

# Tooth loss due to eating disorders and the role of the dental professional

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## Introduction

A question sometimes asked is, 'What do certain patients have in common with some of the celebrities who are publicised in the media?' While there are certainly a number of possible responses, the answer of concern is those who may suffer from an eating disorder. The increasing public awareness of these disorders has enabled more open discussion as well as greater acceptance of these afflictions as disease rather than a character flaw of the respective individual.

Bulimia Nervosa is a psychogenic disease that presents with oral manifestations – most prominently enamel erosion - that can be identified by the dental professional (Little 2002); often times prior to recognition by other health professionals. The affected population ranges between 17 and 50 years of age with most cases exhibiting onset at 18-25 years of age (Robert 1987). The mean age is 19 years old with 85% of those affected being female (Fairbairn 1987a). Many people within these parameters may be typified as a female college student who has resorted to the practice for 5.8 years (Hall et al 1989) and it has been reported that a small percentage, less than 1 in 10, ever seek professional care, generally after seven years of uncontrolled eating difficulties (Whitaker et al 1989).

The role of the dental professional in addressing individuals affected by eating disorders – particularly bulimia nervosa – must follow guidelines that enable successful treatment of the patient. Beginning with an accurate diagnosis, the topic must be discussed with the patient and professional guidance may be suggested. From a dental perspective, transitional therapies must be made available and subsequently the functional and aesthetic aspects of restorative treatment may be initiated.

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## Diagnosis

Diagnosis of the bulimic patient is multifaceted due to behavioural manifestations as well as localised and systemic signs and symptoms (Ibarra et al 2001). It is not uncommon to describe individuals afflicted with an eating disorder as anxious and/or nervous, having a preoccupation with self-image (Grilo et al 2008, Daley et al 2008). Behaviours such as chronic gum chewing, ice chewing, or nail biting may be evident; as well as excessive use of mouthwash and excessive daily brushing. The patient may report depression, dizziness, thirst, and fainting along with observable dryness of the mouth and lips. Muscle cramps and weakness, heartburn and abdominal pain; along with sore throat and tooth sensitivity may also be related with the underlying cause being an imbalance of body hydration (Fairburn 1987b, Hurst et al 1977). Additionally, the use of laxatives and/or excessive exercise may be included in a regimen to control weight.

The clinical signs of bulimia may include callused fingers resulting from repetitive placement in the throat for self-induced vomiting (Russell's sign) and decreased salivary flow with parotid gland enlargement and dysfunction. Parotid gland enlargement, in particular, may be the only clinical manifestation of bulimia nervosa and because patients tend to be secretive about their eating disorder, it is important for the practitioner to consider this painless occurrence in his/her diagnosis (Park and Mandel 2006). Intraorally, an increased occurrence of caries can be seen with enamel erosion that exhibits a smooth and discoloured surface. The loss of vertical dimension due to posterior erosion and the presence of an anterior open bite due to anterior erosion can be observed as the progressive destruction of the enamel occurs. Overeruption of opposing teeth as a compensatory action may be seen as well as reports of thermal sensitivity (Burkhart et al 2005).

In the event laboratory evaluations are made, serum electrolyte abnormalities may provide markers in serious bulimic patients. Acute tryptophan depletion,

hyperphosphatemia, and hyperamylasemia are among the most recognisable markers of this type (Bonne et al 1995).

### Differential diagnosis

Because factors other than eating disorders may provide similar clinical appearances, it is important to properly assess the patient for an accurate diagnosis and to establish appropriate treatment protocols (Table 1). In a research setting with extensive evaluation, multiple causes of erosion have been outlined with only a small percentage classified as resulting from an eating disorder (Shroeder et al 1995) (Table 2).

The pattern of erosion can be an important factor in determining a differential diagnosis (Table 3). In Figure 1, chemical erosion may be misdiagnosed as resulting from bulimic activity while actually a result of chemical erosion. In Figure 2, extrinsic chemical erosion and caries are prominent in the upper anterior segment, while posteriorly there is little damage and the pattern of erosion is not consistent with that of an eating disorder. Figures 3-6 depict the progressive pattern of erosion due to bulimic activity that first involves the incisal edges and lingual surfaces of the maxillary anterior teeth. Then the lingual surfaces of the posterior teeth and subsequently the occlusal surfaces of the posterior teeth.

An alternate cause of tooth loss – abrasion – must be differentiated from the nonbacterial chemical erosion that is seen with an eating disorder or other erosion inducing habit or substance. Toothbrush abrasion and bruxism tend to create flat, sharp, or angular destruction of tooth structure whereas evidence of erosion tends to be smooth, spoon-shaped, or cupped out in appearance (Harrison et al 1985).

### Discussion/professional guidance

The dental team is in a strategic position to offer assistance to individuals who have an eating disorder because the signs and symptoms of the disorder most often ‘speak’ before the patient (Schmidt and Teasure 1997). It must be remembered that although a seemingly physical disease due to the observable ill-effects, this is a psychiatric or psychologically based disorder and warrants extreme sensitivity when attempting to open lines of communication. These individuals suffer from a terror of being rejected and a constant need for approval from others (Ibarra et al 2001). Our goal is to not only treat the dental complications that exist, but to also support treatment of the underlying mental causes.

The following suggests a protocol for encountering the suspected patient.

