

Contents

About the authors

Case 1	Systemic disease associated with gingival hyperplasia	1
Case 2	Surgical crown lengthening of the anterior maxilla	7
Case 3	Tooth sensitivity and aesthetic defects due to gingival recession	13
Case 4	Combined orthodontic tooth movement/ Periodontal surgery to expose an anterior crown margin	19
Case 5	Gingival enlargement	23
Contributor's comments		33

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Systemic disease associated with gingival hyperplasia

Introduction

Diabetes mellitus (DM) is a complex entity whose most common characteristic is that of impaired glucose tolerance as well as impaired carbohydrate and lipid metabolism¹. DM can occur as a result of a deficiency in endogenous insulin levels or an impairment in the body's ability to utilise insulin. The disease can be divided into two sub-categories, Type 1 and Type 2. Type 1 (formerly known as insulin-dependant) diabetes is thought to be associated with an auto-immune or virally mediated destructive process of the beta cells of the Islet of Langerhans in the pancreas. Often, this condition occurs rapidly and affects younger individuals. Type 2 (formerly known as non-insulin dependant diabetes) is thought to be due to a 'relative' lack of insulin, associated with an alteration in the cell receptor function. Patients are thought to be 'insulin resistant' rather than 'insulin deficient'².

Clinical symptoms associated with diabetes include the classic triad of polyuria, polydypsia and polyphagia. These symptoms appear more pronounced in Type 1 diabetics and may also include rapid weight loss. Systemic complications associated with diabetes are the result of long-term exposure to hyperglycemia. These include retinopathies, nephropathies and neuropathies. As well, microvascular disease and impaired wound healing is also noted. This may ultimately lead to chronic renal disease, peripheral loss of sensation and blindness. Diabetic nephropathy may also lead to an increased incidence of hypertension³. Patients are also much more susceptible to infections.

The discovery of insulin by Banting and Best in 1921 has helped to preserve the lives of millions of diabetic patients. The goal of treatment is designed to reduce blood glucose levels and ultimately prevent the long-term complications associated with the disease. For Type 1 diabetics, injectable insulin is necessary on a daily basis. Many Type 2 diabetics attempt diet control by reducing their sugar and fat intake. Oral hypoglycemics such as Glyburide may assist in stimulating endogenous insulin release, while medications such as Metformin act to increase tissue insulin receptor sensitivity without actually increasing the level of insulin production. However, should this method be insufficient to manage the condition, many Type 2 diabetics do require insulin therapy to assist in reducing blood glucose levels. Insulin is administered via injection and is available in four forms: a rapid-acting form, a short-acting form (regular and semilente) an intermediate-acting form (NPH-neutral protamin Hagedorn) and a long-acting form (ultralente). Based on the severity of the condition and the response to therapy, different combinations will be utilised to provide appropriate glycemic control⁴.

The most conventional means of diagnosing and monitoring diabetes is through blood tests. A random blood glucose level is often used as a screening tool in the general population. Traditionally, a

fasting blood glucose level greater than 126 mg/dl is considered as the standard for diagnosis. This test is usually repeated on a subsequent day. Monitoring of the relative control of the diabetic condition is provided by a glycated hemoglobin test. The glycated hemoglobin measures the amount of glucose that is irreversibly bound to hemoglobin. This value is proportional to the circulating blood glucose level and gives insight into the relative control of the diabetic condition over a 30-90 day period. There are two types of glycated hemoglobin tests available, the HbA1 and the HbA1c. The normal range for HbA1 is 8.0% and for the HbA1c is between 6.0% and 6.5%⁵.

The association between periodontal disease and diabetes has been well established for many years. The extent of periodontal disease appears to be associated with diabetics with more advanced systemic disease and poorer diabetic control whereas those under good diabetic control tend towards disease incidence and severity that more approximates the general population. An increased number of infections as well as poor wound healing are characteristics found in poorly controlled Type 1 and Type 2 diabetics.

Treatment of the diabetic patient should include, as routine, addressing any acute dental/periodontal infections. There is some evidence to suggest that periodontal infection may, in fact, exacerbate glycemic control. The use of antibiotic therapy is not necessary under routine dental conditions. However, to assist in the control of acute infection, systemic antibiotics may be indicated. Additionally, as wound healing is compromised, additional precautions following periodontal/oral surgery may be indicated on an individual basis.



Figure 1

History

A 33-year-old woman presented with a chief complaint of “swollen” gums. The problem gradually worsened over an eight-month period whereby the patient complained of “swelling and pain with eating”.

At the time of presentation, the patient denied the presence of any medical condition. No medications were taken, although the patient did admit that it had been “many years” since her last physical examination.

The patient’s dental history was sporadic in that she had not had any dental care for the past five years. Her reason for presentation to a dentist was to deal with the swollen gums. When the initial sanative therapy produced little response, the patient was referred for a specialty assessment.

Findings

The clinical examination revealed no significant extra-oral signs. There were no palpable lymph nodes present. The intra-oral examination revealed a moderately restored dentition. However, severe gingival hyperplasia was present throughout the mouth and was especially noticeable in the vicinity of plaque deposits, which were heavy and generalized. The tissue was quite fibrotic and bled easily on probing. Pocket depths were generally in the range of 6 to 8 mm. A 12 mm pocket was noted on the buccal of 36. Localised areas of recession were also noted. Although there was significant attachment loss, there was little mobility noted. A full mouth series of radiographs revealed generalized moderate horizontal bone loss. A periapical lesion was noted in association with tooth 36. This appeared to be of periodontal origin, as there were no restorations noted on this tooth. From this examination, it appeared that this patient was suffering from generalised aggressive moderate periodontitis. In order to assess the condition further, it was recommended that the patient undergo a medical examination. As well, immunofluorescence testing of the subgingival microbiota was also performed.

The results of the immunofluorescence testing indicated the presence of high levels of *Porphyromonas gingivalis* as well as *Actinobacillus actinomycetemcomitans*. However, the medical evaluation, which included a complete blood count as well as a glycated hemoglobin assessment, revealed the presence of elevated levels of glucose in the blood. In fact, the glycated hemoglobin was 23.6% (normal range ???-???). Given this finding, a differential diagnosis, which included diabetes mellitus, was made. The patient was referred to an endocrinologist, who confirmed the diagnosis of Type 2 diabetes. Given the severity of the condition, the patient was placed on insulin therapy. In conjunction with the medical management of the case, dental care was also undertaken. The patient underwent four one-hour sessions of scaling and root planing under local anaesthesia. Metronidazole, 500 mg given twice daily for ten days was also prescribed in order to address the significant bacterial accumulations.

References

- American Academy of Periodontology Position Paper, Diabetes and Periodontal Disease, *J Periodontol* 2000;71:664-678.
- Atkinson MA, Maclaren NK. *What causes diabetes?* *Sci Am* 1990;263:62-63, 66-71.
- Teuscher A, Egger M, Herman JB. *Diabetes and hypertension: Blood pressure in clinical diabetic patients and a control population.* *Arch Intern Med* 1990;150:169-172.

Mealey BL. *Impact of advances in diabetes care on dental treatment of the diabetic patient.* Compend Contin Educ Dent 1998;19:41-58.

Piche JE, Swan RH, Hallmon WW. *The glycosylated hemoglobin assay for diabetes: Its value to the periodontist. Two case reports.* J Periodontol 1989;60:640-642.

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