Review

Eating Disorders: Diagnosis and Prosthodontic Management

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Abstract

The Eating Disorders (EDs) are severe and at the times fatal psychosomatic illnesses in which people experience severe disturbances in their eating behavior and related thoughts and emotions. Dental professional are often the first health care providers to recognize signs of any EDs due to the various oral complications that are associated with the condition. Since undiagnosed EDs avoid medical treatment, the role of dental professionals is very crucial to detect the bio-psycho-social disease in the early phase and to provide proper multidisciplinary treatment and recovery. Each eating disorder is unique, and the corresponding treatment varies depending on the degree of severity of the illness and the extent of psychiatric involvement.

This article describes the review of two main EDs, anorexia nervosa and bulimia nervosa; and prosthodontic management to rehabilitate patient's stomatognathic system with these EDs. In this particular case, a bulimic patient who had generalized erosion of enamel and dentin, dental caries, mucosal/periodontal abnormalities and very marked deterioration of their esthetic appearance was rehabilitated with traditional porcelain fused to metal (PFM) restorations. After going evaluation and alteration of the vertical dimension during the interim removable/fixed phases, and subsequent comprehensive oral rehabilitation, the final achievement was an outstanding esthetic outcome with high self-esteem.

Introduction

Eating disorders (EDs) are increasingly recognized as complex medical and psychiatric illnesses primarily associated with severe physical and psychosocial morbidity and significant mortality [1]. The dentist is considered to be among the first health care professionals with a significant role in recognizing signs and symptoms of undetected medical or behavioral disorders. Examinations of the entire stomatognathic system including a comprehensive medical history and vital signs are instrumental in discovery. Since undiagnosed EDs avoid medical treatment, the roles of the dental professionals are very crucial to detect clinical findings suggesting significant bio-psycho-social disorder, probably in the early phase to provide proper multidisciplinary treatment and recovery.

Each eating disorder is unique, and the corresponding treatment varies depending on the status of severity of the illness including psychiatric condition. Body Mass Index (BMI) and amenorrhea are typical features of individuals suffering from EDs [1]. EDs can often be hidden well while deteriorating the patient's psychological and systemic health. Cognitions such as marked preoccupation with thoughts of food, weight and shape can consume one's mind. Behaviors such as dieting, fasting, excessive exercise, bingeing and purging with physical correlates such as low eating disorder statistics provided by the National Eating Disorder Association indicated that 10 millions American woman suffer from EDs [2].

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The Diagnosis and Statistical Manual 5th edition (DSM-5) by the American Psychiatric Association classifies four distinct EDs diagnosis: Anorexia Nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED) and eating disorder not otherwise specified (EDNOS) which differ in their symptoms and prognosis. BED experience frequent and recurrent episodes of consuming an abnormal large amount of food in a short period of time compared with what others might eat in the same amount of time under the same or similar circumstances. There is a loss of control over eating during each episode such as consuming food until uncomfortably full, consuming large amounts of food when not hungry, consuming food alone due to embarrassment over how much one is eating. The binge eating is not associated with regular compensatory behavior associated with bulimia nervosa such as to purge excess calories. EDNOS cause significant impairment and distress in a person's life but do not meet the diagnostic criteria for any specific eating disorder diagnosis [1,2].

The present article is to review the current knowledge of two major types of EDs, anorexia nervosa and bulimia nervosa; and the corresponding prosthodontic management to rehabilitate patients' stomatognathic system with EDs, in this case a bulimic patient with BN purging type.

Well trained dental professionals are able to recognize the signs of individuals who are suffering AN and BN due to various oral complications that are associated with the condition. These two majors EDs are characterized by perturbed eating behavior patterns, a pathological control of body weight, and disturbance in the perception of the body shape. Obsessions with food, body, and shape may lead to a very serious health conditions that might have a fatal consequence. The etiology of AN and BN are unknown, but these three main factors can be correlated: genetic, cultural and psychiatric factors to develop EDs.

**Anorexia Nervosa (AN)**

AN is a severe mental illness that causes them to see themselves as overweight even when they are dangerously thin which can lead to starvation, and eventual death. The mortality rate associated with AN is 12 times higher than the death rate of all causes of death for females 15-24 years old. Without treatment, up to 20% of people with serious EDs die. With medical treatment, the mortality rate falls to 2-3%. Standardized Mortality Ratio (SMR): 5.3 and Crude Mortality Rates (CMR): 4.0% [3].

