

## Case history

Ms Josette presents to the office for her periodontal maintenance visit. The patient has recently returned from an 18-month work assignment overseas. Ms Josette visited a local dentist whilst she was away for treatment of her 'gum disease' as recommended by her regular dentist. The patient reported feeling stressed and experienced muscle spasms in the head, neck and ear area during the last year.

## Medical history

Ms Josette reported she is in good health and not taking medication.

## Dental findings

### Extra-oral examination

The patient responded to tenderness in the temporo-mandibular joint region and exhibited limitations of mouth opening. The masseter muscles were pronounced when the patient clenched her teeth.

### Intra-oral examination

Gingival tissue was pale pink and had an almost normal-looking appearance with minimal biofilm accumulations. Periodontal assessment revealed localized probing depths ranging from 6 to 8 mm in the molar regions and 4 to 5 mm in other areas. Localized clinical attachment loss of up to 4 mm. Class I and II furcation involvement on the upper right second and third molar, and upper left first molar. Mobility localized to the anterior sextant and upper right molars. Small, smooth, flat surfaces were evident on the enamel surfaces, especially on central and incisor tooth cusp.

## Radiographs

Moderate localized horizontal patterns of alveolar bone loss.

## Questions

1. The clinical manifestation of Ms Josette's dental condition is characteristic of which classification of periodontal disease?

2. The tenderness in the region of the patient's temporo-mandibular joint can be related to what condition?
3. Discuss one of the aetiological factors contributing to the mobility in the patient's teeth.
4. Discuss treatment recommendations for Ms Josette's dental condition?

## Rationale

1. The clinical manifestations are characteristic of which classification of periodontal disease?

Chronic periodontitis is a bacterial infection resulting in inflammation within the supporting tissues of the teeth, progressive destruction of the periodontal ligament, and loss of supporting alveolar bone. It is characterized by pocket formation and/or gingival recession. It is the most frequently occurring form of periodontitis. This type of periodontitis previously was known as adult periodontitis (1, 2) which progresses at a slow to moderate rate and has a favourable response to periodontal therapy (3). In some instances tissue destruction will continue to progress (worsen) despite excellent patient self-care and professional therapy that would have succeeded in controlling the disease in most patients (1).

Other local risk factors include calculus, overhanging restorations and other retentive conditions that favour microbial growth, smoking, systemic disease conditions, hormonal factors and stress (4). If the patient had >30% of sites with attachment loss, the patient has generalized disease. Attachment loss affecting <30% of sites is considered localized disease (5).

The clinical appearance of chronic periodontitis include gingival tissue that may appear healthy at first glance, but at closer examination will reveal firm, rigid (fibrotic) and the presence of pocketing. Signs and symptoms can also include swelling, redness, gingival bleeding upon probing, periodontal pockets, bone loss, tooth mobility and/or suppuration (discharge of pus). Therefore, the appearance of the tissues is not a reliable indicator of the presence or severity of periodontitis (1).

Radiographically, extensive bone loss can be associated with shallow pocket depths and vice versa, as a patient may have had severe periodontitis at one time, but had periodontal treatment that stopped the progression of the disease (3). The radiographic interpretation is used to supplement clinical findings from the periodontal assessment using posterior vertical bitewing radiographs for ideal visualization of the level of the

alveolar bone crest (6). Evidence of horizontal, vertical bone loss and bony defects can be seen on radiographs; however, furcation will not be seen on the radiograph until the bone resorption extends past the furcation area (7). Radiolucencies appear in the furcation of multirooted teeth, indicating inter-radicular bone loss. In this stage, horizontal bone loss on the buccal or lingual surface may go undetected because of superimposition. Careful examination of the radiograph in most cases reveals a difference in density indicating different levels of bone of the buccal and lingual surfaces (6).

**2.** The tenderness in the region of the patient's temporomandibular joint can be related to which condition?

The aetiology of bruxism can be multifactorial, such as psychological factors, namely nervous anxiety and emotional disorders have been held to play a role (8). In some cases bruxism is not caused by stress or dental problems. It can be a complication of another disorder, such as Huntington's disease or Parkinson's disease. It can also be an uncommon side effect of some psychiatric medications including certain antidepressants (9). Bruxism, a disease generally considered a parafunction buccal habit, usually manifests whilst sleeping, and is characterized by a non-functional convergence and grinding of teeth (10) resulting in a odontoiatria problems and disorders, not only of the temporomandibular articulation, but also of the muscles of chewing (11). In the presence of parafunctional habits, such as bruxism, clenching, tapping or biting objects, many more than the usual number of tooth contacts are made each day, and the intensity and duration are altered (12). Occlusal trauma may cause the muscles of mastication that work the jaw, the largest being the temporalis and the masseter, to become chronically sore, resulting in headaches and muscle pain. Pain usually occurs chewing or upon waking in the morning. The patient may report muscle spasms in the head, neck and ear area (8).

