Unfortunately many Australians with or without diabetes give their teeth a quick brush but not the full care they need.⁶

for the bacterial flora of the mouth to the otherwise protected systemic circulation. Infection can involve the mouth, sinuses and pharyngeal tissues.

Periodontal disease

Periodontal disease is reversible or controllable in its early stages (*Figure 1*). Gingivitis is the inflammatory response to the accumulation of bacterial plaque and may or may not lead to periodontitis. However, once inflammation causes the gums to recede from the teeth, pockets open for bacteria, plaque and progression.

Inflammation progressively destroys the fibrous tissue attaching teeth to the alveolar bone. As pockets deepen down the tooth, the vulnerable cementum is exposed to caries and the tooth attachment in the jaw is weakened.

Even more than caries, periodontal disease predisposes patients to deep tissue infection. The compromised teeth provide access

Figure 3. Tony's mouth



Tooth loss is more than a cosmetic issue, although our appearance is important to our 'persona' and a smile is an important part of how we present to the world. Periodontal disease may also affect diabetes control. Missing teeth may also influence diabetes control, with low GI foods (eg. apples) becoming harder to eat and high GI sticky foods (eg. fruit buns) becoming easier to eat. Deep tissue infections may make glycaemic control difficult until they themselves are controlled (*Figure 2*).

Diabetes and dentistry – suggestions

Case study 1 and 2 – Mary and Tony – both need a plan: a schedule for future oral health and an action plan to respond to likely problems (eg. dental abscess causing localised gum swelling). Both Mary and Tony could benefit from a full diabetes review (GP Management Plan) and a future plan (Team Care Arrangement) involving at least a dentist and diabetes educator.

At the next diabetes review consider:

- a strong recommendation to see a dental health professional (may be eligible for rebates under the Medicare Plus schedule)
- a look in the mouth, a question about dry mouth and a sniff for halitosis. (Not part of the Service Incentives Payment schedule,⁷ but perhaps should be.)

Conflict of interest: none declared.

References

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