Diagnostic criteria: [4].

1. Individual weighs less that eighty five percent of the age appropriate body weight.
2. Body Mass Index (BMI) of individual is less that18 kg/m².
3. Individual possesses a completely distorted body image.
4. Individual has acquired Amenorrhea.

AN is divided into two types: a) Restricting type, no recurrent episodes of binge eating or purging. Weight loss accomplished by dieting, fasting and excessive exercise. b) Binge-eating/purging type occasionally will have a caloric binge followed by a compensatory purging behavior such as self-induced vomiting, strenuous exercise, and use of laxatives, diuretics, or enemas to induce weight loss.

The medical treatment of AN can not proceeds in a meaningful way in the absence of weight gain. The patient's nutritional status and medical stability are evaluated first. Patients with electrolyte disturbance or with electrocardiogram abnormalities may require hospitalization. Once the patient is medically stable, psychiatric treatment can start. Behavior modification procedures are used to assist the patient in weight gain.

The efficacy of psychotherapy has not been established. Drug therapy has not significantly improved the outcome of patients suffering from AN. Supportive care of patient with AN by an understanding physician may accomplish as much as formal psychotherapy. The patient should be seen regularly for a review of weight change, diet, and exercise patterns [4].

Preventive dental treatment including relevant oral hygiene instructions should be advised to anorexic patients to prevent further irreversible damage to intra-oral hard and soft tissues. Restorative dental treatment should be started when the patient's medical condition is stable.

**Bulimia Nervosa (BN)**

BN is considered a multifactorial psychiatric syndrome. This psychiatric disorder is characterized by a clearly-defined alteration of the ingestion pattern, which is presented by recurring or repeating episodes of binge eating and a feeling of being out of control while eating. People with bulimia are often depressed, anxious and concerned. These feelings are associated with an obsessive and compulsive behavior due to the excessive cult of the body image and slimness [1,2]. Almost 50% of people suffering from this disorder meet the criteria for depression, which has the highest mortality rate of any mental illness [2]. In order to prevent and control weight-gain, people with BN take inappropriate compensatory measures such as induced vomiting, abuse of anorectic drugs (appetite suppressants) and other drugs such as laxatives and diuretics, even fast or excessive exercises. In consequence, they suffered from malnutrition affecting their entire organism and brain function, which perpetuate the mental disorder.

The word bulimia comes from Greek word “Bous” (ox) and “limos” (hunger) meaning ox hunger or ravenous hunger. The word “nervosa” refers to the psychic component of the disease. The term BN was noted, defined and described for the first time by the British psychiatrist Gerald Russell who proposed his diagnostic criteria in 1979 [5]. The scientific evidence indicates that the exact origin of the BN etiology is very complex but there is an interaction between underlying and triggering factors that contribute to the development of the BN. These include cultural ideals and...
social attitudes regarding physical aspect, self-appraisal based on weight and body shape as a model of success and happiness [6].

Other factors must also be taken into consideration in the etiopathogenesis of this disorder such as genetic, biological and psychological factors, describing a comprehensive explanatory model, biopsychosocial. The psychotherapy and cognitive behavior therapy (CBT) approach are very important. Various pharmacological treatments (tricyclic’s, selective serotonin-reuptake inhibitors, monoamine oxidase inhibitors, bupropion, trazodone) used during short-term (three-month), double-blind, placebo controlled trials have proven effective in some reduction of the severity of symptoms of BN [7]. To date, the only medication with Food and Drug Administration (FDA) approval for the treatment of BN is fluoxetine which received its approval based upon the evidence elucidated from various double blind trials. One such trial was a 16 weeks double-blind multicenter study with 400 outpatients, which demonstrated greater decreases in the weekly binge-purge episodes in the patient population randomly selected to receive fluoxetine 60 mg per day than among patients in the placebo group (a 50 percent reduction vs a 21 percent reduction) [8]. In general, a combination of antidepressants and cognitive-behavioral therapy appears to be more effective in reducing the frequency of binging and purging than either treatment administered alone [9]. Currently, a series of scientific parameters have been established to diagnose BN following the medical criteria of the American Psychiatric Association (DSM-5) [2] and OMS (CIE-10) [1]. Around 40 - 50 % of the people suffering from bulimia also meet the criteria of anorexia nervosa during the beginning phases of the disorder [6].

