

A Look at Periodontal Disease, the Contrasting Referral Approaches of General Dentists to Periodontal Specialists and How it Affects the Duties and Ethics of Dental Hygienists

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Abstract

Dental hygienists are skilled professionals of the allied health field taught to recognize and treat various oral conditions. However, due to variances in the states' rules and regulations set forth by the Dental Boards, they are prohibited in many states from diagnosing such conditions and/or disease. This can present ethical dilemmas when hygienists know that disease is present and feel that incomplete treatment methods are taking place. For example, periodontal disease is a common oral condition affecting numerous individuals. Given that periodontal disease is thought to be implicated in other overall health crisis, it is essential that it be properly address. Furthermore, questions of standards of care are implied when periodontal disease is not properly addressed or treated. As hygienists, evaluations of personal ethics and current office settings, as well as possible issues of liability and proper documentation, should influence the decisions that are executed as professionals in the field.

INTRODUCTION

As a hygienist, has this ever happened to you? You have just been given a patient whom has just had a "comprehensive exam" with the dentist. The patient is on your schedule for a regular prophylaxis, and as you place the panoramic radiograph onto the view-box you immediately notice at least six millimeters of vertical bone loss on a mandibular premolar. Instantly you look for a periodontal chart, only to find none. When the patient opens his or her mouth you are greeted immediately with erythematous and edematous gingival tissue ready to bleed at a moment's notice. To top it off, the patient is blind making oral hygiene instructions more difficult to demonstrate.

Or how about this, you have a patient whom you have never seen before on your schedule for non-surgical periodontal therapy. Upon looking in the chart, you realize that in previous years he or she has had non-surgical periodontal therapy performed. The patient, for whatever reason, has not or does not want to go to the periodontist, and you do not know whether or not such discussions have ever been presented to the patient in past appointments. When you begin to work on the patient you realize that he or she has

severe periodontal disease. Without diagnosing the patient, you suggest to the dentist and the patient that maybe he or she should get a consultation with the periodontist. You also suggest, to no avail, that a diagnosis can be made by the combination of the professionals in regards to which teeth can be saved and which teeth can be extracted and examined for different restorative options. That being said, non-surgical periodontal therapy is performed as diagnosed and scheduled. Several months later, you see that the patient has now been put in with another hygienist for yet another round of non-surgical periodontal therapy. This other hygienist reports to you that while the dentist was administering anesthesia for the non-surgical periodontal treatment, she proceeded to rinse and evacuate saliva from the mouth only to literally extract, by simple suction, a mandibular anterior tooth in the process.

Okay, maybe not these specific circumstances have occurred, but I would venture to say that many, if not most, dental hygienists face these kinds of dilemma every day. While dental hygienists are not dentists, they have been very specifically trained and educated in their respected field, and their opinions should be respected. Not only have they been tested through the years of required college, they have been

required to pass national, clinical and ethical boards. These rigorous courses, clinical experiences, examinations and board tests have vehemently prepared the hygienist for treatment and recognition of oral conditions including periodontal disease.

LITERATURE REVIEW

PREVALENCE, PATHOLOGY & ETIOLOGY

Studies suggest that the prevalence of periodontal disease is very excessive in the general population of the United States indicating that approximately 75% are affected by this disease. (Campbell, 2007) While this disease is very prevalent, some studies suggest that it does seem to be slightly on the decline. According to a study presented in the Journal of Dental Research, varying factors of ethnicity, socio-economic status, and educational levels affects the level of presentation of periodontal disease. This particular study shows the prevalence to be decreasing among U.S. populations in part due to the increase in awareness, increase in education and socio-economic status, and the decrease in the smoking habits of individuals. (Borrell, Burt & Taylor, 2005)

