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Part I: Complete Dentures and Diabetes Correlation

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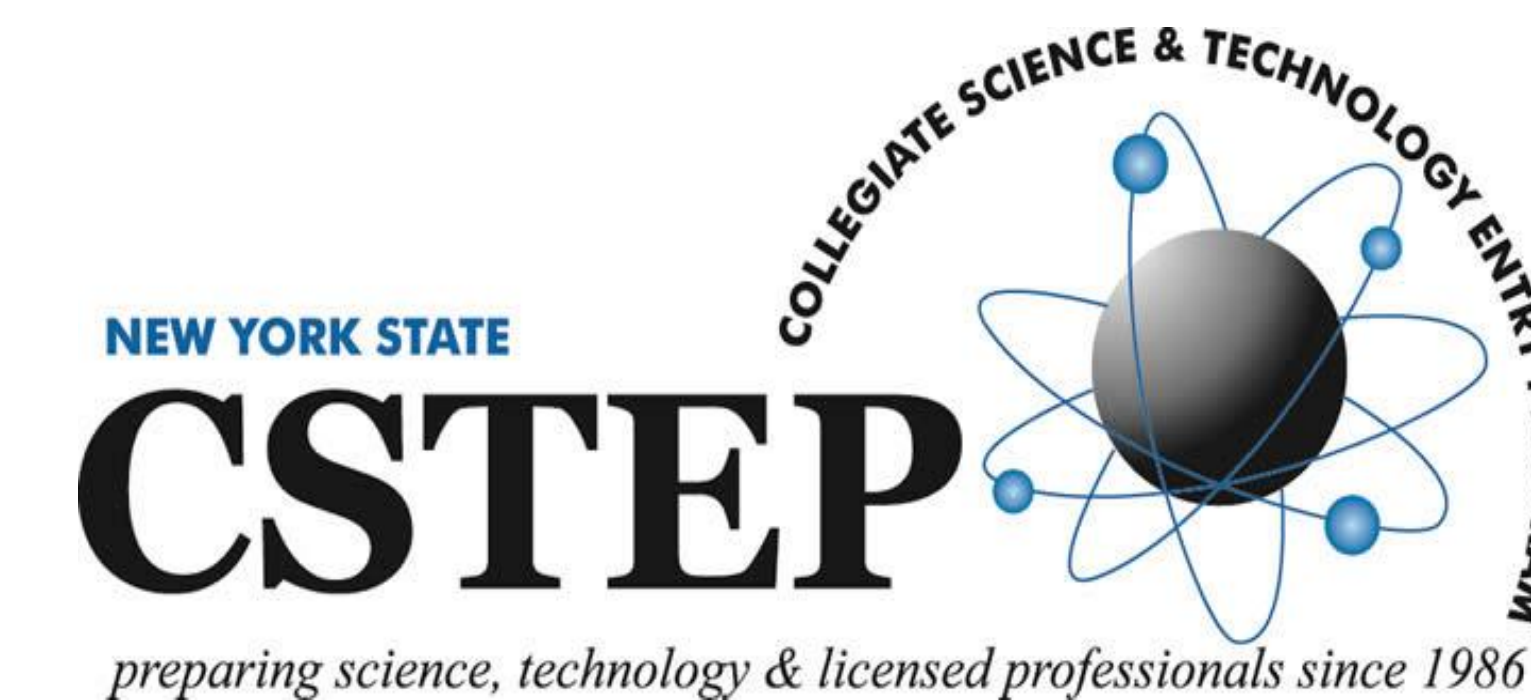
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PART I: COMPLETE DENTURES AND DIABETES CORRELATION