Types of BN:

BN Purging Type: A self-induced weight loss characterized by uncontrolled episodes of binge eating and a feeling of being out of control. The person uses different forms to control weight, such as self-induced vomiting or use of laxatives, diuretics or enemas.

BN Non-Purging Type: To counteract the episodes of binge eating, they apply other compensatory behaviors, such as intense physical exercise, to do nothing or fast a lot; which is a less effective method to counteract and get rid of the calories.

The non-purging type only appears in approximately 6% - 8% of BN cases because it is a less effective method to get rid of a high caloric-intake. This type of BN is also present in people who has the purging type, but is a secondary way to control weight. This clinical case in particular is described as a BN purging type with physical symptoms such as a sad, tired and anxious look, with compulsion to eat, muscular atrophy with cold and cyanotic extremities with a marked dehydration.

Among the organic complications, there are metabolic, cardiovascular and renal disorders, as well as disorders associated with the digestive tract. A accompanying the organic issues are psychological changes such as depression (very low self-esteem and feelings of guilt), anxiety, abuse of substances and alcohol, and social isolation.

Among the systemic characteristics, several well-defined dental manifestations in patients with BN purging type are as follows:[10,11].

1. Severe dental erosion of enamel and dentin of the upper front teeth lingual surfaces with sensibility. The amalgam restorations appeared to be raised in posterior teeth due to the pH of the regurgitated gastric content.
2. Change in the color, shape, and length of teeth. Teeth can become brittle, translucent, and weak.
3. Enlarged parotid glands and sometimes enlarged submandibular glands with presence or absence of pain. The xerostomia (decrease in salivary production) may be attributable to the anxiety and depression.
4. Increased risk of periodontal disease, gingival bleeding, and delayed healing.
5. Erythema of the oral mucosa, gingival bleeding, angular cheilitis, cheilosis, median rhomboid glossitis and sore throat are consequences of the chronic irritation due to the gastric content and vitamin deficiency.
6. Increased risk of dental caries.

Usually, the abnormal dietary pattern of BN purging type is accompanied by a fear being incapable of voluntarily stopping the intake of high-caloric items, which are easy to ingest and chew. The range of high calorie intake varies from 3,000 to 6,000 in only one session, and we have documented cases of up to 20,000 calories followed by compensatory behaviors such as self-induced vomiting at least once a day, which can relieve abdominal pain and the feeling of self-hatred[11-14].

Bulimic patients are victims of a clinical depression and self-esteem; they are frequently confused and disgusted with their behavior, and they can behave unexpectedly to hide the problem [13]. Epidemiological studies provide information about the appearance of people with eating disorders and tendencies in the frequency of these disorders in time. It is difficult for epidemiological studies to provide information about eating disorders because the cases related to eating disorders are relatively rare among the general population and patients tend to deny or hide their illness and avoid professional help. As a consequence, community studies are expensive and ineffective.

Therefore, most of the epidemiological studies use records of psychiatric cases or medical records from hospitals in a demarcated area. This type of study underestimates the appearance of eating disorders in general population because not all patients presenting different types of eating disorders are detected by their doctor or are not sent to the hospital nor are admitted to a mental health institution. Furthermore, the differences in epidemiological studies throughout the years may be more exact due to the improvement in the detection of cases, increase of public awareness.
that leads to an early detection and a growing availability of medical treatment resources [14,15].

The prevalence and incidence are basic measures of a disorder frequency. The calculation of BN Prevalence and Incidence varies depending on the size and age of the sample, on the assessment methods and on the geographical area of the sample. For example, the incidence and prevalence of eating disorders in Japan is less than in the Caucasian European population. This result may be due to the cultural and ethnic differences and/or may be a transitional phenomenon.

According to epidemiological works, this psychogenic illness is constantly increasing in developed countries. Around 2 - 3% of the general population of teenagers and young women worldwide suffered from BN, while the prevalence in men is 10 times lower. However, it is well-known that women who suffered from this disease do not seek medical treatment, they prefer to deny it. Most patients suffering from bulimia are between the ages of 15 and 35 years old tending to be single, white, university students and belonging to the upper middle class [16].