The etiology of periodontal disease stems from the bacterial content as well as the host response to the bacteria. Several bacterial pathogens are responsible for the development and progression of periodontal disease. Some of the main players in the progression of periodontal disease are *Actinobacillus actinomycetemcomitans* (Aa), *Porphyromonas gingivalis* (Pg) and *Prevotella intermedia* (Pi). (Joshi & Vandana, 2007) These pathogens are found in the plaque that is present in the oral cavity, in particular, inside the periodontal pocket. While there is no doubt that the existence of these bacteria plays an important role in the etiology of periodontal disease, studies suggest that it is the combination of these bacteria and the host response of the individual that exacerbates the progression of periodontal disease. It is when there is a state of imbalance between the good bacteria normally present in the oral cavity and the invading bad bacteria that the disease process begins (O'Hehir, 2005).

Everyone has a space between their teeth and their gingival tissue which is referred to as the sulcus. The gingival tissue is attached to the underlying connective tissues and structures by the junctional epithelium. A healthy measure of the depth of this space is one to three millimeters in depth. This is how far toothbrush bristles and floss can clean below the gingival tissue at home. If areas are left with plaque

formation for certain periods of time, then the bacteria in that plaque begins to accumulate. The more bacteria that accumulates, and the longer time the plaque remains on the teeth and surrounding structures, the more virulent the bacteria becomes. After a period of time, the bacteria begins to change from gram (+) cocci to gram (-) spirochetes and vibrios. (Wilkins, 1999) Soon, the bacteria will begin to form endotoxins which release harmful toxins into the surrounding areas. Through the inflammatory process that is triggered by these bacterial releases, the gingival tissue and bone tissue begin to deteriorate leading to deeper probing depths known as periodontal pockets and beginning the process for periodontal disease. Such inflammatory responses include the release of white blood cells into an area to fight off disease. These white blood cells are known as polymorphonuclear leukocytes or PMNs. In addition, the introduction of toxins initiates the immune system to release mast cells which are responsible for the production of histamines. Histamines allow for vasodilation of the area which allows the white blood cells and other cells to enter and attack the bacteria through the release of cytokines. In patients who have a strong and healthy immune system, the lysis of good and bad bacteria is a temporary imbalance and the system is promptly corrected and business continues as usual. However, for the immunocompromised patient this imbalance is detrimental and often not corrected. If the PMNs that are released are not potent enough to overtake the initial invaders, more and more PMNs are released until an unhealthy balance is introduced. Improper phagocytosis from immunocompromised patients and increased cytokines to the area will ultimately damage all surrounding tissue. (O'Hehir, 2005)

Further studies have been conducted confirming the host response to be conducive to periodontal disease progression. These studies have demonstrated that the over stimulated response of the body's neutrophils have indicated a progression in the destruction of the periodontal tissue of the oral cavity. (Matthews, et al., 2007)

CONNECTIONS TO OVERALL HEALTH

There are also systemic conditions that are associated with periodontal disease or seen in conjunction with periodontal disease. Often additional studies need to be conducted for complete understanding of their association. For example, patients that are immunocompromised in various ways will often be more susceptible and more likely to present with periodontal disease. Examples include patients with diabetes,

heart disease, and even women who are pregnant. Certain studies often indicate that patients with uncontrolled diabetes will often be more susceptible to periodontal disease.

Likewise, these studies also reveal that by controlling the periodontal disease, in return, the symptoms of diabetes would become more controlled. (Schutte & Donley, 1996)

Other studies indicate that patients diagnosed with periodontal disease have an increased C - reactive protein level which increases the risk for cardiovascular disease. The increased CRP level is more pronounced in patients of normal weight or body mass index as compared to obese patients. This study states that ... "periodontal disease and adiposity compete for common proinflammatory pathways that elicit an acute-phase response." (Slade, et al., 2003, p.1177)

Testing and studies are continually being conducted on the systemic links of periodontal disease with diabetes, heart disease and low-birth rate babies born to mothers with periodontal disease. A study presented in the Journal of Clinical Periodontology admits to finding a moderate connection between premature births and periodontitis, as periodontal disease can implicate systemic infection. However indications of further research were implied to establish risk factors. (Agueda, MaRamon, Manau, Guerrero, & Echeverria 2008)