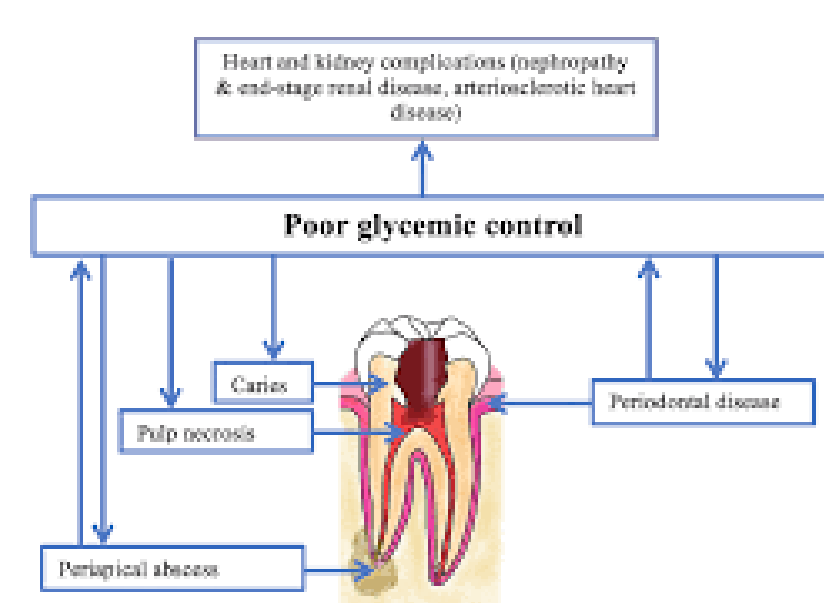
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Abstract

The aim of this study is to emphasize the importance of proper control and denture adaptation to oral environment for diabetic patients. It is common for diabetic patients wearing removable dentures when it comes to their oral rehabilitation. However, their functional and qualitative limitations can still lead to oral lesions. It is known that diabetic patients suffer from delayed wound healing, and have major susceptibility to infections. A good manufacturing and hygiene of a denture is of great importance in order to avoid compromising the oral mucosa. Repeated use can cause denture lesions leading to mastication inefficiency and patient's decreasing nutritional capacity. There is treatment to prevent the effects of diabetes when oral rehabilitation is performed (glycemic control factors) as well as removable dentures and patient's oral health monitoring and periodic assessments.



Materials and Methods

- Selected articles from the PubMed database. Eight scientific articles were selected.
- Key words: diabetes and complete dentures, complications and considerations for the dental management.
- Selection criteria: 2000 to 2019
- Experts consulted: Doctor Burney Croll Prosthodontist, Doctor Katherine Melo Dentist, and Professor Avis Smith CDT.

| Oral pathology related to DM | Pathogenesis | Treatment and Prevention |
|---|--|--|
| Periodontal disease | Accumulation of AGEs in periodontal tissues, decreased periodontal regenerative capacity and defective immune regulation | Assessment of risk of disease progression, periodic reviews, dietary advice and perio-dental therapy |
| Dry mouth | Reduced salivary flow as a result of polyuria and dehydration | Proper control diabetes and dental hygiene |
| Root Caries | As a result of gingival resorption and decreased salivary flow | Use of fluoridated pastes, restorative treatments. The optimal glycemic control prevents progression |
| Oral Candidiasis | Basal salivary dysfunction, hyperglycemia and impaired immune system | Antifungal nystatin or miconazole treatment. Good glycemic control and prevention. |
| Pulp necrosis and periodontal abscess | Ischemic tissue damage related pulp own vascular damage from diabetes | Endodontic treatment and control of diabetes |
| Delayed wound healing and increased incidence of infections following surgery | Caused by vascular dysfunction and decreased immune on diabetes | Preventive administration of antibiotics and good glycemic control |

*AGEs: advanced glycosylation end products.

Introduction

The concepts related to complete dentures and diabetes can be complicated due to the factors of indications, and contra-indications in treatment planning. Diabetes mellitus includes a group of diseases characterized by impaired action or secretion of insulin, or both. There are four etiologic types of diabetes, although the most frequent are type 1 and 2. Realizing that there are two generally known types of diabetes, we should define what they are first. Type 1 (also known as insulin dependent) is congenital, while type two (also known as non-insulin-dependent) is acquired.

| CRITERIA FOR THE DIAGNOSIS OF DIABETES | | |
|--|--------------------------------|--|
| MEASUREMENT | DIAGNOSTIC VALUES FOR DIABETES | CHARACTERISTICS |
| Glycosylated hemoglobin (HbA1c) | ≥ 6.5% | The test should be performed in a laboratory using the standardized method. It reflects average blood glucose levels over a 2- to 3-month period of time |
| Fasting plasma glucose | ≥ 126 mg/ dl (7.0 mmol/ l) | Fasting is defined as no caloric intake for 8 hours |
| Postprandial plasma glucose (2 hours after caloric intake) | ≥ 200 mg / dl (11.1 mmol/ l) | The test should be performed as described by the World Health Organization, using a glucose load containing the equivalent of 75g anhydrous glucose dissolved in water |
| Random plasma glucose | ≥ 200 mg / dl (11.1 mmol/ l) | |