The Prevalence Rate for BN in teenagers between 15 and 20 years old is a 10:1 ratio in women and men respectively, eight times lower in men to the ratio registered in the general population, 18:1. The incidence rate is the number of new cases of an eating disorder present in the population during a certain period of time, which is commonly expressed in terms of per 100,000 people per year. In this case the Incidence Rate of BN between teenagers with ages ranging from 15 to 18 years old is 35 cases/100,000 inhabitants/year [17].

In other studies, 41 cases/100,000 inhabitants per year were identified with ages ranging from 16 to 20 years old [18,19]. Other epidemiological researches have proven that a 25% of university students suffered from BN, 90% of the affected persons are women [20-24]. Also a prevalence of 12% have been identified in a study about students with higher certificate and an 8% rate in non-student population [25,26] Regarding the mortality rate of BN, it is associated with an increased risk of suicidal thoughts and attempts, which can also increase the risk of death. The standardized Mortality Ratio (SMR): 1.49 and Crude Mortality Rates (CMR): 3.9% [3].

There is little controversy about whether the comprehensive restoration treatment must be carried out only when the disease has been medically cured or it must begin while having the disorder. The majority of authors believe that if the disorder persists, erosions may extend beyond the cervical limits of restorations, leading to the failure of the comprehensive oral rehabilitation, which can cause other complications and serious consequences to the patient. The BN treatment is multidisciplinary and it is advisable that patients who suffered from this disease need to receive specialized medical treatment, as well as psychological, pharmacological and nutritional treatment before undergoing a complex dental treatment [27,28].

Presentation of the Clinical Case

A 29-year old woman was referred to our dental practice due to the loss of tooth structure, especially in the anterior teeth, which seriously affected her physical appearance. (Figure 1A,1B) During the initial interview, the main concern of the patient was the esthetic deterioration, which was causing psychological events with loss of self-image. Practically, she was not able to smile and she showed lack of confidence associated with a feeling of insecurity. She had a negative opinion about her esthetic appearance which was causing a very marked depression. (Figure 2) The main problem of the patient was her dissatisfaction with the small size, asymmetric dimensions, position, color, acute sensitivity of her anterior teeth and open bite. (Figure 3).
The bulimic behavior of the patient started when she was 16 years old and continued in different degrees for more than 9 years, gradually affecting the integrity and physiological balance of the stomatognathic system components, resulting in a typical generalized pattern of enamel and dentin erosion, alterations in the oral mucosa and periodontal tissues. We observed the loss of integrity of dental arches, anterior open bite, reduction in chewing ability, loss of vertical dimension verified by the cephalometric analysis, accompanied by angular cheilitis due to the lack of lip-seal posture and dry mouth (xerostomia).

Seven years prior, she completed an orthodontic treatment, and since then, no routine treatment was received. During the extraoral examination, a bilateral asymptomatic inflammation of the parotid glands was found and no abnormality of the temporomandibular joint and adjacent tissues to palpation was found. All mandibular movements in a centric position and lateral movements were normal.

Oral Findings

During the oral exam, we observed that the oral mucosa was irritated and dry associated with cheilosis. Deterioration or significant loss of enamel and dentin was found on lingual/palatal and incisal surfaces of anterior teeth (Figure 4 and 5) and in occlusal surfaces of posterior teeth, causing the elevation of amalgam fillings (Figure 6) due to the chronic vomiting of concentrated gastric acid contents.

A moderate generalized dentin hypersensitivity to cold air was detected as a consequence of the enamel and dentin erosion. Hypersensitivity in

Figure 2. Esthetically Compromised Initial Smile.

Figure 3. Preoperative image of the patient's occlusion. Enamel and dentin erosion can be observed in the upper and lower front teeth.

Figure 4. Preoperative Upper and Lower Occlusal Image. Clinical evidence of erosions with different degrees of enamel and dentin loss in the whole set of teeth.