And finally, another study presented in the Journal of the National Cancer Institute indicates a hypothesized link between patients with periodontal disease and pancreatic cancer. The following is a quote from this particular study:

An association between periodontal disease and systemic inflammation has been observed using biomarkers....c-reactive protein levels were 30% higher in individuals with a history of periodontal disease....Alternatively, periodontal disease could influence pancreatic carcinogenesis through increased generation of carcinogens, namely nitrosamines. Individuals with periodontal disease...have much higher nitrosamines levels in their oral cavity due to nitrate-reducing bacteria. Nitrosamines and gastric acidity have been hypothesized to have an important role in pancreatic cancer; numerous studies support this hypothesis. (Michaud, Joshipura, Giovannucci, Fuchs, 2007, p.174)

These are all indications of various risk factors in the overall health of an individual in association with the many types of periodontal disease.

CASE TYPES

There are different stages of periodontal disease that occur in both childhood and adulthood. In order to reduce confusion, the American Academy of Periodontology established a classification system just as a basic structure to group periodontal disease. This framework is not indicative of the biological determinates of periodontal disease yet, but more as a reference to aid in paperwork, study and analysis. It eliminates confusion of classifying age of onset with the natural understanding that some conditions are going to be identified differently based on each individual basis. For example, a disease could still be either localized or generalized, or refractory meaning often non-responsive and reoccurring. (Armitage, 2005) The classifications are referred to as Case Type I, II, III and IV or respectively gingivitis, mild periodontitis, moderate periodontitis and advanced periodontitis. If the initial stage of periodontal disease better known as gingivitis is recognized early enough, then it can be treated and reversed in most cases. Periodontal disease itself is a manageable disease once it has been diagnosed but it is not reversible.

RECOGNITION AND DIAGNOSING

When diagnosing periodontal disease, it is often times immediately recognizable based on the periodontal measurements that are made either by the dentist or the hygienist. Typically, the hygienists are more involved than many dentists in obtaining periodontal measurements. These measurements should be used as a guideline that directs the hygienist as to how far down to instrument when performing prophylaxis or non-surgical periodontal therapy. In some cases both an analysis of the radiographs and the periodontal measurements together are required for accurate diagnosis. For example, often there are times when periodontal measurements are indicating pocket depth, but radiographically there is no evidence of bone loss. Typically, this is primarily a pseudo-pocket due to the gingival inflammation or gingivitis that has occurred from calculus accumulation harboring bacteria and is not a true pocket from bone loss. In these cases removal of the calculus will often resolve the probing depth dilemma and reverse the initial stage of gingivitis. Included with these indications for diagnosis are obvious signs of bleeding on probing and/ or release of exudates or suppuration. These are all indicative of active infection from the inflammation process brought on by presence of harmful bacteria. A complete assessment of additional risk factors should be considered as well. For example, faulty dental margins that keep gingival tissue

irritated and behavioral patterns of the patient such as smoking. (McLeod, 2000)

Hygienists are trained to recognize all of these signs as indicators of periodontal disease so that the patient can be properly treated and re-evaluated, but the legal statutes of most states do not allow the hygienist to actually diagnose disease. Clinical diagnosis is ultimately the responsibility of the dentist. According to the rules governing the practice of dental hygienists in the state of Tennessee, and many other states, set by the Board of Dentistry, dental hygienist are allowed to perform treatment but not allowed to diagnose disease condition. (Board of Dentistry, 2007)

