Narwhal Tooth

The 16th Biennial Conference on the Biology of Marine Mammals in San Diego, California, in December 2005 contained some surprising news about the narwhal whale, also known as the unicorn whale due to the long tooth, or tusk, which emerges from its head. Dr. Martin Nweea, a researcher at the Harvard School of Dental Medicine (HSDM), revealed that the narwhal's tusk has ten million tiny nerve connections that extend from the central nerve of the tooth to its outer surface.

This lends the tooth hydrodynamic sensor capabilities allowing the narwhal to detect changes in water such as particle gradients, pressure and temperature. Also, given that these whales tend to rub tusk against another, this behavior likely grants them a unique sensation.

Ancient Drilling

A report in Nature (2006;440: 755-756) reveals that dental drilling has been around a lot longer than we ever realized. Researchers at a Neolithic graveyard in Pakistan found eleven drilled molars. The surprise is that these graves date from 7,500 to 9,000 years ago, which is roughly 5,000 years earlier than any other evidence of drilled teeth currently in collections. Apparently, first drill heads were used on the latest finds. Drill depth was from 0.5 to 3.5 mm, and the fact that it was performed on first or second permanent molars suggests that it certainly was not done for esthetic purposes. Only four of the eleven teeth show signs of caries in relation to the hole drilled, a fact that could mean the drilling was intended to be therapeutic in nature. Additionally, the teeth exhibit marginal smoothing, which attests to the fact that the "patients" were alive at the time and continued to chew with the teeth after the fact.

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Systemic Implications of Oral Health: Diabetes

Juliette Reeves, United Kingdom

Periodontal disease has long been considered a localised infection, however, research over the last few years is now linking the periodontal diseases to a variety of conditions and diseases with systemic implications. These include systemic infections, cardiovascular disease, pregnancy outcomes, respiratory diseases, diabetes and increased all-cause mortality rates. It has been suggested that infection in the periodontal tissues, primarily by gram-negative anaerobic bacteria, can trigger a series of immunologic and inflammatory changes leading to the initiation of systemic disease.1

The interaction between oral infection and systemic health was first described in Ancient Egypt2 with the concept of focal infection dating back more than a hundred years. Williamsohn Day of Miller again proposed this relationship in an 1891 commentary published in Dental Cosmos.3 By the 1950s however, the theory was being dismissed.4 More recently the concept has returned to the dental arena. This was partly because of new data reported by Finnish researchers in the late 1980s when dental infections were found to be statistically linked with heart disease and stroke.5

Diabetes

The effect of diabetes on the oral tissues had long been recognised.6 Diabetics are said to exhibit poorer oral health than non-diabetics.7 Diabetes has been found to have a higher average gingival index and higher or the same plaque index levels relative to controls.8 Periodontitis is now considered the sixth most common complication of diabetes mellitus.9 Persons with non-insulin-dependent diabetes mellitus are three times more likely to develop periodontal disease than non-diabetic individuals.10

Risk Indicators

The November 2005 edition of the Journal of Periodontology (2005, Vol. 76, No. 11, Pages 1910-1918) featured the results of a study that defined the risk indicators for tooth loss from periodontal disease. Study subjects included 1,775 patients with a total of 3,694 extracted teeth. Periodontal disease accounted for the loss of 2.8 teeth in those with the disease while those without it lost 1.8 teeth. For those subjects older than 35 years, periodontal disease was the reason for 57% of tooth loss with the remaining 43% lost due to other reasons. Additional results of the study showed that only 16% of study subjects reported that they brushed their teeth more than twice a day. An amazing 60% admitted to never brushing their tooth or doing so irregularly. Also, 39% of the subjects said that they had never had dental prophylaxis or made a periodontal maintenance visit.

Among the subjects, 31% were either currently smokers or had been in the past. More men (38%) lost their teeth for periodontal problems than women (27%). Finally, 19.2% of the subjects had diabetes mellitus while 13.6% experienced problems due to the fact that it was performed on first or second permanent molars suggests that it certainly was not done for esthetic purposes. Only four of the eleven teeth show signs of caries in relation to the hole drilled, a fact that could mean the drilling was intended to be therapeutic in nature. Additionally, the teeth exhibit marginal smoothing, which attests to the fact that the "patients" were alive at the time and continued to chew with the teeth after the fact.