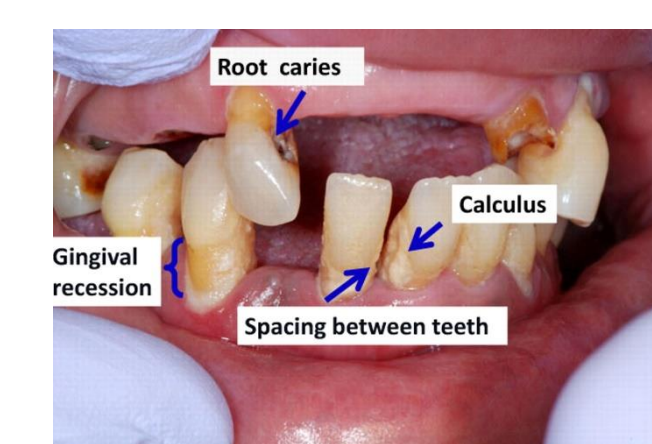
Diabetic individuals have peculiar oral and systemic characteristics such as periodontal disease, salivary dysfunction, fungal and bacterial infections requiring greater accuracy in adjusting their dentures to tissues. Furthermore, studies allowed concluding that with the decrease of saliva secretion (xerostomia) can cause pain or burning sensation in the mouth defaulting swallowing, speech and mastication, decreased taste, intraoral negative pressure and poor prosthetic retention. It is also known that prosthetic wear is one of the main causes of lesions in the oral cavity. Between the most common lessons encountered in the oral mucosa are traumatic injuries and others resulting from incorrect planning of dentures such as angular cheilitis and stomatognathic system trauma, caused by errors in establishing occlusal vertical dimension or by insufficient occlusal adjustments. The determinations in complete denture planning should be assessed to establish a detailed analysis of the diabetic patient's condition and needs in order to achieve a successful prosthetic treatment.



Fissured tongue Denture stomatitis Acute candidiasis

Results

Type 1 patients are prone to develop dental caries and infections. Dental caries is related to poor oral hygiene, rare dental visits, and lack of metabolic control of diabetes. In addition, salivary flow rates are reduced increasing oral infections. Among several reasons which contribute to the decreased salivary flow rate in diabetes is hyperglycemia and glucosuria. All these oral complications generate challenges for the patients' oral rehabilitation because most likely patients with poor oral health would require the replacement of their teeth at some stage of their life specially the ones who suffer from this condition at early age.



Periodontal Disease

Type 2 conventional treatment involves changing habits, such as diet control and physical activity. Well-balanced diets provided by adequate mastication, is part of therapy in patients with type 2 diabetes. Use of immediate dentures as a therapeutic choice for diabetic patients has positive results. Type 2 patients reported an increase of consumption of protein, fruits and vegetables in denture wearers after insertion of complete dentures in comparison to the period when they were edentulous. It is important to mention that the presence of the immediate denture, with its compression might change the conditions of the post extraction wound healing process, representing another risk for impaired wound healing in diabetic patients.



Complete Denture

Wrongly defined treatment planning, maladjusted dentures, poor oral hygiene in addition to conditions such as periodontal disease and xerostomia are a dangerous combination for patients who suffer from diabetes. Maladjusted dentures combined to the patient's lack of instructions may affect negatively the treatment. It is essential to instruct the patient about the importance of correct and proper oral hygiene. Many patients have poor hygiene due to lack of motivation and awareness. It can cause consequences of treatment failure. Maladjusted dentures should be improved or replaced in order to prevent oral lesions.

Conclusion

Diabetes exists in a bidirectional relationship with periodontal disease and may lead to other oral pathologies.

The wear of dentures might lead to mucosal and tissue ulcerations especially in diabetics (denture stomatitis and tissue lesions).