PERFORMANCE AND OUTCOMES OF NON-SURGICAL THERAPY

Non-surgical periodontal therapy can be performed by the hygienist and can often times be very effective in the management of periodontal disease. Outcomes can be very promising especially if you are a very skilled hygienist, and you have a patient that understands that their cooperation with homecare and frequent recalls are crucial to aid in desired outcomes. (Avradopoulos, Wilder, Chichester & Offenbacher, 2004) Depending on the skill of the hygienist, sometimes pocket depths can vary as to desired response. In some cases, generalized mild to moderate periodontal disease with pocket depths of four to six millimeters can have positive response to non-surgical treatment. Localized areas of advance periodontal disease with areas of seven millimeters can also have positive response to non-surgical treatment. Studies have indicated reduction in pocket depth of one to two millimeters after non-surgical periodontal therapy. (Greenstein, 2000) However, with increased pocket depths, removal of subgingival calculus non-surgically becomes more challenging. Periodontal disease that is non-responsive or reoccurring should make the practitioner question the type of bacteria present. Certain bacteria such as *Actinobacillus actinomycetemcomitans* are known to be tissue invasive and therefore may only respond to antibacterial treatment. This is indicative of the need for the treating practitioner to determine exact presence of bacteria by performing microbiological testing. (Greenstein, 2000) Most studies have reported that the use of local antimicrobial agents are only temporarily effective and would require multiple treatments professionally and/or daily irrigation by the patient. Systemic antibiotic therapy seems to be more beneficial than local delivery; however, the question of antibacterial resistance is always prevailing. (Greenstein,

2000) According to Greenstein (2000), recently approved FDA host modulating drugs that reduce collagenase activity have some effect on host response to periodontal disease but it is not significant. (Greenstein, 2000) After treatment has been administered, patients need to be monitored and placed on recall status so that the progression of disease can be observed. Sometimes depending on the amount of healing that is needed, surgical procedures are required. (Greenstein, 2000) Lots of patients show favorable response with reduced gingival bleeding and reduction in pocket depths. Since periodontal disease is a fluctuating disease sometimes you may see periodic returns in inflammation and slight pocket depth increases, but often times these situations can be managed by sufficient periodontal debridements and frequent recalls. It is when these situations do not seem to be responding to treatment that other options should be examined.

GUIDELINES

There have been suggested guidelines that have been presented by the periodontal academy in regard to the referral of the periodontal patient to the periodontist. Arthurs Krebs and Clem (2006), discuss the guidelines in the Journal of Periodontology. These guidelines have been differentiated into categories that would include both sole treatment by the periodontist and co-management by both the general practitioner and the periodontist. The following is a description of these guidelines according to the Academy of Periodontology: Level one type patients are co-managed patients who have periodontal disease in association with systemic conditions such as diabetes, pregnancy, cardiovascular disease and chronic respiratory disease. It also includes patients with periodontal disease that are scheduled to have major surgery or cancer treatment. Level two patients are also co-managed patients who present for re-evaluation or initial examination with early-onset (prior to age 35), or progression of the disease. Signs of progression include increasing pocket depths greater than or equal to 5 mm, increase in radiographic bone loss, tooth mobility and attachment loss. This level also includes medical and behavioral factors that increase the risk of periodontal disease including the following: tobacco use, drug-induced gingival conditions and compromised immune systems that may or may not be drug induced. The last level is level 3 patients who are listed as patients that should be treated by a periodontist. These patients include those with severe chronic and or refractory periodontitis, bony defects that are vertical or angular, peri-implant disease, and significant root

exposure especially with furcation involvement, as well as, any periodontal patient that the general dentist just prefers not to see. (Krebs & Clem, 2006)

After the academy released their recommended guidelines for referral, the Academy of General Dentistry (AGD) was very upset. The AGD stated that they prefer to adhere to their own guidelines for referral which were adopted in 1990 and revised in 2006. The AGD's homepage quotes the AGD as saying "AGD firmly believes these guidelines reflect the ADA's emphasis that referrals should be based on the education, training, interest and experience of the dentist and unique needs of the patient" (Academy of General Dentistry, 2008 <http://www.agd.org> viewed 2/6/08).