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Sudden Death of WHO Director-General

The 59th World Health Assembly opened in Geneva on May 22, 2006 in a somber mood following the death of the World Health Organization (WHO) Director-General Dr. Lee Jong-won, who was 61 years old, in hospital on May 20, 2006 in the afternoon where he underwent surgery to remove a blood clot in his brain. The Assembly observed a two-minute silence and suspended for 30 minutes following the announcement of Dr. Lee’s death.

Dr. Lee, a national of the Republic of Korea, had been Director-General of the World Health Organization since 21 July, 2003. He had worked for WHO for 23 years, at country and regional levels, and at WHO Headquarters in Geneva. He is survived by his wife and son, and the families of his two brothers and one sister.

Dr. Lee’s death shocked the international community and sends its sincerest condolences to Dr. Lee’s family.

Glycemic Control
It is well-established that poor glycemic control is known as an independent risk factor for periodontitis. However, there is also evidence that severe periodontal disease may deteriorate glycemic control. A positive association between variations in the blood glucose level and the degree of periodontal disease was reported in type II diabetes mellitus. One study demonstrated loss of attachment is greater in controlled diabetes ages 30–40 with a disease duration of over ten years. Periodontal treatment has been shown to be associated with improved diabetic control as demonstrated by reduced glycosylated haemoglobin in diabetic patients. In this study, however, periodontal therapy on its own did not significantly affect glycemic control in diabetic patients. This was only achieved when combined with antibiotics. Other studies have shown a reduced need for insulin administration in diabetes after receiving periodontal treatment. Further studies are needed to show a consistency in these associations. Other groups also need to be examined such as women and low income groups. Common risk factors also need to be evaluated.

Common Risk Factors

Dental Tribune

In these common. Include stress, smoking, dietary intake, socio-economic status, weight, fear and depression.

Stress
Factors such as elevated levels of hormones antagonistic to insulin such as cortisol also play a role in the development of insulin resistance and inflammatory bone loss. Stress has been shown to play a role in affecting glycemic control and also as a negative factor in periodontal treatment outcome.

Smoking
Smoking and diabetes are considered to be two major factors in the development of periodontal disease. Smoking is recognized as a major factor in the aetiology of oral infections and inflammatory bone loss and is also considered as a significant risk factor in the progression and development of diabetes.

Nutrition
Diabetes is fundamentally affected by dietary intake. Several dietary factors have been linked to the onset of diabetes. These include inadequate antioxidant intake from fruit and vegetables, adequate fibre and a reduction in refined carbohydrate consumption. Antioxidant status has shown to be impaired in diabetic patients, negatively affecting the production of the antioxidant enzymes. Glutathione peroxidase and superoxide dismutase.

These provide a defence against the damage of cells by reactive oxygen species, which is increased in the diabetic state. The impairment of this same system has also been implicated in the increased susceptibility to the periodontal diseases.

Obesity
Obesity has also been linked to the development of diabetes and periodontal diseases. The link between obesity, periodontal infections and diabetes has been suggested as being mediated by increased levels of tumour necrosis factor (TNF) which may lead to a hyper inflammatory state. This would in turn increase the risk for periodontal disease and account in part for insulin resistance. Further research is required. Recent studies have shown that both smoking and obesity are independent risk factors for periodontitis exhibiting a dose–response relationship with periodontal disease.

Healthy Lifestyle
Maintaining normal weight, engaging in the recommended level of exercise, and eating healthy food are known to improve general health. The impact of these behaviours on periodontal disease was examined and it was found an increased number of healthy–enhancing behaviours is associated with a lower periodontitis prevalence.
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Contact info

Juliette Reeves is an experienced Dental Hygienist and qualified Nutritionist. She writes regularly for the dental press including a regular column in Dentistry magazine and clinical articles for smileon.com. Juliette has written a number of post graduate training modules in nutrition and oral health for the dental profession. Her main areas of interest are nutritional influences in periodontal disease, stress, bone density and female hormones. She currently divides her time between writing, researching and lecturing in nutrition and oral health. For further information on nutrition and oral health visit, www.peno-nutric.com.