

**Treatment Planning for 65 year old Female Patient
with Coronary Artery Disease with Coronary Stent,
Obesity; Medication – Brilinta, Atorvastatin**

DEN1217-226

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4/17/19

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Dental Hygiene Treatment Plan Phase I

A treatment plan is an individualized outline of services and procedures which will be performed by the dentist, dental hygienist and patient to restore periodontal health, esthetics and normal function. When creating a treatment plan, a dental hygienist is responsible for providing a dental hygiene process of care called ADPIED, which includes: Assessment, Diagnosis, Planning, Implementation, Evaluation, and Documentation. By performing the dental hygiene process of care, the dental hygienist will acquire knowledge about the patient's medical history and periodontal health, allowing the hygienist to identify issues that may affect the treatment and outcomes of the treatment. After diagnosing, the hygienist can proceed to plan oral health goals, plan procedures and get informed consent for dental hygiene interventions. Once informed consent has been given, the hygienist can then activate the plan. The treatment plan is created with evidence-based and problem based dental care, customized to fit the patient's needs.

In this case, the patient is a 65 year old female diagnosed with coronary artery disease with coronary stent. The patient is obese and has chronic periodontitis type III. She is prescribed Brilinta, a blood thinner used to prevent blood clot and Atorvastatin for high cholesterol. After reviewing the medical history and assessing the patient's periodontal health, the dental hygienist will understand the relation between coronary artery diseases, chronic periodontitis type III and obesity.

The risk factors for coronary artery disease is chronic periodontitis type III, and obesity. Having chronic periodontitis type III makes the patient more susceptible to coronary artery disease because the "inflammatory phenomenon of periodontitis" produces "mediators such as C-reactive proteins" and "periodontal organisms contain proteins which cross-react with the heart" [1]. "Many risk factors for periodontal disease are also risk factors for atherosclerosis," which is the main cause of coronary artery disease [2]. Being obese also makes the patient susceptible to coronary artery disease due to the "increased dietary intake of cholesterol, saturated fat, carbohydrate (especially sucrose), alcohol, and calories" [2] which would leave fatty deposits or lipids in the blood vessel that partially blocks the flow of blood. With time, the fatty deposits and lipids would build up in the vessel until it has completely

restricted blood flow. Due to the restriction of blood flow, the patient would need to undergo surgery to have a coronary stent placed in the coronary arteries to keep it open and allow blood to flow. Also, insufficient physical activity from the obese patient contributes to the fat deposit and lipid buildup which then leads to coronary artery disease.

Obesity is also a risk factor for periodontal disease. It increases the occurrences of dental caries. Obesity is associated with greater clinical attachment loss and deeper periodontal pockets. Clinical attachment loss and periodontal pocket depths are measurements used in assessing a patient's periodontal health. Dental caries and periodontal disease may eventually lead to tooth loss. Obese individuals are more prone to have fewer teeth than non-obese individuals. Patients without dentures and who have few teeth or no teeth present are at risk of becoming obese. Edentulism, a toothless condition, is a contributing factor for poor diet. Edentulous patients may consume fewer vegetables and more cholesterol and saturated fat which may lead to weight gain.

The patient is prescribed Brilinta, a blood thinner that prevent strokes, heart attacks, reduce stent thrombosis and other heart problems. The medication helps blood flow through restrictive vessels more easily, preventing blood from clotting. The side effects caused from taking Brilinta includes bleeding and shortness of breath. While taking this medication, the patient can experience bruising, bleeding easily, nosebleeds and longer bleeding time than normal.

The patient is also prescribed Atorvastatin, a medication that reduces cholesterol in the blood. This medication is also used along with diet and exercise to reduce the risk of heart attack, angina and strokes. This medication is used to decrease the amount of low-density lipoprotein (LDL) and triglycerides commonly known as "Bad Cholesterol" in the blood. It increases the amount of high-density lipoprotein (HDL) and triglycerides known as "good Cholesterol" in the blood. Atorvastatin may adversely react with the erythromycin antibiotic. Elderly patients may also be at risk of myopathy (muscle weakness) when using this medication.

After getting a complete understanding of the relationship between coronary artery diseases, chronic periodontitis type III and obesity, the dental hygienist can come up with a treatment plan. First,

the dental hygienist should educate the patient about how obesity can affect periodontal disease and what the outcomes may be. Obesity can mutate the host's response to the antigens that come from bacterial plaque therefore creating disruptions in the inflammatory response in the course of periodontal disease. Being obese, the patient may present surgical difficulties as well as increased postsurgical complications. Diminished surgical visibility and accessibility for anesthesia may be evident. Post-op complications may be due to an impaired immune response, increased vulnerability to infection and diminished performance in wound healing. Predisposing factors linked with obesity make the healing process more difficult, indicating a faulty outcome.

Then we would educate the patient about effective tooth brushing and the use of interdental aids. We would recommend to the patient a power toothbrush and a water floss/ water pik. Although the Atorvastatin medication may cause muscle weakness, the patient may benefit more from using a power brush and water floss/water pik because she would not need to move her arm as much when brushing and flossing. Using the water floss/ water pik may also save her time from holding her arm up in the air for a period of time. We would consult with the patient's cardiologist first before recommending the power brush to the patient because it may interfere with the patient's coronary stent and the patient is prone to bleeding more easily for a longer period of time.

For therapeutic/clinical intervention, there are a few things to consider. Coronary artery disease predisposes patient to infection and blood clotting when patient is present for a dental cleaning. The metal stent is a foreign object. When placed in the coronary artery, it can trigger the body's host immune response/platelet aggregation. The antiplatelet medication is often prescribed to lessen the chances of stent stenosis and to prevent blood clot. Medical doctor will be consulted prior to dental treatment to avoid the side effects of the medication such as bleeding upon treatment.

In presence of periodontitis, alerted immune system would react to the stimulant differently. The bacteria such as Porphyromonas Gingivalis and Actinobacillus Actinomycetemcomitans are major offenders in periodontal disease. Those bacteria are found in the arterial plaque in the blood vessels. The coronary stent is placed in the inter wall of coronary artery to open up the blood vessels, which also

collects arterial plaque. In the case of bacteremia, it can worsen the condition. It is recommended that the patient is given prophylactic antibiotics prior to the dental treatment.

Also, prolonged sitting during the dental treatment is a risk for the patient. Gravity pulls the blood to patient's leg when the patient stands. The body compensates by vasoconstriction and increase the heart rate to ensure adequate blood supply to the brain. When patient sits for a long period of time, the blood pressure drops, blood vessel dilates, and the blood viscosity increases. Increased blood viscosity leads to higher prevalence of blood clot especially in patient with high cholesterols and diabetes. We would suggest for the patient to be given a break from sitting every 30 minutes. If patient is experiencing orthostatic hypotension from prolong sitting, instruct patient to dangle when sitting up on the edge of the chair for a few minutes to bring up the blood pressure.

In conclusion, we would consult with the dentist, the patient and the patient's cardiologist about the treatment plan. Once we have consulted with them, we would proceed with the treatment with extra caution. Also, we would incorporate break times for the due to her health and have her come back every three months for cleaning.

References:

1) Chaudhry, S., Jaiswal, R., & Sachdeva, S. (2016). Dental considerations in cardiovascular patients: A practical perspective. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4990738/>

2) Dental Care and Heart Disease: What to Tell Your Dentist. (n.d.). Retrieved from <https://www.webmd.com/oral-health/dental-care-heart-disease#1>