Figure 5. Side View of Right and Left Posterior Occlusion.
anterior teeth of the upper and lower arch was acute, to the point that the patient was not able to sleep at night without taking a medication to control the pain. The patient was informed that unless she quit the binging and purging behavior, she could not receive any restorative dental treatment satisfactorily. Thus, four factors were highlighted to the patient before starting with the dental treatment: a) Acceptance of her eating disorder; b) Psychotherapy to stop the vomits; c) Desire to receive dental treatment, and d) A balanced diet and improvement of her oral hygiene. After performing the intraoral and extraoral examinations, periodontal analysis including measuring the clinical attachment level with a periodontal probe, radiographic interpretation (Figure 7 and 8) and a thorough occlusal evaluation with preoperative diagnostic casts (Figure 9) mounted in a fully adjustable articulator (Denar D5A), the diagnosis was established and a comprehensive interdisciplinary restorative treatment plan was prepared. This interdisciplinary treatment includes orthodontics, endodontics, periodontics and prosthodontics to rehabilitate the stomatognathic system and meet specific goals such as the aesthetic demands of the patient.

Before starting the comprehensive oral rehabilitation, the patient cooperated during the first four months of psychotherapy. Various antidepressants had proven to be effective in reduction of the severity of symptoms of BN. Evidence to date has demonstrated that a combination of antidepressants and cognitive–behavioral therapy appears to be more effective in reducing the frequency of binging and purging than either treatment administered alone.7–9

She completely stopped vomiting and was monitored during the initial phase of the diagnostic casts’ preparation, which included the complete wax-up of the clinical case. The patient was thoroughly informed verbally and in writing about restorative therapeutic methods to select the ideal treatment to properly rehabilitate her masticatory system. Every single restorative treatment was evaluated, emphasizing its advantages and disadvantages and their consequences before the dental treatment of prosthodontics, which would take 18 months. Traditional invasive restorative procedures were compared with minimally invasive procedures based on adhesion showing excellent aesthetic results and with great longevity of its restorations in very complex cases.

Despite the improvements in composite resin, ceramics and the advent of adhesive systems, which have made significant advances in techniques used in restorative dentistry, there is not a consensus on their use for cases of this scale. Adhesive systems and their corresponding techniques are still being questioned and evaluated due to the limited durability of the interface in simple cases in a number of research projects in the world.
The patient did not want to experience any of the possible effects from conservative, additive adhesive treatment, so she opted for traditional restorations.

The patient decided to choose a full oral rehabilitation using a more invasive subtractive restorative treatment, including periodontal, endodontic and prosthodontic treatments that fully prepare all teeth to create a biological space to be able to place porcelain-fused-to-metal crowns and obtain excellent results from an aesthetic and functional point of view, and also providing longevity to the restorations in the comprehensive rehabilitation of the masticatory system [27]. Several studies defend conservative adhesive ceramic restorations in the rehabilitation of bulimic patients with 2 to 4 years of follow-up [29,30]. However, the use of Amalgam bond (Parkell) to reinforce restorative teeth is questionable, because recent studies show that the reinforcement effect of adhesive resin is temporary and suffers from plastic deformations [31].

**Vertical Dimension**

Due to esthetic considerations and the insufficient space of occlusal relief in the centric occlusion showed by the patient, vertical dimension was evaluated through two methods: a) The phonetic method to measure her closest speaking space [32], and b) The chin-nose method [33].

After a complete clinical evaluation and an occlusal and cephalometric analysis, we decided to restore the patient’s vertical dimension of occlusion (VDO); therefore, a full diagnostic wax-up was performed over study models that were mounted in a Denar DSA articulator with VDO restored of 4 mm in the incisal pin (Figure 10). A mutually protected occlusal scheme was developed in the diagnostic wax-up that served as a guide during the prosthodontic treatment.

Two temporary tattoos were made as arbitrary intraoral points over the gum adhered to the upper right and lower left central incisor. The tattooed marks were made with a 30 gauge dental needle, [34]. Containing lidocaine anesthetic solution and a small amount of indelible ink (India ink). These two marks in the mucosa were useful to evaluate and verify the vertical measure of the restored VDO during the full oral rehabilitation of the patient.

The patient’s VDO was restored with the Occlusal Esthetic Denture known as the BODA removable appliance (Figure 11), which is a removable denture developed by doctors Bonilla and Del Aguila since 1994, complying with four functions: Restore the lost VDO, establish the occlusion scheme related to the neuromuscular system, guide anterior teeth during the provisional phase to a fixed anterior canine guidance to prevent occlusal interference and aesthetics.