Patients subjected to bruxism or clenching grind their teeth at various times of the day or night, and usually the tooth wear is catastrophic. Excessive tooth grinding can eliminate canine and incisal guidance in the dentition. If bruxism or clenching is not treated, the centric-occlusion contacts become worn with a relatively flat plane or occlusion (13), which is evidence of attrition. Cracks and pits form on the worn edges and may become plaque traps. The canines and central and lateral incisors most commonly receive the heaviest and earliest lateral wear. Radiographic evidence of angular vertical moderate bone loss and widened of the periodontal ligament space on the teeth that have wear facets on the incisal and occlusal surfaces (11).

**3.** What could be the contributing factor(s) to the patient's mobility?

Tooth mobility is classified as either physiologic or pathologic. Physiologic movement of the tooth is limited to the width of the periodontal ligament space. Pathologic mobility of teeth results from bone loss, gingival inflammation, periapical pathology, hormonal imbalance or occlusal trauma, where excessive occlusal forces are placed on the tooth (14), in addition to local factors such as food impaction, patient habits, and faulty restorations or appliances (1). As tooth mobility may not result from periodontal problems, identification of the cause is important so that the appropriate treatment can be rendered (14).

Tooth mobility in the absence of supporting alveolar bone may be characteristic of a parafunctional habit. However, tooth mobility does not occur in all patients who grind and clench their teeth, in some case tooth wear accommodates for the bruxing habit (3). When inflammation and trauma from occlusion are combined in causing the destruction and irregular shape of the bone, the bone may appear with 'angular defects' or with 'vertical bone loss' (12) radiographically.

**4.** Discuss treatment recommendations for Ms Josette's dental condition?

Appropriate therapy for patients with periodontitis varies considerably with the extent and pattern of attachment loss, local anatomical variations, type or periodontal disease and therapeutic objectives.

The primary objective of therapy for patients with chronic periodontitis are to halt disease progression and to resolve inflammation (15).

The method of instrumentation should be chosen by evaluating the attachment topography and root surface textures occurring throughout the mouth. In this manner, the treatment approach can be based on the specific needs of each patient (16). Blended instrumentation entails the use of both hand and ultrasonic instruments for efficacious scaling and root planing, as well as debridement procedures during periodontal maintenance. Using a combination of both hand and ultrasonic instruments will facilitate the achievement of the desired result (5). Evaluation of the initial therapy's outcomes should be performed after an appropriate interval for resolution of inflammation and tissue repair (2). If the results of the initial therapy do not resolve the periodontal condition, periodontal surgery should be considered to resolve the disease process and/or correct anatomic defects (2).

Due to the multifactorial aetiology of bruxism several approaches can be implemented in the treatment of this condition (8). Occlusal adjustment as a component of periodontal therapy is based upon an evaluation of clinical factors related to patient comfort, health and function which is accomplished

to make the teeth come together in a harmonious interdigitated position (13, 17). In the treatment process occlusal management may aid in reducing tooth mobility and gaining some bone loss due to traumatic occlusal forces (18). During sleep a mouth guard can be worn to control occlusal habits. A night guard serves to protect the teeth from abnormal occlusal wear due to bruxism. The night guard is made of either hard or soft acrylic, usually covering the occlusal surfaces of all teeth in the maxillary arch. The night guard is adjusted so that all mandibular teeth make simultaneous contact in centric occlusion (3).

Pharmacotherapeutics have not been proven to be effective for the treatment of bruxism. In some cases patients have been prescribed a muscle relaxant before bedtime. However, if the aetiological factor of the patient's bruxism is the side effect of their antidepressants medication an alternative medication can be prescribed to counter act the bruxism. Botulinum toxin (Botox) injections may help some people with severe bruxism that is responsive to other treatments (9). One of the most important methods of preventing bruxism is educating the patient about the condition and its expected consequences. Usually, education reduces daytime bruxism, however tooth grinding during sleep is still a problem (13). Psychological support, communication strategies, biofeedback methods and sleep therapy have been shown to be particularly useful in many patients (19, 20).

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