**Table 1** Effects of mimicking behaviours

1)	bruxism
2)	sucking on lemons or citrus foods
3)	drugs and diseases causing dry mouth and burning of the tongue
4)	lesions on the palate or gums
5)	aggressive oral hygiene
6)	extrinsic staining agents
7)	periodontal disease or chemotherapy

**Table 2** Causes of erosion

43%	combined upper gastrointestinal disorder and acid diet
25%	upper gastrointestinal disorder
24%	acid diet
6%	eating disorder (habitual vomiting)
2%	unknown

**Table 3** Patterns of wear

1)	bilateral anterior facial erosion – lemon sucking habit
2)	unilateral anterior facial erosion – lemon drop habit
3)	bilateral posterior lingual erosion – chronic regurgitation (GERD)
4)	bilateral anterior and posterior lingual (and occlusal) erosion – bulimic vomiting

**Table 4** Transitional therapies

1)	use of basic rinses (1 tsp baking soda in 8oz water) rather than brushing after vomiting
2)	reduced sugar intake
3)	use of soft brush, tongue scraper, and regular recall visits
4)	sugarless gum for salivary flow or artificial saliva
5)	daily rinse with 0.5% fluoride solution
6)	custom stents to deliver 1.1% neutral fluoride, desensitizing agents, or magnesium hydroxide (to be used while vomiting)



**Figure 1:** Chemical erosion may be misdiagnosed as resulting from bulimic activity while actually a result of chemical erosion.



**Figure 2:** Extrinsic chemical erosion and caries are prominent in the upper anterior segment.



**Figure 3:** The progressive pattern of erosion due to bulimic activity that first involves the incisal edges and lingual surfaces of the maxillary anterior teeth.

- 1) Allow sufficient time to discuss the issue.
- 2) Select a location that is private where conversations will not be overheard.
- 3) Establish a comfortable physical setting for the discussion that is not threatening - for example two to three feet of separation; do not cross one's arms, and maintain comfortable eye contact. Begin with 'This may be a little awkward for me to ask you these questions, but I am concerned about you.'
- 4) Relate the facts of what has been seen clinically and suggest possible causes of damage.
- 5) Review patient's diet and eating habits, medications (i.e. are they taking diuretics or laxatives), and oral hygiene practices.
- 6) Provide referral and/or referral materials.

While this format can allow for more indepth questions and discussions with the patient, the practitioner should be comfortable with his/her involvement in the situation. With positive feedback – or lack of resistance – each step becomes a continuation of the previous step and the final goal of referring the patient to an eating disorder centre can be accomplished. However, the patient may become defensive at any time during the conversation and the most important offerings are calm, reassurance, and support.

Perhaps the best means of being able to skillfully manage these circumstances is by contacting one's community resources on the subject. The dental provider will subsequently need a source of professional assistance in allowing for comprehensive treatment of the patient and this

source can be one of information on how to conduct the initial conversation as well as for psychological treatment.

### Transitional therapy

The majority of patients exhibiting bulimia nervosa do not seek medical treatment (Bouquot et al 1997), however those who do may require some form of transitional guidance or therapy from a dental perspective. A quick guide for some of these advisements can be viewed in Table 4 (Sunduram and Bartlett 2001). In addition, brushing the tongue or using a tongue scraper after vomiting removes the acid residue in the papilla. Brushing with a soft bristle brush can be performed, but not for at least an hour after purging.

The goal of any transitional therapy is to minimise the deleterious effects on oral structures until such time that the disease can be controlled. As described above, a good percentage of patients may remain in this transitional phase of treatment without continuing on to definitive restorative treatment.

The choice of restorative materials used during transitional therapy does not guarantee stability insofar as there are no materials that offer 'challenge resistance' to adjacent tooth structure other than full coverage of the teeth. The latter being a step ahead of the demands during this phase of treatment.

### Restorative treatment

Restorative treatment should only begin after successful

treatment of the eating disorder (Hilsen 2006, Hasting 1996). The treatment for these patients will most often require both functional and aesthetic treatment plans that can be formulated simultaneously. A thorough examination begins the process in order to assess caries, periodontal pathology, occlusal discrepancies, and aesthetic compromises. A complete intra-oral set of radiographs should be taken, clinical photographs, and impressions for diagnostic casts that would preferably be mounted on a fully adjustable articulator depending upon the severity of the case. This will allow for functional evaluation of the patient and a diagnostic wax-up that will accommodate the treatment plan (Kavoura et al 2005). The aesthetic component of treatment can also be evaluated on the models in conjunction with the clinical photographs.

There are three key issues for treatment planning in evaluating the compromised dentition when the patient presents with moderate to advanced abnormalities. The first is loss of vertical dimension that affects facial aesthetics as well as tooth height and the subsequent retentive quality of planned restorations. The second is compensatory tooth eruption resulting from loss of occlusal enamel that may affect occlusal plane configuration. And lastly, the position of the free gingival margin relating to correctness of position and bilateral symmetry.

Contemporary materials and techniques can allow for ultraconservative restoration of the dentition – particularly the use of dentin bonding. In this circumstance, remaining tooth structure can be preserved and prosthodontic management of the case can be accomplished (Bartlett 2005).

## Conclusion

The dental professional is in a unique position to offer early recognition of an ever increasing ( de Moor 2004) and potentially life threatening disease. There are many challenges in differentially diagnosing this malady and even more so, in constructing a positive interaction with the patient that can ultimately lead to a state of good health. The knowledge and skills necessary for the well-being of the patient require interdisciplinary cooperation between the mental health provider and the dental office. At this time there is a significant need for dental professionals to be knowledgeable and interactive in identifying and enabling treatment of patients with eating disorders (Debate and Tedesco 2006).

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