The patient used the Occlusal Esthetic Denture (BODA) for 12 weeks to determine if the restored VDO did not cause problem with her stomatognathic system. The patient handled this new VDO very well (Figure 12).

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**Figure 10.** Right and Left Side View of the Diagnostic Wax-Up in the new VDO.

**Figure 11.** Occlusal Esthetic Removable Denture BODA to increase the patient's vertical dimension of occlusion.

**Figure 12.** In the left image, a front view is observed of the patient using the removable denture BODA with an esthetic color in the new VDO restoration. In the right image, two tattoos can be observed over the adhered mucosa to be able to verify the new VDO that has been restored in the patient.
Prosthodontic Treatment

After modifying the gingival tissue levels in all teeth through a periodontal surgical procedure called “crown lengthening”, for esthetic reasons, root canals were made; cast post and core prepared and cemented over the six upper anterior teeth. The maxillary anterior teeth were slightly prepared and provisional restorations were cemented. Then, all upper and lower anterior teeth were prepared and provisionalized. The esthetic occlusal device was adjusted to the upper arch, maintaining the posterior portion of the device in contact with the lower posterior teeth to maintain the proper occlusion (Figure 13).

The new vertical dimension was evaluated, provisional crowns and provisional treatment denture for a period of 6 weeks (Figure 14). The remaining teeth were prepared (Figure 15) and provisionalized in the following visits, preserving the restored VDO of the patient. The restored vertical dimension was evaluated again and the provisional crowns in the esthetic and functional aspect for a period of 12 weeks to ensure a proper response of the neuromuscular system.

Once the aforementioned evaluation period had passed, the patient was very satisfied with her new facial appearance, and reported no adverse symptoms and signs of the stomatognathic system. Functionally, she was able to eat, speak and smile comfortably (Figure 16). Final impressions of the patient’s upper and lower teeth were taken with silicone adhesive (Reprosil low and medium viscosity, Dentsply Dens/Caulk) in individual trays made of acrylic resin. The pantograph (Denar) was used to record the mandibular movements of the patient and transfer those pantographic records to the Denar D5A fully adjustable articulator (Figure 17).

Figure 13. Anterior provisional restorations in the new VDO. The removable denture BODA can be observed with esthetic color in posterior teeth.

Figure 14. Front and lateral view of the initial patient smile.

Figure 15. Right and left side view showing the preparation of the entire posterior teeth maintaining the provisional restorations in the anterior teeth.

Figure 16. Front and side view of the occlusion and VDO restored of the patient with acrylic provisional crowns.

Figure 17. Pantographic records of the patient. The left image shows that the pantograph recorded mandibular movements and trajectories in the three planes of space, at condylars and incisal level. The image at the right shows the records of the right condyle movements in two planes, one vertical and the other one horizontal.
The upper cast was transferred to the articulator with facebow instrument and the lower cast was mounted through zinc oxide and eugenol interocclusal records over final impressions of the patient’s upper and lower teeth were taken with silicone adhesive (Reprosil low and medium viscosity, Dentsply/ Dens/Caulk) in individual trays made of acrylic resin. The pantograph (Denar) was used to record the mandibular movements of the patient and transfer those pantographic records to the Denar D5A fully adjustable articulator (Figure 17). (Bite Registration Paste, Kerr) (Figure 18-21).

Figure 18. The upper and lower casts were mounted onto a completely adjustable D5A articulator.

A complete wax-up of all upper and lower teeth was performed defining the mutually protected occlusal scheme and the aesthetic aspects according to the provisional crowns based on contour, inclination, form, diameter and length especially in anterior maxillary teeth to satisfy the aesthetic and functional aspect of the patient (Figure 22). All teeth were treated with porcelain-fused-to-metal restorations and cemented with GC Fuji I (GC America) as planned. (Figure 23-27).

Figure 19. Right and Left side view of the working casts in the D5A articulator.

Figure 20. Occlusal view of the upper and lower working casts with all prepared teeth.

Figure 21. Image of the prepared dies with 90 degree cavosurface angle with a rounded internal angle.