REFERRAL VARIANCES

There are some dentists today that are very good at referring periodontal patients to the periodontal specialist. In fact, some dental offices refuse to treat any forms of periodontal disease and feel more confident just referring all treatment out to the periodontal specialist. Other dentist will often initially treat the periodontal patient with some form of non-surgical periodontal therapy and perhaps subgingival antibacterial placement of antibiotics. Afterwards, if conditions worsen they will refer the patient to the periodontal specialist. In these cases, the periodontist will often treat the patient, sometimes surgically and then have the patient alternate every three months between their office and the general dentist office. This often times will have favorable responses and presents a shared responsibility and liability of the patient.

According to studies conducted of general dentist in Northern Ireland and a comparable study conducted in North West England, there were many variances in the referral protocols of general dentist to periodontal specialist. (Linden, 1998) One particular conclusion indicates that the closer the specialty practice is to the general dentist, the higher the referral rates. Linden (1998) points out accessibility plays an important role and often patients located in rural areas with more deprivations would not be able to travel very far for treatment. Linden (1998) also indicates that patients that were considered to be of low socio-economic status were less often referred to the specialist. The high socio-economic class tended to be the ones that were referred more often as well as more women were referred in comparison to men. This however is ironic as Linden (1998) points out that often the high socio-economic class and women tend to be less affected and

present less often with periodontal disease. Linden (1998) also points out that the dentists may interpret the desires of the patients differently when he states the following quote:

Many dentist seemed to operate a form of triage in which they referred only those patients whom they believed were co-operative and would benefit from periodontal care...It is dentist who explain to patients the need for and the importance of periodontal treatment. However, a substantial number of dentists, conscious of previous refusals, had given up trying to persuade patients that referral was necessary. (Linden, 1998, p.660)

Further examination of dental referrals presents an interesting fact according to a study presented in the Journal of Periodontology. This particular study examines the thought that because of the increase in the knowledge of periodontal disease that referral practices would be affected, yet the interesting fact is that the type and or conditions of the patients referred showed change. This particular study examines the same offices in the year 1980 and then later in the year 2000 to evaluate the change in referral patterns. The following is a quote from the study:

Characteristics of patients referred in 1980 compared to those referred in the year 2000 indicate that, although fewer patients use tobacco, there were several noteworthy trends. At referral, patients exhibited a greater loss of teeth, had more severe disease and required extractions of a greater number of teeth in 2000 compared to 1980. (Cobb, et al., 2003, p.1470)

QUESTIONABLE TREATMENT

Ethical situations often arise when dentist do not refer a patient with active periodontal disease to the periodontal specialist. It is the responsibility of the dentist to act in the fashion of doing what a prudent and responsible person would do to ensure the best treatment of the patient. Granted, one can only inform the patient of the situation and the necessary recommendations to manage the condition and ultimately the patient has to give consent. The problem comes into play when either the patient has not been adequately informed and/ or the treatment that is performed after the patient has decided they do not want to go to the periodontal specialist. For example, repeated inadequate subgingival removal of calculus and bacteria and or repeated in-effective non-surgical periodontal therapy. Also along with inadequate removal of debris, some dentist will choose to place subgingival antibacterial medicines in areas of non-

restorable periodontal pockets. Inadequate removal of subgingival debris in and of itself can be harmful, but even more so in advanced periodontal disease. Sometimes if an adequate amount of debris is left in the pocket region, partial healing can occur and some tissue can close up over the debris often causing periodontal abscesses. (Dello Russo, 1985) Also, studies show that the most effective use of subgingival antibiotics occurs right after proper and thorough removal of debris. In stages of advanced periodontal disease, adequate removal can only be obtained thorough surgical treatment. Long term studies have not been proven in the placement of subgingival antibacterial medicines. Further studies suggest that administration of systemic antibiotics without proper removal of subgingival bacteria will further complicate the disease and could lead to increased infection. (Helovuo, Hakkarainen & Paunio, 1993)

New techniques for non-surgical periodontal therapy are always being researched. Currently there are some dental offices that utilized equipment such as lasers and perioscopes to treat periodontal disease and are successful in managing the disease. Perioscopy allows the technician to view the subgingival area on a screen while performing non-surgical periodontal therapy; thereby potentially making treatment more successful. According to a report in the Journal of Dental Research, studies are also underway on the effective use of photodynamic therapy in the treatment of periodontal disease. (Konopka & Goslinski, 2007).