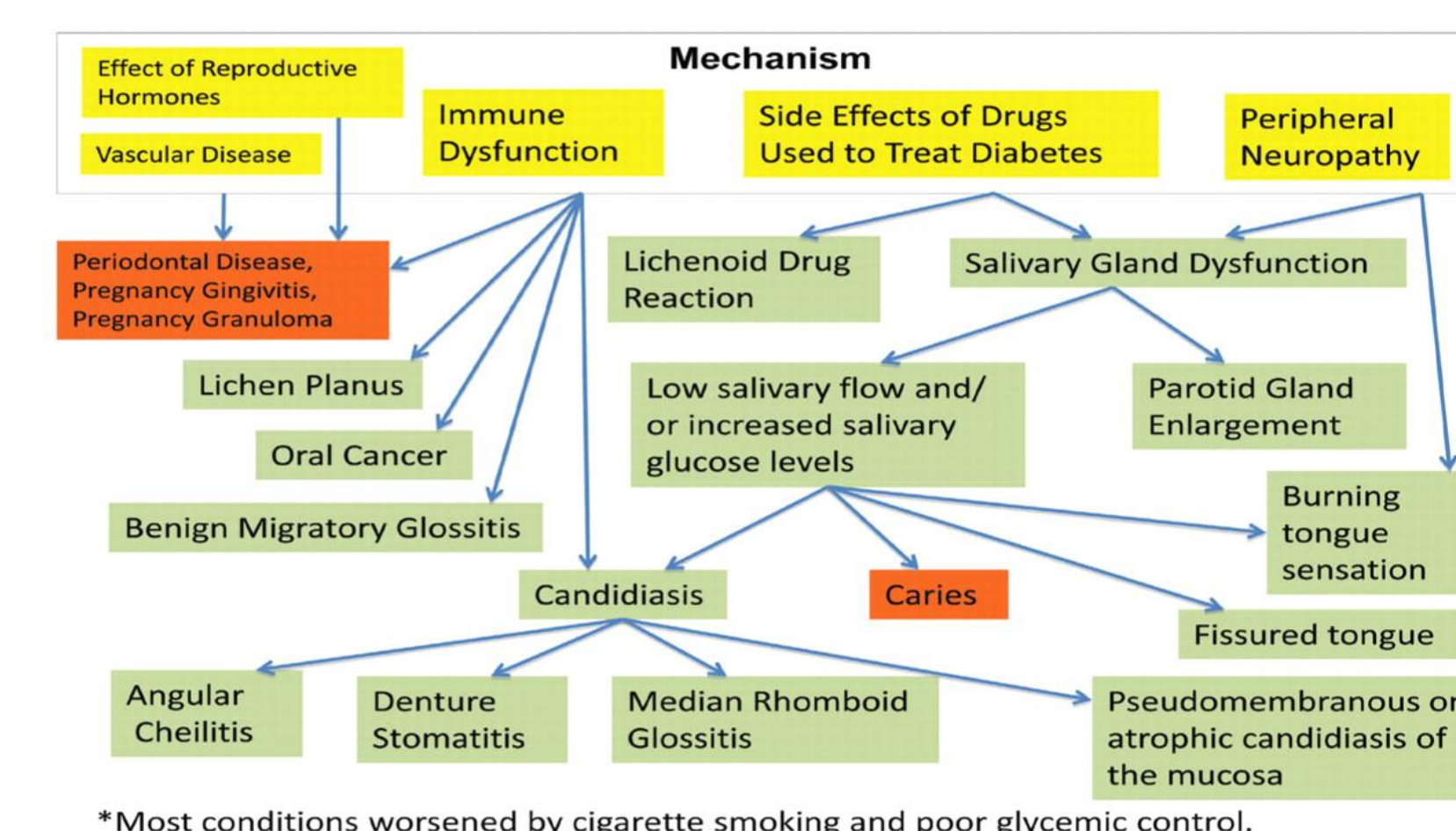
Doctors and dentists must be alert to the various oral manifestations of diabetes in order to make an accurate diagnosis and treatment.

Patients who suffer from diabetes and are in need of oral rehabilitation require extra care when it comes to their oral treatment because the repeated use of dentures can cause oral lesions.

Oral lesions are more common when there is a poor oral hygiene.

A proper fabrication and hygiene of a denture is crucial in order not to compromise the oral mucosa and general health of the patient.

Oral manifestations of diabetes and their mechanisms and interrelationship



*Most conditions worsened by cigarette smoking and poor glycemic control.

Acknowledgements

Doctor Burney Croll, Prosthodontist
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