Figure 22. Front and lateral view of the functional wax-up of the entire dies and definition of the occlusal scheme in its maximum intercuspatation.
The patient was very happy and satisfied with the obtained results of the dental practice (Figure 28 and 29). The patient had appointments every week during the first month to evaluate the response of the stomatognathic system to the 4mm increase in the anterior section of the patient's vertical dimension. No adverse symptoms or signs were presented during the first evaluations.

We observed that the patient continues with excellent oral hygiene as taught during her initial appointments. Then, she was evaluated every two months for a year. When the treatment ended, the appearance of the patient and her self-esteem changed significantly. Moreover, the patient changed her hair and turned into an outgoing and confident person with a very happy and steady life.

Figure 23. Front view of the upper and lower anterior porcelain-fused-to-metal restorations in their corresponding dies showing a high esthetic level.

Figure 24. Lingual image of the finished and glazed porcelain-fused-to-metal restorations, with the lingual collar of the crowns well polished.

Figure 25. Postoperative occlusal image of the upper and lower arch with cemented porcelain-fused-to-metal restorations.

Figure 26. Front and lateral view of postoperative images of the porcelain-fused-to-metal restorations.

Figure 27. Front view of the patient showing her beautiful and satisfactory smile.

Figure 28. Photograph showing a total change in the patient's behavior and lifestyle.
Discussion

Certain psychological factors and personality traits may predispose people to developing EDs. Many people with EDs suffer from low self-esteem, feelings of helplessness, and intense dissatisfaction with the way they look. People sometimes have EDs without their families or friends ever suspecting that they have a problem. Aware that their behavior is abnormal, people with EDs may withdraw from social contact, hide their behavior, and deny that their eating patterns are problematic [13].

Specific traits are linked to each of the disorders. People with anorexia tend to be perfectionistic, for instance, while people with bulimia are often impulsive. Physical factors such as genetics also may play a role in putting people at risk [11-13].

EDs can devastate the body. Physical problems associated with anorexia, for instance, include anemia, constipation, osteoporosis, even damage to the heart and brain. Bulimia can result in a sore throat, worn-away tooth enamel, acid reflux, and heart attacks. People with binge eating disorder may develop high blood pressure, cardiovascular disease, diabetes, and other problems associated with obesity. EDs are also associated with other mental disorders like depression [2-5].

Researchers don’t yet know whether eating disorders are symptoms of such problems or whether the problems develop because of the isolation, stigma, and physiological changes wrought by the EDs themselves. What is clear from the research is that people with EDs suffer higher rates of other mental disorders - including depression, anxiety disorders, and substance abuse - than other people [12-13,19].

Most cases of EDs can be treated successfully in conjunction with medical and dental healthcare professional. Since undiagnosed EDs avoid medical treatment, the roles of the dentist is crucial to detect clinical findings suggesting significant life-threatening mental illness, probably in the early phase to provide proper multidisciplinary treatment and recovery [10,35].

Bulimia nervosa is an increasingly recognized eating disorder, with significant medical and dental complications. In order to prevent more destruction of the dental hard tissue, oral mucosa and salivary glands; and ensure the best possible treatment and prognosis. It is necessary for the family dentist or hygienist to perform an early diagnosis of the psychological disorder [35].

Once identified, bulimic patients must be sent to evaluation and medical treatment. Most of the patients, who have developed a well-established BN pattern, including advanced behavior complications, need comprehensive treatment programs. These programs are designed to mainly offer psychological or psychiatric help but only 50% of BN patients consider to be totally recovered even 5 to 10 years after their treatment [36]. Around one third of the treated patients suffer a relapse within 4 years [36].

In the described clinical case, the binging and purging behavior stopped before beginning with the preventive and complete dental treatment in order to succeed and accomplish long-term dental restorations.

Conclusion

A review of scientific knowledge of two major EDs and the guidelines of prosthodontic management to rehabilitate a patient’s stomatognathic system with BN were presented.

Since undiagnosed EDs avoid medical treatment, the role of the dentist is essential in detecting clinical findings and for suggesting medical help for a significant life-threatening mental illness, ideally in the early phase to provide proper multidisciplinary treatment and recovery. A proper development of a comprehensive prosthodontic treatment plan altering the patient’s VDO was crucial to achieve an outstanding esthetic outcome, ultimately leading to professional success and positive patient outcome.

& Occlusal Esthetic Removable Denture (BODA) developed by Drs Bonilla and Del Aguila.

References