DISCUSSION

Ethically, dental hygienists are placed in a touchy situation. Providing proper care involves fully informing the patients of the situations that are seen taking place in the mouth. Patients need to be fully informed of their conditions and of all the possible treatment options available. Hygienists basically can only inform the patients of what they see and maybe discuss the etiology of periodontal disease with the patients without flat out diagnosing. Proper documentation of these discussions should be written in the chart. It is understood that cases should be treated on an individual basis. Often patients may always have deeper probing depths in certain areas, but as long as there are not any obvious signs of active infection (i.e. bleeding, suppuration, increase in pocket depth or mobility) and the patients are compliant with office visits and homecare, these situations are maintained and managed. Even if patients flat out refuse periodontal treatment whether it is surgical or non-surgical, they need to understand that they potentially will not

improve their condition. Also if these patients refuse to comply with the suggested recall status and homecare instruction, then theoretically supragingival treatment only, and not subgingival treatment, is suggested so as to not further the progression of infection or potentially cause an abscess. However, these cases of supragingival debridement become a difficult process for the hygienists as it can be very physically demanding.

Not all offices have the newest technology for advanced periodontal therapy and this can be another obstacle to improving patient's conditions. However, interestingly enough, advanced knowledge does not equal increased care. The bottom line question becomes: Where is the intended focus of the dentist or the practice, is it patient care or pocket book? Many hygienists are restricted by the dentists as to how much time they are given for treating patients. They may also be required to see a certain number of patients a day and/or produce a certain amount of income per day. This puts restrictions on proper and complete care. When not enough time is allotted to properly treat patients this may restrict patients to more return visits. As indicated from the above research, patients often will not travel if it is inconvenient.

Hygienists are taught that the goal is reduction of bacteria through the removal of debris. However, as the depth of the pocket increases this becomes more difficult and sometimes impossible. Bottom line is that some patients just need periodontal surgery to get them back to a manageable state.

CONCLUSIONS

Periodontal disease has strong systemic implications and brings about questions of an individual's overall health. When general practitioners and periodontal specialists cannot agree on referral guidelines patients are left hanging in the balance. When hygienists are not allowed to diagnose, they are forced to perform the diagnosed treatment of the general dentists they are working for. This can be not only physically demanding but ethically demanding as well. Unfortunately litigation presents itself in these questionable areas and often times both the hygienists and the dentists are targeted in these potential suits. This is ironic when legally, in most states, the hygienists are actually not allowed to diagnoses periodontal disease. I can only strongly recommend that the hygienists take the time to have serious discussions with the dentists they are working for and determine their particular guidelines for referrals. The best time for this discussion may actually be in the interview

process. However, if the situation arises later on and as a hygienist you do not agree with the diagnosis of the dentist, you have to do your own assessment of how you want to handle the situation. You may just decide that maybe a different office may be a more ideal working environment for you. If that is not the case, be very careful in that you do not specifically tell the patients that they have periodontal disease as this could be misconstrued as a diagnosis. You may suggest the signs that you are seeing and talk to the patients about the etiology of periodontal disease. Be careful that you document in this fashion as well. It may even be good to have brochures on hand that you can give to the patients showing pictures or progression of periodontal disease. Sometimes patients will recognize their own signs and symptoms. Hopefully you will be able to rectify the situation before any teeth are accidentally extracted with the high speed suction.

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